



# MONTHLY REPORTS

OF THE

# DEPARTMENT OF AGRICULTURE

FOR

THE YEAR 1874.

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NEW YORK  
BOTANICAL  
GARDEN



WASHINGTON:  
GOVERNMENT PRINTING OFFICE.  
1875.

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1874

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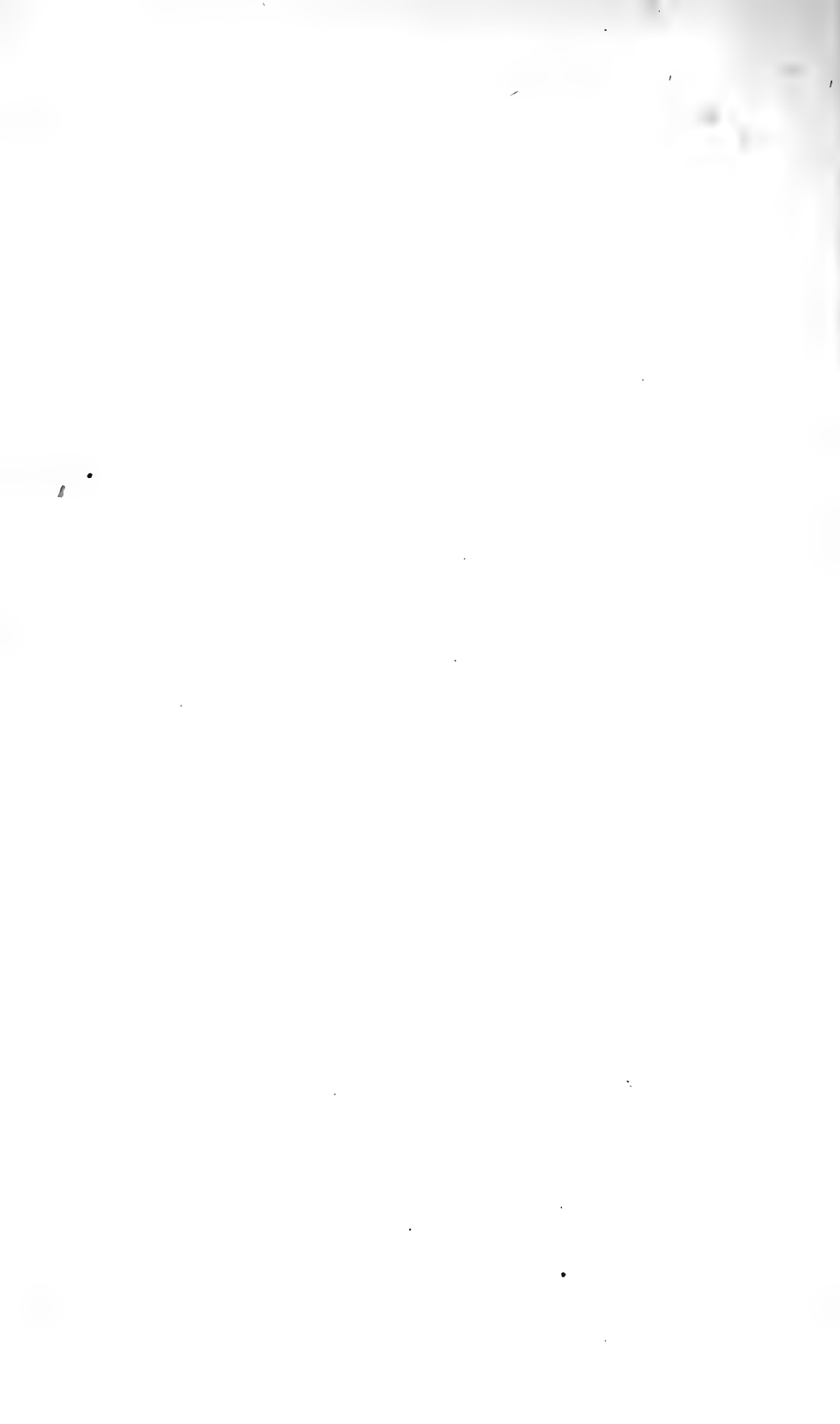
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MONTHLY REPORT

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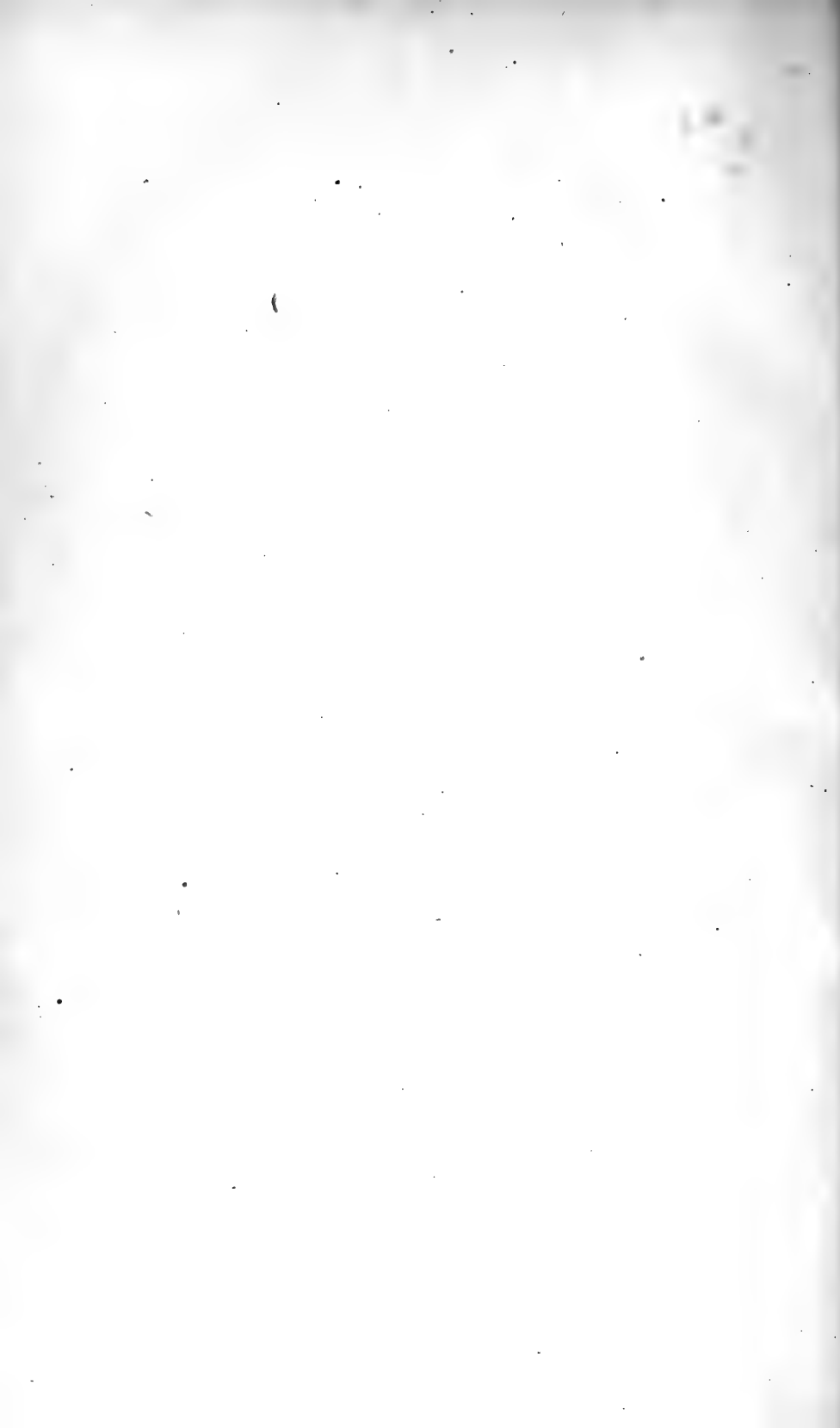
DEPARTMENT OF AGRICULTURE

FOR

JANUARY, 1874.



WASHINGTON:  
GOVERNMENT PRINTING OFFICE.  
1874.



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# MONTHLY REPORT.

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DEPARTMENT OF AGRICULTURE,  
*Statistical Division, January 26, 1874.*

SIR: I herewith submit for publication my report of agricultural statistics for the present month of the current year, including an investigation concerning prices and yields of farm crops, and comparative numbers of domestic animals in the several States on the 1st of January, with the average prices of each kind for each State, together with a review of recent advances in agricultural science in its practical application, and a record of current work of the several branches of the Department service.

Respectfully,

J. R. DODGE,  
*Statistician.*

Hon. FREDERICK WATTS,  
*Commissioner.*

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## PRICES OF FARM PRODUCTS AND FARM ANIMALS.

The annual investigation concerning yields and prices of principal farm productions, and of numbers and prices of the animals of the farm has been completed, with results as indicated in the following paragraphs.

**YIELD.—Corn.**—There is no State in which corn is a crop of any general importance which reports the yield of last year. Only Massachusetts, Florida, West Virginia, Oregon, and California maintain their previous rate of production. The decline is considerable in all sections of the country, but is greatest in the heart of the corn-growing region. The lowest rate in the Western States is 21 bushels in Illinois. The estimated average in Kansas is 22.5; in Missouri, 23.5; in Nebraska, 25.7; Iowa, 29; Indiana, 29.6; Wisconsin, 30; Michigan, 31. In the Gulf States the usual yield is less than in other portions of the country; the decline from last year is generally heavy. The yields of Arkansas and Tennessee, which ordinarily produce more heavily than any of the other Southern States, are, respectively, 23.5 and 22.5. The rates in the following States bear an increasing ratio from east to west: South Carolina, 9.5; Georgia, 12.3; Alabama, 14.5; Mississippi, 15.5; Louisiana, 16.5; Texas, 19. The corn-fields of these States have undoubtedly some of the richest soil in the country, yet the product is small in com-

parison with the yield of the Miami and Sciota bottoms and the prairies of Illinois; many have thought that thin planting—a single stalk in a hill—has some influence upon this result. In the Middle States the reported yield is less by one-eighth than last year. In New York from 37.5 to 31 bushels; in Pennsylvania, from 39 to 35.1; and in New Jersey, from 39.5 to 36. The highest estimated average this year is 41 bushels in California; the lowest, 9.5 in South Carolina. The estimated quantity of the crop of 1872 was 1,092,719,000 bushels; its area 35,526,836 acres; average yield, 30.7 bushels. The average yield in 1873 is 23.3 bushels per acre.

*Wheat.*—The yield of wheat in New England is a little less than last year; is materially larger in the Middle States and in Maryland, smaller in all the Southern States and in West Virginia, and north of the Ohio and west of the Mississippi the average yield is larger, the main improvement being in Illinois, Missouri, Kansas, and Nebraska. The rate of production in California is less. The yields of wheat-growing States are reported as follows: Ohio, 12 bushels; Michigan, 12.2; Indiana, 12.3; Illinois, 13.5; Wisconsin, 16.5; Minnesota, 16.8; Iowa, 13; Missouri, 12.8; Kansas, 15.5; Nebraska, 15.5; California, 13.5. In the South the range is from 5.5 in South Carolina to 17 bushels in Texas. The highest yields are 19 bushels in Oregon and Massachusetts, (in the latter State the whole area is scarcely equal to one of the larger class of western farms,) and the smallest in South Carolina.

*Other grains.*—The average yields of rye and barley are less than in 1872 in nearly all the States; and the rate of production in oats is also reduced in many States; yet it is placed at higher figures in Wisconsin, Missouri, and Kansas in the West, and in all of the Middle States. The figures for the principal interior States are: Ohio, 27 bushels; Michigan, 30.2; Indiana, 25; Illinois, 30; Wisconsin, 35; Minnesota, 36.3; Iowa, 33; Missouri, 28; Kansas, 33; Nebraska, 30.

*Potatoes.*—The rate of yield of this esculent is low for most of the States. The highest yields are in New England and New York, being 100 bushels or more in all but Rhode Island and Connecticut, and 130 in Oregon, no other States reaching a higher figure than 97. In the South the range is from 60 in Louisiana to 94 in North Carolina, next to the latter coming Florida, Texas, Mississippi, and Alabama.

*Hay.*—The yield of hay per acre differs little from that of 1872. The rate is highest in Texas, 1.5 tons; in Oregon and Nebraska, 1.4; 1.38 in Minnesota; 1.37 in California; 1.3 in Wisconsin and Kansas; 1.27 in Mississippi; 1.25 in Iowa, Missouri, Illinois, Indiana, and Tennessee; 1.23 in Kentucky; 1.20 in North Carolina, Alabama, and Louisiana; 1.18 in Arkansas; 1.15 in Michigan and Pennsylvania; 1.10 in Vermont, South Carolina, and West Virginia; 1.09 in Connecticut; 1.05 in Ohio, Georgia, and New Hampshire; 1.04 in Massachusetts; 1.03 in New Jersey; 1.02 in New York; 1 in Maryland and Virginia; .95 in Rhode Island; .93 in Maine; .81 in Delaware.

PRICES OF FARM CROPS—*Corn.*—The effect of a diminished yield of corn is a marked increase in its price, notwithstanding the average quality is inferior. The prices given are not those of principal commercial cities, but the average of local prices in the home markets of each county—the prices received by farmers at home rather than those paid by buyers in the great marts of trade. The difference between the rates of this and the previous season, from the Missouri to the sea-board, may be gathered by reference to the figures for the following States:

	December, 1873.	December, 1872.
New Jersey .....	62 cents.	62 cents.
Pennsylvania .....	60 "	60 "
Ohio .....	42 "	34 "
Indiana .....	40 "	29 "
Illinois .....	32 "	24 "
Iowa .....	31 "	18 "
Nebraska .....	28 "	18 "

In New Jersey and Pennsylvania there has been no increase. The difference is greatest in Iowa and Nebraska, the advance being 72 per cent. in Iowa, 55 in Nebraska, 33 in Illinois, 37 in Indiana, and 20 in Ohio. The greatest glut of last year's crop was in Iowa, the more eastern States having a larger proportion of farm stock to feed and fatten. In New York the average price of home-grown corn is the same as last year, and about the same in the New England States; in some of them even lower this year. The New York City prices of western corn were in January last 65 to 66 cents; this season 78 to 85. It should not be forgotten that the prices given in the Atlantic States are those for home-grown corn, which commands higher prices than that brought from the West. In the northwest where the quantity grown is only equal to the requirements for home consumption, the price is little higher than last year; in Wisconsin 44 against 40 last year; Minnesota 41 against 36 last year. In Texas the advance is from 43 to 80 cents; in Tennessee and Arkansas the increase is material, but in the other States of the South the difference is comparatively slight.

The shipments of corn being almost inappreciable portions of the crop in nine counties out of every ten, the home prices of different counties, especially in all Western States, vary greatly with the variations in home demand and supply. In Pope and Pulaski, Illinois, the price returned is 50 cents; in Mason and La Salle but 22 cents; in Kankakee and Jersey, 25 cents; in Putnam and Ford, 28; most of the others ranging between 30 and 45. Of 55 counties reporting in Illinois, 31 return above 30 cents per bushel.

A similar range is observed in Iowa—Adams, Union, and Fremont, reporting 20 cents; Allamakee, Emmett, Plymouth, and Winnesheik, 50 cents; Dubuque and Chickasaw, 45; Buenavista, Calhoun, Crawford, Clayton, Clinton, Fayette, Jackson, Humboldt and Woodbury, 40.

The influence of prominent towns on prices of corn suggests the advantages of local bodies of consumers in the heart of the producing region, and offers a hint toward the problem of better remuneration, which no increase of transportation facilities can equal in promised efficacy. Comparing the prices from Ohio to Nebraska, they are found lowest where the smallest proportion of the population are engaged in industries outside of agriculture. The rapid increase of mechanical, manufacturing, and mining industry in the Ohio basin, illustrates the feasibility of a more equal distribution of producers and consumers. It is well known that the amount of corn shipped from this basin is an insignificant proportion of what is produced within it. Allowing the prominent town to represent its county, as better known to those outside of the State, we have the price of corn in Dubuque, Iowa, 45 cents, 40 in Clinton, 41 in Davenport, Des Moines 35 cents, an average above 40, and very little lower than the average for Ohio, and more than 25 per cent. above the general average for the State. Nebraska has in former years obtained higher prices than Iowa, not only by the reason of the demand from immigrants before they have made a crop, but from the demand from the Territories beyond.

*Wheat.*—The price of wheat is a little lower than last year. The comparison in prominent wheat-growing States is as follows :

	1873.	1872.
	Per bushel.	
Ohio.....	\$1.31	\$1.42
Michigan.....	1.35	1.46
Indiana.....	1.22	1.32
Illinois.....	1.10	1.23
Wisconsin.....	.97	1.03
Minnesota.....	.80	.83
Iowa.....	.79	.85
Missouri.....	1.13	1.41
Kansas.....	1.00	1.42
Nebraska.....	.75	.78

The influence of a partial crop failure in 1872 is marked in Missouri and Kansas, causing great scarcity and high price. The fact that Kansas this year obtains a higher price than Wisconsin, and Missouri higher than any other State west of Indiana, shows that other causes than facilities for transportation affect the price of grain. The quantity grown in Missouri is much less than half the crop of Iowa, and is largely manufactured in her own mills. Kansas always obtains remunerative prices for wheat, because immigrants at home and in adjoining Territories absorb any surplus without necessitating a dependence on eastern markets.

*Other crops.*—Rye commands rather better prices than last year in New England, slightly lower in the Middle States, in the South variable with increase or decrease of quantity, (being saved mainly for seeding winter pastures,) and in most Western States slightly increased rates, just in proportion to the rate of yield and comparative supply.

The averages for oats are some above and others below those of last year, according to local production. The prices in prominent States as follows :

	N. Y.	Pa.	Ohio.	Ind.	Ill.	Iowa.	Mo.	Kans.
1873.....	43	43	35	32	28	27	30	23
1872.....	44	43	29	25	19	16	23	22

A reference to the tables will show a positive increase in the prices of barley in nearly all the States.

A heavy increase in the price of potatoes is observed in the Western States, while a decline is seen in the seaboard States. The comparison in the West is as follows :

	Ohio.	Mich.	Ind.	Ill.	Wis.	Iowa.	Mo.
1873.....	88	76	85	112	80	88	87
1872.....	63	63	54	46	44	22	50

The price of hay rules a little lower than last season in most of the States; rather higher in Massachusetts and New Hampshire; lower in Rhode Island and Connecticut; about the same in New York; a decline in New Jersey and Pennsylvania, a majority of the Southern, and most of the Western States. The following illustration of different sections is given as the price per ton.

	N. Y.	Va.	Ga.	Texas.	Tenn.	Ill.	Kans.
1873.....	\$18 00	\$17 20	\$20 50	\$12 75	\$15 50	\$8 75	\$3 90
1872.....	18 60	21 25	25 31	13 52	15 46	9 47	3 89

For the value of other crops in and details of local prices of the above, reference is made to the tables.

The influence of the law of supply and demand upon price—relative quantity acting with great delicacy as an indicator of value—is all-pow-

erful, and shows that it is useless for farmers to expect average returns from production much above the usual demand for consumption. It appears to be a self evident proposition; but it proves a difficult one for producers to appreciate.

## COMPARATIVE NUMBERS AND PRICES OF FARM ANIMALS.

**NUMBERS.**—*Horses* : Returns relating to the numbers and prices of farm animals in 1873 show a decrease of horses of 1 per cent. in Connecticut, Georgia, Florida, and Alabama, and 7 per cent. in California. Maine, New Hampshire, Vermont, Rhode Island, New York, New Jersey, Delaware, Maryland, North Carolina, Kentucky, Ohio, and Wisconsin report the same number as in 1872. In the remaining States the increment varies from 1 per cent. in Massachusetts, Mississippi, Louisiana, Arkansas, West Virginia, Indiana, and Illinois, to 111 in Kansas and 119 in Nebraska.

*Mules* : California reports a decrease of mules of 8 per cent; Oregon, 6 per cent.; Indiana, 5 per cent.; Iowa, Wisconsin, and Florida, 3 per cent. each; Illinois, 2 per cent.; Michigan, Ohio, Kentucky, Alabama, Maryland, and New York, 1 per cent. each. The other States show either an equal or an increased number, the maximum, 10 per cent., being in Kansas. None of the New England States make any returns under this head.

*Oxen and other cattle* : A decline of 15 per cent. is manifested in Texas; 5 per cent. in Rhode Island and Delaware; 4 per cent. in Louisiana; 3 per cent. in Connecticut, New York, Alabama, and California; 2 per cent. in Vermont, Mississippi, and Ohio; 1 per cent. in New Jersey and Kentucky. All the other States report a number fully equal to or greater than the previous year, the maximum, 20 per cent., being in Nebraska.

*Milch cows* : Nearly all the States report the number of cows as equal to or in excess of last year. Texas declines 7 per cent.; Delaware and Florida, 4 per cent.; Louisiana, 3 per cent.; Massachusetts, New York, and Alabama, 2 per cent.; Rhode Island, North Carolina, and Ohio, 1 per cent. A number equal to the previous year is found in Vermont, Connecticut, New Jersey, Maryland, Virginia, Georgia, Mississippi, Tennessee, Kentucky, and Michigan. In the remaining States an increase varies from 1 per cent. in Arkansas to 15 per cent. in California.

*Sheep* : An enormous increase, 96 per cent., is noted in Kansas, several counties having during the year developed a very considerable enterprise in sheep-husbandry. Large flocks were directly imported by resident farmers, but a very large proportion of the increase was brought in by emigrant settlers. California increased her flocks 17 per cent.; Arkansas, 10 per cent.; Maine and Texas, 8 per cent.; Nebraska, 7 per cent.; Oregon, 5 per cent.; Minnesota, 4 per cent.; New Hampshire, Connecticut, Maryland, and Wisconsin, 3 per cent.; Massachusetts, Alabama, and Michigan, 2 per cent.; Illinois, 1 per cent.; New Jersey and Ohio report a number equal to the previous year. In all the other States there is a decrease, ranging from 1 per cent. in South Carolina and West Virginia, to 12 per cent., in Louisiana and 15 per cent. in Delaware.

*Hogs* : The only States reporting an increase are Kansas and Nebraska, 6 per cent.; California and Oregon, 5 per cent.; Alabama, 3 per cent.; Delaware, 2 per cent.; Florida, 1 per cent. The greatest decrease, 15 per cent., is found in Louisiana. Tennessee declines 11 per cent.; New Hampshire and Arkansas, 10 per cent.; Ohio, 9 per cent.; Vermont, Virginia, Mississippi, Indiana, and Illinois, 8 per cent.; Texas, 7 per

cent.; Michigan and Wisconsin, 6 per cent.; Rhode Island, Pennsylvania, West Virginia, and Kentucky, 5 per cent. The remaining States show minor rates of decrease.

**PRICES.**—A general decline of prices is noted in all parts of the Union. New Jersey, however, indicates a slight advance in all kinds of farm animals.

**Horses:** An average increase in the price of horses is shown in Maine, New Hampshire, Massachusetts, Rhode Island, New Jersey, Iowa, Nebraska, and California. In Texas prices remain comparatively unchanged. In all the other States there is a decline. In Maine, Massachusetts, and Rhode Island the increase is decided. In Massachusetts the comparison is as follows:

	1 year.	2 years.	3 years.	Over 3 years.
1873.....	\$33 20	\$55 00	\$84 40	\$130 00
1874.....	40 00	66 70	95 00	142 50

The increase in New Hampshire is not great, while in Connecticut there is a small decrease. New York indicates a considerable decline, as follows:

	1 year.	2 years.	3 years.	Over 3 years.
1873.....	\$42 00	\$69 50	\$99 00	\$135 00
1874.....	38 20	63 67	92 54	125 50

New Jersey reports an increase a little greater than the decrease of New York. The South Atlantic and Gulf States show a marked decline, except in Texas, where prices remain stationary. The southern inland States and those north of the Ohio River present nearly the same indications. Ohio presents the following comparison:

	1 year.	2 years.	3 years.	Over 3 years.
1873.....	\$34 39	\$53 89	\$77 00	\$104 45
1874.....	34 17	53 80	76 75	103 81

Kentucky, Michigan, Indiana, and Illinois present a much wider variation.

West of the Mississippi River, Iowa exhibits some increase in the prices of older horses, but all the other States of this section show a marked decline. Missouri may be taken as a specimen:

	1 year.	2 years.	3 years.	Over 3 years.
1873.....	\$24 72	\$36 62	\$51 45	\$72 35
1874.....	21 25	34 00	49 64	68 75

On the Pacific coast, California shows an increase and Oregon a decrease.

**Mules:** Prices are increased in South Carolina and Iowa; in New Jersey, Texas, and Tennessee they remain about the same as in the previous year, and decline in all the other States.

**Cows:** An increase is shown in Maine, New Hampshire, Vermont, Massachusetts, Connecticut, New Jersey, Delaware, Maryland, Texas, and Tennessee; in all other States there is a decline.

**Oxen and other cattle:** The older grades of cattle show a large increase in Maine. There is a general increase in New Jersey, Virginia, Texas, Minnesota, and Iowa. New Hampshire, Massachusetts, Mississippi, and Illinois present but little change; all other States decline.

**Sheep:** An increase is shown in Massachusetts, New Jersey, Maryland, Mississippi, Texas, and Tennessee; all others decline.

**Hogs:** An increased rate of prices is noted in Maine, New Hampshire, Vermont, Rhode Island, Connecticut, New Jersey, Delaware, Mississippi, Arkansas, West Virginia, Kentucky, Ohio, Michigan, Indiana, Illinois, Iowa, Missouri, and California; the other States indicate a decline.

Table showing the average yield per acre and price of the principal crops of the United States for 1873, and the area and condition of winter grain.

States.	CORN.		WHEAT.		RYE.		OATS.		BARLEY.		BUCKWHEAT.		POTATOES. ( <i>Solanum tuberosum</i> .)	
	Average yield per acre in 1873, stated in bushels.	Average price per bushel on 1st day of Dec-ember, 1873.	Average yield per acre in 1873, stated in bushels.	Average price per bushel on 1st day of Dec-ember, 1873.	Average yield per acre in 1873, stated in bushels.	Average price per bushel on 1st day of Dec-ember, 1873.	Average yield per acre in 1873, stated in bushels.	Average price per bushel on 1st day of Dec-ember, 1873.	Average yield per acre in 1873, stated in bushels.	Average price per bushel on 1st day of Dec-ember, 1873.	Average yield per acre in 1873, stated in bushels.	Average price per bushel on 1st day of Dec-ember, 1873.	Average yield per acre in 1873, stated in bushels.	Average price per bushel on 1st day of Dec-ember, 1873.
Maine.....	84	\$0 91	11	\$1 00	14.5	\$1 15	21	\$0 58	16.7	\$0 91	17.4	\$0 72	117	\$0 52
New Hampshire.....	37.5	02	15	1 88	17.2	1 10	36	55	20	1 00	18.7	75	150	48
Vermont.....	31	85	16	1 67	16.1	95	33.6	59	33.8	86	20.5	72	140	40
Massachusetts.....	35	84	19	1 66	17	1 04	33.3	59	22	1 03	15.6	86	135	70
Rhode Island.....	28.7	92	18	1 65	16.2	97	31.3	61	25.5	1 15	18.2	98	96	81
Connecticut.....	30	94	18	1 65	1 06	1 06	32	60	23.5	1 10	19.7	77	103	54
New York.....	31	70	13.5	1 60	14.1	85	26.5	49	49	96	16.5	96	90	67
New Jersey.....	36	62	16.2	1 65	14.1	81	30.2	43	20.6	1 05	23	84	96	65
Pennsylvania.....	35.1	60	14.2	1 50	14.5	87	19.3	46	18.5	70	17.9	70	78	78
Delaware.....	19	53	11	1 08	11	87	18.8	44	18.5	70	17.9	70	71	69
Maryland.....	21.4	68	11.3	1 54	9.7	78	16.3	50	16.6	66	16.6	65	70	70
Virginia.....	19	50	7.5	1 45	8.1	85	14	85	20	2 00	10	70	74	115
North Carolina.....	14.2	64	6.2	1 55	7	60	13.4	70	13.2	1 20	10	70	78	115
South Carolina.....	19.5	94	5.5	2 25	6	1 01	13	92	13.2	1 20	10	70	78	115
Georgia.....	12.3	82	7	1 75	6	1 61	13	92	13.2	1 20	10	70	78	115
Florida.....	10.4	1 11	7	1 75	6	1 61	13	92	13.2	1 20	10	70	78	115
Alabama.....	14.5	84	7.3	1 70	9.4	1 56	13.5	78	14.4	80	10	70	78	115
Mississippi.....	15.5	85	9.6	1 75	10	1 60	14.4	86	16.3	84	10	70	78	115
Louisiana.....	16.5	90	9	1 75	10	1 60	14.4	86	16.3	84	10	70	78	115
Texas.....	19	80	17	1 40	17	1 10	30	82	30	1 04	30	80	90	1 65
Arkansas.....	23.5	80	10	1 50	12.8	1 20	23.4	70	19.2	85	10.5	95	75	60
Tennessee.....	22.5	58	7.2	1 33	9	90	20.6	41	19.2	85	10.5	95	75	60
West Virginia.....	22.5	54	9.6	1 43	12.8	81	27	34	24	92	17.1	81	70	70
Kentucky.....	29.5	44	9	1 21	8.5	77	24	36	20	1 00	15.3	86	55	62
Ohio.....	42	42	12	1 31	11	75	27	35	21.8	98	11.4	99	85	83
Michigan.....	31	47	12.2	1 35	11	75	30.5	34	18	91	14.3	78	75	76
Indiana.....	29.6	40	12.3	1 22	14.2	71	25	32	22.2	1 00	12.1	88	65	85
Illinois.....	32	32	13.5	1 10	13.5	58	30	28	23	95	12.1	99	40	40
Wisconsin.....	30	44	16.5	97	12.7	62	35	28	23.6	1 08	8.5	92	71	80
Minnesota.....	31.5	41	16.8	80	17.3	51	33	26	26.6	77	16.6	82	70	63
Iowa.....	29	31	13	79	18	48	33	27	19	73	10.5	95	44	58
Missouri.....	23.5	38	12.8	1 13	14.5	64	28	30	21	86	12.5	77	38	87
Kansas.....	22.5	31	13.5	1 00	17.5	56	33	23	23	70	9.5	80	30	94
Nebraska.....	25.7	28	13.5	75	16	53	30	23	30	82	14.5	67	28	98
California.....	41	73	13.5	1 32	20	90	30	84	26.5	85	23.5	85	110	85
Oregon.....	30	60	19	90	25	82	37.5	42	28	52	20.3	1 20	130	56

Table showing the average yield per acre and price of the principal crops, &c.—Continued.

States.	POTATOES. ( <i>Batatas edulis</i> , sweet.)		LEAF-TOBACCO.		HAY.		SORGHUM MOLASSES.		WINTER WHEAT.		WINTER RYE.		WINTER BARLEY.	
	Average yield per acre in 1873, sta.	Average price per bush. on 1st day of Decem. ber, 1873.	Average yield per acre in 1873, sta.	Average price per pound on 1st day of Decem. ber, 1873.	Average yield per acre in 1873, sta. and hundredths.	Average price per ton on 1st day of Decem. ber, 1873.	Average yield per acre in 1873, sta.	Average price per gallon on 1st day of Decem. ber, 1873.	Average area sown compared with 1872.	Condition of the crop compared with an aver. age.	Average area sown compared with 1872.	Condition of the crop compared with an aver. age.	Average area sown compared with 1872.	Condition of the crop compared with an aver. age.
Maine.....	83	\$1.94	1,750	.23	1.02	18.00	99	102	98	100	100	100	90	100
New Jersey.....	82	1.48	1,375	12.3	1.15	17.80	137	\$0.57	101	102	99	101	100	102
Pennsylvania.....	82	1.75	700	7.7	1.00	19.00	75	.50	103	103	97	103	100	100
Delaware.....	108	1.06	700	7.7	1.00	17.30	80	.60	100	100	97	100	99	99
Maryland.....	87	75	650	3.2	1.20	13.00	73	.48	106	99	100	99	100	99
Virginia.....	98	35	597	9	1.10	27.00	40	61	85	100	95	100	95	100
North Carolina.....	81	85	57	30.7	1.05	20.50	69	52	111	100	101	100	101	99
South Carolina.....	90	57	700	42.5	1.20	18.50	200	50	118	100	148	100	156	101
Georgia.....	130	50	700	43.6	1.27	20.25	113	71	98	108	60	100	60	100
Florida.....	107	59	337	71	1.30	17.50	95	71	118	106	98	107	116	109
Alabama.....	105	74	725	26.2	1.50	12.75	76	65	148	110	93	100	93	100
Louisiana.....	130	79	650	15.2	1.18	16.00	80	53	102	102	95	100	112	102
Texas.....	119	75	675	6	1.25	15.50	76	58	108	101	97	99	91	102
Arkansas.....	85	67	775	9.3	1.10	14.00	81	81	107	102	95	100	95	100
Tennessee.....	114	1.13	730	7.9	1.23	13.00	73	52	107	102	95	100	97	96
West Virginia.....	78	85	1,000	5.5	1.05	14.61	86	64	107	107	99	99	100	105
Kentucky.....	77	1.48	700	6	1.15	14.00	85	54	103	102	106	100	98	102
Ohio.....	76	1.17	700	9	1.25	11.50	85	54	102	102	97	100	98	102
Michigan.....	110	1.47	775	6	1.35	8.75	61	57	118	103	86	97	86	97
Indiana.....	70	1.55	700	9	1.30	9.50	73	68	106	106	86	97	86	97
Illinois.....	110	1.55	800	8.8	1.38	5.60	68	68	106	106	86	97	86	97
Wisconsin.....	69	1.55	800	8.8	1.55	6.25	71	58	119	114	105	105	98	103
Minnesota.....	76	1.80	800	8.8	1.30	3.90	85	48	108	108	105	105	98	103
Iowa.....	57	1.35	800	8.8	1.40	4.50	71	65	108	108	105	105	98	103
Missouri.....	76	1.80	800	8.8	1.40	4.50	71	65	108	108	105	105	98	103
Kansas.....	57	1.35	800	8.8	1.40	4.50	71	65	108	108	105	105	98	103
Nebraska.....	133	1.13	1,400	16.50	1.40	16.50	1,400	16.50	1,400	16.50	1,400	16.50	1,400	16.50
Nebraska.....	133	1.13	1,400	16.50	1.40	16.50	1,400	16.50	1,400	16.50	1,400	16.50	1,400	16.50
California.....	133	1.13	1,400	16.50	1.40	16.50	1,400	16.50	1,400	16.50	1,400	16.50	1,400	16.50
Oregon.....	133	1.13	1,400	16.50	1.40	16.50	1,400	16.50	1,400	16.50	1,400	16.50	1,400	16.50



Table showing the relative percentage of numbers and prices of farm stock in January, 1874, as compared with the returns of January, 1873.

States.	HORSES.				MULES.				MILCH COWS.			
	Total number of horses compared with that of January, 1873.	Average price per head under 1 year old.	Average price per head between 1 and 2 years old.	Average price per head over 2 years old.	Total number of mules compared with that of January, 1873.	Average price per head under 1 year old.	Average price per head between 1 and 2 years old.	Average price per head over 2 and 3 years old.	Total number of milch cows compared with that of January, 1873.	Average price per head over 3 years old.	Average price per head at this time.	
Maine.....	100	\$32 50	\$54 75	\$81 63	1113 50	.....	.....	.....	104	.....	\$37 50	
New Hampshire.....	100	79 00	51 60	79 00	110 70	.....	.....	.....	103	.....	38 00	
Vermont.....	100	28 60	49 33	73 66	106 00	.....	.....	.....	100	.....	35 50	
Massachusetts.....	101	40 00	66 70	95 00	142 50	.....	.....	.....	98	.....	45 00	
Rhode Island.....	100	35 50	67 33	98 33	132 00	.....	.....	.....	99	.....	41 65	
Connecticut.....	99	34 50	61 25	87 50	137 50	.....	.....	.....	100	.....	42 50	
New York.....	100	38 20	63 67	92 54	125 50	.....	.....	.....	98	.....	30 50	
New Jersey.....	100	53 77	88 43	122 65	150 85	101	\$40 42	\$110 00	100	.....	45 75	
Pennsylvania.....	102	40 11	68 33	80 08	130 02	100	46 80	114 45	102	.....	33 25	
Delaware.....	100	38 00	60 00	80 00	115 00	100	40 00	62 50	96	.....	33 50	
Maryland.....	100	30 33	61 50	83 88	112 50	99	45 00	105 00	100	.....	31 00	
Virginia.....	102	20 68	49 43	74 86	100 50	101	38 12	94 17	100	.....	23 00	
North Carolina.....	100	28 47	59 02	81 64	103 26	102	43 64	60 22	100	.....	15 50	
South Carolina.....	102	36 00	60 43	87 50	115 80	100	45 00	106 00	102	.....	21 83	
Georgia.....	99	38 50	61 40	84 20	110 50	100	44 25	120 24	100	.....	18 54	
Florida.....	99	37 82	64 50	84 50	124 33	97	46 00	106 50	96	.....	14 32	
Alabama.....	99	30 52	50 96	70 64	98 50	99	40 00	87 60	98	.....	19 50	
Mississippi.....	101	32 00	48 20	72 50	102 60	100	34 13	86 10	100	.....	21 58	
Louisiana.....	101	20 00	34 66	52 83	93 33	103	36 66	83 33	97	.....	20 70	
Texas.....	104	15 40	23 10	34 13	52 00	106	25 30	54 33	93	.....	15 25	
Arkansas.....	101	25 80	37 50	58 18	84 00	101	31 75	75 00	101	.....	17 75	
Tennessee.....	103	38 80	56 30	77 50	103 40	103	43 40	95 00	100	.....	21 86	
West Virginia.....	101	27 09	42 25	61 09	87 50	104	33 45	78 00	103	.....	27 50	
Kentucky.....	100	29 30	43 76	58 55	82 61	99	37 93	81 50	100	.....	26 46	
Ohio.....	100	34 17	53 60	76 75	103 81	99	36 50	87 40	100	.....	29 57	
Michigan.....	102	30 09	49 52	76 69	102 75	99	33 67	85 67	100	.....	30 50	
Indiana.....	101	28 50	44 46	69 20	85 66	95	34 41	75 69	99	.....	29 62	
Illinois.....	101	26 92	41 18	59 04	82 00	92	30 53	72 74	102	.....	30 03	
Wisconsin.....	100	30 71	46 73	65 38	97 00	97	37 69	76 50	104	.....	26 93	
Minnesota.....	107	30 48	48 06	72 53	105 90	102	34 72	78 50	108	.....	26 27	
Iowa.....	102	27 81	42 11	62 66	88 49	97	34 72	76 50	106	.....	30 45	
Missouri.....	103	21 25	34 00	49 64	68 75	100	30 26	66 00	90 01	.....	22 45	
Kansas.....	111	35 70	53 33	70 26	110 29	109	29 62	45 86	108	.....	25 30	
Nebraska.....	119	27 70	46 87	69 50	101 66	108	36 40	54 54	109	.....	29 50	
Nebraska.....	93	20 38	30 35	43 82	71 44	92	19 60	36 50	115	.....	35 28	
California.....	107	19 00	27 71	39 37	63 57	94	18 33	30 50	105	.....	24 42	

Table showing the relative percentage, &c.—Continued.

States.	OXEN AND OTHER CATTLE.						SHEET.			HOGS.		
	Total number of oxen and other cattle compar'd with that of January, 1873.	Average price per head under 1 year old.	Average price per head between 1 and 2 years old.	Average price per head between 2 and 3 years old.	Average price per head over 3 years old.	Total number of sheep compar'd with that of January, 1873.	Average price per head under 1 year old.	Average price per head over 1 year old.	Total number of hogs compar'd with that of January, 1873.	Average price per head under 1 year old.	Average price per head over 1 year old.	
Maine.....	107	\$12 33	\$21 75	\$35 40	\$64 93	108	\$3 12	\$1 02	97	\$8 83	\$17 58	
New Hampshire.....	100	10 40	20 00	34 60	62 00	103	3 40	4 20	90	10 20	20 80	
Vermont.....	98	9 00	16 50	30 00	55 50	90	2 63	3 90	92	7 95	14 50	
Massachusetts.....	101	11 20	20 80	35 60	64 50	102	3 00	4 40	97	11 00	18 75	
Rhode Island.....	95	12 00	18 66	34 00	63 00	92	3 40	4 60	95	11 80	19 50	
Connecticut.....	97	12 00	21 00	33 67	62 00	103	4 05	4 50	97	11 40	19 25	
New York.....	97	8 64	16 71	27 54	44 40	97	2 75	3 57	97	5 96	13 04	
New Jersey.....	99	12 81	22 00	33 63	49 00	100	4 83	5 24	99	8 60	15 35	
Pennsylvania.....	101	9 40	16 36	27 50	40 50	99	3 30	3 50	95	5 10	11 20	
Delaware.....	95	9 50	15 25	21 50	33 50	85	3 00	3 00	102	6 50	7 75	
Maryland.....	100	9 75	15 00	22 50	34 30	103	3 68	4 67	97	4 79	9 90	
Virginia.....	100	6 82	11 96	19 00	27 97	95	2 40	3 07	92	2 75	5 80	
North Carolina.....	100	3 87	6 50	10 26	15 50	95	1 16	1 68	97	2 17	4 93	
South Carolina.....	103	5 20	8 75	12 35	17 50	99	1 40	2 00	97	3 00	6 77	
Georgia.....	101	4 20	7 40	11 15	15 18	93	1 20	1 72	96	2 25	4 90	
Florida.....	100	4 50	6 75	10 35	14 60	97	1 30	1 72	101	1 80	4 09	
Alabama.....	97	5 50	8 00	12 80	18 00	102	1 16	2 04	103	2 12	5 16	
Mississippi.....	98	4 60	7 60	12 00	16 00	92	1 47	2 08	92	2 73	5 70	
Louisiana.....	96	4 10	6 50	9 88	15 75	88	1 14	1 94	83	2 20	6 23	
Texas.....	85	3 15	5 45	8 36	12 00	108	1 36	2 24	93	2 12	5 10	
Arkansas.....	102	4 33	7 30	11 00	17 50	110	1 41	2 15	90	2 03	5 69	
Tennessee.....	101	6 25	9 00	13 60	21 50	94	1 58	2 26	89	2 39	5 20	
West Virginia.....	103	8 10	15 80	22 74	34 52	99	1 88	2 73	95	2 82	6 28	
Kentucky.....	99	7 66	13 17	22 03	35 67	98	2 00	2 75	95	2 40	5 90	
Ohio.....	98	9 40	16 25	27 00	40 30	100	2 00	3 10	91	3 40	9 12	
Michigan.....	101	7 66	14 48	24 00	41 24	102	1 77	2 71	94	3 68	8 12	
Indiana.....	102	7 75	14 36	17 50	37 28	96	2 00	2 87	92	3 62	7 95	
Illinois.....	101	9 68	16 75	26 06	39 20	101	2 00	2 76	92	3 28	8 50	
Wisconsin.....	101	7 47	13 35	20 85	34 73	103	1 85	2 85	94	3 41	7 41	
Minnesota.....	105	7 75	13 84	23 72	37 95	104	2 10	3 05	96	3 60	8 35	
Iowa.....	104	9 10	15 61	24 80	35 50	96	1 55	2 66	96	3 60	8 50	
Missouri.....	103	6 63	11 66	18 48	29 40	98	1 29	2 11	98	2 40	6 00	
Kansas.....	111	6 73	13 00	19 50	28 99	106	1 35	2 30	106	4 00	8 52	
Nebraska.....	130	7 50	13 67	23 67	37 56	107	1 40	2 50	106	3 17	6 52	
California.....	97	9 20	14 58	22 17	29 47	117	1 72	2 51	105	5 05	9 50	
Oregon!.....	100	6 14	11 80	17 75	26 14	103	1 36	2 68	103	1 80	4 00	

## CONDITION OF WINTER-GRAIN.

A voluntary return of the condition and comparative area of winter-grain has been quite general in connection with the regular returns of this season of the year, relative to numbers and prices of farm-stock. The indications are more than usually favorable, both for a larger area in wheat and a better promise of vigorous and healthy growth. The early-sown was, in some counties in Maryland, attacked by the fly, and in Virginia the sowing was often too late for a vigorous start before cold weather set in; but the real difficulties there, as indicated by correspondents, are mainly poor preparation and fertilization of the soil, well-cultivated fields yielding three times the general average. In the South a larger area in wheat is indicated; its growth is generally vigorous, so much so in many instances as to be fed down by cattle; and in the Carolinas and Tennessee frequent reference is made to better preparation of the soil.

The condition of winter-grain in the great wheat-growing States is generally good, with an apparent increase of area more than equaling the annual increase of population. In some counties of Illinois the chinch-bug pest is still prevalent. A more general use of the drill is apparent, and some indications of progress in the direction of better culture. The open winter may affect the promise unfavorably.

### WINTER-WHEAT.

MAINE.—*Androscoggin*: Injured by worms.

PENNSYLVANIA.—*Armstrong*: Never looked better. *Butler*: All sown in due season, and looks excellent. *Chester*: Looks quite promising. *Bucks*: Looks remarkably well. *Lycoming*: Looks very promising. *Erie*: Unusually good.

MARYLAND.—*Saint Mary*: All wheat sown in September has been attacked by the fly. *Washington*: Looks promising; no fly has yet made its appearance. *Anne Arundel*: Very fine, but rumors of much fly in early-sown. *Baltimore*: The late excellent wheat-crop encouraged farmers to plant a large area this fall. The early-seeded is seriously injured by the Hessian fly in some localities. The area sown is estimated at about 21,000 acres.

VIRGINIA.—*Buckingham*: Presents an unpromising appearance; one-third of the crop not yet up; about one-tenth of the area intended for wheat has not been sown. *Henrico*: Looking badly; making a poor start. *New Kent*: In many cases the late-sown is not yet visible. *Campbell*: Unusually late in being sown, and therefore makes but little show at present. *Middlesex*: Looking rather badly on account of a cold, wet fall; considerably damaged by fly, especially very early crops. *Northumberland*: Sowed late, mostly without fertilizers, and has made but little growth. *Orange*: The very cold autumn and late sowing on many farms explain the very poor show of wheat; the worst, perhaps, ever known; where seeded at the proper time it looks well. *Amelia*: Wheat here chiefly follows tobacco; this crop was late. Wheat, of course, was put in late; a bad spell of weather followed, so that much is not yet up; have never seen the crop look worse. *Fluvanna*: The condition as good as, or better, than usual. *Page*: Ten per cent. above last year's crop is sown in wheat, owing to a favorable fall and the extra exertion of us who are determined to work. *Prince William*: Wheat (average yield 8 bushels) will yield 25 to 35 bushels per acre in this county on lands in a good state of fertility, well cultivated. *Pulaski*: Promising. *Caroline*: The fall has been propitious for wheat. *Essex*: Fultz best; about 8,000 acres sown. Area would have been larger but for late corn, (a majority of farmers sowing corn-land.) That seeded late did not come up well. *Floyd*: Looks favorable. *Prince George*: Owing to the difficulty of procuring labor and to the extremely sickly season, many large farmers did not sow as much wheat as usual, but the deficiency has been more than made up by the number of small farmers who have seeded for their own consumption. *Rockingham*: About one-tenth of the farming land is in wheat at this time. *Dinwiddie*: We are generally sowing a larger area this season; the growing crop looks much better than it did last autumn. *Montgomery*: An exceedingly fine season for winter-wheat. Many farmers are pasturing it, thinking the growth excessive. *Bath*: Looks well. *Madison*: Later than usual, but the season favorable and it is improving.

NORTH CAROLINA.—*Jefferson*: The farmers are improving their wheat-crop very

much by preparing their land and getting better seed. The dry fall has caused the crop to look weakly and bad at present. *Person*: Not so much sown by 25 per cent. as in the last crop; the prospect rather bad. *Davie*: The young wheat is showing a fine stand and growth. *Hertford*: Not yet above the surface; the quantity seeded being below the average. *Mitchell*: The high price of seed-wheat is one reason why the area sown is not so great as last year.

**SOUTH CAROLINA.**—*Somers*: More attention than usual is given to manuring wheat, selecting good seed, and plowing it in with as much care as in the best Virginia wheat-fields. This is due to the low price of cotton. *Marion*: Now being sown; more than an average area. *Newberry*: Sowing backward; that sown in October looks well.

**GEORGIA.**—*Carroll*: A large amount being sown. *Dawson*: Sown earlier than last year and looks well. *Johnson*: Have not finished sowing yet. *McDuffie*: More sown this fall than any season since the war; the stand and appearance excellent. *Clayton*: Farmers very late in sowing wheat, and always will be when they plant so much cotton. *Lee*: Coming into notice in small plantings. *Fulton*: An increase sown; the prospect promising. *Hart*: Sowing just commenced; only a small area will be planted, because of scarcity of seed. *Douglas*: Not so much sown as last year, owing in part to scarcity of seed, high price, and no money to buy.

**ALABAMA.**—*Henry*: More attention than heretofore will be given to the cultivation of wheat. *Calhoun*: There will be 25 per cent. increase in acreage over last year; the crop not yet up; unusual care has been taken in putting it in. *Franklin*: Impossible to estimate the condition, as much of the crop is not yet up. *Randolph*: More sown and sowing than for years; some are using cotton-seed as manure.

**TEXAS.**—*Blanco*: Owing to the destruction of small grains by grasshoppers, and their appearance again this fall, farmers have sown comparatively little fall wheat; intend to sow a larger quantity of spring wheat than usual. *Burnet*: Farmers not inclined to sow as wide an area of small grains as formerly. *Collin*: Never looked better; that sown early will have to be pastured heavily, which will save much feed. *McLennan*: In consequence of the appearance of the grasshoppers in the counties west of this, and the general apprehension of their coming here, many were late in sowing wheat. *Navarro*: The acreage very small. *Red River*: Acreage largely increased; has not grown as rapidly as usual, but is improving. *Coryell*: Much larger acreage than last fall, and in fine condition. *Dallas*: Never looked more promising. *Hill*: Increased at least 15 per cent., and I never saw it look better during the eighteen years I have resided in the State. *Cooke*: Twice as many acres sown as last year, and it looks very fine. *Ellis*: The stand and appearance better than for the last five years; will pay well as a winter pasture. *Titus*: The area sown much greater than any former years; more than 200 per cent. greater than last year. The condition of the early sown compares favorably with last year. *Wood*: Area fully double that of last year, and the condition fine. *Bandera*: Very little sown, owing to scarcity of seed. *Bezar*: Ten inches high, and looks well. *Kaufman*: Very promising. *Lamar*: Looks very fine indeed. We hope to harvest our own flour-bread next year. *Upshur*: A large quantity has been sown; more than ever before, and more yet would have been if seed could have been procured. *Grayson*: The season more favorable to the crop than for several years, and it looks very fine.

**ARKANSAS.**—*Arkansas*: Very little sown for want of seed. *Franklin*: Area put in wheat ten times the average since 1862. Looks remarkably well. *Little River*: It would have perhaps been nearer the truth to put the area of winter-wheat at ten times that of last year, instead of five, but not having exact data, I have put it at five to be within bounds. *Prairie*: At least double last year's quantity of wheat has been sown, and more would have been, had not the cost of seed been so great. *Independence*: More than 100 per cent. more wheat sown than last year. *Baxter*: The most favorable fall for wheat-sowing for the last ten years, and much more has been sown. *Columbia*: Almost all the farmers have abandoned raising wheat; a few have commenced to sow again this year; seed-wheat sells at \$2.50 to \$3 per bushel. *Fulton*: Season favorable; crop looks well. *Benton*: The finest fall for sowing wheat for many years.

**TENNESSEE.**—*Greene*: The area sown would have been increased but for wet and cold weather setting in unusually early. More pains taken with the crop than heretofore. *Lincoln*: A larger area and more pains in the preparation of the soil than in 1872; good stands, looking healthy and well. *Smith*: Has come up well, and the weather is fine. *Bradley*: All in, and what is up looks well. Twice the acreage of last year. Farmers turning more attention to wheat and less to corn. *Blount*: Very large breadth sown. *Canon*: Late sown, but good stand, and looks well; acreage at least 10 per cent. above an average. *Jefferson*: Generally put in in better condition and in better time than usual; looks remarkably well. *Macon*: Generally sown late; backward; seed-wheat inferior. *Monroe*: Some of the farmers have prepared their ground for wheat better than usual. *Sullivan*: A fall favorable for the growth of wheat has brought it forward finely, wet and cool weather preventing the ravages of the fly; heavier manuring and better cultivation have inspired the belief that our

next crop will be a good one. *Wayne*: Not yet done sowing. The late sowing of wheat in this county is doubtless one cause of so small a yield, (five bushels per acre,) as those who sow early generally reap from ten to twenty bushels per acre. *Wilson*: One-third more area sown; looks well.

WEST VIRGINIA.—*Braxton*: Looking well. *Marion*: Looks very well; much better than usual at this season. *Mercer*: Sown late to avoid the grub-worm; looks rather bad.

KENTUCKY.—*Taylor*: The small quantity sown was owing to the protracted drought this fall; impossible to break up the ground; sown a month too late; hence the low condition. *Lincoln*: Season very favorable for the sowing of small grains. *Spencer*: The drought prevailing till the middle of October caused much of the wheat to be late in sowing. *Jackson*: Condition equal to or better than that of former years. *Hardin*: Has made but little growth. *Shelby*: Owing to repeated failures in the years preceding the last two, our farmers had become somewhat discouraged, but the partial success of the last crop has induced them to increase the acreage. I estimate the extent in the county at 10,000 acres. *Russell*: At least 25 per cent. more sown than usual; stand good, and looking very fine.

OHIO.—*Noble*: Good crop sown and looks well. *Franklin*: Unusual breadth sown, and it looks remarkably fair. Very early fields injured somewhat by the Hessian fly. *Medina*: More than usual put in, and put in well. *Vinton*: The prospect better than for fifteen years. *Montgomery*: Fall very favorable for sowing winter-wheat; looks much better than usual. *Williams*: Looks very well. *Adams*: Never saw wheat look so well at this season. *Coshocton*: The acres sown will approximate 27,000, and the prospect was never better. *Crawford*: More than average amount sown; looking well. *Erie*: Has not looked so well for years. *Geauga*: Looks very fine. *Delaware*: The most favorable season for many years; increased acreage and looking unusually well. *Morrow*: Almost universally sown earlier than usual, and to a great extent drilled in; looks remarkably well.

MICHIGAN.—*Calhoun*: Never looked so well, except in the fall of 1871, which preceded the best crop we ever raised both in quantity and quality. *Oakland*: Looking finely when it was in sight; well covered with snow now. *Tuscola*: Has gone into winter quarters in good condition; covered with about a foot of snow. *Washtenaw*: Looks remarkably well, (under the snow.) *Wayne*: Never looked better. *Barry*: Got a fair start; the season favorable; the ground has been covered with snow two or three weeks and not frozen. *Cass*: The fall and winter very favorable for the young wheat.

INDIANA.—*Switzerland*: Fifty per cent. more sown than in 1872. *Dubois*: Looks very well. Farmers are drilling more and more every year. *Grant*: Looks unusually well. *Franklin*: Has generally a good start, and seems free from the fly. *Harrison*: A majority of our farmers prepared the land better; are using more manure and drilling more than formerly. *Brown*: Dry weather in August and September prevented the usual crop from being sown; 30 per cent. less than average sown; looks well. *Fountain*: Prospect for a splendid yield. *Marion*: Looking well. *Stark*: Early sown; looks extremely well.

ILLINOIS.—*Clark*: The increased acreage sown this fall is safely put at 50 per cent.; many prominent farmers put it at 100 per cent., and such is the fact in some districts, but I think not for the whole county. *Ford*: Our farmers are turning their attention more to this crop than in years past. *Wabash*: Looking unusually well. *Bureau*: Looks well. *Saint Clair*: Was never put in in better order, and more was sown than usual. The early sown is attacked by myriads of chinch-bugs. *Tazewell*: Looks splendid. *Franklin*: The fall was favorable for sowing, and very much more has been sown than last year. It has a very fine appearance. *Efingham*: Growing finely. *Mason*: The area is no greater than last year, but there is a disposition to sow more spring-wheat than there has been for some time. Since the corn was gathered there has been a goodly number of acres plowed for sowing wheat next spring.

IOWA.—*Fremont*: Owing to the drought we could only sow fall grain in spots where there were showers. *Louisa*: Owing to the extreme drought of the fall but little plowing was done, and, consequently, but a limited amount of wheat was sown. The same cause retarded the growth.

MISSOURI.—*Douglas*: Looks better than for many years past, and at least 25 per cent. more sown. *Mercer*: After a drought of four months, a nice shower, about the close of November, brought the wheat out finely. *Franklin*: Far above average in acreage and condition. *Caidwell*: Very good. *Franklin*: The best prospect I ever saw at this season of the year. *Maries*: The fall the best for years for plowing and seeding to wheat. *Laclede*: Looks better than for years. *Adair*: Ten per cent. more sown than in 1872; condition above average. *Moniteau*: Exceedingly promising. *Greene*: Never looked better; many fields have too rank a growth. *Holt*: In good condition. *Caldwell*: Looking healthy. *Texas*: Looks better than I have ever seen it at this time of the year; the ground now completely covered. *Platte*: Greatly injured by the grasshoppers and grub-worms; also by the long-continued drought though

which we are now passing. *Crawford*: Looks the best of any crop for a long time. *Lawrence*: Looking much better than for the last eight years. *Carter*: The prospect better than ever known at this season. *Jasper*: Having been sown (mostly drilled) much earlier, and the ground much better prepared than usual, and the fall being very favorable, the prospect is very flattering. *Shelby*: Looks very fine; at least one-fourth more than usual sown. *Clay*: Promising. *Harrison*: A very dry fall has injured the small grain. *Nodaway*: Looking well. *Phelps*: Has been rather dry for wheat, but it looks tolerably well; about 6,500 acres sown. *Perry*: Increased acreage, and put in in superior order.

KANSAS.—*Miami*: Indications good. *Lincoln*: Looks very poor, owing to the long drought since sowing. *Marshall*: A large per cent. sown very late. *Bourbon*: Was being injured by dry weather, but a warm rain, November 24, brought relief. *Riley*: The grasshoppers and dry weather discouraged wheat-sowing. *Cherokee*: Looks unusually fine; sown earlier and the ground in better condition than usual. *Douglas*: Has suffered for want of rain, but in fair condition now. *Coffey*: Looks well, with a double amount sown. *Franklin*: That sown early looks promising; a considerable portion was sown late and is backward. *Jackson*: Quite thin on the ground, but looks well. *Lyon*: The drought since seeding has damaged the crop somewhat, but recent rains have improved it. *Neosho*: Put in early and in better shape than ever before, (mostly drilled;) looks well. *Osage*: The long-continued drought has considerably damaged the wheat crop. *Washington*: That sown in the middle of August looks well; that sown late has not had rain enough to germinate. *Woodson*: Uniformly above an average. *Wabaunsee*: Acreage greater than last year, but the great drought has reduced the prospect 50 per cent. *Ottawa*: But a small acreage sown, and that badly damaged by the dry fall. *Reno*: Looks very well, except where it was eaten by grasshoppers, on the outer edge of the field. *Smith*: In the north part of the county, looks well; in the south part, very bad.

NEBRASKA.—*Nemaha*: But little sown on account of drought. *Nuckolls*: Poor.

CALIFORNIA.—*Sonoma*: But little sown as yet, owing to want of rain. Should the season be favorable, a very large acreage, greater than ever before, will be sown. *San Luis Obispo*: No winter-seeding has yet been done, on account of having no rain. *Anderson*: No rains to date; a large area of wheat being put in by "dry-sowing." *San Joaquin*: More surface covered this fall with wheat than ever before. Prospect good for a large crop. *Tuolumne*: As there has been no rain, the winter-wheat has not started. *Mendocino*: The rains have just commenced, and no wheat has yet been sown. *Butte*: As the rain is late this year, the sowing-season will begin in December and will last till March, and later if March should prove a wet month. *San Bernardino*: No rain having fallen, but little grain is yet sown, and that on such lands as are susceptible of irrigation, and light sandy soils, which latter is called "dry-sowing." *Stanislaus*: Not yet up. First rain of the season November 23.

OREGON.—*Clackamas*: The dry fall has retarded the growth of all kinds of winter-grain; but the season for sowing winter-grain here continues from the 1st of September to the 1st of March, and, as we have ample time yet to put in a large crop, I feel well assured that the harvest of 1874, in this county, will be much larger than ever before. *Douglas*: Have had hardly rain enough to moisten the ground sufficiently for plowing; consequently very little winter-grain is yet sown. Not more than half the area sown last year will be this. *Tillamook*: Looks better than usual, with a larger acreage than last year. *Columbia*: Our farmers are putting every available acre into wheat, on account of the failure in the potato crop.

UTAH.—*Morgan*: The autumn has been so dry it was impossible to plow, except bottom-lands soaked by the river; therefore there is not sufficient winter wheat, rye, or barley sown to report. *Kane*: Winter-grain has not been sown, owing to the land being too dry to plow. *San Pete*: Not so good as last year, on account of the long dry weather. *Salt Lake*: A much larger breadth sown than in any previous season.

IDAHO.—*Nez Perce*: The fall has been too dry to sow winter-grain.

ARIZONA.—*Maricopa*: Owing to the low prices this fall, there will not nearly so much grain be sown as last year.

WASHINGTON.—*Walla-Walla*: As the fall has been remarkably dry, but little plowing and seeding has been done so far, though we look for an open winter, and expect to plow during most of it. *Clallam*: In the fall of 1872, 250 acres sown; 300 this fall.

#### WINTER-RYE.

MAINE.—*Androscoggin*: Injured by worms.

CONNECTICUT.—*New London*: In excellent condition.

PENNSYLVANIA.—*Butler*: All sown in due season and looks excellent.

MARYLAND.—*Washington*: Has a good appearance.

VIRGINIA.—*Northumberland*: Very little seeded; does not do well here. White rye seeded two years will become almost black. *Caroline*: But little yet up. *Floyd*: Looks favorable. *Montgomery*: An exceedingly fine season for winter-rye.

NORTH CAROLINA.—*Jefferson*: The dry fall has caused the crop to look weakly and bad.

SOUTH CAROLINA.—*Marion*: Now being sown; perhaps less than an average area. *Newberry*: Sowing backward. That sown in October looks well.

GEORGIA.—*Johnson*: Sowing not yet finished. *McDuffie*: More sown this fall than any season since the war. The stand and appearance excellent. *Lee*: Increased quantity sown. *Fullton*: Increased area sown, with promising prospect.

FLORIDA.—*Levy*: More being sown than usual, and sown earlier.

ALABAMA.—*Henry*: More attention will hereafter be given to the cultivation of rye.

TEXAS.—*Coryell*: Smaller acreage than last fall. Mostly sown for winter-pasturage and turned under in the spring. *Dallas*: Never looked more promising. *Titus*: Area a little above that of last year. Sown deeper than heretofore to insure against winter-killing. *Bandera*: Very little sown, owing to scarcity of seed. *Kaufman*: Very promising.

TENNESSEE.—*Bradley*: Claiming much more attention than heretofore. *Monroe*: More attention given to the growing of rye.

WEST VIRGINIA.—*Mercer*: Sown late to avoid the grub-worm. Looks rather bad.

KENTUCKY.—*Spencer*: The drought prevailing till the middle of October caused the rye to be late in sowing.

ILLINOIS.—*Stephenson*: Has got a very meager growth, owing to the dry fall. *Bureau*: Looks well. *Tazewell*: Looks splendid. *Edwards*: Almost all the rye sown is for pasture.

MISSOURI.—*Mercer*: A nice shower about the last of November brought out the rye finely. *Nodaway*: So universally pastured in the fall that it does not look as well as the wheat.

KANSAS.—*Lincoln*: Somewhat better than wheat, as it is hardier and not easily injured by drought.

#### WINTER-OATS.

VIRGINIA.—*Henrico*: Doing very well; near the city, winter-oats, sold in the sheaf, are more profitable than hay, bringing nearly as much per ton, and yielding sometimes, over four tons per acre. *Middlesex*: Looking remarkably well.

SOUTH CAROLINA.—*Marion*: Now being sown; more than an average area. *Newberry*: Sowing backward; that sown in October looks promising.

GEORGIA.—*Johnson*: Sowing not yet finished. *McDuffie*: More sown this fall than any season since the war; the stand and appearance excellent. *Liberty*: Sown pretty extensively; our farmers are sowing oats at this time and will continue to do so until March. *Early*: Now mostly sown and up, with an increase of 10 per cent. in acreage.

FLORIDA.—*Levy*: More oats than usual being sown, and sown earlier than usual.

ALABAMA.—*Henry*: More attention will hereafter be given to the cultivation of oats. *Lavaca*: Coming into notice and pay well to cultivate.

TEXAS.—*Grimes*: The cultivation assuming large proportions, but mostly for forage without thrashing. The kind known as the anti-rust-oats is the only one giving promising returns. *Bandera*: Very little sown, owing to scarcity of seed. *Kaufman*: Very promising.

#### WINTER-BARLEY.

TEXAS.—*Dallas*: Never looked more promising. *Titus*: Area, a little above that of last year; condition, average. *Bandera*: Little sown, owing to a scarcity of seed. *Kaufman*: Very promising.

TENNESSEE.—*Monroe*:—A few farmers are sowing some barley this fall.

INDIANA.—*Franklin*: Has generally a good start and seems free from the fly.

ILLINOIS.—*Tazewell*: Looks splendid.

CALIFORNIA.—*Amador*: No rains yet; a large area of barley being put in by "dry sowing." *San Joaquin*: More surface covered this fall with barley than ever before; prospect good for a large crop. *Tuolumne*: As there has been no rain the winter-barley has not started. *Mendocino*: The rains have just commenced and no winter-barley has yet been sown.

## EXTRACTS FROM CORRESPONDENCE.

PROGRESSIVE FARMING.—*Macon, N. C.*—Since the war agriculture with us has made decided progress, which is shown by the introduction of better implements, more thorough tillage, and the now rapidly-extending cultivation of clover. Unfortunately our clover is badly mixed with ribbon-grass. We need clean seed.

*Walker, Ala.*—The prospect of an improvement in the agriculture of this section is very flattering. The distribution of improved seeds from the Department of Agriculture, and the practical skill of a few good northern and English farmers are waking up quite an interest in this important industry.

*Clarke, Ala.*—Sorghum and sugar-cane are raised in a small way. More will be planted next year, and crops will be more diversified.

*Fayette, Tenn.*—Two encouraging symptoms have exhibited themselves in this county this year; farmers sowed grass during the summer, and are now sowing wheat. A diversity of crops, it is hoped, will prevail in a few years.

*Woodson, Kans.*—The wheat sown indicates a falling off in acreage from last year; but this is owing to the fact that the farmers are cultivating fewer acres and farming them better—giving to six acres the labor formerly expended on ten—plowing deeper, harrowing well, and drilling in the grain. This method of cultivating, together with early sowing, shows largely in the good condition of winter wheat, as it is now uniformly above an average.

AGRICULTURAL CHANGES AND DIVERSIFICATION.—*Pettis, Mo.*—Wheat-raising is on the decline and stock-raising on the increase; therefore, corn, oats, and other feeding-grains are invariably from 5 to 10 cents per bushel higher in the country portion of the county than at Sedalia, a shipping-station on the Pacific railroad, of 8,000 inhabitants.

*Knox, Tenn.*—There is a commendable spirit of enterprise growing up in this county. Many farmers' clubs have already been organized for the discussion of questions of practical value and for the interchange of opinions founded on individual observation and experience. These meetings are well attended and are increasing in numbers and interest. A few granges have been organized. Altogether our people are making progress, and I think they owe much to the Department of Agriculture.

*Gadsden, Fla.*—The corn-crop of this year (average 13 bushels per acre) is a little above the average of former years, but no indication of what the land is capable of producing, if our farmers could be induced to abandon an old and universal prejudice against thicker seeding. The prevailing custom is to have the rows five feet and the stalks of corn three feet apart in the drills, and but one stalk in a hill, thus securing only 2,940 stalks to the acre. The idea is that in our climate it is necessary to give great distance between the stalks to prevent the *firing* of the leaves. Convinced that this idea is erroneous, and that the firing complained of is occasioned, not by overcrowding, but by injudicious cultivation, I have made two experiments, both of which proved successful. I selected a four-acre lot of high oak and hickory ridge-land, which was cleared in 1842, and had been annually cultivated in cotton and corn ever since without any interval of rest. For several years anterior to the experiment the average yield of this lot had 15 bushels per acre, one handful of cotton-seed to the hill being used for a fertilizer. This lot was thoroughly broken up in the month of February, and about the first of March it was checked both ways with a narrow shovel-plow,  $3\frac{1}{2}$  by 3 feet, (giving 4,200 hills to the acre,) and one grain of corn dropped in each check. The fertilization was the same as in previous years, one handful of cotton-seed to the hill. In the intervals between the hills of corn on the drill I deposited one ground-pea immediately after the first working. The cultivation was done exclusively with Allen's "horse-hoe," running once in each alley and three times successively, at intervals of twenty-one days between each plowing. The result was a yield of 45 bushels of corn and 620 pounds of fodder to the acre, besides a good crop of ground-pease, upon which my porkers were fattened, and an abundant supply left for the rooting of the stock-hogs. The past season I added two acres to the lot, and observed the same programme as to distance and fertilization; but, owing to the blowing down of the corn after the first working, I was unable to give it any further cultivation; consequently the yield was reduced to 35 bushels per acre. In both experiments the ears were large and fully developed, and in neither case was there any indication of *firing*. I design to repeat the experiment annually until I shall have ascertained the maximum number of stalks that the land will sustain.

*McDuffie, Ga.*—The low price of cotton will make a great change in the farming interest of this section; more wheat, oats, and rye sown this fall than in any season since the war, and a large area will be planted in corn in the spring.

*Cobb, Ga.*—The decline in the price of cotton in November caused farmers to sow larger crops of wheat this fall than in former years. The high prices of corn and wheat have also had their influence.

*Fulton, Ga.*—The stringency of the money-market and low price of cotton have forced many of our farmers to stop following the flowing tide to financial ruin in planting nothing but cotton. There is a great change; we are now endeavoring to raise more grain; an increase of wheat has been sown this fall, the soil well prepared for its reception, and the results look very promising. The same is true of rye and barley.

*Marion, Ga.*—For the first time since the war, farmers are turning their attention to raising grain. There will be more small grain sown this fall in this county than in



any year since 1864, and a great deal more would have been sown but for the want of seed. The reason of this change is found in the uncertainty of labor. As to the freedmen, they do not like to be employed in repairing farms, but want to frolic in idleness from the time the crop is gathered until planting. They cannot be persuaded to take any interest in stock, only to kill and eat, and that by stealth.

*Oglethorpe, Ga.*—There is a large increase in the acreage in wheat, and will be, I think, in the acreage in corn next spring. The financial condition of the country has caused our farmers to turn their attention more to the production of provision-crops and less to cotton.

*Wilkes, Ga.*—More disposition to sow grain. The money-panic caused some to say they will change the practice and, hereafter, plant more corn and less cotton; but a high price of cotton in the spring would run them wild again.

*Butler, Ala.*—Cotton crops short; prices short; hard times; I think the planters will sow, next spring, a great deal more grain than ever before in this county. They will pay more attention to cereals and less to cotton.

*Franklin, Ala.*—There is really nothing raised here worth estimating except corn and cotton—the latter being the all-absorbing crop. There is now, however, a very general disposition to raise wheat, clover, etc. The very rapid deterioration of lands under the present system of farming has convinced every reflecting man that a change is a necessity.

*Barbour, Ala.*—There is a very general disposition, this fall, to sow wheat and all kinds of grain. Heretofore rye and barley have been sown for pasturage only, no seed being saved.

*Louises, Miss.*—Unfortunately we, as farmers, have devoted ourselves exclusively to the production of cotton. It is the custom of the county to buy all the horses and mules used, and but few cattle and hogs and very few sheep are raised. The changed condition of labor, and the high prices for cotton which have prevailed, have caused other crops to be made secondary to this specialty. The failure of the cotton has well nigh bankrupted the farmers this year, and will teach the wholesome lesson that an agricultural people must diversify their products, if they will become permanently prosperous.

*Spartanburgh, S. C.*—It is ruinous for our belt of country to purchase all their supplies with cotton. We never shall be prosperous under this system. A few "panics" may bring our people to raise their own supplies.

*Putnam, Fla.*—There is no doubt that we can raise our meat, horses, and mules cheaper than we can raise cotton with which to purchase them. The farmers generally see it in this light, but it takes time to get men out of an old groove which they have run in so many years; and then the hog and cattle thieves are arrayed against the change in this, that their thieving discourages stock-raising.

*Douglas, Ga.*—The farmers are not so well off, generally speaking, as they were twelve months ago. Fertilizers and provision bills secured by crop liens have pretty well absorbed the cotton crop, and left nothing to pay old debts with. Our farmers must turn over a new leaf. Before relief comes they will have to make their own fertilizers, and raise their own meat and bread, and therefore give less attention to cotton.

*Wabasha, Minn.*—Very much of the land heretofore planted to wheat is being cultivated to grasses, which are found to flourish much better than was expected a few years ago. Fewer acres of wheat are planted yearly as the country grows older.

*Franklin, Vt.*—The tendency, mentioned in my report a year ago, to reduce stock, for the purpose of selling hay for shipment, is more apparent this season than ever before, especially among the small farmers and dairymen.

**AGRICULTURAL RECONSTRUCTION NEEDED.**—*Hanover, Va.*—The unsettled condition of the business of agriculture in this part of Virginia is scarcely yet mitigated. The reports we have to make by no means represent the agricultural capacities of the region in a state of affairs even approaching a normal one. The disturbing influences are not particularized, being beyond the reach of the Department; but the decided amelioration afforded by the efforts of the Department at distributing seeds, and in disseminating facts and theories, is plainly recognized.

*Upson, Ga.*—The agricultural prospect in this section is quite gloomy; cotton, our leading product, has fallen in price below the cost of production. Before the war we grew cotton at 10 cents per pound. The increase and growth of our slaves was our chief income, but, having perfect control of the labor, we were enabled to make good crops. We now grow large cotton-crops, but it is at the expense of our grain-crops. In Crawford County, a few days since, a gentleman stated to me that there was neither meat nor corn in the county to supply the people sixty days. In Upson we have about four months' supply of corn, and perhaps three of meat. Our people have devoted themselves almost exclusively to cotton-growing, and depended entirely on buying their supplies of corn, flour, meat, molasses, sugar, tobacco, and last, though not least, commercial manures, to the utter neglect of producing any manures upon their farm. This kind of farming has been experimental, and has failed. Our people are all left badly in debt, and consequently despondency is felt throughout the land. Large numbers of farmers and

planters have abandoned their farms and embarked in other pursuits. A stranger passing through our section would be wonder-struck at the desolation and waste he would see all along the highways. Our labor system amounts to no system at all. Where proprietors have remained upon their farms, and have had the patience and fortitude to superintend in person, they have done well; but where they have been left to the control of tenants, (white or colored,) loss rather than profit has resulted. The negro is not yet capable of taking charge of a farm and conducting operations to a success. In almost every case, even where he owns the land and stock, he has failed of success. It has now become plain that, to succeed, we must diversify our crops; grow our own supplies of corn, meat, flour, and manures. Then we shall be sure not to over-stock or glut the cotton-market, and, consequently, always to realize remunerative prices for the crops. Such a diversified system would advance the interests of the freedmen and all laborers, as well as proprietors.

*Clayton, Ga.*—Our people are not yet done gathering their cotton. A great many have not commenced sowing their wheat, and they will not, probably, get through before Christmas. If our farmers would plant only half the amount they do in cotton, and put double the amount in corn, wheat, and oats, it would, undoubtedly, be much better for us. We can raise in this county 30 bushels of wheat and 50 bushels of corn per acre, and if the same interest taken in raising cotton were taken in raising grain, we should raise our own supplies, and cotton-money would be a surplus. But, as it is, it takes all our cotton-money to buy our corn, bacon, and guano, and, so, at the end of the year, we are generally as poor as we were in the beginning, and some of us poorer.

*Lowndes, Miss.*—Profiting, I hope, by the sad experience of the present and past years, we are starting to prepare for another crop, with a determination to curtail expenses and diversify crops.

*Page, Va.*—We have a great lack of farm-labor. Our boys and young men, with few exceptions, desert the labor of the farm and turn their attention to other pursuits less useful and much more demoralizing.

*King and Queen, Va.*—I hope the steady decline of our Virginia tide-water lands has reached the bottom. Good lands, worth since the war \$10 to \$15 per acre, are now selling at \$5 to \$6. Want of reliable labor, and the abandonment of the farm for almost any other kind of work, are the causes of the low state of agriculture.

*Iberia, La.*—Not ten planters in the parish have raised a sufficient quantity of corn to winter their stock, and not one-fourth of the remainder have made a sufficiency for bread for their families. Notwithstanding these facts, the negroes who have been working on shares, and who change about almost every year, are bringing in their proportion of the crop and selling it at \$1 per barrel, the average price in more prosperous times. Like his more assuming and pretentious employer, even the negro has saddled himself with debts, to pay which he must rob his family of bread. The immediate future of our parish and State is most disheartening.

*FARM-STOCK.—Sullivan, Tenn.*—Many fattening hogs are sick with the so-called cholera. Considerable numbers have died. The kidneys, so far as examined, appear to be the seat of the disease, being of a bruised, bloody mass, the leaf-fat surrounding them showing an unhealthy condition. Give us a remedy if you can.

*Livingston, Ky.*—There have been a good many deaths among hogs from a disease like cholera, though it presents itself in various forms. Some have lost nearly all their pork. A strange disease has occurred also among horses. One of my neighbors lost four, all he had; but he believes the first three died from eating green sorghum. He turned them into it in the green state, and he thinks that killed them.

*Spencer, Ky.*—The hog-cholera still exists sporadically, no other disease prevailing among stock.

*Montgomery, Md.*—The hog-disease is still raging in portions of this county. Many young hogs have died from it.

*Nueces, Tex.*—It is becoming more evident every year that cattle-raisers will have to purchase and confine their stock instead of letting them run loose and stray where they will. Wherever land has been inclosed and not overstocked, the grass is magnificent, and the owners are pasturing beef-cattle for parties who have no pastures at about 25 cents, gold, per head per month. A few days since Mr. Kennedy, of the Laurells ranche, who has a pasture of about 145,000 acres fenced in, imported a number of Durham bulls to cross with our native stock. This is a step in the right direction. The first cross is a great improvement; other parties will have to do the same or pay the penalty for their lack of enterprise with heavy losses in winter and lower prices for their poorer stock. Our people seem to be awakening to the idea of more farming and fewer cattle-ranches. If they would but study the climate, and plant more in the fall and winter, they would succeed better. Ripe tomatoes, fresh from the garden, and cucumbers from the vine, also green pease, were served in Corpus Christi Christmas-day. Two crops of Irish potatoes, also two crops of corn and beans, can be grown in one season, and all we want is skilled and enterprising labor to make this a farming as well as a stock and wool growing region.

*Putnam, Mo.*—A disease called "quivering" is prevailing among hogs, and in some localities they are dying quite rapidly. No remedy has yet been discovered.

*Cherokee, Tex.*—Why is it that in a season when bitter mast is plenty, many hogs have kidney-worms? I have several now down with them. They first commence to stagger on the hind legs, then break down entirely in the loins, and drag the hind legs on the ground until they become wholly disabled, when they starve. I refer to hogs in the woods.

*Jefferson, Ga.*—The unusual severity of last winter and the general want of comfortable protection for all cattle, resulted in a loss of at least 10 per cent. of the cattle in this county, and of about 5 per cent. of the hogs. It is lamentably true that few farmers think of stabling their cattle or preparing comfortable quarters for their hogs or sheep, but let them take the rigor of the weather as it comes. Hence a corresponding loss after a severe winter.

*Sonoma, Cal.*—The remarkable decrease in the number of horses in this county (84 per cent. compared with one year ago) is worthy of note, inasmuch as it indicates the prevailing conviction among farmers of the necessity of ridding themselves of a lot of mustangs, which are a nuisance on the farm. They eat as much feed as serviceable work-horses, without any equivalent of usefulness. Our farmers are paying much more attention to raising good horses. The lands and pastures are now mostly fenced, so that owners of mustangs are compelled to either feed and care for them, or sell them for what they can get. Much attention is also paid to the improvement of cattle, sheep, and hogs, by crossing with fine imported stock. This and the adjoining county of Mendocino are noted for producing the finest wool in the State. The large increase in the number of milch cows (175 per cent.) is owing to the fact that many potato farmers on the coast are giving up this crop as unprofitable, and devoting their farms to dairies, which experience has proved to be more profitable than raising cultivated crops, wherever the location is adapted to this branch of business.

*Franklin, Ind.*—The raising of mules, which a few years ago was common here, has almost ceased. Farmers are coming back to the use of the horse generally. An experience of twenty years with mules makes us prefer the horse for general purposes.

*Alameda, Cal.*—There has been the heaviest fall-clip of wool ever produced in the State. The most of it is now in market, but the sales have been very limited, and at reduced prices. Stock is generally looking thin, and some farm-animals are dying for want of feed. The old grasses, in large sections of the State, have become extremely short, and for the want of rain the new feed has not come forward as usual. Cattle have been and are suffering more than other kinds of stock.

FARMING AIDED BY OTHER INDUSTRIES.—*Montcalm, Mich.*—Corn, oats, and hay have not been so low for years as now, on account of a decrease in the business of lumbering. Owing to the tightness of the money-market, there is but very little being done in that line this winter. Flat River runs through this county. Last winter 200,000,000 feet were put into this river. This winter, the highest estimate is 20,000,000 feet.

*Tazewell, Ill.*—Have given the prices of cereals, &c., at the river-towns, which is 5 to 6 cents higher than at the railroad-stations.

*Ogle, Ill.*—The beet-sugar factory at Freeport, Stephenson County, is running in full force, day and night, and is manufacturing a large amount of sugar of superior quality. The beets this year are very good, but not enough beets were produced to supply the demand. The superintendent thinks he will get a sufficient quantity next year, as those who cultivated them this year are greatly encouraged. More manufactories, such as beet-sugar, corn-starch, and cheese factories, &c., are needed in the West, to manufacture its bountiful crude products into condensed marketable commodities, and thus diversify industry and create a good home-market.

MISCELLANEOUS.—*Hanover, Va.*—The average yield of corn and tobacco is much reduced by the numerous small crops, or attempts at crops, of the freedmen. Their cropping is generally nearly abortive.

*Labelle, Kans.*—One farmer, by way of experiment, cultivated and harvested from one acre over 120 bushels of good, ripe pea-nuts, which he says will bring in the market over \$1 per bushel.

*Steel, Minn.*—The Osaka wheat, was sown largely last spring, as the results of the two previous sowings had been very favorable. That sown early and put in well, generally turned out well—from 20 to 30 bushels per acre; but that sown late resulted badly, some pieces not being worth cutting. The Scotch Fife, after many years of remarkably successful crops, was thought to be running out; but it proved the past season as good as ever. In fact I have not heard of a single failure of it. Early-sown grain invariably did the best, which accords with the general experience in previous seasons.

*Northampton, Pa.*—The wheat and rye look well; the favorable fall caused these crops to spring up early, covering the ground like rich meadows, upon which we have been pasturing our cattle for fear of the grain getting too heavy a top. This is always done with us, care being taken not to put cattle on in wet weather. A heavy top with a deep snow on causes the wheat to rot; hence we resort to pasturing.

*Ripley.*—Last year our county exported 200 bales of cotton; this year it will export over 500 bales.

*Franklin.*—Cotton is our principal crop and is exceedingly good; 25 per cent. in advance of the previous year, and the yield at least 110.

*McLennan, Texas.*—One-fourth of the bottom-land cotton yet to be gathered; paying \$1.25 in gold per 100 pounds for picking. In consequence of a large area planted, and an unprecedented yield, together with a scarcity of hands with which to secure the crop, it has been badly done, and the bulk of the crop will class "ordinary," or even lower. Much less cotton will be planted next year.

*Fresno, Cal.*—The cotton crop has averaged about 800 pounds of lint-cotton per acre, and about 250 acres matured. Some 60 acres were destroyed by grasshoppers. The area of land planted to cotton will be trebled next season. A few jute-plants, which came up from seed obtained from the Department, grew splendidly, and attained the height of 10 feet. The seed did not generally come up. I think this climate suited to its culture.

*Clackamas, Oreg.*—We have as good varieties of wheat in this county as can be found in the world. The following are standard varieties: Old White-Winter; White Velvet; Canada Club; Chili Club; White Australian, Spring and Winter, and Ninety-day wheat. The Old White-Winter was brought to this country by the Hudson Bay Company, not less than 40 years ago; and for every variety of soil is probably the best kind we have. Some of the other varieties were obtained through the Department of Agriculture. The good that has grown out of its distribution of seeds can scarcely be told. This county is indebted to that source for some of its most valuable seeds, which otherwise might have been years in reaching here.

*Lamar, Texas.*—Our best farmers produced greatly above the figures given, (for the average per acre of grain,) but the slothful and lazy farmers have to be considered, which greatly reduces the average, and this year makes it very low for this county. This being a hard year, grain would not grow, even in Texas, without the necessary culture.

*Assumption, La.*—A remarkable decrease in the yield of sugar-cane has been noticed for several years past, the largest yield now being 1,500 to 2,000 pounds per acre, whereas formerly the yield often reached 3,500 pounds.

*Cheshire, N. H.*—The farmers in the valley of the Connecticut are running their farms with tobacco, and in consequence of the heavy drain on the land by the crop, and of remunerative prices, are fast putting the farm into the pocket by running the land out.

*Douglas, Minn.*—The Agricultural Association of this county is hereafter to be controlled by the farmers. They have elected their officers. It is expected that the next fair will contribute more to the success of agriculture than those heretofore.

*Hancock, Ohio.*—The failures in our cereal crops are owing entirely to the season. No devouring insects; losses to farmers fully made up by the shipment of 100,000 barrels of apples from this county. The "panic" does not hurt us much, and really we are in a prosperous condition.

*Saint Clair, Ill.*—The panic is not felt in this county to any considerable extent. As our farmers are free from pressing indebtedness they are holding back their crops, and it is supposed (correctly too) that they are advancing on their hands. Enough of wheat is disposed of to keep our mills continually running, and first-rate flour finds a ready market, with a larger margin than usual. All our people are doing well.

*Logan, Ohio.*—The frequent droughts and consequent partial failure of the crops of late years is a subject worthy the consideration of all interested in American agriculture. I believe the principal cause is to be found in the loss of our timber. The history of all inland countries which have been denuded of forests goes to prove this. The wonderful change in the climate of Egypt since the most extensive planting of forests that we have on record speaks volumes on this subject. Were 25 per cent. of our cleared lands replanted with forests, there is little doubt that the remainder would produce more than the whole does now; and how might the country be enriched by the growth of valuable, selected timber!

*Seneca, N. Y.*—We have a new variety of white winter-wheat, discovered by Mr. G. Clawson, of this town, (Ovid,) four years ago. It is a red-chaff bald wheat, long open head and stiff straw. It has proved more hardy than any other white wheat in this vicinity, and is superseding all others.

*Martin, Minn.*—The Cherokee corn deserves particular mention for the size and filling of the ears and the yield per acre. The seed was brought here from Dane County, Wisconsin.

*Prince William, Va.*—Mr. Waters, of Brentville, seeded on six acres six bushels of buckwheat, intending to turn the crop under as a fertilizer; but as it promised a good yield he harvested it, and it gave him 274 bushels, which he sold at \$1 per bushel. He applied 10 cwt. of bone-meal.

*Santa Anna, N. Mex.*—The farmers have made molasses this season out of the common corn-stalk.

*Granville, N. C.*—Stock of all kinds has been decreasing in numbers every year since the war, but more rapidly than previously for the past two years. Very few freed-

men will work for wages, most of them renting land and working an ox or cow. Consequently they make but little crop and raise no stock. Most of them move every year. With few exceptions the stock of every kind is raised by white people here, and not being able to hire help they have been compelled to reduce their stock, and are likely to continue to do so.

*Perry, Ala.*—Horses and mules range very low in price on account of the scarcity of money and unprecedented emigration of the colored laborers to Mississippi. Unless white labor comes into this county and into the prairie belt of lands, an unheard-of decrease of acreage in cultivation will take place the coming year. To show the prospects, I will refer to two rentings for the present year: 800 acres of prairie lands, as good as any land in the county, rented for \$75; 500 acres of good prairie land rented for \$80; good improvements on each place. Rents will not pay taxes.

*Prairie, Ark.*—The financial troubles have compelled speculators to throw their lands on the market, and the consequence is that land is nearly as low as in 1850. Immigration seems to be coming in rapidly, and all appear to be satisfied with the country.

*Attala, Miss.*—The agricultural prospects of Attala are pretty good. The agricultural industry is mostly made up of small farmers, who are themselves inured to labor and are doing very well under the improved prices of all products—though “the panic” has now greatly deranged the prices of everything, reducing them nearly one-third, except of corn, which remains the same as last year, that is, \$1 to \$1.25 per bushel. Our corn will have to be supplied from other States.

Freedmen are purchasing all kinds of property and the most industrious prefer farming for themselves. The refuse and jobbers can only be hired by the day or week, and must have their pay each day or week, as the case may be. Labor is scarce and commands high prices, the jobbers making as much as \$3 per day in many instances, which is spent for groceries and liquor. The incoming year promises to be one of great hardship and distress among the more opulent debtors as well as the poorer classes. Among agriculturalists the remedy is to be found in strict economy—make more money and spend less.

*Hempstead, Ark.*—The agriculturists in this county devote all their attention to cotton as a market product, and only a small percentage attempt to raise any farm-stock beyond a meager supply of milk-cattle. Hogs cannot be raised on the range, owing to their being stolen by the freedmen. Corn is too costly a crop to feed them much with that. Planting is evidently about “played out.” The old rush for hands is all past, and land-owners seem to be indifferent as to whether hands, that is, negroes, occupy their lands or not. There is a growing demand for white men, and a white man who is honest and will work can make his own terms. A few negroes seem to be making some money, but by far the larger part, as it seems to me, are retrograding.

*Cedar, Mo.*—The failure of banks and the almost total absence of money in this section have compelled farmers to hold their stock and produce. Many who have purchased with a view of selling the past fall have to hold and feed over, notwithstanding the great scarcity of feed. This state of affairs has produced a stringency and hardship upon the masses, the like of which has never been known here. The farmers in the, perhaps, vain hope of ousting those in high places to whom they ascribe a great part of their calamities, are organizing granges in nearly every school district, and their strength is only limited by their ability to get means to pay an initiation fee.

*Box-Elder, Utah.*—Since the branch line of the Utah Northern Railroad has reached Corrine, on the Beaver River and on the line of the Central Pacific, our trade in produce with the far west has greatly increased. Prices, however, have changed but little, though we have a little more money than formerly among our population.

It becomes more apparent every year that satisfactory crops of wheat and other small grain can be raised here without any irrigation at all, which in time will become a matter of great importance to surrounding sections that hardly know rain.

*Holt, Mo.*—In the northern end of the county apples and peaches were destroyed by the severity of last winter; the first failure of apples for thirteen years. The southern end produced a fine crop, owing to its peculiar position. It is evident that lands there will, in time, become invaluable for supplying fruits to the bleak northwest, though now the price is almost nothing—not exceeding \$5 per acre.

*Antelope, Neb.*—The first white man settled in this county in August, 1868. The first plowing was done in the spring of 1869. Now we have 300 farms opened, 2 saw-mills, 1 flouring-mill, and another building, and enterprise and thrift on every side.

*Clinch, Ga.*—Sugar-cane is planted extensively here, and will produce 10 barrels of sirup per acre, 40 gallons to the barrel, worth 50 cents per gallon. Upland rice is also planted here, and the average yield per acre 20 bushels, worth \$1.25 per bushel.

*York, Me.*—The season now closed has been a favorable one for farm-laborers. A large amount of fall-plowing has been done; most of the summer manure moved; fields smoothed, &c. Since the era of high taxes, capitalists have not been willing to let money to the farmers; few expensive improvements have been made, and the result is that the farmers of this county were never so free from debt as now.

*Levy, Fla.*—The season has been more favorable for crops than for several years previous. There was enough corn made to supply the home demand if it were distributed, but we are so favorably situated to get supplies from New Orleans that it does not pay to haul corn a long way unless it can be bought for less than \$1 per bushel, and farmers are not inclined to sell at less than that. Corn from New Orleans can be delivered anywhere along the railroad and coast for less than \$1, but farmers prefer to pay that for country corn, for it is always sold on the ear in the shuck, a flour-barrel of ears being counted a bushel and good corn will shell from one to four quarts over a bushel to the barrel.

The cotton-crop is turning out better than was expected when it was first struck with the rust. The yield in this county is far ahead of last year. The crop is mostly of the black seed long-staple, though there was more than usual of the grey seed short-staple planted. That did well in some lands. The long-staple does the best on light sandy land, and the short on the heavy clay lands. Long cotton is selling at Bronson in the seed at 3 cents per pound cash; 6 cents in trade.

*Kemper, Miss.*—The corn-crop is very short, and corn will have to be shipped from the west if farms are to be cultivated the ensuing year. My impression is that many of the laborers employed this year will find it difficult to get employment next. They have generally worked badly. As they work on shares they do not consider the time lost as affecting the employer, and they are not disposed to hire for wages, although the result would be favorable if they worked as they should. The crop of cotton in this county will probably be equal to that of last year, owing to a greater breadth of land in cultivation.

*FLAX.—Warren, N. Y.*—Flax has nearly become one of the products of the past, since it requires more hand-labor than farmers can make profitable in raising it.

*Ford, Ill.*—Flax has become a favorite crop with our farmers, at \$1.60 per bushel for the seed. It seems to promise more than corn, besides a mill here gives us a ready market for the straw.

*Portage, Wis.*—A good deal of flax was sown for the seed only; the yield is eight to ten bushels per acre. Price, \$1.50 per bushel.

*Stearns, Minn.*—Flax is becoming a staple with us. It will be extensively sown another year. Average yield this year 20 bushels of seed per acre; price, \$1.30.

*Moniteau, Mo.*—Flax is becoming an important crop for the seed alone; but it impoverishes the land so much that I am trying to discourage its culture.

*Bates, Mo.*—Many of our farmers tried flax for the first time and find it a decided success, some crops yielding 22 to 25 bushels of seed per acre.

*Cass, Mo.*—There seems to be an inclination to sow flax for seed.

*Franklin, Kan.*—Flax-seed has been sown the last two years, and those who have tried it speak favorably of it as a paying crop.

*Washington, Neb.*—Black crickets destroyed the flax-seed to such a degree that we are discouraged about raising it.

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## RECENT PROGRESS IN AGRICULTURAL SCIENCE.

[It has been thought desirable to present a succinct yet comprehensive statement of the results of the later investigations in applied science, so far as they relate to agriculture, and the following, by Prof. Wilbur O. Atwater, of the Wesleyan University, at Middletown, Conn., whose fitness for the work may be deemed in some respects unequaled, is submitted, in the hope that intelligent farmers may make a profitable application in daily practice.—ED. REP.]

It is our purpose to give a description of some of the more important phases of the later progress and present status of agricultural science, especially in the application of chemistry and physiology to the study of the laws of animal and vegetable nutrition and growth. The production of animals and plants being the chief purpose of agriculture the laws of their production constitute a most important part of agricultural science.

## AGRICULTURAL EXPERIMENT STATIONS.

It is in the experiment stations in Europe, particularly in Germany, that the larger part of the latest research has been made. These are chemical and physiological laboratories, situated generally in more or less direct connection with a farm, garden, or stable, or all of these together, where men of the highest scientific skill are engaged in investigating the effects of different manures and methods of culture upon the growth of different crops, or the effect of various kinds of fodder upon domestic animals, and more especially in the study of the more abstruse laws of nutrition in animals and plants.

Some thirty-eight years ago Boussingault commenced on his farm at Bechelbronn, in France, a series of researches in agricultural chemistry and physiology which have become classic. Five years later, Liebig, in Germany, began his remarkable work in agricultural chemistry. Two years thereafter, Lawes, aided by Gilbert, commenced in England a series of experiments which are still in operation, and are quite famous. Under the patronage of the Highland Agricultural Society of Scotland, and the Royal Agricultural Society of England, Voelcker, Anderson, Way, and others, have done much for agricultural chemistry.

In 1851 the first German experiment station was founded at the instigation of some prominent agriculturists, and with the aid of the Leipsic Economical Society on the farm of the society at Moeckern, near Leipsic. So useful were its labors and so great was the interest thereby awakened that others were soon established, governments, agricultural societies, and private persons uniting in their support. In 1856 there were, in Prussia, 7; in Saxony, 3; in Hanover, 3; and in Bohemia, 2. In 1858 the investigations made in the stations, had become so extensive that it was found advisable to establish a journal for their publication, *Die Landwirthschaftlichen Versuchs-Stationen*.

The success of these stations in Germany has led to their establishment in other countries.

In 1867 the French government, through its minister of agriculture, sent M. Grandeau to examine the German stations. On receipt of his report steps were taken for the founding of stations in France. Similar procedures have led to the establishment of stations in Italy and Belgium.

According to the latest accessible data, the present number of establishments which may be classified as experiment stations, including those connected with agricultural schools and those maintained by private individuals, is approximately, as follows:

In Prussia, 23; Saxony, 7; Bavaria, 4; Other German states, 6; Austria, 9; Italy, 11; France, 5; Switzerland, 1; Belgium, 1; Holland, 1; Sweden, 2; England, 1; total, 71. The objects of these stations are:

1st. The study of the laws of animal and vegetable production, taking this expression in its widest sense, so as to include not only the sciences of chemistry and physiology, as applied to the nutrition and growth of plants and animals, but also zöotechny and meteorology in their relations to agriculture.

2d. Investigations and analyses of soils, waters, and particularly of fertilizers. The analyses of commercial fertilizers constitute a very important part of the work of the stations. In Germany these are sold at prices based upon their chemical composition. They are warranted by the seller to contain certain percentages of valuable fertilizing in-

redients, as nitrogen, phosphoric acid, and potash. The stations working in the interest of the buyers test their composition by analyses, and thus farmers are enabled to guard against imposition and secure good wares. The control thus exercised by the stations upon these prevents a very large amount of fraud in the trade of these articles, and causes a great improvement in the general character of the fertilizers sold in the regions where the stations exist. The saving by this means to the agricultural communities amounts to many times the whole cost of the stations.

The stations consist in general of a chemical laboratory, connected with experimental fields, garden, or glass-house, for experiments in vegetable production, or, when the nutrition of animals is the object of investigation, with stables, and in some cases a respiration apparatus.

By examining the character and results of some of the researches in these stations we shall be best able to learn somewhat of the present condition of the science of animal and vegetable production.

*Experiment stations for researches in animal physiology.*—So far as the writer is aware, almost no descriptions of the plan and results of the most important of the later investigations in this subject have appeared in the English language. An admirable résumé of the subject, by Wolff, of the station at Hohenheim, in Würtemberg, may be found in Mentzel & Von Lengerke's *Landwirthschaftlicher Kalender*, Berlin, 1872. Among the stations which have been most active in this line of investigation are those of Weende and Halle, in Prussia, Moeckern and Leipsig, in Saxony, and Hohenheim, in Würtemberg. These experiments may be divided into four classes:

1st. Experiments in which chemical analyses are made of the fodder given to the animals, and, in case of milch cows, of the milk produced; while the investigation of the excrement, urine, and gases given off in respiration is omitted. Experiments of this sort are of great value in deciding what are the most economical kinds, mixtures, and amounts of food for different domestic animals, as horses, cattle, sheep, and swine, according as the production of meat, milk, labor, &c., are required of them. They do not tell what proportions of the different foods are actually digested, nor do they give any direct explanation of the nutritive processes that go on, nor of the ways of formation of fat and flesh in the animal body.

To this class belong many well-known feeding experiments, made by Lawes & Gilbert in England, whose results have already been made known to the English-reading public.

Of still greater importance are the experiments made within a few years past in the German stations, on the composition and amount of food needful for the sustenance of cattle and sheep, and upon the effects of different kinds and amounts of food given to milch cows upon the amount and quality of the milk produced.

*Experiments on the effect of different kinds and quantities of food on the amount and quality of the milk produced.*—The most important investigations of this subject have been made since 1866 at the stations at Moeckern by G. Kuehn and Hohenheim by Wolff & Fleischer, on cows, and at the station at Halle, by Stohmann, on goats.

The general plan is to feed the animals for a certain period with a certain ration; then for another period with a different ration; to make accurate measurements and analyses of the food and of the milk produced, and thus note the effect of the different kinds and quantities of food upon the milk.

In some experiments the rations fed out in the different periods are



the same in quality, and differ only in the amount. The object of these experiments is to learn what amounts of different foods may be most profitably fed, when not only the amount, but also the quality of the milk is taken into account. In others, the rations differ in composition, the object being to determine whether an increase or decrease in the proportion of albuminoids, fat, or starch in the food will cause an increase or decrease in the proportion of albuminoids (casein) or fat (batter) in the milk.

As an example of experiments of the first sort we have a series made in Moeckern, (Vs.-St., 1869, xii, p. 114,\*) in which four cows were fed with rations consisting of hay, barley-straw, turnips, and rape-cake. In one period the daily ration consumed contained an average of 19.34 pounds of organic substance per 1,000 pounds live weight; in the other, 22.36 pounds. Each period continued some three weeks, and the milk was carefully measured, and was analyzed nearly every day.

The increase in the ration, amounting to about 17 per cent., was attended by hardly any increase in the amount of milk, although, with the richer feeding, the milk contained a slightly larger percentage of organic substance. The composition of the latter was essentially unaltered.

In another series performed at Moeckern (Vs.-St., XII, 1869, p. 197) was studied the effect of varying proportions of albuminoids, fats, and carbo-hydrates on the proportion of albumen (casein) and fat in the milk produced.

Two cows received as a normal fodder during one experiment a moderate ration of meadow-hay, to wit, 20 pounds per head, containing about 1.5 pounds albuminoids, 8 pounds carbo-hydrates, and 0.5 pound fatty matter. To this was added, in experiment 2, 0.7-0.8 pound of albuminoids, in the form of rape-cake, for the one cow, and bean-meal for the other; in experiment 3, 2.3 pounds of starch; in experiment 4, 1 pound rape-seed oil; while in experiment 5 the 20 pounds of hay were fed alone. These experiments were performed in successive periods. In order to make up for the natural depression in amount and change in composition in the milk, with advance of time from calving, the above order was followed with one cow and the same inverted with the other.

Here follows a tabular statement of the average result. In order to compare the composition of the dry substance in different experiments, the composition shown by analysis is reckoned on a uniform percentage of 12 per cent. of dry substance.

Kind of food.					
	Hay.	Hay and albuminoids.	Hay and starch.	Hay and oil.	Hay.
Daily amount of milk produced .....	16.15	15.90	14.68	15.47	13.02
Containing dry substance .....	13.25	13.18	13.33	12.88	13.24
Equivalent to milk of 13.25 per cent. dry substance .....	16.15	14.80	14.58	14.34	13.02
Dry substance on basis of 12 per cent. in milk contained—					
Fat .....	4.18	3.95	3.88	3.85	3.99
Albuminoids.....	2.74	2.92	2.88	2.80	2.86

It appears from the above figures that the variation in the proportions of albuminoids, carbohydrates, and fats of the food had as good as no effect on the relative amounts of these in the milk.

\* Vs.-St. Die landwirthschaftlichen Versuchs-Stationen. Organ of the German Experiment-Stationen. Dr. F. Nobbe, editor. Published at Chemnitz, Saxony.

As the result of these and other experiments, conducted with the greatest accuracy and involving many hundreds of analyses of fodder and milk, Kuehn concludes that, as soon as the amount of the ration exceeds a certain minimum, an increase is without effect upon the quality, and exercises only a slight influence upon the quantity of the dry substance of the milk produced.

This principle, first enunciated by Kuehn, has been confirmed by an extended series of experiments of similar character made in Hoheheim by Wolff & Fleischer. (Henneberg Journal für Landwirthschaft, 1871, No. 4.)

As in the Moeckern experiments the series were divided into periods, in which different rations were fed out, the latter varying from 21 pounds of dry substance, containing 2.3 pounds of albuminoids, to 31 pounds, containing 7.4 pounds of albuminoids. These changes in the fodder were accompanied by corresponding changes in the condition of the animals, as shown by their looks and weight. There was likewise a variation in the quantity of the milk, the difference between the largest and smallest averages being some 7.4 pounds per day. It was also found that the milk given when the animals were in better condition was not only larger in quantity, but was also richer—contained a larger percentage of dry matter, of organic substance.

The composition of this dry matter, the relative amounts of casein, fat, sugar, and mineral matters, remained unaffected. Indeed, as is shown by, perhaps, thousands of analyses in these and other experiments, the composition of the milk is less affected by the food than by other circumstances, as the time of the "heat" and the advance of time from calving, and particularly by individual and race peculiarities.

It is worthy of note, however, that Kuehn (Vs.-St., XVI, 1873, 221) finds that certain foods seem to cause a slight increase of fat in the milk, an effect which Wolff is inclined to attribute rather to the individual peculiarities of the animal.

These results are quite well accounted for by the view which Voit, the well-known physiologist in Munich, has of late propounded, (Zeitschrift für Biologie, vol. v, 1869, p. 79,) and with apparently great justice, as to the mode of formation of milk by the lacteal glands in the udder: "It was formerly the general belief that the system of lacteal glands was simply a filter of large surface which allowed the passage of certain constituents of the blood, (those which make up the milk,) and that consequently, the quantity and quality of the food may determine the quantity and quality of the secretion, (milk,) as is the case of the urine which is filtered from the blood by the kidneys." He says that this is not the case, however, but that the milk, instead of being filtered out of the blood by the lacteal glands, is made of the lacteal glands themselves. "The lacteal glands prepare the fluid in their cells, or rather the milk is the gland dissolved. The milk is not a product of the activity of the glands; it is the glands changed to a liquid form. \* \* The milk is essentially this organ liquified by fatty degeneration. \* \* \* An influence of the food upon the milk is to be expected only when the lacteal glands are first affected. These need albuminoid matters for the structure of their cells. The albuminoids of the food are efficient only in forming more of these cells in the glands, which in part degenerate into fat, and in part take up fat from the blood."

In this view it is easy to see that when the cow is well fed and in good condition, there will be plenty of food for the formation of lacteal glands, and hence a plentiful production of milk, and that the composition of these would not be easily affected by variation of the composition of the

food within ordinary ranges; and hence, why it should be so difficult by changes in the food to effect any change in the composition of the organic substance of the milk.

The practical inferences from these researches are thus summed up by Kuehn: "The farmer will then infer that with milch-cows the richest fodder is not always the cheapest. On the other hand too meager fodder is still worse. \* \* \* \* Here, as elsewhere, a fair mean will be found best." As regards the effect of different foods on the composition of the milk, he says that the farmer may not hope by variation in the fodder to change a "butter cow" to a "casein (cheese) cow." He must rather depend for the quality of the milk, the relative richness in fat or caseine, its special fitness for butter-making or cheese-making, upon the peculiarities of different breeds or different individuals, and for quantity upon the peculiarities of the animals themselves; or, in few words, for quality of milk, select proper breeds; for quantity, good milkers; and feed well but not over-richly.

2d. *Experiments to determine the proportions of different foods that are digested by different animals.*—In these not only the food but also the excrement is accurately measured and its composition determined by analysis. Of the food consumed by the animal a portion is digested, while the rest passes off as excrement. If, then, the total amount of the food consumed, and the amounts of its chemical constituents, albuminoids, fat, carbo-hydrates, and mineral matters be known, and the same factors of the excrement be determined also, we have only to subtract the latter from the former, and we have the amounts actually digested.

A long series of experiments of this sort have been made at the station at Weende, near Göttingen. They were commenced by Henneberg and Stohman, in 1868, and have since been continued by them and by G. Kuehn, Aronstein, Schultze, Wolff, Hellriegel, Lucanus, Hoffmeister, Lehmann, Märcker, and others at Weende and elsewhere, with very important results. The accounts of these researches are to be found in the *Journal für Landwirthschaft*, published at Göttingen, and in the *Landwirthschaftlichen Versuchs-Stationen*.

Here follows a tabular statement of the mean results of sixty-six experiments made with eleven different oxen at Weende. The figures represent the average percentage of the different food-ingredients actually digested from different food-materials. They are given by Henneberg *Neue Beiträge*, Göttingen, 1872, p. 449.

Kind of food.	Amounts digested in 100 parts.				
	Total organic substance.	Crude fiber.	Fat.	Carbo-hydrates.	Albuminoids.
Clover hay .....	56	41	45	69	51
Meadow hay .....	63	63	39	63	63
Bean straw .....	50	36	55	65	50
Oat straw .....	52	59	34	44	47
Rye straw .....	53	60	?	?	49
Wheat straw .....	45	52	27	40	26f

It will be seen from these figures that the digestibility of different kinds of straw and of the woody fiber of fodder-plants in general is much greater than has ordinarily been supposed.

The digestibility of root-fruits, grains, oil-cakes, &c., has also been investigated by Henneberg and Stohmann, by Wolff, in Hohenheim, Kuehn, in Moeckern, Hoffmeister, in Dresden, and others.

The number of experiments up to the present time is much less than those with hay, straw, and other *crude fodder-materials*, as the Germans call them. The following are mean results :

Kind of food.	Amounts digested in 100 parts.				
	Total organic substance.	Crude fiber.	Fat.	Carbo-hydrates.	Albuminoids.
Potatoes.....	89			94.9	64.9
Turnips.....	90			97.7	76.8
Bean-meal, (unbolted).....	93	70	99.7	94	94.6
Bran (of spelt, bearded wheat).....	84.8	69.1	88.2	90.8	72.5
Rape-cakes.....	58.8	?	69.8	79.6	77.9
Cotton seed cakes.....	49.7	22.7	90.8	46.2	73.8

The digestibility of cotton-seed cakes and their consequent value as fodder is one of special interest in this country.

Wolff, by whom the experiments (four in number) with cotton-seed cakes were performed, (Vs.-St., XIV, 1871, p. 409,) remarks that "The chief value of oil-cakes is due to their large content of albuminoid and fatty substances, and it is interesting that these ingredients in cotton-seed cakes, according to direct experiments, are scarcely less digestible than in other oil-cakes. That less of the crude fiber was digested was due to the amount of leathery husks occurring with the unshelled seeds of the oil-cakes."

The effect of addition of the more digestible substances, as meal, oil, and potatoes, to rations of crude fodder, as hay and straw, upon the digestion of the latter, has also been made a subject of extensive investigations. Some of the results are as follows :

1st. As to effect of easily digestible substances, rich in nitrogen and gluten, such as cracked beans, &c. Experiments at Weende, Moeckern, and Hohenheim, indicate that the digestion of hay, straw, &c., is not essentially affected by presence of these substances.

2d. As to the effect of easily digestible carbo-hydrates, starch, sugar, and materials rich in these substances, as potatoes. The general effect of these substances when added in considerable quantities is to decrease the digestion of crude fodder-materials. For instance, in a series of experiments performed by Wolff, at Hohenheim, (Vs.-St., 1871, XIV, p. 405,) in which sheep were fed with clover-hay alone, 63.7 per cent. of the albuminoid and 51.2 per cent. of the crude fiber were digested. In succeeding periods mixed rations of clover-hay and potatoes were given, the proportion of the potatoes being increased in successive periods. The proportion of albuminoids digested from the hay in these successive periods was gradually reduced from 63.7 to 45.7 per cent., and that of the crude fiber from 51.2 to 43.3 per cent.

The practical applications of the results of the experiments of the two classes mentioned are very important. It has been seen that straw is nearly as digestible as hay. Indeed, Henneberg found that his oxen digested as much material from 20 pounds of straw as from 17 pounds of hay. There was, however, a great difference in the composition of the digested material. That from the hay contained more nitrogenous matter, albuminoids, and less non-nitrogenous matter, fat, carbo-hydrates, and crude fiber, than that from the straw. In other words, the hay furnished a diet richer in nitrogen than the straw. Straw would be too poor in nitrogen to make alone a good diet for ordinary feeding purposes. But by mixing it with some material rich in nitrogen, as clover-hay or oil-cakes, the proper proportion between nitrogenous and non-nitrogenous

constituents can be produced, and thus the digestible portions of the straw can be utilized.

Such experiments as have been described have given an insight into the amounts and proportions of these different constituents which a ration should contain in order to be the most economical in feeding, in order to give the largest amount of product in the form of meat, milk, or labor from the smallest amount of raw material in the form of food.

Knowing the amount of digestible albuminoids, carbo-hydrates, fat, &c., which the animal requires, and the amount of these which each kind of food will furnish, we can calculate what amounts and mixtures of the fodder we have will be most profitable in feeding our stock. Scores of tables of fodder-mixtures, giving amount and proportions of the more common fodder materials suitable to different animals under different circumstances, have been made out by the experimenters. They are published in a great variety of forms, and many thousands of German farmers can from actual experience testify to their value.

In the experiments thus far described, no data are obtained for the direct determination of the ways in which the various constituents of the food are assimilated and used in the animal body. A partial solution of this problem, the discovery of the laws of flesh-building, is sought in—

3d. Feeding experiments in which, in addition to the food and excrement, the quantity and composition of the urine are also determined, with a view to learning the laws of flesh-building in the animal body. The great importance of these experiments depends upon the fact that the nitrogen in the urine comes from the transformation of the albuminoid constituents (flesh) of the animal body, and that under normal circumstances the amount of the nitrogen in the urine is an accurate measure of the transformation of these substances. If, therefore, on comparing from day to day the amount of nitrogen in the urine with that in the food digested, we find a deficit, we infer that it has been retained in the body, or, in other words, that the amount of the albuminoid matters of the food that has been stored away as flesh is greater than the amount of flesh consumed. If, on the other hand, the amount of nitrogen in the urine is more than was digested from the food, the inference is that the store of flesh in the body is decreasing. We have, therefore, in experiments of this sort a means of determining whether, under the influence of a given food-ration, there is from day to day an increase or diminution in the store of flesh in the animal body. We have thus a means of telling what are the effects of different food-materials on the building of flesh in the animal body.

An important and much-vexed question at the present is, Of what constituents of the food is the fat in the body built up? The solution of this, as well as of the more general question, as to what are the functions of the different constituents of the food, albuminoids, fats, carbo-hydrates, and crude fiber and mineral matters in the animal economy, is sought in—

4th. Experiments which give as results complete data for computing the amount of transformation of these different substances in the animal body, in that measurements and analyses are not confined to the food consumed on the one hand, and the excrement and urine produced therefrom on the other, but also, by means of a respiration apparatus, are extended to the remaining and otherwise undetermined products of these transformations, to wit, the gases given off by respiration through the lungs and skin.

The first successful respiration apparatus was that devised by Petten-

kofer, in Munich. A second one, constructed on the same plan, but large enough for an ox to live in while being experimented upon, was put up some nine years ago in the station at Weende. A third was added in 1870 to the equipments of the station in Halle; and a fourth was put in operation about a year since at the station in Leipsic.

The apparatus consists essentially of a large chest or compartment with air-tight walls, in which is placed an animal, for instance an ox. The interior is furnished with arrangements for supplying food and water and collecting the excrement and urine. By appropriate machinery a current of fresh air is introduced through openings provided for the purpose, and, after it has supplied the wants of the animal for respiration, is conducted out, bringing with it the gaseous products of respiration, into a gasometer, where it is measured. It is then analyzed, and a comparison of its composition with that before it had passed through the apparatus shows what material has been added to it by the respiration of the animal.

We have thus from the analysis of the food, and of all the ultimate products of its transformation, a means of following out the processes of the transformation of the food in the body of the living animal, and can infer what parts the different food-ingredients play in building up the different tissues as flesh and fat, and what materials of the food and body contribute to the supply of animal heat and muscular force.

The last three classes of experiments belong almost exclusively to the last decade. The researches of the last class are, it may be said, only begun, and thus far the results have not assumed so definite a form as is the case with others. The experiments are extremely laborious and complicated. One of the experimenters at Weende lately remarked to the writer that after several years of work with the respiration apparatus, they had only learned how to manage the apparatus, the animals, and the food, and were just ready to commence a series of researches, which gave promise of success.

We hope to be able hereafter to give accounts of the details and results of these researches.

Sufficient has been said to show that although much has been done, yet the science of animal nutrition is still in its infancy. It is by such researches as these that the theory of the feeding of domestic animals is brought into the form of an exact science.

It is greatly to the credit of the German stations and a very high compliment to the wisdom of the agricultural public, by whose voluntary contributions they are largely supported, that so much labor is spent upon abstract scientific investigation. But the value of the application of the results of these researches to practical agriculture is recognized, and the German farmers put their hands in their pockets and take out the money to support these experiments, for the very simple reason that they know that "it pays."

*Experiments in vegetable production.*—These may be divided into two general classes:

1st. Field experiments, whose object is to determine the effects of different manures and methods of culture upon different crops in different soils.

One common plan for conducting these experiments is to lay off a field in plots, and on these to put different manures, and note the effects upon the crops raised thereon. The number of experiments of this sort made within the past two decades is very great. In general, however, while they are quite interesting, yet, as many of the investigators in the German stations say, the different factors of the experiment, as temper-

ature, rain-fall, composition of the soil, are so variable and indeterminate as to render them of comparatively little scientific value. Exceptions to this rule, however, are the remarkable experiments of Lawes and Gilbert, in which the same crops have been raised year after year on the same land, each plot receiving continuously the same manure. By thus continuing the experiments through a series of years, the sources of error are compensated and results of the highest importance obtained. The results of the experiments of Lawes and Gilbert have already been made known to the English reading public, and we forbear any description here.

2d. Experiments for raising plants in artificial soils and solutions, in order to determine what are the nutritive ingredients of the food of plants and what are their functions in nutrition. A description of the character and results of investigation in these subjects, up to the year 1869, may be found in the admirable books of Johnson, "How Crops Grow" and "How Crops Feed." We append descriptions of some later researches.

The important questions of the relation of the atmosphere and soil to the nutrition and growth of plants have been the subject of extended research in the experiment stations and elsewhere. Of special interest are the subjects of the relation of the nitrogen of the air to vegetation; the formation of nitrogen compounds in the soil, or nitrification, and the absorptive power of soils, which have also been treated most satisfactorily in the works referred to.

*Experiment stations for investigations in vegetable physiology.*—Among the stations where the most work in this line is done are those at Tharand, in Saxony; Dahme, in Prussia; and Hobenheim, in Württemberg. A good example of these is the one at Tharand, near Dresden, in Saxony, whose object as enunciated in a resolution of the Agricultural Society by which it was founded in 1869, is, "to investigate scientifically the natural laws by which the culture and utilization of the plants important in agriculture are governed." (Vs.-St., XI, 1869, p. 224.)

The investigations made thus far have been, as stated by the director, Dr. Nobbe, applied to "the study of the rôle which the mineral ingredients of plant-food play in the vital processes of cultivated plants." (Vs.-St., XIII, 1871, p. 321.)

A brief notice of some of the later results of previous research may facilitate an understanding of the objects, methods, and results of the Tharand investigations.

It is only within a very few years that any reasonably exact knowledge has been attained as to what ones of the mineral elements found by analysis to exist in plants are essential to their normal growth, and what ones are accidental or superfluous.

Some of the most important data for the solution of these questions have been obtained by what is known as "water-culture." This consists in raising plants not in soil, but in water containing in solution the substances needful for their nutrition.

It is known that plants take up from the soil through their roots certain mineral matters, as lime, potash, silica, and phosphoric acid. In order to learn which of these are indispensable to the growth of the plant, an obvious plan would be to supply to the plant, during its growth, the ingredients it is known to take from the soil, varying the number and quantities of these supplied in different experiments, and noting the results. Solution in water affords a most satisfactory means of regulating these supplies. Seeds are therefore allowed to germinate in sand or moist cotton, and then suspended so that the roots may

be immersed in such solutions. By varying these solutions, from some omitting one, and from others another of the ash ingredients, and otherwise varying their composition, and noting in which one the plants attain their normal growth, it is learned which of the ingredients are essential and which are not essential to the plant's normal development.

Nearly all of the most valuable researches in water-culture have been made by German chemists, among whom Knop, Sachs, Nobbe, Siegert, Wolff, and Kuehn have been most prominent. Plants have been raised in this way as large, as healthy, and as perfect as when grown in the soil. Nobbe obtained a plant of Japanese buckwheat nine feet high, weighing, air-dry, 4,786 fold the weight of the seed, and bearing 796 ripe and 108 imperfect seeds. (Vs.-St., X, 1869, p. 1.) And Knop delights in showing his friends a young oak tree whose growth has, thus far, been normal, though its roots have only been immersed in aqueous solution.

As the general result of these experiments it appears that, besides carbon, oxygen, hydrogen, and nitrogen, which, though indispensable, are not reckoned among the mineral or ash ingredients, potash, lime, magnesia, iron, phosphoric acid and sulphuric acid are absolutely necessary for the life and normal growth of agricultural plants. Chlorine seems also to be needful for the perfect development of some plants, as buckwheat and vetches. As regards soda, it appears that but a minute amount, if any, is essential, while silica seems not to be an essential ingredient of the food of the more common cultivated plants, though Bretschneider, (Hoffmann's Jahresbericht d. Ag. Chem., 1868-'69, p. 238,) as the result of a number of experiments, arrives at a contrary conclusion. (See, also, Johnson's "How Crops Grow," pp. 167-201.)

After finding what are the essential ingredients of plants, the next step would evidently be to determine what is the especial office of each in the vital processes of the plant.

The observation was made by Gris, in 1843, and has since been substantiated by the works of numerous experimenters, that iron is needful to the development of chlorophyll in the leaves of the plant. Nobbe (Vs. St., IV, p. 339; VI, p. 111; and VII, p. 374) and Leydhecker (Vs.-St., VIII, p. 186) have shown that chlorine is necessary to the normal formation of seeds of the buckwheat-plant; that without chlorine the transfer of starch from the foliage, where it is elaborated to the flower and fruit, is impeded, while the leaves and stem become peculiarly diseased. These results are corroborated by experiments of Beyer, (Vs.-St., XI, p. 262,) while Knop has concluded, from a series of experiments with maize, buckwheat, cress, oak, and horse-chestnut, in solutions free from chlorine, that the latter element is not necessary to the perfection of the plant. (Chem. Centralblatt, 1869, p. 177.)

Of the functions of the other ash ingredients almost nothing is known. To discover what is the part which each plays in the vital processes of the plant has been the object of an extended course of experiments at the station at Tharand, which commenced in 1869, and are still in process. The chief attention has thus far been given to the discovery of the function of potash, and some very interesting results have been obtained.

Two series of experiments were carried out, one with Japanese buckwheat, (Vs.-St., XIII, 1871, p. 321,) and the other with summer rye, (Vs.-St., XIII-p. 401.)

*Experiments on the function of potash in the buckwheat plant.*—The questions proposed by Nobbe for solution by these experiments were—



1st. How will the plant comport itself in a solution containing all the ingredients necessary to its growth except potash, and what will be the explanation of the peculiar phenomena that may be manifested?

2d. How will the plant comport itself in solutions, each containing potash, but in different forms of combination, (as chloride, sulphate, phosphate,) and what are the causes of the relatively more or less favorable effect of these salts?

3d. Can sodium or lithium replace potassium in the performance of its physiological functions?

The method of water-culture was used for the experiments.

Plants were cultivated in various solutions. One, the "normal solution," contained all the essential ingredients, including chloride of potassium. In a second, potash was omitted; in a third, it was supplied as nitrate; in a fourth, as sulphate; in a fifth, as phosphate, while in others it was replaced by salts of sodium and lithium. In the normal solutions the plants grew normally, and reached a height of several feet. Without potash the plants were only a few inches in height, and micro-chemical investigation showed that there was no proper formation of starch in the leaves, a fact of which their stunted growth was an obvious result. The phenomena observed in the development of the different plants were very interesting. The general result of the experiments is expressed by Nobbe as follows:

1st. In a solution containing all the nutritive ingredients except potash, the plant grows as in pure water. It cannot assimilate the materials needful for its growth, and shows no increase in weight, because, without the co-operation of potash in the chlorophyll grains, no starch is formed.

2d. The chloride is the most efficient form of combination in which potassium can be furnished to the buckwheat plant. Nitrate of potash stands next. If the potassium be given only in the form of sulphate or phosphate, there appears sooner or later a very marked disease, which is due to the fact that the starch which is formed in the chlorophyll grains is passively accumulated in the leaves rather than carried away to be utilized in the development of the plant.

3d. Potassium cannot be replaced physiologically by sodium or lithium. While the sodium is simply useless, lithium, in the cellular fluid, has a positively injurious effect upon the plant-tissues.

Similar results were obtained in the experiments with summer rye.

It seems, then, to be reasonably well established that the co-operation of potassium in the cellular fluid is requisite for the building of starch in the chlorophyll grains, and hence its necessity to the growth of the plant. In other words, these experiments show that at least one office of potash in the plant is to aid in the formation of starch.

Nobbe proposes, by similar experiments, to investigate the functions of the other elements that make up the food of the plant. We may look forward to very interesting results from studies of this sort.

It should be borne in mind, however, that conclusions like these, founded upon a particular series of experiments, are not to be universally applied. In this case the buckwheat plants did better with potassium as chloride than as sulphate. Had a small amount of chlorine been furnished in another form, the sulphate might have been found more efficient—indeed, practical.

## SUGGESTIONS BY THE COMMISSIONER.

THE AGRICULTURAL DEPARTMENT. — *Its purposes and how they are executed.*—It is very manifest that much misapprehension exists throughout the country with regard to the design of this Department and its operations. Its design is to have a general supervision over the agricultural interests of the country; to observe and learn every new principle and practice which has been developed, and any new seed, plant, or fruit which gives promise of usefulness, whether such be the enterprise or the product of our own or any foreign country. It is designed also to collect, tabulate, and publish the statistics of agricultural products, so as to prevent speculative operations; and by the observations and studies of the entomologist, the botanist, the microscopist, and the chemist, to keep pace with the progress of all these branches of knowledge, and thus afford the farmer and planter the most reliable means of guarding against the injurious inroads of insects, of making the wisest selection of plants and seeds, of arresting destructive diseases of vegetation, and of learning the qualities of soil most suitable for their purposes, the composition of fertilizers, and generally the most approved methods of culture.

Congress has annually appropriated a certain sum for the purchase of seeds and plants; the last year, \$65,000. This money is expended only for seeds and plants which are of a superior quality, or newly discovered to be useful and valuable; and they are distributed, not for the purpose of supplying *the wants* of individuals, but for the purpose of their introduction throughout the country, because they are either new, useful, or superior; and the mode of distribution is through members of Congress, to whom a large portion of them are sent, because they best know who among their constituents will make the best use of them; to the correspondents of the Department, who are found in every county of the country, for the benefit of the farmers around them; and to such individuals as apply directly for them, leaving the Department to judge who will appropriate them to the proper purpose.

It has been said that much misapprehension exists upon this subject of distribution. In applications made directly to the Department for seed, individuals often furnish a list of twenty or fifty kinds of seed, embracing a whole catalogue, while it should be understood that the Department does not profess to distribute seeds which are common and may be purchased at any seed-store, but such only as are new, improved, and not to be obtained elsewhere. Seeds, when obtained by the Department, are put up in packages, in quantities adapted to the various soils and climates of the United States. No other selection is made at the instance of any individual; so that for applicants to make their own selections of seeds is labor lost. Individuals, too, often send lists of the names of persons living in the same neighborhood to whom they desire seeds to be sent. No attention is ever paid to such requests; otherwise, the power of the Department for good would very soon be exhausted, and the object in view, to introduce into as many parts of the country as practicable what is new and useful, would be entirely defeated. Many letters from one place, and not unfrequently written by one hand, are received at the same time, containing requests for the

same description of seeds. The most that the Department can do in such cases is to send to one or two persons only. It is often the case, too, that applications are made for seeds—garden-seeds particularly—with the remark that seeds sent the previous year turned out very satisfactorily, and that another similar supply is wanted. The answer to such requests must necessarily be, that those who neglect to save seed are not entitled to a further supply. There is another class of requests frequently made to which it is equally impracticable to respond. It is that of individuals who conceive themselves favorably situated to become distributors of seeds and reports, and ask that supplies may be forwarded to them for that purpose. It is sufficient to say, that the Department has ample means of knowing how its distributions can be most appropriately and usefully made, and that a compliance with such requests would only embarrass its operations and tend to defeat its objects.

The Department publishes monthly a report of the statistics and condition of crops, &c., of which there are twenty-five thousand copies printed. These are distributed to about four thousand agricultural and other newspapers, and a large number to members of Congress, agricultural societies, and individuals who apply for them, and to the correspondents of the Department in the different counties.

Congress has heretofore, and until the last session, authorized the publication of two hundred and fifty-five thousand copies of the Annual Report of the Department, which were distributed as follows: One hundred and eighty thousand to members of the House of Representatives, fifty thousand to members of the Senate, and twenty-five thousand to the Department of Agriculture. This would give to each member of the Senate and House about six hundred copies, to be distributed among their constituents; and those given to the Department are distributed to their agents in the different counties; to public libraries at home, and in exchanges with foreign libraries; to agricultural and horticultural societies, and, to some extent, to individuals who apply directly for them. Persons often request that their names be placed upon the list of recipients. No such list is kept, and if it were it would very soon be swelled to an extent beyond the ability of the Department to supply.

When individuals apply for these reports, or, indeed, for seeds, it must be understood that their requests are always responded to in accordance with the rules and principles which have here been stated.

One other remark is proper: The Department is in the daily receipt by mail of small sums of money to pay for seeds, publications, and postage, which is always returned to the sender, inasmuch as the Department has no lawful right to money for any purpose whatever.

**AGRICULTURAL EDUCATION.**—There is no intelligent man now who hesitates to believe that early education is a great help to success in any sphere of life. Whatever the occupation of a man may be, whether a merchant, buying and selling the products of the world or sailing a ship upon the ocean; a farmer, dealing with the plow, the harrow, and the reaper; the professor of law, medicine, or divinity; each in the practice of his daily calling constantly feels the advantages of early education, and how it lessens the burden of his daily work. It is, therefore, the first dictate of common sense that the plan of education should be graded, not only by the capacity of the student, but in view of the business which he anticipates will occupy his future life.

It is only within a few years that the necessity to educate the farmer did at all attract public attention. It was erroneously almost conceded

that to till the soil was a mere operation of brute force that required no other direction than that which belonged to the physical force of the body. It did not enter into the computation of the necessities of a farmer's knowledge that the earth was a set of mouths and lungs which breathe, and feed, and live, with powers of attraction and repulsion, affected by heat, cold, and moisture; that seeds germinate, root, and grow, and that their growth is a thing of life susceptible of improvement and degeneracy, and that their names, genus, and character are as well defined and classified in the vegetable kingdom as are men and animals who live, breathe, and feed in but another sphere of creation. But now it has attracted the attention of the philosopher and the statesman, the mechanic and the laborer, that inasmuch as to till the soil is the occupation of about one-half of the whole population of the world, the mind that gives a right direction to this immense work must be an educated mind, and that such education should point to the attainment of the kind of knowledge which is best adapted and most profitable for the attainment of success in the end to be realized.

The appreciation of these views is strongly marked by the action of our National Congress in the passage of the act of 1862, which provides the means for the establishment of an agricultural college in every State of the Union. This liberal provision manifestly recognizes the necessity and points to the education of the farmer. Experience has demonstrated that the purely literary institutions of the country are not well adapted to the farmer's wants; that their teaching was the education of youth to a state of certain unfitness for the pursuit of an agricultural life, and imbued him with a store of that kind of knowledge which was ill adapted to his practical occupation. In a very few years of this college training the youthful life of the farmer's son was turned into a path of habit and thought which became very uncongenial to the domestic employments of the farm; and returning home a graduate in science, after an absence of four years, he finds the farm no place for him. He looks around in vain to find some congenial spirit who can appreciate the knowledge that he has gained, some object upon which he can spend a happy thought and hour. His family and friends within the narrow precincts of a farm have ceased to be companionable for him. A contempt for the dull ploddings of a country life causes him to gaze around that he may discover some place of escape from that which is so devoid of interest to him. He is thus driven to the nearest country town, where he may meet spirits more congenial and employment, to him, less irksome; where he may learn to be a merchant's clerk, an indifferent doctor, a dull lawyer, or inefficient preacher, and, perchance, be thrown into the temptations of vice and intemperance, and thus the effort of a fond parent to educate his son results not only in the loss of the hard-earned means of his education, but the son himself.

Not so the boy whose course of education has never turned his mind from the first impressions which the farm has made upon the earlier days of his life. At an agricultural college he is taught sufficiently in exact science to enable him to hold a respectable position in all the practical walks of life; to know the composition of the earth itself, and of the plants that grow upon it; how they live and move and have their being, and with his own hands habitually dealing with nature, and molding God's creation into forms of higher production, as well as loveliness. This, while it breathes into the body the breath of health, is the delightful work of the world, of which the mind never tires, only because the sources of inquiry and mystery of result are entirely inexhaustible.

The boy whose mind has been thus cultivated to a scientific knowl-

edge of the art which he is so soon to enter upon, and whose hands have been taught practically to apply that knowledge to this important work of the world, returns after graduation to a home where all is congenial around him, and where father, brothers, and sisters delight to listen when he talks of the mathematical and mechanical structure of the plow, and why it is so formed; of the curious science of the composition and growth of plants, and of their marvelous germination and life and death; of insects which prey upon the fruits of the earth, and remedies for their depredations; of chemical changes produced by lime and manure in their application to the soil. He is listened to with a degree of interest which makes him feel that his study has not been in vain, but that he has grown to the stature of a man, who is about to take his place in the march of agricultural progress and afford an example to those around him of the value of agricultural science.

I would not be understood as attempting to detract in the slightest degree from the high estimate in which purely literary institutions of the country are so justly held. No one can for a moment forget or fail to appreciate the mark which their graduates make upon the learned professions, the distinction which they attain as scholars and statesmen, and how essential their teaching is to the honor and dignity of the nation; but the impression which I endeavor to make is, that a different course of study, extending over a different and wider field, and better adapted to the practical operations of life, is of still more importance and better calculated to advance that great interest of mankind in which the farmer is engaged. The agricultural college educates the physical and practical as well as the moral status of the man.

**FARM FENCES.**—Fencing has become one of the most important considerations demanding the attention of the farmers; and it is wonderful that they should so long submit to the want of proper legislation in their respective States, which would relieve them from this most expensive and unnecessary burden.

An impression, almost as old as our country itself, seems to exist that public roads are public property, and that grass which grows upon them is the common property of all the inhabitants, upon which their cattle may be turned to pasture. This is a great mistake, and one which requires immediate correction, if for no other reason than that it is a very expensive one to farmers. Public roads are, to be sure, public property, but only for special purposes. While the public have the right to pass and re-pass over them, they have no other right than this, which the law gives them, and no more substantial claim to pasture their cattle upon the road than upon the other side of the fence, in their neighbor's field. The law allows the public to use the land occupied by the road to travel over, and whenever they cease, either by operation of law or otherwise, to use it for that purpose, it again becomes the property of the owner of the farm through which it passes. His is the fee-simple right. It is very unjust that either he who owns no land, or, owning it, prefers to use that of his neighbors, should be indulged in so manifest a wrong. It is the duty of the legislatures of all the thickly-settled States to protect the agricultural interests of the country, by providing that cattle shall not run at large, but that every man shall be compelled to take care of and feed his own stock, instead of turning it loose upon the highway to depredate upon the possessions of his neighbor.

Money expended in fencing against these depredations of straggling cattle is sometimes disbursed so gradually that the farmer does not actually realize how great is the loss.

In the thickly-settled States, where the farms are divided into ten or fifteen acre fields, the cost of fencing is enormous. Here there is used either wire, board, or post-and-rail fences, and their cost varies in different situations in proportion to the cost of materials, and these differ in quality. I have made an estimate of the cost of fencing in the interior farming-districts of Pennsylvania, with the purpose of showing the comparative cost of different kinds and qualities of fence, as well as to point out how enormous the cost is of making and keeping up either kind; and the calculation is equally applicable to most of the settled States of the Union. And it may be remarked, too, that this expense is annually increasing with the cost and scarcity of material.

The estimate is made of the cost of eighty rods of fence, which, of course, will be modified and altered by the circumstances which surround each particular locality.

Eighty rods, locust posts and chestnut rails, viz:

132 posts, mortised posts, at 70 cents.....	\$92 40
655 chestnut rails, pointed, at 11 cents.....	72 05
Setting 132 panels, at 15 cents.....	19 80
Hauling and distributing materials.....	4 00
	<hr/>
	188 25

A like fence made with oak or chestnut posts would cost \$59.40 less, the difference being in the expense of the post.

Board fence, the two lower boards being 6 inches wide, and the three upper ones 5 inches wide, and flat on top 4 inches, each post stripped 4 inches wide, viz:

160 locust posts, at 20 cents.....	\$32 00
3,733 feet inch boards, at \$22.....	82 12
Setting 80 panels, at 15 cents.....	12 00
Nails.....	4 00
Hauling and distributing.....	4 00
	<hr/>
	134 12

Eighty rods of wire fence, the wire being No. 9, galvanized, 16.5 feet to the pound, viz:

2 large braced locust posts, at \$1.....	\$2 00
78 locust posts, at 20 cents.....	15 60
160 strips, 4 feet long, 1x3 inches.....	3 00
400 pounds galvanized wire, at 10 cents.....	40 00
400 wire staples, at 1¼ cents.....	5 00
Setting posts and putting up wire.....	8 00
Hauling and distributing.....	4 00
	<hr/>
	77 60

The two strips of pine in each panel serve the purposes of stiffening the fence, preventing cattle from running against it, and, if notched at the corners, will keep the strands of wire in their places.

The farmer who cultivates one hundred acres of land must have at least one thousand rods of fence, according to the present system. This fencing, if of locust posts and chestnut rails, would cost \$2,353.12; of oak or chestnut posts, \$1,610.62; of locust posts and boards, \$1,676.50; of galvanized wire, \$970.

If the annual interest of these sums be computed, and then the estimation be made that the average durability of the fence will not exceed sixteen years, it will be found that the heaviest tax paid by the farmer is that of making and keeping up fences.

While fences may not be entirely dispensed with, it will be found

that the character and great cost of the same is occasioned by the necessity for protection against trespassers. Another suggestion may be made, that farmers would gain largely by confining their own cattle to the barn-yard, and cutting grass for them until after harvest, thus dispensing with at least one-half of their inside fences, and avoid the injurious effects of the tramping of cattle upon wet fields.

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## ENTOMOLOGICAL RECORD.

BY TOWNEND GLOVER, ENTOMOLOGIST.

FURTHER REMARKS ON THE PHYLLOXERA.—On page 55 of this issue will be found an article from M. Planchon, who was sent officially to investigate the insects and diseases infesting grape-vines in America, in order to ascertain if the true *Phylloxera vastatrix* was also injuring the vines as in France. As we have given his report, we deem it only just to give also the other side of the question, as much doubt has existed in the minds of some of our vine culturists as to the theory of the *Phylloxera* being an American insect at all, and as such having been imported into France with American grape-vines.

M. Laliman, in the French journal *La Guienne*, published at Bordeaux, criticises severely M. Planchon's report to the minister of agriculture upon his late mission to the United States, and questions his conclusions as to the identification of the *Phylloxera*. He says M. Planchon's period of observation in America was too brief for any settlement of the question; and when speaking of the identity of the *Pemphigus vitifoliae*, (of Fitch,) or the grape-leaf gall-louse, and the *Phylloxera vastatrix*, or grape-vine root gall-louse, he says, "We are a little surprised not to see in the present report any indication on this point." M. Laliman adduces several facts contradicting the idea of the root gall-louse of Europe being an American insect, as "in Missouri, one of the alleged States from which the gall-louse is said to have originated, the grape yield is larger than ever, depressing the market prices in Saint Louis," and quotes Dr. Parker, who says, "We know of no insect ravaging our vines; our sole concern is to sell our grapes, so great is the production of our vines." M. Laliman also argues that if the two insects are identical, as maintained by Messrs. Planchon and Riley, that vines of the *Labrusca* type, the *Isabella* and *Catawba*, would die in America, whereas those gentlemen formerly reported them as the most robust and healthy. The reviewer then cites the points raised by Mr. Berckman, editor of the *Farmer and Gardener*, that the root gall-louse has been imported into America in large numbers, as M. Labiaux, a prominent vine-grower in North Carolina, imported one hundred thousand vine-plants from the department of Hérault, which has been infested with the European grape-root gall-louse; and many other American nurserymen have also received large numbers of vines from this and other infested European districts. The presence of the *Phylloxera*, or grape-root gall-louse, in America is, therefore, easily accounted for without identifying it with the leaf gall-louse. M. Laliman thinks it scarcely worth while to consider the numerous differences of form and habit characterizing these insects, which have been pointed out by various entomologists, and says that M. Maxime Cornu, in one of the reports given to the Academy of Sciences, declares that, in order to establish the absolute identity of the

two insects, one fact is wanting, and that is, that hitherto no one has yet been able to obtain galls upon the leaves from the *Phylloxera*, or insect which produces the galls on the root, and says that this is indispensable, in his view of the case, in order to incontestably prove the identity of the two insects. M. Laliman further says that Mr. Engelmann sent to the Garden of Plants several vine-stalks, coming from Missouri, a State at present infested. One of these vine-stalks was given to him by M. Cornu, on which experiments had been tried during the summer of 1873 with the *Pemphigus*, or leaf gall-louse, and which, in truth, had produced swellings on the roots, and which was verified on taking it out of the pot. "When we planted it in the open soil, at the commencement of November, alas! this vine, martyr to science, imprisoned in a pot of twenty-five centimeters, was superb in vegetation for the situation it was placed in, and the *Pemphigus* had fled."

M. Laliman, after giving other supposed proofs, adds at the end of the paragraph, "consequently the *Pemphigus* is not murderous like the *Phylloxera*, and it is not the same insect, although having some resemblance." He says that, in 1869, M. Planchon told the Society of the Gironde "the insect has always been in Europe," therefore M. Planchon has altered his views since his visit to America. In 1873 Messrs. Bush & Son wrote us from St. Louis, "It is only European vines that are lousy, sometimes the Isabella and Catawba, and we pay little attention to it," and, lastly, M. Laliman says, "We have sent American vines to a hundred places, and have not had a single report of the introduction of the *Phylloxera* or root gall-louse." There are also several other points of great importance in M. Laliman's article which we might give, but enough has been said to show that some French and American vine-growers differ from the opinion of Messrs. Riley and Planchon as to the identity of the two insects, and the American origin of the great French vine-destroyer, *Phylloxera vastatrix*, or the root gall-louse of the vine.

Some of the American papers have also taken the matter up. In an article in Moore's Rural New Yorker, copied into the Farmer and Gardener, edited by Mr. P. J. Berckman, in Augusta, Ga., Mr. E. J. Labiaux, of North Carolina, states that Dr. Planchon says he "is satisfied that the American *Phylloxera* and theirs are identical." This opinion Mr. Berckman seriously questions, but, admitting it for the sake of argument, he denies that the identity proves that the insect in question was ever exported from this country to France. He then inquires why Dr. Planchon did not visit the locality in Georgia whence, as stated by Dr. Plumeau, of Bordeaux, the insect was exported to France, and asks, "What positive proof has Dr. Planchon acquired during his hasty visit to assert that the insect is of American origin?" and adds that when the report of the special committee, appointed by the American Pomological Society, at its late meeting at Boston, to investigate its origin and injury, will be made next summer, it is more than probable that its existence on this continent will be traced to importation from France, and that instead of American vines having introduced the insect into France, we owe to the introduction of French vines its existence in a few districts in the West. M. Berckman also questions the value of the remedy proposed, namely, the fumes of sulphuret of carbon applied to the roots, and says that, when properly applied, the fumes of this chemical will destroy the insects but will also materially injure the vines. He quotes three experiments made by a competent vineyard-owner in 1869. In the first experiments the application of sulphuret of carbon killed most of the vines operated upon; in the second, a portion of the vineyard was destroyed, even with the application of about one ounce



and a half; in the third, he estimates the cost of applying the sulphuret of carbon in sufficient quantity to destroy the insect to be over ten cents for each vine, which, on a large vineyard, would make it too costly to be profitable.

We merely give these facts in order to stimulate inquiry and experiment on this subject, and to warn vine-culturists not to be too sanguine of new remedies until tested.

In order to test the identity of the root and leaf gall-lice, in the autumn we inclosed some root-infested plants, sent from the vineyards of Mr. George W. Campbell, Delaware, Ohio, (the originator of the Delaware grape,) in pots, in a Wardian or nearly air-tight case, with some healthy leafless vines from our own green-houses. We then cut off some of the infested roots, and put them in juxtaposition with the roots of the healthy vines, in order to find out if the healthy vines will become infested with the root-lice, and *vice versa*. If the now leafless vines next season are attacked by the leaf-lice, we shall consider the proof conclusive; and further, consider the two insects as identical, although in form and habits altered by a residence above ground on the leaf, or under ground on the roots. Mr. Campbell has also promised us a further supply of root-infested vines next spring to continue our experiments.

**THE PHYLLOXERA ON FRUIT-TREES.**—Mr. Erni, United States consul at Basle, Switzerland, writes to the Department that he learns from a Berlin journal that the *Phylloxera vastatrix* has been found extensively on fruit-trees imported from France; and that the intention of the German and Swiss governments is, in consequence of this discovery, to prohibit the importation into those countries from France of fruit-trees, as they have already done, for some time, of grape-vines.

**PARIS GREEN AS AN INSECTICIDE.**—The assumption of patent-vendors, and those interested with them in the sale of insect-destroying compounds, that they are entitled to the credit of discovering the fact that Paris green is not a healthy diet for insects, and to the emolument of a monopoly of the sale of a well-known poison, is absurd as it is mercenary. The writer made use of this substance in destroying insects several years ago. Experiments have been made upon cotton-insects for several years, and our correspondents have been encouraged to make and report them more carefully than ever the present year; and the unusual prevalence of the caterpillar has caused these trials to become more or less general, and we have reported results from nearly all the cotton counties of the United States, as a matter of course, and do not claim any special credit for the work, and we scout and deride any attempt to make pecuniary or professional capital out of this subject.

**HOW TO RECOGNIZE THE COTTON-CATERPILLAR.**—As much confusion has hitherto existed, and yet exists, relating to the appearance of the true cotton-caterpillar, *Anomis xylinæ*, and as there is another insect (the grass-worm) infesting the cotton-fields about the same time the real caterpillar makes its appearance, it will be well to repeat a portion of our report on this insect published six years ago, and mention some distinguishing marks by which the cotton-moth may be recognized in either the egg, caterpillar, chrysalis, or perfect state. In the first place, the egg of the cotton-worm is round and very much flattened in form, and of a green color, whereas the egg of the boll-worm moth is round, somewhat bluntish, conical in shape, and of a yellow color.

**INSECT AND SQUIRREL DEPREDATIONS.**—The following extracts are from the statistical correspondence of the Department:

*Baltimore County, Md.*—The following insects were to a greater or less extent destructive in our county the past season: The Hessian-fly, on wheat; cut-worms, on corn; more caterpillars than usual on fruit trees; and potatoes were injured by a worm preying on the roots or lower parts of the vines. When this insect came to perfection, it was a small bug of a black color.

*Madison, Ill.*—From August to October, swarms of moth, which proved to be the *Angoumois* wheat-moth, as described in the annual report for 1856, were seen, especially at sundown, around wheat-stacks and thrashing-machines and in granaries.

#### RAVENOUS SQUIRRELS.

*Contra Costa, Cal.*—On ground not overrun by squirrels wheat averaged 20 bushels per acre. The loss by the depredations of squirrels and gophers will average one-fourth of the crop.

## CHEMICAL MEMORANDA.

BY WM. MCMURTRIE, CHEMIST.

**SOIL ANALYSIS.**—Great difficulty has generally been experienced by analysts in fixing upon a method by which the absolute fertility of a soil may be determined, or at least one which will afford results indicating a degree of fertility that will correspond with the experiences of actual practice, and founded upon the amount of the crops produced from it. Many soils containing a considerable quantity of organic matter in the form of *humus* have the mineral elements of plant-food locked up in organic combinations, which are insoluble in water, and, therefore, unless these combinations be acted upon by other materials having a stronger solvent power, and which may at the same time be readily taken up by the plants, they must lie dormant in the soil. In the decomposition of the nitrogenous matters of the soil, carbonic acid and ammonia are formed. Alkaline carbonates are known to have a solvent action upon the *humus* of the soil, and these substances are the materials which do the most work in supplying plants with nutritive principles. It is therefore evident that when we make use of the stronger acids in our analyses, we go further than the forces brought to bear in nature will warrant. Mons. L. Grandeau has thoroughly developed this idea in his investigations upon the black soils of Russia, and has found that in all cases the sample of soil to be analyzed should be exhausted with a dilute solution of carbonate of ammonia, since, he says, this latter re-agent plays the part, first, of an acid, and then of a base, and that the intervention of a strong acid, such as chlorhydric, is unnecessary. This Department has lately had an opportunity of making a practical application of M. Grandeau's ideas and of his method of soil analysis. During the past year we received, through Lieut. Col. S. C. Lyford, of the Ordnance Office of the War Department, a sample of black soil from the plantation of Mr. P. Kemble Paulding, on Brae's Island, Beaufort County, South Carolina. The sample in question had every appearance of being decidedly fertile, but as far as the cotton-crop is concerned, experience has proved that quite the opposite is the case, as may be seen from Colonel Lyford's communication. He says:

It having been found impracticable to raise cotton from this soil, Mr. Paulding desires to know what constituents are present which prevent the cultivation of such a crop. As a great deal of such soil is found on the various islands of the South Atlantic coast, a complete analysis will be of great interest to the planters of that section.

In compliance with the suggestion of Colonel Lyford, a qualitative examination of the soil was made, revealing the presence of protosulphate of iron; and this fact may be considered sufficient cause of failure in the production of cotton. A complete quantitative analysis has, however,

been prosecuted according to Grandeau's method, and the following statements indicate the results obtained.

Preliminary analysis of soil gave :

Moisture.....	4.75
Organic matter.....	14.24
Inorganic matter.....	81.01
	<hr/>
	100.00

Specific gravity of soil, 1.14.

The aqueous extract of the soil has an acid re-action.

The soil itself is of very fine texture, free from stones, is very compact, and becomes very hard when dried. When treated with a dilute solution of carbonate of ammonia, it yielded an extract which, when evaporated to dryness and strongly heated, left a residue which contained, in 100 parts, the following constituents :

Organic matter.....	86.950
Silica.....	1.878
Sulphuric acid.....	3.421
Magnesia.....	1.956
Lime.....	1.434
Peroxide of iron.....	0.913
Phosphoric acid.....	0.619
Potash.....	2.909
	<hr/>
	100.080

One hundred parts of the mineral matter remaining in the soil, after exhausting with carbonate of ammonia, contain :

Insoluble silica, sand, etc.....	78.100
Soluble silica.....	0.205
Lime.....	0.380
Magnesia.....	0.200
Manganese.....	0.491
Alumina.....	16.843
Peroxide of iron.....	2.970
Phosphoric acid.....	0.190
Sulphuric acid.....	0.677
	<hr/>
	100.056

Collecting the above results, we find that 100 parts of air-dried soil contain :

Moisture.....	4.750	
Matter soluble in carbonate of ammonia.	{ Silica.....	0.0432
	{ Sulphuric acid.....	0.0786
	{ Magnesia.....	0.0450
	{ Lime.....	0.0330
	{ Phosphoric acid.....	0.0142
	{ Peroxide of iron.....	0.0210
	{ Potash.....	0.0669
	{ Organic matter.....	2.0000
	<hr/>	2.3019
Matter insoluble in carbon- ate of ammonia.	{ Insoluble silica, sand, etc.....	62.93
	{ Soluble silica.....	0.165
	{ Lime.....	0.307
	{ Magnesia.....	0.161
	{ Peroxide of manganese.....	0.395
	{ Peroxide of iron.....	2.390
	{ Alumina.....	13.594
	{ Phosphoric acid.....	0.153
{ Sulphuric acid.....	0.546	
{ Organic matter.....	12.240	
	<hr/>	92.781

100.8315.

As we have seen above, the specific gravity of the soil is 1.14. A cubic foot of it therefore weighs 71.42 pounds, and a stratum of soil, one foot in depth, extending over one acre, will contain 3,100,055 pounds. This amount of soil is capable of yielding materials immediately available for plant food as follows :

	Pounds.
Silica .....	1, 331
Peroxide of iron.....	651
Phosphoric acid.....	440
Potash.....	2, 077
Magnesia .....	1, 395
Lime.....	1, 023
Organic matter.....	62, 001

It will therefore be seen that the soil in question contains sufficient material to satisfy the immediate demands of a cotton crop, although the quantity may be somewhat limited. The main trouble is undoubtedly due to the fact of the existence of proto-sulphate of iron in the subsoil, and probably free sulphuric acid also. Both of these substances have a poisonous influence upon plants. The planters of the South Atlantic coast, who have this difficulty to contend with, must necessarily adopt some means to remove this salt of iron, and to neutralize the free sulphuric acid. The most economical method by which this may be accomplished is a copious application of lime. In case of the soil in question, about 150 bushels of lime per acre will probably be required. I would also advise thorough under-draining where this is deficient, and it is probable that this is the case wherever the difficulty in question exists.

**EXHALATION OF MOISTURE BY PLANTS.**—That plants emit moisture during their growth is generally admitted, but what are the circumstances which are the most favorable to this action has never been fully determined until lately, when Mons. A. Barthelemy took up the subject. Many observations have been made it is true, but it is probable that the results obtained by the observer named above will be found more satisfactory than any heretofore published. In some of his observations Mons. Barthelemy followed the method of Mariotte, which consists in causing the branch to be experimented upon to penetrate a flask or other closed vessel and weigh the condensed water. He took the precaution, however, to introduce into the vessel a thermometer. When the plants were enclosed in this manner and exposed to direct sunlight, the temperature rose to 50° C., and small drops of moisture condensed upon the cold parts of the receiver. When removed to the shade the temperature rose slightly and the condensation almost entirely ceased.

For certain reasons, however, he was inclined in further researches to give preference to the method of M. Gareau, which consists in absorbing the moisture in chemical substances, in order to determine the comparative quantities evaporated from each side of the leaf. The leafy portion of the plant, with a weighed quantity of chloride of calcium is placed under a carefully luted receiver, and in order that the plant may have the same conditions as in the atmosphere, there was also inclosed in the receiver a small quantity of bicarbonate of soda, which by disso-ciation supplied the requisite quantity of carbonic acid.

The complete results of his experiments are too lengthy to be given in extenso, and we shall give only his conclusions, referring those of our readers who may desire more complete data with regard to this subject to M. Barthelemy's report in *Comptes Rendus* of November 10, 1873.

He concludes that aqueous exhalations from plants may be effected in three ways:

1. By insensible exhalation from the entire surface of the cuticle by means of a true gaseous dialysis.

2. By sudden emission of saturated gases which escape from the stomata when the plant is submitted to a rapid elevation of temperature, especially when inclosed.

3. By accidental exudation, resulting from a defect in the equilibrium between the absorptive action of the roots and the work of the parts exposed to the atmosphere, in fixing carbon combined with the elements of water, work which ceases with the disappearance of light.

I know that it is also right to conclude that heat exercises a strong influence upon this function, and that at equal temperatures carbonic acid in presence of light has the effect of diminishing the evaporation.

**AMMONIA AND NITRIC ACID—THEIR RELATIVE VALUE IN AGRICULTURE.**—Dr. Hellriegel of Dahme, having had his attention particularly, directly directed to the comparative influences of ammonia and nitric acid upon plant growth, was led to make an extended course of investigations continuing through a series of years, the results of which formed the subject of an interesting paper which he presented at a late meeting of the Central Agricultural Society in Frankfort. His work consisted principally in sand and water culture experiments with different compounds of ammonia and nitric acid which may be practically applied in agriculture, and he has certainly obtained some very interesting and valuable results; effects of the application of the different compounds may be shown by the following table:

Kind of seed grown.	Nitrogenous compound applied.	Amount of dry substance harvested.
		<i>Milligrams.</i>
Barley.....	Nitrate of lime.....	12,800
Do.....	Sal ammoniac.....	300
Do.....	None.....	300
Summer-wheat.....	Nitrate of lime.....	22,000
Do.....	Sal ammoniac.....	380
Do.....	None.....	630
Summer-rye.....	Nitrate of lime.....	15,000
Do.....	Nitrate of ammonia.....	720
Do.....	None.....	810

In case of the barley, when the nitrogen was applied to the plants in the form of nitric acid they grew normally and well, but as may be seen from the table when sal ammoniac was applied, no more was produced than when no nitrogenous material was added. The same remarks apply to summer-wheat and summer-rye, except that in these cases the production was less when ammonia-salts were applied than when the plants received no nitrogen whatever, showing that the ammonia-salts seem really to have an injurious effect. It would, therefore, appear that in their decomposition the roots suffered from the deleterious influences of the separation-products. In the decomposition of nitrate of lime, however, nothing but carbonate of lime, which is perfectly harmless, is left behind. Since it is evident, therefore, that ammonia-salts failed to produce good results in sand-culture, it was considered of some importance to make some experiments to determine if it were not possible to devise some means by which these could be employed and be not entirely lost. In order to avoid the injurious separation-products in question, Dr. Hellriegel tried the effect of nitrate of ammonia, and as this combination contained two sources of nitrogen, both nitric acid and ammonia, he took advantage of it to endeavor to determine the relative value of these two constituents, since, when comparing this combination with nitrate of lime, the former contains two equivalents of nitrogen, while

the latter contains but one. Application of two equivalents of the latter should therefore produce an effect equal to that of one equivalent of the former. If this be confirmed by experiment, then must nitric acid be as assimilable as ammonia, and *vice versa*. The experiments with this regard resulted as follows:

In 1870, barley which had been fertilized with 12 equivalents of nitrate of lime, gave, in two experiments, respectively, 14,910 and 15,854 milligrams of dry substance. Application of 6 equivalents of nitrate of ammonia also gave in each of two experiments, respectively, 14,910 milligrams of dry substance. In other years, little more than one-half the amount of dry substance was collected when one equivalent of nitrate of ammonia was applied as when two equivalents of nitrate of lime were employed.

Experimenting with regard to the neutralization of the injurious acids liberated by the processes of vegetation in case of the application of sulphate of ammonia and sal-ammoniac, he made use of a simultaneous application of carbonate of lime, and found that by this means healthy growth could be produced. The following table indicates his results:

Kind of seed sown.	Compounds applied.	Am't of dry substance harvested.
		<i>Milligrams.</i>
Summer-wheat	Twenty equivalents of nitrate of lime	39,532
Do.	Twenty equivalents of sulphate of ammonia	406
Do.	Twenty equivalents of sulphate of ammonia and carbonate of lime	22,674
Do.	Twenty equivalents of sal-ammoniac	171
Do.	Twenty equivalents of sal-ammoniac and carbonate of lime	25,647
Barley	Sixteen equivalents of nitrate of lime	19,525
Do.	Sixteen equivalents of sulphate of ammonia	953
Do.	Sixteen equivalents of sulphate of ammonia and carbonate of lime	16,081

These results have a practical bearing in that they show that while ammonia salts of any kind may be employed upon soils containing carbonate of lime, their application must be avoided in case of clay soils containing little or none of this constituent.

## BOTANICAL NOTES.

BY GEO. VASEY, BOTANIST.

**APOCYNUM CANNABINUM AS A FIBER PLANT.**—We have received from Rev. George Ainslie, Idaho, some roots and stalks of a plant which grows wild in that Territory, and which furnishes an abundant and strong fiber, used by the Indians in manufacturing cord, cloth, &c. Mr. Ainslie says that the Indians believe that for bow-strings, fish-lines, &c., it is stronger than any fiber furnished by civilization. They call it *kam*. The specimens sent appear to be *Apocynum cannabinum*, a plant closely related to the milk-weed family, which also furnishes some valuable fibers. This plant occurs more or less extensively in all parts of the country, and particularly in the West. It has long been known to possess a strong fiber, and has, on that account, been called Indian hemp.

Some months ago the Gardener's Chronicle (London) gave an account of a species of *Apocynum* (*A. Venetum*) which had been discovered in Turkestan, growing wild in great abundance, and whose fiber is said to be "as tender and delicate as flax, as strong and tenacious as hemp, and, by combining the qualities of the two, greatly superior to either."

It was expected that this plant would be transplanted to Europe and other countries. It is very probable that our own *apocynum* may possess all the qualities of the one above mentioned. Many of our native plants furnish strong fibers, but their relative value and commercial importance can only be determined by experiments on a suitable scale, and these experiments can nowhere be more satisfactorily instituted than in those places where the plants have a natural foothold.

**NOURISHMENT OF BUDS THROUGH THE BARK.**—In *Comptes Rendus* for November is an article of much interest, by M. E. Favres, detailing the results of some experiments made by him to determine the direct source of supply of food to the buds of trees.

The trees selected for the experiments were the mulberry, walnut, and cherry laurel. Three kinds of experiments were instituted: 1st. The removal of a complete or partial ring of bark. 2d. Separating flaps or strips of bark bearing buds. 3d. A combination of the two preceding methods.

On the walnut and laurel complete ringing of a branch was followed by early death of the buds above it, but a narrow bridge left sufficed to secure continued growth. The exposed wood was in all cases protected from the air. If the ringing is performed around the bud instead of around the branch, the same results followed. In all these cases starch is found in the buds below the ringing, but above it is soon exhausted by the growth of the bud, and when the supply of starch is exhausted the death of the bud follows.

There is no difficulty, M. Favres observes, in proving the ascent of nourishment by the bark, if a strip bearing a bud be detached, except its lower end, from a mulberry during the season of active vegetation.

A strip of bark with a bud separated the 20th of June made a branch 20 inches long by the end of August. The walnut gave the same results, with abundant cellular exudation on the internal face of the strip, which must be kept from drying, but which did not show quite as great growth as normal branches. A strip of wood may or may not be left on the detached bark. If a branch be ringed at short intervals the buds in the intervals will die in a time proportionate to their distance from the lower ring, and the starch will be found wanting in such intervals, conclusively proving the passage of starchy matter to the bud by means of the bark.

**DE CANDOLLE'S PRODROMUS.**—The seventeenth volume of this great work has been published, and the work is here concluded, although only the plants of the Exogenous or Monocotyledonous class have been described. The work was commenced in 1818, by Augustin P. De Candolle, who conducted it until the publication of the seventh volume, about 1841, when, his death occurring, the work was continued by his son, Alphonso De Candolle, assisted by his son, Casimir De Candolle, the concluding volumes having been published solely by Casimir, since the death of his father Alphonso.

There are described in the work 5,134 genera and 58,975 species, although this is probably not more than one-half the number of species of Dicotyledonous plants existing.

The principal natural orders described are :

	Genera.	Species.		Genera.	Species.
Compositæ .....	911	8,561	Acanthaceæ .....	154	1,481
Leguminosæ .....	283	3,853	Asclepiadaceæ .....	134	1,013
Rubiaceæ .....	225	1,888	Labiatae .....	122	2,401
Euphorbiaceæ .....	191	3,272	Cruciferae .....	100	988
Serophulariaceæ .....	176	1,879	Solanaceæ .....	65	1,725
Umbelliferae .....	160	1,016			

The most numerous genera are as follows :

	Species.		Species.
Solanum .....	915	Phyllanthus .....	447
Euphorbia .....	751	Erica .....	429
Senecio .....	601	Salvia .....	410
Croton .....	461	Peperomia .....	389

POPULUS MONILIFERA AS A SHADE TREE.—M. Van Hulle, curator of the Royal Botanic Gardens at Ghent, writes as follows :

Many kinds of trees, chosen for planting avenues, public promenades, &c., either do not accommodate themselves to all kinds of soils, or else require an inconvenient length of time to attain to such size and development of foliage as will afford the desired shade. In consequence of this, the Canada poplar (*Populus Canadensis*) has been largely planted about Munich and other places in Germany. This tree grows quickly, and in almost any kind of soil. Its only defect, as a shading tree, is that it sometimes, if left to itself, shoots up into too spiral a form to be of service in that way. This, however, is easily guarded against by heading down the young trees to the height of from 12 to 15 feet, and paying some attention to the pruning of the branches for some time, so as to secure the formation of handsome crowns. Treated in this way, the trees are quite as effective at some distance as well-grown specimens of horse-chestnuts.—*The Garden*.

The *Populus Canadensis* mentioned above probably means our cottonwood, (*Populus monilifera* Ait., of which *P. Canadensis* is a synonym.) We would suppose the *Populus balsamifera* to be at least equally valuable for the purpose of shade.

EARLY FLOWERING OF THE JASMINE.—In consequence of the mildness of the winter thus far, *Jasminum nudiflorum*, a Japan species of jessamine in cultivation here in the open air, has been in flower since near the 1st of January, two or three weeks, at least earlier than usual.

## MICROSCOPIC INVESTIGATIONS.

BY THOMAS TAYLOR, MICROSCOPIST.

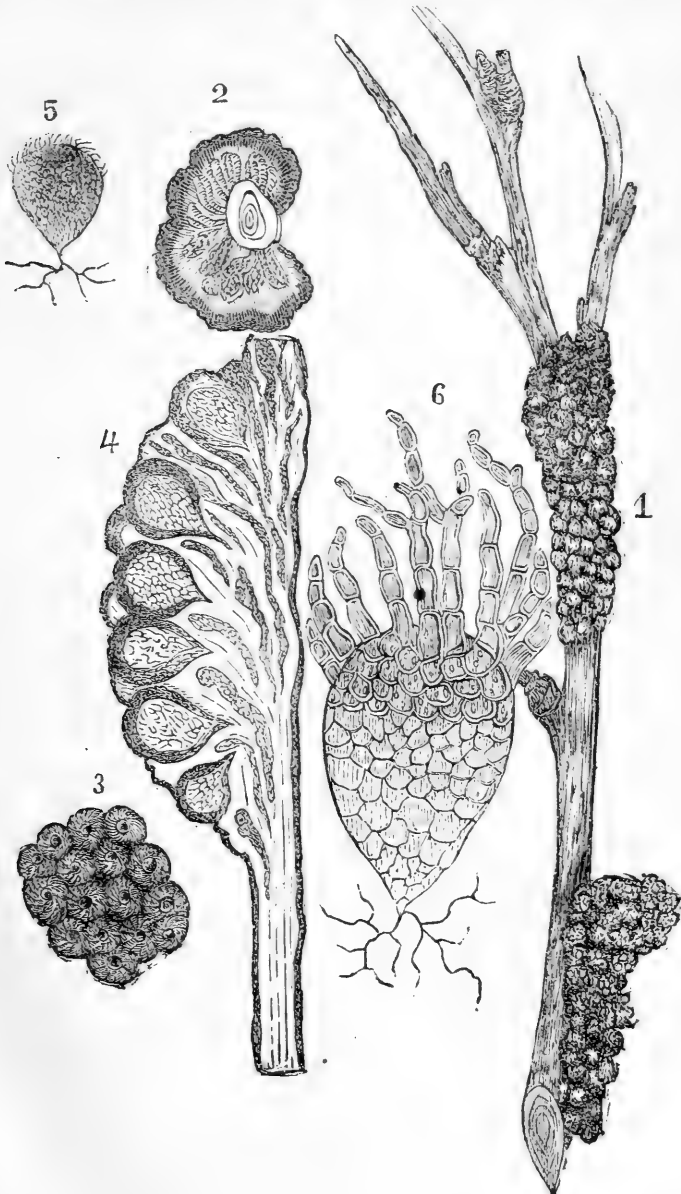
BLACK-KNOT.—Entomologists and botanists are now pretty generally agreed that the black-knot of cherry and plum-trees is produced by a fungus, but they have failed thus far to define its internal structure. Schweinitz, the American botanist, who died in 1834, seems to have been the first who suggested that it might be of fungoid origin, and he named it *Sphaeria morbosa*. During the present year several correspondents engaged in fruit-growing have sent to the Department specimens of cherry and plum tree black-knot, asking for information in relation to its cause and cure.

Hon. Marshall P. Wilder, of Boston, forwarded some specimens of the black-knot on cherry-tree branches, which I used as the basis of my experiments. The usual methods of investigating the black-knot by placing opaque sections of it under the microscope, gave results so unsatisfactory that I determined to employ my usual methods of rendering organic bodies transparent and yielding, by means of acids and alkalies. In this way the higher powers of the microscope may be brought to bear effectively on the fungus, its mycelium and spores, if present. The immediate use of strong mineral acids and caustic alkalies on suspected fungoid bodies has this advantage, that these prevent the possibility of the production of fungus growths by fermentation during the investigation. Portions of the black-knot were subjected to strong nitric acid during several days, and then examined under low and high powers of the microscope. Portions were also well washed in pure water, to free them from acid, and then submitted to the action of caustic potash. For the purpose of distinguishing colorless spores, mycelium, starch, chlorophyl, and cellulose from one another, a solution of iodine, con-



taining a small portion of nitric acid, was applied to the specimens. This solution colors starch blue, fungoid transparent matter a light amber, infusorial forms a dark amber, while cellulose and chlorophyl remain colorless under certain conditions. When viewed under a power of 100 to 600 diameters these substances are clearly distinguished from one another. I also submitted the dry leaves of the twigs to the same processes and examined their translucent cellular forms carefully, and observed some indications of fungus spores within the cells of the leaves.

1. Fig. 1 represents the general appearance of the black-knot of the cherry; 2, a cross section; 3, an enlarged view of it, showing indenta-



tions in the center of the conceptacles or *Perithecia* of the fungus; 4, a longitudinal section of the black-knot and branch of a cherry tree, in which sections of the *Perithecia* are exhibited highly magnified, while the woody fiber is represented of the natural size, as seen by the naked eye; in its advanced stages its woody structure appears as if it had been broken up into shreds or burst asunder, and its interstices filled with a very porous bark-like substance, which is again interspersed with a very fine transparent thread-like mycelium; I have no evidence, however, that this mycelium has any direct relation to the black-knot fungus; 5, a typical representation of the *Perithecia*; 6, a very highly magnified transparent view of a *Perithecium*. The structure is cellular as exhibited, and of a dark amber color. Each top surface-cell of the *Perithecia* generally contains two or more very minute spore-like bodies; frequently the bottom cell of the mycelium contains these spores also. Perfected fruit will doubtless yet be found on the mycelium, which is jointed and branched, and resembles very much in structure the fruited black-orange mycelium, described in my last report, except in color. I have found floating in the gum solution, when examining the mycelium of the black-knot, several *Perithecia* without stalks having the same color as the mycelium; but further observations are necessary to demonstrate their relationship. Further investigations will have to be made before any suggestions can be published in relation to the prevention of black-knot as a result of the work already prosecuted.

ONION-RUST.—In a recent experiment, made for the purpose of destroying fungus on the onion, the following mode has proved very successful: Some specimens were obtained in the market, covered with amber-colored fungus. I secured one of them in an inverted glass receiver, which I placed over a beaker filled with nitrous acid. The fumes arising from the acid, without the application of heat, enveloped the onion, and soon dissolved and destroyed the fungus covering its surface. In order to ascertain whether the life of the plant had been destroyed, I placed it in a bulb-glass filled with water. It sprouted in a few days, and is now in healthy growth on my desk. It has numerous leaves, which have attained a length of 6 to 12 inches; thus showing conclusively that, in some cases, fungoid growths may be effectually destroyed without injury to the plants on which they grow.

This principle admits of many important applications. In some diseases of the potato the surface alone appears to be affected, and the same is true in regard to certain diseases affecting the tubers, roots, fruits, and grains of various other plants, any of which may be readily exposed in large quantities to the fumes of nitrous acid. As nitrous acid has the power of depriving organic bodies of their oxygen, its destructive action on fungus is probably due to this property. The extent to which this treatment may be safely applied to the smaller grains will be the subject of future experiment.

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## THE PHYLLOXERA IN AMERICA.

It is known that M. Planchon, a distinguished scientist, was delegated by the Agricultural Society of Hérault, in France, to visit the United States during the last summer for the purpose of investigating the character and habits of the insect which has for several years past been so terribly destructive to the vineyards of Europe, and the ravages of

which, although to a much less extent, have also been experienced in this country. M. Planchon, upon his return to France, has promptly made known the results of his mission. An early copy of his report enables us to state these results for the information of vine-cultivators in this country. It will be seen from what follows that M. Planchon's observations have led him to conclude that the insects which have devastated the European grape-vines, and which have been more or less injurious to the vines in this country, are identical; that in consequence of the disease occasioned by this insect the culture of European grape-vines in this country has in all cases proved a failure; that certain American vines are found to resist, to a great extent, the attacks of this destructive enemy, while there is one, the Scuppernong, of North Carolina, that absolutely and entirely escapes its ravages; and, what is most important, that another insect has been discovered here, which proves to be a natural and active enemy of the great destroyer, and which it is believed may be effectually employed in impeding if not in finally arresting its ruinous march. M. Planchon's report, of which the following is a translation, is dated at Montpellier, France, the 10th of November, 1873, and is addressed to the minister of agriculture of France:

REPORT OF M. PLANCHON ON THE PHYLLOXERA OF EUROPE AND AMERICA.

MR. MINISTER: In accordance with the proposition of the Agricultural Society of Hérault you have commissioned me to proceed to the United States to study the history and habits of the insect which has for years ravaged the grape-vines of Provence, Languedoc, and Bordelais. The points indicated to me for investigation were as follows:

1. Is the *Phylloxera vastatrix* of Europe the same as the insect described in the United States under the name of *Pemphigus vitifoliae*?
2. Does the European vine yield to the fatality in America?
3. Do certain varieties of American grape-vines resist the destructive action of this insect while others absolutely escape its attacks? Consequently, can the different varieties of European vines be successfully engrafted upon such vine-stocks as may be found to resist the Phylloxera?
4. Does there exist in the United States an insect which is destructive of the Phylloxera, and that even seeks it beneath the ground? And, if so, could these *cannibals* of the Phylloxera be introduced into Europe, so as to keep the ravages of their enemy within certain limits?

To these principal objects were added, as accessories, those of the study of the habits of the Phylloxera in America; of indigenous vines and the principal varieties of vines in that country; and finally, the study of American vines with a view of ascertaining their specific characters and the mode of culture.

I left Havre on the 4th of August, 1873, and was enabled to devote to these researches the interval of time between the 29th of August and the 4th of October, to visit the principal vine-growing districts of the United States, with the exception of California, where the Phylloxera is yet unknown, and, thanks to the generous aid which I received in all quarters, I was enabled to collect the materials for a complete and satisfactory report upon the objects of my mission.

I have now the honor to submit to you, in an abridged form, the conclusions to which my researches have led me; conclusions which are confirmed by the opinions of Mr. Riley, in America, and of Messrs. Laliman and Lichtenstein, in Europe:

First. As to the identity of the European and American insect. There is no doubt on this point. I have examined the insect in all its forms and under all its conditions, upon American vines, both wild and cultivated, and have found it absolutely the same as that of Europe. Its existence in America for a long period has been proved by the *Phylloxera* galls which were collected in Texas as long ago as 1834, by the botanist Berlandier, upon the vines of the *Vitis monticola*.

Secondly. The decline, in some cases nearly fatal, of European vines transported to America is a fact long known but not generally understood. I have found new proofs of it. Some have attributed the decline to a change of climate, since the culture of European vines has been universally unsuccessful throughout the whole country, from

Canada to Florida, and from the East to the Rocky Mountains, Mr. Riley has discovered the true cause to be the *Phylloxera*.

Thirdly. The resistance of certain American vines to the attacks of the *Phylloxera* has been noted by Mr. Laliman in Europe, and by Mr. Riley in America. Shall we confide implicitly in the statements of these gentlemen, or shall we inquire into some apparent contradictions in their assertions? Upon these points I make, from my notebook, the following extract:

A particular species of vine, special to the Southern States, and not generally known in the Northern States, where the climate will not admit of its culture, the Scuppernong, (*Vitis rotundifolia*), absolutely escapes the *Phylloxera*; and, in all my researches, I have never found it upon either roots or leaves. It is the only vine that possesses this characteristic, and it will, therefore, be the vine-stock to choose as a graft-bearer of European vines, if certain difficulties can be conquered, that the nature of the wood seems to oppose to its multiplication by cuttings and its aptitude to receive the graftings of other vines.

I shall refer again to this entirely new subject, that I have studied with care in North Carolina, where the Scuppernong exists in a wild as well as cultivated state.

Although the *Phylloxera* attacks the roots and sometimes the leaves of the resisting vines, I will point out those stocks that ought to make excellent graft-bearers of our vines. They are the Concord, (*Vitis labrusca*), the Clinton, (*Vitis cordifolia*), the Herbemont, the Norton's Virginia, and the Cunningham (*Vitis aestivalis*). My detailed observations would permit me to add other names to this list; but I have purposely limited myself to the indication of those stocks the resistance of which has been proved, and the introduction of which can be recommended to the vine-cultivators of Europe, as proof against the *Phylloxera*.

Upon the question of the attempt to graft European plants upon the resisting vine-stocks of America, allow me to await the approaching deliberations of the Central Agricultural Society of Hérault, and then to transmit to you for publication the conclusions which may be reached concerning the stocks to introduce; the practical means of procuring them in good condition; the modes of grafting by which we may most promptly discover whether the grafting of our vines upon them will give the desired results, or whether it is necessary, in case of failure, to cultivate seedlings of the best American vines. This last resource of direct culture depends upon the localities where the constant presence of the *Phylloxera* and the impossibility of submersions will oppose themselves to the culture of European vines.

Fourthly. The existence in America of an enemy to the subterranean *Phylloxera* is happily no longer an hypothesis. The active and intelligent researches of Mr. Riley have enabled him lately to discover an *acarus*, which justly fills the rôle of cannibal to the *Phylloxera*. This *acarus*, the history of which has not yet been published, but of which Mr. Riley and myself will shortly give an account in detail, is actually living in my possession, having been captured more than a month ago. It is a kind of *Tyroglyphus*, which we have named the *Tyroglyphus phylloxera*. It is of the same genus as the mite, or flesh-worm of cheese-rind, and like other *Tyroglyphs*, produces an *acarus* of a different appearance, described under the name of *Hypopus*. My efforts this winter have been to multiply it in a close box, and in the approaching spring, I shall endeavor to acclimate it in the soil.

Although naturalists perfectly understand the importance of the rôle that these parasites or cannibals play, in checking the increase of certain destructive insects, it is not well to exaggerate the importance of the *acarus* that devours the *Phylloxera*. Upon this point, as well as that of grafting upon resisting stocks, experience alone will permit positive affirmations.

The results of my mission may be stated in general terms to be:

1st. The discovery of the absolute identity of the *Phylloxera vastatrix* of Europe, and the *Pemphigus vitifoliae* of America; the proofs that the European vines have always failed in the United States, California excepted; the confirmation of the existence of vines which resist the attacks of the *Phylloxera*; the discovery that the Scuppernong, (*Vitis rotundifolia*) is not even attacked by this insect, and the introduction of an *acarus* that can check the multiplication of this enemy of our vines.

2d. The consequences of the preceding facts are: the probability of being able to save our vine-stocks from destruction by grafting them upon the American resisting vines that have been named; and the possibility of cultivating directly these resisting vines and obtaining good stocks, the Norton's Virginia, and the Herbemont, for example.

I propose to treat the subject of the culture of American vines, and the nature and fabrication of their wines, *in extenso*, in a subsequent report. I also intend to introduce into the report, a study of the species and varieties of American vines.

M. Planchon is undoubtedly in error in attributing the failure in the out-door culture of the European grape (or, more properly, the Asiatic grape) in this country solely to the ravages of the *Phylloxera*. The true cause of this failure is well known to be that of fungoid growth

upon the foliage. It is purely a climatic influence, as totally independent of any insect as was the destruction of European vineyards in 1845 by the *Oidium*.

In the summary of his observations, M. Planchon refers to the measurable absence of the *Phylloxera* in California. It is remarkable that he did not note the evidence in the case, as the European grape is almost exclusively cultivated there; and consequently it might be expected that the *Phylloxera* would be more plentiful there than here, where the foreign grape is not generally cultivated. In this particular M. Planchon has evidently been misled by Mr. Riley, whom he quotes as his authority for the statement relative to the cause of failure with the foreign grape.

It may also be questioned whether the selection of our native varieties of grapes that are comparatively free of the disease, as made by M. Planchon, agrees with the numerous observations of American grape cultivators. Certainly, all recorded observations go to prove that the smooth-leaved species and varieties of our grapes are more generally attacked than are those with pubescent foliage. The Clinton, a variety of *Vitis riparia*, is particularly subject to attack, yet M. Planchon includes this variety in the list which he recommends for importation into France, as resisting the attacks of the *Phylloxera*. As a strong growing stock to graft upon, it is undoubtedly meritorious, much more so, indeed, than some other varieties in his list.

W. S.

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## FACTS FROM OFFICIAL SOURCES.

**JUTE.**—*North Carolina.*—A planter, writing from North Carolina, says that he planted the jute-seed, furnished by the Department, May 1. The ground was prepared as for cotton, and the seed dropped 12 inches apart; land, moist bottom, and, as the spring was a very wet one, the seed lay dormant for three weeks; consequently, a good stand was not had. The plant grew to a height of 13 feet, with limbs from 5 to 7 feet long. The plat was plowed twice, and hoed once. It was cut October 1 and thrown into water, where it remained to rot three weeks; the bark was then easily stripped from bottom to top. A specimen of the fiber was exhibited at the State fair, and pronounced very fine by persons who were familiar with its culture, having seen the plant and fiber in their native habitat. Our correspondent is of the opinion that the bottom lands of North Carolina could be made to produce, by liberal manuring, as much as 3,000 pounds of fiber per acre. It was troubled by no insects; besides, he had a cotton patch by the side of the jute, and no caterpillars made their appearance to disturb the cotton; while in other fields they destroyed several acres in a week.

*Georgia.*—A planter in Georgia, who has succeeded well in an experiment in raising jute, says that if 5 cents per pound can be netted, more can be made by raising jute than cotton. He planted about the 1st of May; the seed germinated freely, and the plants grew finely on rather poor land, attaining a height of over 10 feet by the 19th of September.

*Louisiana.*—Mr. Le Franc, President of the Jute and Ramie Company of New Orleans, has sent to the Department, for its museum, five specimens of jute and its fabrics raised and manufactured in Louisiana. These consist of jute filament, rolled, after cleaning by machinery; jute rope, crude or unrotted, as it comes from the machine; and jute rope

made of rotted jute. Mr. L. says the jute is acknowledged to be 50 per cent. superior to the India article. Inspection of these very fine specimens, by those interested in this new American industry, is invited.

*Bengal.*—The increased demand for jute in Calcutta, whence almost all that is manufactured is imported, has stimulated the culture of the plant in India in a high degree. In Bengal, where twenty years ago jute was only cultivated for individual use, the plant now forms a staple product of the country. Next to rice, it is the principal product; and, as compared with rice, it is found to be the safer and more certain and profitable crop. In several divisions of Bengal the culture has been extended enormously within three or four years, and yet the demand for exportation is by no means met. Both high and low lands are found to be adapted to its growth, and it is easy and sure of cultivation; and so remunerative that the condition of the *ryots*, or cultivators, is seen amply to have been much improved by it. Hitherto India has not merely raised the best jute, but it has been almost the only country where it was grown at all. The culture in the United States is only just beginning; but, as will be seen from the opinion quoted above, in regard to Louisiana, we have already succeeded in producing a fiber which competent judges pronounce to be superior to that of India.

INTERNATIONAL HORTICULTURAL EXHIBITION AND BOTANICAL CONGRESS IN ITALY.—The Department of Agriculture has received through the State Department an official communication from Count Zannini, the charge d'affaires of Italy here, giving information that an International Horticultural Exposition and a Botanical Congress will be held coincidentally at Florence in May next, under the patronage of the Royal Tuscan Horticultural Society; and that the project is commended by the government of the King of Italy to that of the United States, to the end that commissioners may be appointed to take part therein. It has not been deemed advisable to request legislation upon the subject; but Count Zannini has been informed that such information will be given through this Department as will enable horticultural and other bodies in this country, if so disposed, to take part in the exhibition and congress. The former will embrace exhibitions of fruits, plants, flowers, &c., for the best collections of which gold and silver medals will be given, respectively, by the King of Italy, the minister of agriculture, and an association of lady patronesses in Florence. The botanical congress will be occupied with memoirs, essays, and discussions of appropriate topics. Both the exhibition and congress will remain open from the 11th to the 25th of May.

GUINEA GRASS.—Mr. C. Codrington, of Florida, formerly of Jamaica, communicates to the Department a paper touching the cultivation and natural growth of Guinea grass in the West Indies, and its introduction into Florida. Speaking of the island of Jamaica, he says he has never known the working mules there to get grain of any kind, and if offered them they would not eat it, yet they are as hard-worked as any stock in the world; Guinea grass being the only feed supplied. Of course, therefore, in those islands this grass is not considered a noxious weed, as it is too often regarded by Southern planters. The people are only too glad to have it, and, where it thrives, abandon every other cultivation to make way for it. Once established, very little cultivation is required. Hired laborers go through the fields cutting out the young trees with *machetes*, (a kind of cutlass,) at a cost of about 25 cents per acre. Mr. Codrington says:

On coming to Florida I perceived at once that the great want of the State was a good grass to suit the climate. I wrote to Jamaica for some seeds of the hardest variety, called there the "St. Mary's grass." This I planted in the spring of 1872, and got about twelve plants to grow. As fast as the roots got sufficiently large I took them up, separated them and replanted, some roots giving me twenty-five to thirty plants; but I found that the planting should be done immediately after a heavy rain, when the earth is quite wet. I continued this operation until September, when I allowed the plants to go to seed. Part of the seed I gathered, and left some to drop. The plants stood several severe frosts before the grass was killed. I then cut it off and found stock even then eat it with avidity. This spring the old roots sprouted again, and all around them innumerable young plants came up from the seed that had been sown the last autumn. I continued the same system this summer that I did with my plants in 1872, with perfect success. Others, who procured plants from me and have followed the directions, have also succeeded, and it now only requires enterprise to make this State the grazing State of the Union; for the success of the grass I consider established beyond a doubt. The land I used was the poorest, worn-out pine land; too poor even to grow sweet-potatoes. I had the grass 8 feet high in some places, and I cut some of it three times during the summer.

He adds, in a postscript :

In planting from roots, the tops should be cut off before planting; and do *not* plant the roots *straight*, but in a slanting position, almost lying down. Do not plant deep; about four inches of the stem should be out of the ground.

A letter on the same subject has been received from Mr. Adams, of Jacksonville, Fla., to whom a small quantity of seed, received from Jamaica, had been sent by the Department for experiment. He sowed the seed in rather poor, light land, slightly manured. It grew rapidly and steadily, even luxuriantly, "and has at the height of two feet (December 11) been cut three or four times during the season, and is now flourishing finely." Mr. A. continues :

It does not "plant" or spread from the root during the first season as much as I had expected, showing that probably the best way to start a field is by broadcast or drill sowing. But as to its adaptability to the climate and soil of the South, and of Florida especially, (where the greatest agricultural need is confessedly a grass that will bear sun and drought,) I have not a shadow of doubt. In two-thirds of the northern and southern extent of the State cattle are raised without any feed or care except grazing at large; yet there is an annual ratio of increase of more than 30 per cent. So that with an available grass to supplement the natural or wild grasses, Florida is bound to be an important cattle and stock raising State.

EXPERIMENT WITH GRASS.—A package of grass-seed, *Lolium Italicum*, having been sent to a gentleman in Cobb County, Georgia, he conceived the idea of an experiment to determine whether cutting early, and not allowing seed to ripen, would preserve the vitality of the roots. In a former season he had raised grass on a piece of ground on which sheep were pastured, and gathered twenty-seven bushels of clean seed from three-fourths of an acre; the stems were three feet high; still, after cutting, all the old roots and the fallen seed sprouted, but the dry weather and crab-grass together killed both.

At the time of sowing the *Lolium Italicum*, above mentioned, the season was unfavorable on account of the early springing up of the crab-grass, which smothers whatever has not got a good start in advance of it. The planting was on the 3d of March, on good, high ground, well prepared and manured with Charleston phosphates. A second application of phosphate was made on the 2d of June. It was first cut June 23, to keep down the weeds and crab-grass, when a few seed-stems were in bloom; a second cutting was made about seven weeks after—weather hot and dry. At the date of writing, November 24, there was every hope of the success of the experiment, with the help of nitrogenous fertilizing.

This correspondent thinks that the best cultivated grass for that part of the State, which is of granitic formation, is the orchard, since it stands hot and cold, dry and wet weather, equally well.

**CORN IN MAINE.**—Adams' Early corn grew 10 feet high last season, but had many false stalks, ears short; "too late," says our correspondent, "by three weeks, for Maine." He finds that corn grown two hundred miles north or south accommodates itself to the seasons of Maine in about ten years.

**DEPARTMENT SEEDS IN LOUISIANA.**—Dr. Allen, of Saint Mary's Parish, says of the garden-seeds received from the Department, that some of the varieties have developed and flourished beyond any of the kinds he has ever before seen in that section. He mentions the early red onion, Brussels sprouts, horticultural pole-bean, kohlrabi, purple cap broccoli, large Brunswick cabbage, and McLean's advanceer peas, as having produced well; but that each was the best of its kind, as to quality, that he had ever tasted. The McLean pea proved a wonder; with a low vine, requiring no support in the way of sticks, it produced an extraordinary number of pods, each pod filled with the largest and most tender peas "I ever tasted." In conclusion, Dr. Allen says that he cannot conceive of a more satisfactory or more profitable garden than one planted with the same kind and assortment of seeds as those distributed by the Department.

**ARNAUTKA WHEAT.**—A correspondent of Vivian, Minnesota, says that Arnautka wheat proves to be hardy, vigorous, and very productive, but grades as "rejected" in Chicago, and sells at 15 cents per bushel less than varieties usually grown in his locality. The complaint against the wheat is as to its flintiness. He says the varieties of spring-wheat grown in Eastern Europe all rust so as to shrink badly when grown in Minnesota.

**PEELER COTTON.**—Two quarts of this cotton-seed were planted in Greene County, North Carolina, in sandy loam; seed dropped at intervals of 12 inches, in rows  $3\frac{1}{4}$  feet apart, occupying about one-eighth of an acre. Amount of seed-cotton picked, 150 pounds, which made 50 pounds of lint, equal to 400 pounds per acre; considered a very good yield in that county. Our informant says that the staple is considerably longer and finer than any other variety in the county. This variety is only the ordinary cotton of our Southern States developed by selection and superior cultivation.

**SORGHUM.**—Mr. James Vaux, of Iowa, says of the imported sorghum (black seed) sent to him by the Department, that he planted the seed side by side with the same quantity of the large red variety, and that the former was far the richer in product, growing also three feet higher than the latter. From twenty rows grown across a two-acre garden he made forty-three gallons of molasses, which was thick and of good quality. Planted the last of April.

**FULTZ WHEAT.**—In Saratoga County, New York, one grain of Fultz wheat is reported as having thrown out nine stalks bearing 378 kernels. Selected heads in the field contained 50, 53, 58, and up to 63 kernels.

**FLOWER-SEEDS.**—A Missouri correspondent says that the vegetable and flower seeds he received from the Department have invariably proven true to name and of superior kind. Of the flowers he freely distributed seeds of their production, and a hundred homes have been adorned.

**IMMIGRATION IN 1872-'73.**—The records of the Bureau of Statistics, Treasury Department, show that 459,803 immigrants arrived in the United States during the year ending June 30, 1873. Of these, 66,859 had attained the age of forty years or more, 288,272 were between the



ages of fifteen years and forty years, and 104,672 were under fifteen years of age. The following table gives the principal nationalities of the immigrants:

Countries.	Males.	Females.	Total.
England.....	45,094	29,777	74,801
Ireland.....	40,993	36,351	77,344
Scotland.....	28,254	5,587	33,841
Germany.....	86,411	63,260	149,671
Austria.....	3,098	2,667	5,765
Sweden.....	8,656	5,647	14,303
Norway.....	9,928	6,319	16,247
Denmark.....	3,326	1,605	4,931
Netherlands.....	2,282	1,529	3,811
Switzerland.....	1,943	1,164	3,107
France.....	9,500	5,298	14,798
Italy.....	6,851	1,864	8,715
Poland.....	2,224	1,114	3,338
China.....	19,403	889	20,292
Canada.....	17,113	14,598	31,711
Nova Scotia.....	2,093	1,826	3,919
Other British North American provinces.....	1,240	1,001	2,241
All other countries.....	7,453	3,515	10,968
Total.....	275,792	184,011	459,803

The total immigration from the British Isles was 166,843. There were 1,560 immigrants from Russia, 1,347 from Hungary, 1,176 from Belgium, 1,161 from the Azores, 962 from Cuba, and 1,130 from Australia. The following gives a general classification of occupations:

Occupations.	Males.	Females.	Total.
Professional occupations.....	2,747	239	2,986
Skilled occupations.....	47,490	1,302	48,792
Miscellaneous occupations.....	152,575	16,143	168,718
Occupations not stated, (chiefly women and children).....	1,371	3,497	4,868
Without occupation.....	71,609	162,830	234,439
Total.....	275,792	184,011	459,803

Detailed statements of occupations show 36,983 farmers, 530 farm-laborers, 538 gardeners, 104,423 laborers, 7,038 merchants and dealers, 6,406 carpenters, 4,293 masons, 2,411 shoemakers, 2,393 tailors, 1,894 blacksmiths, 334 clergymen, 187 physicians, and 370 teachers.

**PROFIT IN CLOVER-SEED.**—Our correspondent in Outagamie County, Wisconsin, reports that from the second crop on a clover-field of ten acres, clover-seed was harvested which sold for \$340.

**UNIFORMITY IN WEIGHTS AND MEASURES.**—One of our correspondents calls attention to the desirableness, on account of its great practical value, of a law passed by Congress securing uniformity in weights and measures throughout the country. In illustration of the evils of the present system, in which each State and Territory has its own independent standard, he states that the legal weight for a bushel of seed is in some States 12 pounds less than in others. Those who are not aware of these differences in weight or measure are often deceived by quotations in the newspapers, and in buying or selling in markets outside of their own State.

**FOREST-TREES.**—The following is an extract from the recent message of the governor of Pennsylvania addressed to the legislature of that State:

I respectfully invite your attention to an evil of considerable magnitude, which every year grows more aggravated, and in certain regions, at times, is the occasion of serious apprehension. I refer to the wholesale destruction of our forests, the stripping of our mountains and hills of their trees, resulting in an enormous diminution of water for mechanical and fertilizing purposes, and in great changes in the normal conditions of temperature and moisture, affecting the general health and at seasons bringing about devastating floods. These consequences, as the effects of this indiscriminate waste, are demonstrable, and a wise legislation will forecast the future and establish such regulations as will rescue our descendants from the ills a perseverance in this practice will certainly entail upon them.

**PENNSYLVANIA FISH COMMISSION.**—In his recent message, the governor of Pennsylvania communicates facts and conclusions of general interest respecting the transactions and anticipated results of the fish commission of that State. Assuming that the success of fish-culture is now assured; that its extent is to be limited only by the wants of consumers and the capacity of the streams, rivers, and lakes of the country, and that Pennsylvania has superior advantages for producing fish, not only of ordinary but of rare and most delicious varieties, he gives the following summary of the doings of the State commissioners the past year: At Newport, Perry County, where the water is especially adapted to the purpose, they succeeded in hatching, by the aid of Mr. Seth Green's patent, 2,700,000 shad, which were turned into the Juniata at that point. They also, during July and August, distributed in the Susquehanna, Lehigh, and Juniata, 2,600 black bass. Through the co-operation of Professor Baird, United States Fish Commissioner, 27,000 California salmon were planted in the Susquehanna and its tributaries. In 1870 two or three hundred bass, which are represented as not migratory, and very prolific, were placed in the Susquehanna near Harrisburgh, and the great number now found in the river in that vicinity affords evidence of the rapidity with which they multiply. The law creating the commission directed that four fish-ways should be constructed at different dams on the Susquehanna and Juniata, but the commissioners regarding the question whether fish will ascend an artificial way as still a mooted one, have thus far constructed only one; that is at the Columbia dam, and is 120 feet long, 60 wide, very gradual in the ascent, and made as nearly as possible to imitate a natural fish-way. If in the spring it is found that shad pass up this, the construction of the others will immediately follow. The commissioners have erected and properly furnished, near Marietta, a hatching-house, supplied with water from an inexhaustible spring, and having a capacity equal to the proper care of 700,000 young fish.

**RATE OF EXHAUSTION OF MANURES.**—At a late meeting of the Ayrshire Farmers' Club, Scotland, the subject discussed was, compensation to outgoing tenants for permanent improvements and unexhausted manures. By way of illustration an agreement with his tenantry entered into by Sir Patrick Keith Murry was introduced. Among the principal points were these: the beneficial effects of horse, cow, and town manure, guano, bones, and coprolites are held to last four years, and the rate of exhaustion to be  $\frac{4}{10}$  the first year, and  $\frac{1}{10}$  less each succeeding year; of lime, applied to arable land, to last ten years, and the rate of exhaustion  $\frac{10}{50}$  the first year, and  $\frac{1}{5}$  less each succeeding year; applied to permanent pastures to last twelve years, and the rate of exhaustion  $\frac{12}{72}$  the first year,  $\frac{11}{72}$  the second, and  $\frac{1}{72}$  less each succeeding. Nitrate of soda and sulphate of ammonia are held to be exhausted by the crop to which they are applied. For oil-cake or any similar substance of equal manurial value except grain of all kinds, purchased and used by the tenant in feeding sheep or cattle on the farm,  $\frac{1}{6}$  of the entire cost of all so used during the

last three years of occupation shall be allowed. The value of any new manures not included in the above list, and the unexhausted value of any included, but of a quality better or worse than average, or applied in exceptional quantity or under exceptional circumstances, is to be determined by arbitration. In the course of the proceedings it was unanimously resolved :

That in the opinion of this meeting the land of this country will never be farmed in such a way as to make it produce all that it is capable of doing until a law is passed giving fair and reasonable compensation to the tenant, when he leaves his farm, for all unexhausted improvements and manures that will add to the value of the farm : and that, on the other hand, when a tenant, through negligence and bad farming, deteriorates the natural fertility of the soil, he should be compelled to pay his landlord for all such deterioration.

**WILD CATS IN MAINE.**—Our correspondent in Hancock County states that within the last two years wild cats have been making great havoc of sheep in that section. It is estimated that during the past season they destroyed in one town sheep valued at \$100.

**WOLVES IN PENNSYLVANIA.**—Our correspondent in Elk County reports that wolves have lately been very destructive among sheep in that locality. One man lost his whole flock, 55 ; and during the past six months as many as 150 had been killed by them within a distance of five miles. Our correspondent in Clearfield also states that great numbers of sheep have been killed by wolves in that county within the preceding two months.

**EXTRAORDINARY YIELDS OF CORN.**—Mr. John W. Murry, of Carroll County, Maryland, reports in the Westminister Advocate, that on one acre, the past season, he raised 30½ barrels (152½ bushels) of shelled corn. The reported culture was as follows : the land was so situated that it received the washings from the road and from his barn-yard, and had been in grass for fifteen years. In the spring of 1872 he plowed it and planted it in corn. The yield that year was 26½ barrels. On the 16th of May, 1873, he plowed the corn-stubble ground very deep, and harrowed and rolled it. The next day he sowed 300 pounds of bone-dust and harrowed it again, marked it off 32 inches one way, sowed 200 pounds of Rhodes's super-phosphate in the rows, and dropped the corn, one and two kernels in the hills, 10 inches apart. The variety of corn was the Chester County Mammoth Yellow. On the 4th of June, as much was missing, he "dragged the ground and replanted ;" plowed on the 10th, some hills still missing ; on the 17th plowed, hoed, and "plastered the weak spots ;" on the 30th dragged, plowed and thinned ; on the 4th of July "hilled with a potato-plow as deep as one horse could pull," and continued to thin as it required until the shoots appeared.

According to a report of the Agricultural Society of Washington, Pa., Mr. James W. Dickey, whose farm lies partly in that county and partly in Brooke County, West Virginia, produced last season, on 15 acres, 2,535¾ bushels of shelled corn—average 169 bushels per acre. The only conditions of culture reported were these : the field had been used for a sheep-pasture for the preceding eighteen years. In the spring, as soon as the frost was out, he broke up the sod, plowing not deeper than three inches, planted with good seed, and gave due care and culture to the growing crop.

**BLED SOE COUNTY, TENNESSEE.**—The following is condensed from a report to this Department by the secretary of the Farmers and Mechanics' Association in this county. The crops of wheat and rye the past season were the best for several years. Wheat sells at \$1.25 ; rye, 75 cents ; corn, 50 cents ; oats, 50 cents ; potatoes, Irish and sweet, 40 to 50 cents ;

cattle, \$2.50 per cwt., gross; hogs, (badly thinned by cholera,) \$3.75 to \$4; horses and mules, "dull sale at low prices." Our correspondent further reports:

Lands are greatly reduced in price. Farms which were purchased five and six years ago for \$20 and \$25 per acre can now be had at \$12 to \$18 per acre. Mountain table-lands are a mere drug—worth from 10 cents to \$1 per acre, and no buyers. Five years ago these lands were sold readily at \$2 to \$5 and \$10 per acre, according to amount of improvement. Wild lands generally (and wild-cat titles) on Walden's Ridge and Cumberland Mountain get away with northern and western men. The object of many unprincipled men here is to rob and plunder. They write flattering letters to be published in the different agricultural papers of the Union, or send out circulars in every direction; and for the past four or five years they have succeeded admirably in entrapping the unwary. Now, however, the pens of those who have been *taken in* are making vast changes in regard to emigration; hence the great decline in the prices of mountain lands. We might safely add that two-thirds of the immigration to these lands for the past five years have migrated elsewhere after having been stripped of every dollar and valuable. The mountain is the home of the rich man who can number his cattle by the hundred and in the autumn drive them to his farm in the valley, or to market. The land is not adapted to agricultural purposes, or, at least, has failed for some reason to produce enough to bread the settlements, and, therefore, men with limited means cannot accomplish anything on them.

**MARION COUNTY, OREGON.**—Under date of December 1, the Secretary of Rock Point Farmers' Club, in this county, reports that within its limits the year 1873 has been one of general prosperity to agricultural industry. Farmers have realized good crops and higher prices than ever before. The wheat crop was 20 per cent. larger than any previous one, averaging 30 bushels per acre; rye, 30 bushels per acre; corn, potatoes, and hay were average; oats, 10 per cent. below; wool and cheese, each 10 per cent. above; butter, 10 per cent. below, but in good demand at 37½ cents per pound; the number of horses 20 per cent. and of hogs 30 per cent. below. Cattle plenty and dull sale, except for good dairy-stock; all kinds of fruit plenty except peaches. Prices: Wheat, \$1 per bushel; rye, 75 cents; oats, 40; potatoes, 40; dried apples, 6 cents per pound; dried plums, 16; beef on the hoof, 5 cents net; pork, 5½, net; hay, \$10 per ton.

**RICE STRAW.**—Our correspondent in McIntosh County, Georgia, reports that rice-straw in that section has become an important article of traffic. It is used largely by farmers and lumberers as a substitute for hay, and is also in great demand for the manufacture of paper.

**ATASCOSA COUNTY, TEXAS.**—This county is situated in the interior of Southern Texas. A correspondent communicates the following statement respecting its products in 1873: Besides the "enormous number" of cattle killed and stolen away by Indians and Mexicans, over 50,000 were driven to distant markets, and yet "untold thousands" remain in the county. The cotton-crop turned out 450 to 500 pounds of lint-cotton to the acre; corn, 35 bushels; sorghum, sweet-potatoes, and other vegetables, also pea-nuts and the native Mustang grape, a full crop.

**THE COW-PEA IN SOIL RESTORATION.**—On almost every plantation in the cotton States there are worn-out cotton-fields, which must remain unproductive until restored by fertilization. To find a fertilizer adapted to the wants of the soil, involving neither cost nor trouble of transportation, easy of application, and yielding the quickest and largest returns with the smallest outgo, is a great desideratum. The cow-pea, as an agent in soil restoration, combines in a large degree these advantages. A planter in Gwinnett County, Georgia, reports as follows: Having a worn-out field of 20 acres which had been lying in broom-sedge for several years, he broke it up in the summer of 1868, plowing deep with a turn-over plow. In the fall he sowed it in wheat. The yield, carefully measured,

was a little less than 4 bushels per acre. In 1869, immediately after harvesting the wheat, he sowed cow-peas at the rate of 2 bushels per acre. Early in October he turned the resulting crop under with a deep furrow. A few weeks later he sowed on this pea-sod wheat, harrowing it in carefully. He harvested 9 bushels per acre. He repeated the same process in 1870, and realized  $17\frac{1}{2}$  bushels per acre; and again in 1871, followed by a yield of 27 bushels per acre; and again in 1872, with a promise at the time of reporting of 40 bushels per acre. Throughout this experiment, covering five years, no fertilizer except the cow-pea was applied.

PRODUCTION OF IRON AND STEEL IN THE UNITED STATES.—The following facts are condensed from a report of the secretary of the American Iron and Steel Association, made at its late annual meeting. The number of furnaces in the country, not counting abandoned and projected, is 636. Of these, 41 were completed and put in blast in 1872, and 42 in 1873. These 83 increased the furnace capacity of the country fully one-fourth. The ascertained and estimated numbers of net tons of iron and steel produced in the United States in 1872 and 1873 respectively were:

	1872.	1873.
Iron and steel rails .....	941,992	850,000
Other rolled and hammered iron .....	1,000,000	980,000
Forges and bloomeries .....	58,000	50,000
Cast steel .....	32,000	28,000
Bessemer steel .....	110,500	140,000
Pig-iron .....	2,830,070	2,695,434

Pig-iron is now made in twenty-two States, and the estimated annual capacity of all the furnaces for producing it is 4,371,277 net tons. Sixteen States manufacture iron and steel rails, and of the aggregate Pennsylvania produces  $44\frac{1}{2}$  per cent.; Ohio ranks second, and Illinois third; these two States having exchanged ranks since 1872. New York holds the fourth place. On the 17th of September, the day before the financial crisis, the quoted prices of raw and manufactured iron were as follows: American Bessemer rails, \$120; iron rails, \$75; No. 1 pig-iron at Philadelphia, \$12; merchant bars at Pittsburgh,  $3\frac{1}{2}$  cents; English iron rails at New York, \$65, gold; the prices asked November 1 were, for Bessemer rails at mill, \$110; iron rails at mill, \$68; best No. 1 anthracite pig-iron at Philadelphia, \$36; merchant bars at Pittsburgh, 3 cents; English iron rails at New York, \$60, gold. It is estimated that fully one-third of the 636 furnaces above named were blown out by the 1st of November, and that one-half would be by the end of the month.

EFFECTS OF COLD IN FATTENING.—A producer of pork in Muskingum County, Ohio, who has made an experiment with hogs, with a view to ascertain how far cold retards the rate of fattening, reports the following results: Carefully weighing the hogs fed, and the corn fed to them, and estimating pork at four cents per pound, he found that what he fed out during the first week in October returned (in pork) 80 cents per bushel; the first week in November, 60 cents; the third week 40; the fourth week in November and the month of December, 25; the first half of January, 5; the last half, 0. In the October week of the experiment the weather was pleasant and warm. It gradually grew colder till the latter part of November, from which time it remained about stationary till the 1st of January, after which it ran down to zero, and below in the latter part of the month. The hogs were well sheltered in a good pen with plank floor.

**TRIAL OF THE PARVIN STEAM-PLOW.**—This plow, patented by R. C. Parvin, works by "direct traction." It is manufactured at Farmington, Fulton County, Illinois, and costs \$4,000. A trial of it, reported as entirely successful, took place under the direction of the inventor, at Dixon, Solano County, California, November 11. The ground, stiff clay, or clay adobe, was a field of wheat stubble, from which the grain had been harvested by heading. An eight-gang plow was first attached and found not adapted to the conditions. A large three-gang plow and a two-gang plow were substituted, each cutting a foot wide furrow and running 5 to 6 inches deep. With forty pounds of steam it traveled off and worked these plows with ease. Subsequently twelve men got upon the plows and a drag was attached so that both plows and drag ran to the depth of 10 to 12 inches. By applying 80 pounds of steam the engine again had sufficient draft power to move forward and plow without apparent effort. It appeared to be as easily managed in its movements as a team of farm-horses. Its speed is regulated by the amount of steam, and is controlled by the operator up to the rate of three miles per hour. The proper rate is represented to be about two miles per hour. Moving at this rate, never tiring, and plowing a ribbon 5 to 8 feet wide, it is easy to estimate the amount it would plow per day. To run it requires a man and boy, and a "tender to furnish fuel and water." The inventor claims that one of these steam-plows has, at a cost of 75 cents per acre, "broken up the toughest kind of prairie meadow" in Illinois. In this estimate the cost of hands was reckoned at \$2.50 per day, and of coal at \$2.50 per ton. It is reported that so much confidence in its success has been inspired that a joint-stock company is being organized in Sacramento for the purpose of manufacturing these steam-plows.

**THE SEASON OF RAIN-FALL IN CALIFORNIA.**—The amount of rain-fall at Sacramento for the last four months of 1873 was 11.529 inches; the amount for the same months in 1871 was 12.021 inches. This was followed by 11.326 inches in the first four months of 1872; in 1867, 16.662, followed by 15.837 in 1868; in 1866, 11.938, followed by 13.359 in 1867; whereas, the 7.540 inches which fell in the last four months of 1872 was followed by only 6.653, in the first four of 1873; in 1869, 4.932, followed by 8.639 in 1870; in 1868, 3.386, followed by 12.602 in 1869. These facts seem to furnish ground for anticipating an abundant rain-fall (and consequently a fruitful season) in the four months following January 1, 1874.

**PORK PACKING IN THE WEST.**—The Cincinnati *Price Current* gives the following statement of the number of hogs packed up to January 22 of the present and previous season at the six principal packing points of the West, together with the total operations of last season :

	To January 22, 1874.	To January 22, 1873.	Total for the season of 1872 and 1873.
Cincinnati.....	550,000	560,000	626,305
Chicago.....	1,375,000	980,000	1,425,079
Saint Louis.....	430,000	460,000	538,000
Louisville.....	230,000	300,000	303,246
Milwaukee.....	240,000	175,000	303,500
Indianapolis.....	235,000	150,000	196,317
Total.....	2,960,000	2,625,000	3,391,447

The aggregate number, at the date above mentioned, is 430,000 short of the operations of the previous season. On account of the scarcity of hogs at some points, and of high prices and poor qualities at other points the packings had nearly or quite closed.

## MARKET PRICES OF FARM-PRODUCTS.

The following quotations represent the state of the market, as nearly as practicable, on the 1st day of January, 1874:

Articles.	Price.	Articles.	Price.
NEW YORK.		BOSTON—Continued.	
Flour, superfine State...per bbl.	\$5 60 to \$6 00	Lard.....per lb.	\$0 09½ to \$0 10
extra State.....do.	6 55 to 7 30	Butter, N. Y. and Vt.....per lb.	30 to 40
superfine western.....do.	5 60 to 6 00	western, fair to extra.	
extra to choice western,		per pound.....	28 to 35
per barrel.....	6 50 to 11 00	Cheese, N. Y. and Vermont fac-	
common to fair, extra		tory, per pound.....	12 to 15
southern.....per bbl.	6 85 to 8 00	western factory, per	
good to choice, extra		pound.....	11 to 14½
southern.....per bbl.	8 05 to 11 00	Sugar, fair to good refining, per	
Wheat, No. 1 spring.....per bush.	1 63 to 1 65	pound.....	7½ to 8
No. 2 spring.....do.	1 58 to 1 61½	Tobacco, lugs.....per lb.	7½ to 9
winter, red, western,		common to medium	
per bushel.....	1 58 to 1 65	leaf.....per lb.	9 to 10½
winter, amber, western,		Cotton, ordinary to good ordi-	
per bushel.....	1 65 to 1 68	nary.....per lb.	14 to 15½
winter, white, western,		low middling to good	
per bushel.....	1 70 to 1 95	middling.....per lb.	16 to 18
Rye.....per bush.	1 00 to —	Wool, Ohio and Pa.....do.	48 to 65
Barley.....do.	1 55 to —	Michigan.....do.	45 to 53
Corn.....do.	78 to 85	other western.....do.	40 to 52
Oats.....do.	60 to 63	pulled.....do.	25 to 60
Hay, first quality.....per ton.	26 00 to 28 00	combing fleeces.....do.	55 to 60
second quality.....do.	23 00 to 25 00	California.....do.	17 to 36
Beef, mess.....per bbl.	8 75 to 11 00	Texas.....do.	18 to 30
extra mess.....do.	11 50 to 13 00		
Pork, mess.....do.	16 37½ to 16 50	PHILADELPHIA.	
extra prime.....do.	13 00 to —	Flour, superfine.....per bbl.	4 50 to 5 50
prime mess.....do.	14 25 to 14 75	Pa. extra.....do.	6 75 to —
Lard.....per lb.	8 13-16 to 9½	Pa. family and fancy.....do.	7 00 to 8 00
Butter, western.....per lb.	26 to 35	western, extra.....do.	6 00 to 6 75
State dairy.....do.	33 to 45	western family.....do.	6 75 to 8 00
Cheese, State factory.....do.	12 to 14½	Wheat, winter, red.....per bush.	1 47 to 1 63
western factory.....do.	12 to 14½	winter, amber.....do.	1 68 to 1 70
Cotton, ordinary to good ordi-		winter, white.....do.	1 73 to 1 85
nary.....per lb.	13½ to 14½	spring.....do.	1 55 to 1 59
low middling to good		Rye.....do.	90 to 93
middling.....per lb.	15½ to 17½	Barley.....do.	1 20 to 1 65
Sugar, fair to good, refining.....do.	7½ to 7½	Corn.....do.	70 to 85
prime, refining.....do.	7½ to —	Oats.....do.	52 to 58
Tobacco, lugs.....do.	6½ to 7½	Hay, fresh baled.....per ton.	23 00 to 24 00
common to medium		common to fair shipping,	
leaf.....per lb.	8 to 10	per ton.....	20 00 to 22 00
Wool, American XXX and pick-		Beef, western mess.....per bbl.	8 00 to 10 00
lock.....per lb.	62 to 70	extra mess.....do.	9 00 to 12 00
American X and XX, per		Warthman's city family,	
pound.....	47 to 60	per barrel.....	16 00 to —
American, combing, per lb.	52 to 60	Pork, mess.....per bbl.	16 50 to 17 00
pulled.....do.	25 to 52	prime mess.....do.	15 00 to —
California spring clip, per		prime.....do.	13 00 to —
pound.....	18 to 35	Lard.....per lb.	8½ to 11½
California fall clip and		Butter, choice Middle States,	
lambs'.....per lb.	19 to 29	per pound.....	30 to 42
Texas.....per lb.	15 to 35	choice western.....per lb.	30 to 38
		Cheese, N. Y. factory.....do.	14 to 15
BOSTON.		Ohio factory.....do.	14 to 14½
Flour, western, superfine per bbl.	5 50 to 6 00	Sugar, fair to good refining, do.	7½ to 7½
western extras.....do.	6 75 to 8 00	Cotton, ordinary to good ordi-	
western choice.....do.	8 50 to 11 00	nary.....per lb.	14 to 15½
southern extras.....do.	6 50 to 7 00	low middling to good	
choice Baltimore.....do.	9 00 to 11 00	middling.....per lb.	15½ to 18½
Wheat.....per bush.	1 50 to 1 85	Wool, Ohio fleeces X and XX, do.	55 to —
Rye.....per bush.	1 00 to 1 05	Ohio combing.....do.	60 to 63
Barley.....do.	1 25 to 1 75	pulled.....do.	42½ to 50
Corn, southern yellow.....do.	83 to 85	unwashed, clothing and	
western yellow.....do.	89 to 90	combing.....per lb.	31 to 43
Oats.....do.	60 to 63		
Hay, eastern and northern, per		BALTIMORE.	
ton.....	15 00 to 25 00	Flour, superfine.....per bbl.	5 25 to 6 00
Hay, western choice.....per ton.	24 00 to 25 00	extra.....do.	6 75 to 8 50
Beef, western mess.....per bbl.	10 00 to 12 00	family and fancy.....do.	— to 10 75
western extra.....do.	13 00 to 14 00	Wheat, white, fair to choice, per	
Pork, prime.....do.	13 00 to 14 00	bushel.....	1 70 to 1 90
mess.....do.	16 50 to 17 00		

## Market-prices of farm-products—Continued.

Articles.	Price.	Articles.	Price.
BALTIMORE—Continued.		CHICAGO—Continued.	
Wheat, amber.....per bush.	\$1 65 to \$1 87	Rye, No. 2.....per bush.	\$0 73 to \$0 80
red.....do.	1 60 to 1 80	Barley, No. 2.....do.	1 43 to 1 45
Rye, common to prime.....do.	90 to 98	Hay, timothy.....per ton.	11 00 to 15 50
Corn, white southern.....do.	70 to 78	prairie.....do.	7 00 to 10 50
yellow southern.....do.	74 to 80	Beef, mess.....per bbl.	8 25 to 8 50
Oats, southern.....do.	51 to 54	extra mess.....do.	9 75 to 10 00
western.....do.	50 to 53	Pork, mess.....do.	14 35 to 14 40
Hay, Pennsylvania.....per ton.	20 00 to 24 00	prime mess.....do.	13 00 to 13 25
Maryland.....do.	24 00 to 25 00	extra prime.....do.	11 00 to 11 25
Beef, Baltimore mess.....per bbl.	15 00 to 20 00	Lard.....per cental.	8 45½ to 8 50
extra.....do.	23 00 to 25 00	Butter, choice to fancy.....per lb.	30 to 34
Pork, mess.....do.	15 50 to 16 25	medium to good.....do.	22 to 27
Lard.....per lb.	9 to 9½	Cheese, N. Y. factory.....do.	15 to 16
Butter, western.....do.	24 to 35	Ohio and western fac-	
eastern.....do.	24 to 35	tory.....per lb.	14 to 15
Cheese, eastern cutting.....do.	15½ to 16	Sugar, N. O., prime to choice.....do.	8½ to 9½
western cutting.....do.	14½ to 15	N. O., common to fair.....do.	7½ to 8½
Sugar, fair to good refining.....do.	7½ to 8	Wool, tub-washed, common to	
Tobacco, lugs.....do.	5 to 8	prime.....per lb.	40 to 50
common to medium leaf,		fleece-washed.....do.	36 to 45
per pound.....do.	7 to 10	unwashed.....do.	25 to 32
Cotton, ordinary to good ordi-		pulled.....do.	30 to 35
nary.....per lb.	14 to 14½		
low middling to mid-		SAINT LOUIS.	
dling.....per lb.	15½ to 16½	Flour, spring.....per bbl.	5 00 to 6 40
Wool, fleece com. to fine.....per lb.	45 to 50	winter.....do.	5 00 to 9 00
tub-washed.....do.	55 to 60	Wheat, red winter.....per bush.	1 24 to 1 65
unwashed.....do.	35 to 38	white winter.....do.	1 32½ to 1 66½
pulled.....do.	35 to 40	spring.....do.	1 21 to 1 28
		Corn.....do.	50 to 54
CINCINNATI.		Rye.....do.	80 to 83
Flour, superfine.....per bbl.	5 00 to 5 50	Barley.....do.	1 20 to 1 65
extra.....do.	6 00 to 6 60	Hay, choice timothy.....per ton.	16 00 to —
family and fancy.....do.	6 85 to 7 25	mixed.....do.	12 00 to 14 00
Wheat, red winter.....per bushel.	1 30 to 1 52	Beef, mess.....per bbl.	13 00 to —
hill.....do.	1 55 to 1 60	Pork, mess.....do.	14 50 to 15 00
white.....do.	1 60 to 1 65	Lard.....per lb.	7½ to 9½
Rye.....do.	93 to 95	Butter, common to medium,	
Barley.....do.	1 20 to 1 60	packed.....per lb.	20 to 25
Corn.....do.	56 to 60	choice.....do.	28 to 32
Oats.....do.	44 to 50	Cheese, factory.....do.	13½ to 14
Hay, baled, No. 1.....per ton.	15 00 to 16 00	Sugar, N. O., common to fair, per	
lower grades.....do.	10 00 to 14 00	pound.....do.	9 to —
Pork, mess.....per bbl.	15 25 to 15 50	N. O., prime to choice, per	
Lard.....per lb.	8½ to 8¾	pound.....do.	9½ to 10
Butter, choice.....do.	28 to 30	Cotton, ordinary to good ordi-	
prime.....do.	25 to 27	nary.....per lb.	12½ to 13½
Cheese, prime factory.....do.	13½ to 14	low middling to good	
Sugar, N. O., fair to good.....do.	8½ to 9½	middling.....per lb.	14½ to 15½
prime to choice.....do.	9½ to 10	Wool, tub-washed.....do.	50 to 52
Tobacco, lugs.....do.	9 to 12	fleece-washed.....do.	35 to 42
leaf.....do.	15 to 25	unwashed combing.....do.	29 to 31
Cotton, ordinary to good ordi-			
nary.....per lb.	12½ to 13½	NEW ORLEANS.	
low middling to good		Flour, superfine.....per bbl.	5 25 to 5 50
middling.....per lb.	14½ to 16½	extras.....do.	6 00 to 7 00
Wool, fleece common to fine, per		choice to fancy.....do.	8 00 to 9 75
pound.....do.	45 to 46	Corn, white.....per bush.	71 to 72
tub-washed.....per lb.	48 to 49	yellow.....do.	70 to 74
unwashed, clothing.....do.	30 to 32	Oats.....do.	57 to 58
unwashed, combing.....do.	33 to 35	Hay, choice.....per ton.	25 00 to —
pulled.....do.	35 to 37	prime.....do.	21 00 to —
		Beef, Texas.....per bbl.	11 00 to 12 00
CHICAGO.		Fulton market.....per ½ bbl.	11 00 to 12 00
Flour, white winter, fair to good,		western.....do.	9 00 to 9 50
per barrel.....do.	6 75 to 7 50	Pork, mess.....per lb.	15 25 to —
white winter, choice, per		Lard.....do.	8½ to 9½
barrel.....do.	8 00 to 9 25	Butter, choice southern.....do.	42 to —
red winter.....per bbl.	5 75 to 7 00	choice western.....do.	30 to 33
medium to fancy spring		Cheese, choice western factory,	
extras, per barrel.....do.	4 75 to 6 25	per pound.....do.	14½ to 15
spring superfine.....per bbl.	2 50 to 4 25	N. Y. cream.....per lb.	17 to —
Wheat, No. 1 spring.....per bush.	1 20 to —	Sugar, fair to fully fair.....do.	6½ to 7½
No. 2 spring.....do.	1 17½ to 1 18	prime to strictly prime,	
No. 3 spring.....do.	1 14 to 1 14½	per pound.....do.	8 to 8½
Corn, No. 2.....do.	49 to 53½	clarified, white, and yel-	
Oats, No. 2.....do.	38½ to —	low, per pound.....do.	8½ to 10



## Market-prices of farm-products—Continued.

Articles.	Price.	Articles.	Price.
NEW ORLEANS—Continued.		SAN FRANCISCO—Continued.	
Cotton, ordinary to good ordinary, per pound.....	\$0 11½ to \$0 13½	Oats ..... per cental.	\$1 60 to \$1 85
low middling to good middling..... per lb.	14½ to 17½	Corn, white ..... do.	1 40 to 1 45
Tobacco, lugs ..... do.	5½ to 7½	yellow ..... do.	1 40 to 1 45
low leaf to medium leaf, per pound.....	7½ to 9½	Hay, State..... per ton.	13 00 to 18 00
Wool, lake..... per lb.	25 to —	Beef, mess ..... per bbl.	9 50 to 10 00
SAN FRANCISCO.		family mess ..... per ¼ bbl.	9 00 to 10 00
Flour, superfine..... per bbl.	5 50 to 5 75	Pork, mess ..... per bbl.	18 00 to 18 50
extra..... do.	6 00 to —	prime mess..... do.	16 00 to 16 50
family and fancy..... do.	6 25 to 7 00	Lard..... per lb.	10 to 11
Wheat, California..... per cental.	2 25 to 2 30	Butter, overland..... do.	15 to 25
Oregon..... do.	2 25 to 2 30	California..... do.	30 to 45
Barley..... do.	1 35 to 1 65	Oregon..... do.	15 to 20
		Cheese..... do.	12 to 18
		Wool, native..... do.	13 to 16
		California..... do.	18 to 22
		Oregon..... do.	18 to 22

## LIVE-STOCK MARKETS.

Articles.	Price.	Articles.	Price.
NEW YORK.		CHICAGO—Continued.	
Cattle, extra beeves... per cental.	\$12 50 to \$13 00	Cattle, Texans, choice corn-fed, per cental.....	\$4 25 to \$4 75
good to prime..... do.	11 75 to 12 25	Texans, north-summered, per cental.....	3 00 to 3 75
common to fair..... do.	10 25 to 11 50	Texans, through-droves, per cental.....	1 75 to 2 75
average..... do.	10 25 to 11 25	Sheep, poor to choice, per cental.	3 00 to 5 00
Texans..... do.	7 50 to 10 00	Swine, poor to common..... do.	4 90 to 5 10
premium bullocks..... do.	13 00 to 13 50	medium..... do.	5 20 to 5 30
milk-cows, ordinary to choice, per head.	40 00 to 80 00	good to extra..... do.	5 35 to 5 55
calves, grass-fed, per head.	6 00 to 12 00	SAINT LOUIS.	
Sheep..... per cental.	3 50 to 7 37½	Cattle, choice native steers, 1,300 to 1,600 pounds, per cental.	5 00 to 5 50
Swine..... do.	5 37½ to 5 87½	prime second-class, 1,150 to 1,400 pounds, per cental.	4 50 to 4 75
PHILADELPHIA.		good third grade, 1,050 to 1,300 pounds, per cental.	3 50 to 3 75
Cattle, common to choice beeves, per cental.....	3 50 to 8 00	fair butchers' steers, 1,000 to 1,200 pounds, per cental.	3 25 to 3 50
Sheep..... per cental.	4 50 to 6 25	inferior native grades, per cental.	2 00 to 4 25
Swine, corn-fed..... do.	7 50 to 7 75	Texans and Cherokees, corn-fattened, per cental.	1 75 to 4 00
BALTIMORE.		through-droves..... do.	1 50 to 3 00
Cattle, best beeves... per cental.	5 75 to 7 00	Sheep..... do.	3 75 to 5 00
first quality..... do.	4 75 to 5 75	Swine..... do.	2 51 to 5 37½
medium or good fair quality..... per cental.	4 00 to 4 75	Horses, plugs..... per head.	30 00 to 65 00
general average of the market..... per cental.	5 12 to —	street-car horses..... do.	75 00 to 90 00
extreme range of prices, per cental.....	3 00 to 7 00	good work-horses..... do.	80 00 to 100 00
Sheep..... per cental.	4 00 to 6 50	driving-animals, good to extra..... per head.	90 00 to 150 00
Swine..... do.	7 00 to 8 25	draught horses, heavy to extra heavy..... per head.	125 00 to 175 00
CINCINNATI.		Mules, 14 to 15 hands high, per head.....	60 00 to 110 00
Cattle, common to fine butchers' beeves..... per cental.	2 75 to 5 25	15 to 16 hands high, per head.....	120 00 to 160 00
shipping grades..... do.	4 50 to 5 25	extra..... per head.	150 00 to 200 00
milk-cows..... per head.	35 00 to 60 00	NEW ORLEANS.	
calves..... per cental.	6 00 to 7 00	Cattle, Texas beeves, choice, per head.....	— to 45 00
Sheep, common to prime grades, per cental.....	3 50 to 5 00	first quality..... per head.	35 00 to 40 00
Swine..... per cental.	5 25 to 5 80	second quality..... do.	20 00 to 28 00
CHICAGO.		western beeves, per cental.	10 00 to 12 50
Cattle, extra-graded steers, 1,400 to 1,550 pounds, per cental.	5 80 to 6 00	milk-cows..... per head.	35 00 to 100 00
choice, fat, well-formed, 3 to 5 years old, 1,300 to 1,450 pounds, per cental.	5 30 to 5 65	calves..... do.	7 00 to 10 00
good, well-formed and fattened, 1,200 to 1,350 pounds..... per cental.	4 90 to 5 15	Sheep, first quality..... do.	4 00 to 5 00
medium, fair-fleshed, 1,150 to 1,250 pounds, per cental.	4 50 to 4 75	second quality..... do.	3 00 to 4 00
lower grade natives, per cental.....	1 75 to 4 40	Swine..... per cental.	7 50 to 8 00

## FOREIGN MARKETS.

**WHEAT.**—The year 1873, in England, closed with fair prospects to the grain-growing interest. A very unusual mildness of weather prevailed through Christmas week, with very little wet or frost. A good breadth of wheat had been sown, and the early sown fields, for the most part, looked even and well. Those more lately planted were springing up favorably. The price of wheat was well maintained, and there was every prospect that it would so continue clear up to harvest. Wheat-sowing in France was generally forward, and there was no apparent drawback to the crop except a lack of rain, which is desirable on light lands to settle the plantings before frost comes. In continental Europe the prospects of the crop just sown were generally favorable, even in Hungary, where drought and vermin had been so injurious to the crop of 1873. The acknowledged deficiency of the rye-crop, however, had kept up the high rates of some continental markets. Late rains had greatly improved the newly sown crop of Australia.

The sales of English wheat during Christmas week amounted to 56,610 quarters, at 61*s.* 7*d.*, against 53,276 quarters, at 56*s.* 3*d.*, during the Christmas week of 1873. The London averages were 63*s.* 1*d.* on 2,387 quarters. The imports of the week ending December 20 were 1,011,283 hundred-weight of wheat and 172,500 hundred-weight of flour. Monday before Christmas opened upon small supplies of English wheat, but a large stock of foreign, more than half of the latter being from New York.

In Mark Lane, new Essex and Kent white wheat brought from 53*s.* to 68*s.* per quarter. Norfolk, Lincolnshire, and Yorkshire new red, 55*s.* to 61*s.*; Dantzic and Konigsberg, 62*s.* to 72*s.*; Rostock, 62*s.* to 71*s.*; Silesia, red, 57*s.* to 66*s.*; Pomerania, Mecklenberg, and Uckermark, 62*s.* to 64*s.*; Ghiska, 55*s.* to 61*s.*; Russian hard, 52*s.* to 57*s.*; Saxonska, 61*s.* to 63*s.*; Danish and Holstein red, 62*s.* to 64*s.*; American, 57*s.* to 62*s.*; Chilian white, 65*s.*; Californian, 67*s.*; Australian, 68*s.*

In Liverpool American white brought 12*s.* 10*d.* to 13*s.* per cental; ditto, red winter and southern, 13*s.* to 13*s.* 4*d.*; ditto, spring, No. 1, 12*s.* 4*d.* to 12*s.* 8*d.*; Canadian white, 13*s.* 6*d.* to 13*s.* 9*d.*; ditto, red, 12*s.* 8*d.* to 12*s.* 10*d.*; California white, 13*s.* 6*d.* to 14*s.* 6*d.*; Australian, 14*s.* to 14*s.* 2*d.*; Chilian, 12*s.* 8*d.* to 13*s.* 2*d.*; Spanish white, 13*s.* 6*d.* to 14*s.*; Danubian, 7*s.* to 9*s.*; Ghiska, 11*s.* 6*d.* to 12*s.* 2*d.*; Egyptian, 10*s.* 9*d.* to 12*s.* 8*d.*

**FLOUR.**—The supplies of English flour in Mark Lane were good, with a large import of American in barrels. The Paris flour trade during the week was very inactive. Prices were generally steady in the continental markets, and but little varied from our last report.

**MAIZE.**—In Mark Lane American white was quoted at 36*s.* to 38*s.* per quarter; ditto, yellow, 35*s.* to 37*s.* In Liverpool, American white, 36*s.* 9*d.* to 37*s.* 6*d.*; ditto, yellow, to 37*s.* 6*d.*; Galatz, 38*s.* 6*d.*; Danubian, 37*s.* 9*d.*

**WOOL.**—English wool was in moderate demand in London. For colonial produce there had been but little demand since the close of the public sales. Prices about the same as in our last monthly report.

**LIVE STOCK.**—In London, coarse inferior cattle brought 4*s.* 4*d.* to 4*s.* 10*d.* per 8 pounds, sinking the offal; second quality, 5*s.* 4*d.* to 5*s.* 8*d.*; prime large oxen, 6*s.* 2*d.* to 6*s.* 4*d.*; prime Scots, 6*s.* 4*d.* to 6*s.* 6*d.*; sheep, 4*s.* 8*d.* to 6*s.* 10*d.*; prime Southdowns, 6*s.* 10*d.* to 7*s.*; calves, 5*s.* 10*d.* to 6*s.* 2*d.*; hogs, 3*s.* 10*d.* to 5*s.*

MONTHLY REPORT

OF THE

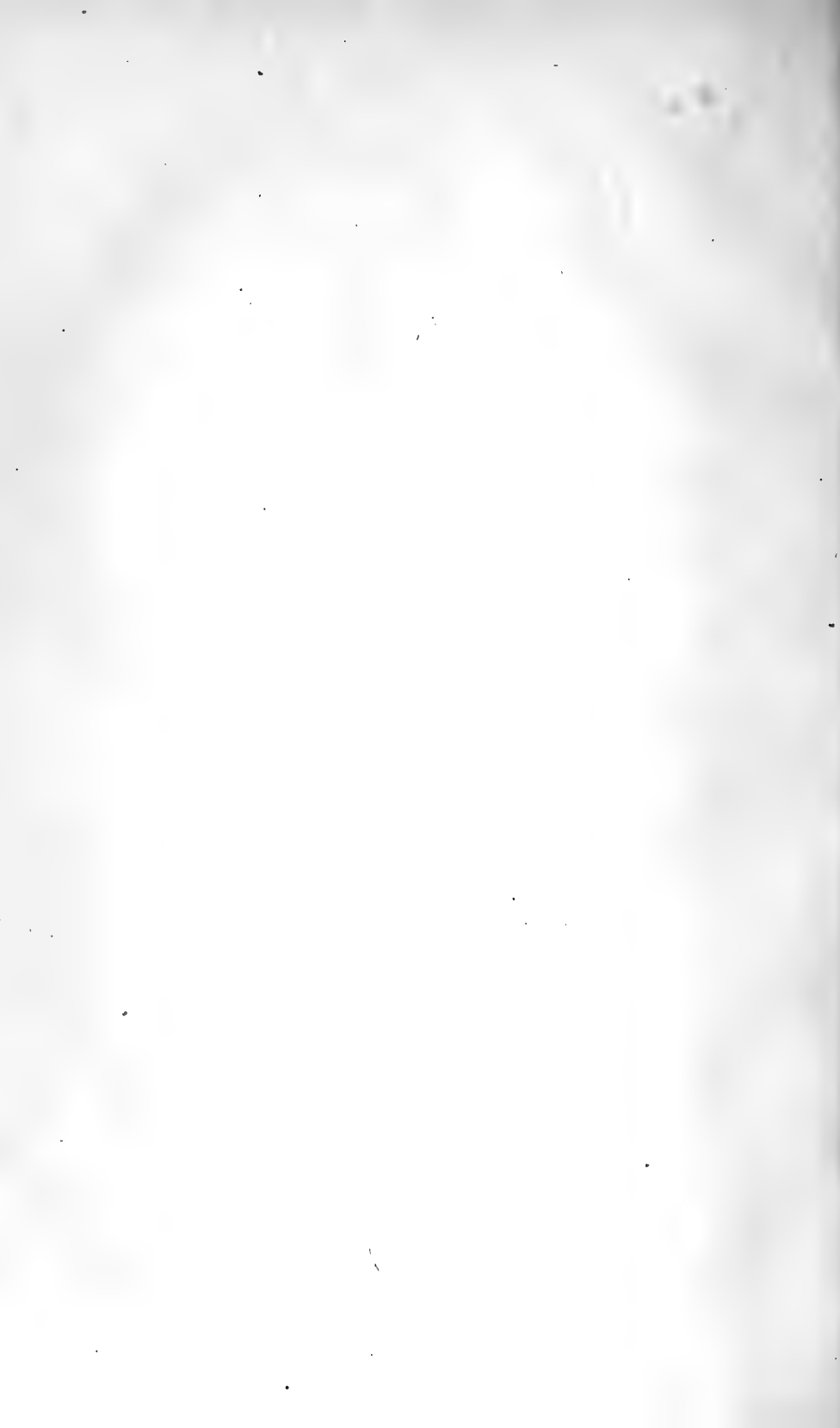
DEPARTMENT OF AGRICULTURE

FOR

FEBRUARY AND MARCH, 1874.



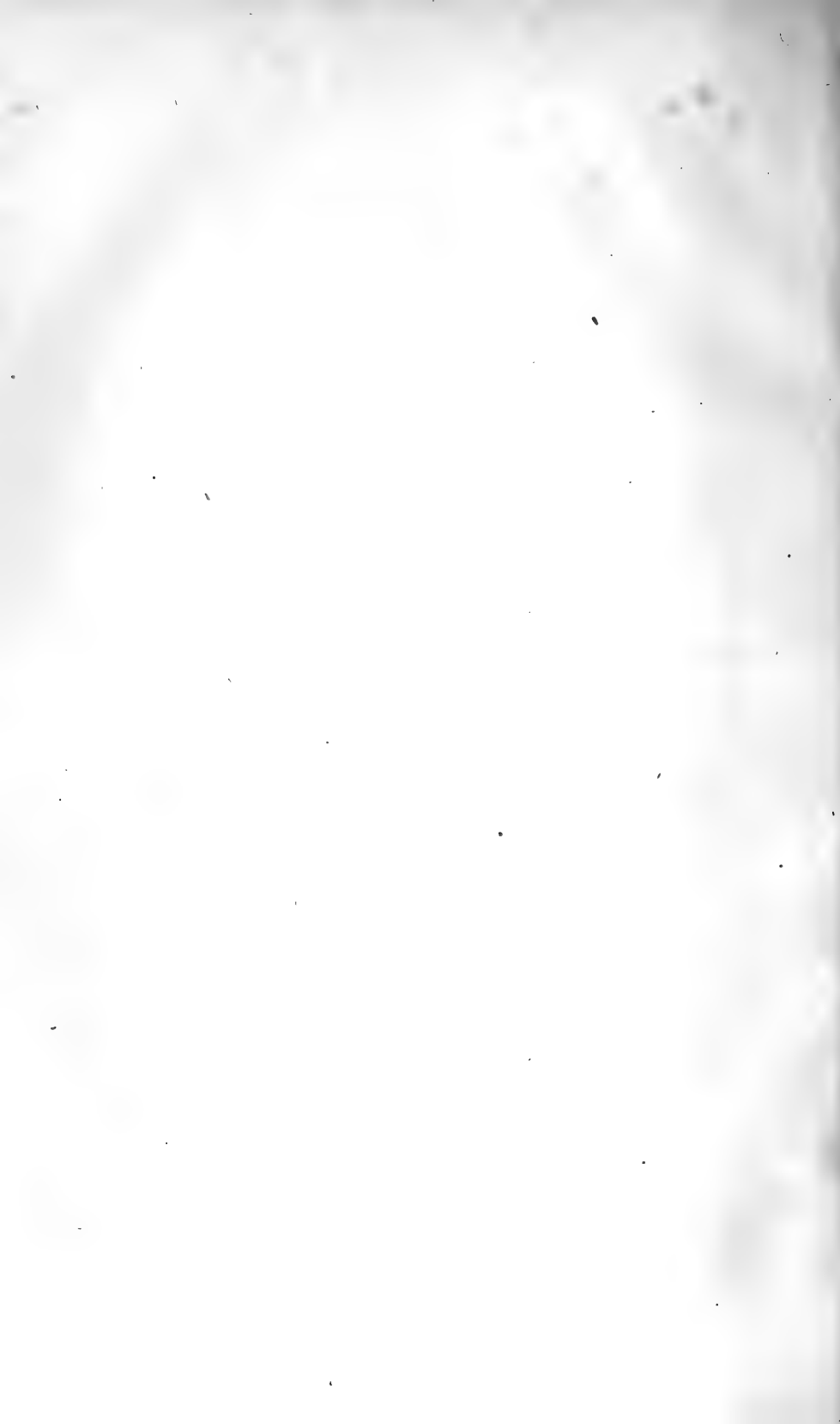
WASHINGTON:  
GOVERNMENT PRINTING OFFICE.  
1874.



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# MONTHLY REPORT.

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DEPARTMENT OF AGRICULTURE,  
*Statistical Division, March 25, 1874.*

SIR: I present herewith, for publication, a digest of the returns of March upon certain tendencies of progress in agriculture, with the results of a special statistical investigation of the status of the last cotton-crop, as to comparative quality, causes of injury, length of cotton season, &c.; a statistical inquiry relative to the quantity and quality of the tobacco-crop; a synopsis of a recent Austrian official report on forest-culture; chemical memoranda; botanical notes; market reports, &c.

Respectfully,

J. R. DODGE,  
*Statistician.*

Hon. FREDERICK WATTS,  
*Commissioner.*

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## REPORT ON CONDITION OF AGRICULTURE.

### THE MOST PROFITABLE CROPS.

*What branch of agriculture has been most profitable in your county the past year?*—This was one of the inquiries in our circular returnable March 1. Our correspondents have very generally responded. A demonstration of superior absolute profit in the culture of particular crops was not intended, as profits vary from year to year, with changing conditions of supply and demand. Profits also vary with variable fertility of soil, adaptation of soil to crops, and differing skill and economy in culture. Aside from these causes of difference of opinion and statement, another prominent bar to such a demonstration would inevitably be the want of accurate record of expense and receipts, the general neglect of thorough book-keeping in farm accounts, resulting in fragmentary or incomplete statements. Nor would a mere record of current receipts and disbursements suffice; it would be necessary to calculate exactly the value of both manures and manipulation upon crops of subsequent years—a height in the mathematics of farm economy to which neither practice nor science has fully attained. It was believed, however, that valuable data, even though fragmentary, would be obtained relative to the cost and income of particular crops, showing incidentally the amount and kind of culture, the local yield and prices; and also that expressed preferences of different sections would show in a general way what are actually the popular and paying branches of husbandry, as at present managed, in those localities. The number of these details

has been so great that only the most suggestive and important facts are given.

Generalizing very briefly the results of this investigation, as to the industries popularly esteemed most productive, local preferences are as follows: In Maine, hay occupies the first place and dairy-husbandry the second; hay and stock-raising are of equal importance in New Hampshire; dairy-husbandry stands high in its predominance in Vermont; in Massachusetts, hay first, market-gardening next; the garden and the dairy divide the honors in Rhode Island; and tobacco stands first in Connecticut. There is much diversity in New York, but dairy-husbandry is far in advance, being the choice of one-third of the counties. There is much variety in New Jersey, though market-gardening stands first. In Pennsylvania, manufacturing and mining make a varied production most popular, few counties indicating very decided preferences, though wheat (as few would suppose) holds the first place in one-sixth of the counties. In Delaware, tobacco; in Maryland, tobacco and fruit growing. Of more than fifty Virginia counties expressing decided preferences, 16 favor tobacco, 9 "mixed husbandry," 6 corn, 5 stock-raising, 5 market-gardening, and others pea-nuts, sheep-husbandry, fruit-growing and wheat. In North Carolina corn stands numerically before cotton. In Florida sugar-cane is preferred, while cotton predominates in South Carolina, Georgia, Alabama, Mississippi, and in Texas. In Arkansas corn stands first; and in Tennessee hay and corn are preferred. In West Virginia, corn and stock-growing; in Kentucky, tobacco and corn; in Ohio, great diversity appears—sheep-husbandry, corn, general cropping, wheat, hay, and fruit growing; and in Michigan a similar variety—wheat, dairying, and fruit-growing. Corn is king in Indiana and hay prime minister. Corn is also first in Illinois and wheat next. In Minnesota, wheat; in Wisconsin, wheat and the dairy; in Iowa and Missouri, stock-growing, corn, and wheat. The order in Kansas and Nebraska is wheat, stock-growing, and corn. In California, wheat, sheep-husbandry, and fruit-growing. In Oregon, wheat and stock-growing.

One of our correspondents, after setting forth the impoverishing results, in the long run, of the single-crop system and dependence on imported supplies and fertilizers, says: "Our intelligent farmers are waking up to the necessity of improving the land and considering *that* a part of the year's profit. When they do that and get some of our old fields now worth \$4 to \$10 per acre to be worth \$50 per acre, then our people will begin to open their eyes to their best interests." Many more fail to see the all-important distinction between the return above expenditure of so much per acre and the per cent. of profit on the amount expended. For instance, a farmer reports that cotton was more profitable than corn, and proves it by exact statistics which show that, after deducting in both cases all expenses up to sale, the cotton returned per acre \$3 more than the corn. But the same statistics show that the corn returned 175 per cent. on the cost of producing and the cotton only about 68 per cent. That is, 3 acres of corn, yielding a profit of \$14 per acre, could have been cultivated at less cost than 1 acre of cotton yielding a profit of \$17.

There is no vocation in which a well-trained judgment, and a knowledge of the principles and practice upon which success depends, are more important or pay better than in that of the farmer. The size of the farm; the amount of additional capital required; the adaptation of soil and climate; the practicability of obtaining labor and the expediency of employing it at the cost; the distance from market and



cost of transportation ; the difference between a certain and uncertain, and a constant and intermittent, cash-market ; comparative uniformity or great fluctuations in prices ; comparative risks in producing different crops ; the relative per cent. of profit in the expense of producing ; the relative advantages of producing market-crops with which to purchase supplies and fertilizers, or producing them on the farm, thus avoiding transportation both ways ; the time intervening between the outlay and the return ; the comparative advantages between cultivating crops to be sold off the farm and crops to be utilized and concentrated in value on it ; the relative profits of systems which furnish profitable employment for labor and work-animals longer and shorter portions of the year ; and, above all, the anticipated result, after a series of years, on the *productiveness of the farm itself*, the farmer's invested capital—these are some of the more prominent considerations which the intelligent farmer takes into account in deciding what branch of farming will be most profitable for him ; and the following extracts will afford many illustrations of the fact that, in all sections of the country alike, as a rule, the degree of permanent success or continued failure of success is in proportion to the degree in which they are regarded or overlooked.

These extracts also furnish several striking illustrations of the great advantages resulting to a farming community by the establishment, either by their own or other agency, of mechanical or manufacturing industries. In Columbia, N. Y., mills for the manufacture of straw-paper make rye one of the most profitable crops raised. In Butler, Pa., in consequence of recent developments of oil production, "towns and improvements have sprung up as if by magic, scattering millions of dollars among land-owners," and causing "an unprecedented demand, at high prices, for every article the farm can produce for man or beast." In Mercer, also, iron manufactories and oil production "make a cash demand for cattle, cheese, and butter;" and in Luzerne, in consequence of mining operations, farm products of every kind find a ready market at good prices."

## COTTON.

The purport of the returns from the cotton States is this: Nothing pays but cotton, and cotton does not pay. Every season of large production and consequent decline of prices wakes the echoes of the old wail of ruin. Like all statements of individual views of comparative profit in any branch of industry, these are various and apparently contradictory, the difference in part consisting in widely different rates of yield and cost of culture, and in part in the varying judgment of the observers and their differing views as to what profit may be deemed remunerative. Supposing these differences harmonized, there is another important element of error which the majority of our correspondents have apparently not considered. They simply deduct expenditures from receipts, without inquiring whether they have enriched or depleted the soil. Many report gratifying success from the first or second annual application of commercial fertilizers ; many others, in giving the history of further applications, say that they fail to yield the former return. When such results follow, the first success was only apparent, not real.

Another defect in reasoning is very apparent. Many appear to deduce, from a clear showing that an acre of cotton yields a larger net return than an acre of corn, or that \$100 expended in the culture of cotton produces more money than a similar sum used in the production

of corn, the conclusion that the exclusive culture of cotton in the present exhaustive mode is more profitable than rotation with other crops upon a recuperative basis. Herein lies the whole question of the future profit of cotton culture. Our correspondents, now and heretofore, furnish facts to prove the possibility of growing more than the present amount of cotton on half of the area now cultivated, leaving the remainder to produce, with little added cost, an abundance of corn, beef, pork, wool, fruits, etc. This can be accomplished by a system which shall make the soil more productive than at present, while it is undeniable that the mode of culture now and heretofore practiced renders the soil less productive.

Will planters continue the old practice? Many correspondents think a new departure is pending. It has often been promised before. The first rise in cotton has usually buried the impulse in oblivion. The difficulty is, as one correspondent has foreseen, the present race of planters know better than outsiders how to "make cotton," but very few of them have learned how to do it without injury to the soil. They can only obtain golden eggs by killing by inches the goose that produces them.

**NORTH CAROLINA.**—*Craven*: The only crop for money or exportation; \$50 per acre may be counted as the maximum yield, though some, by extra care and culture, have produced three times as much. *Montgomery and Tyrrell*: Cotton and corn the chief products; corn, being heavier in proportion to value, costs more for transportation, and therefore brings the producer less money. *Pitt*: The crop from which the tillers of the soil expected to realize the most profit; but, in consequence of the low price, many have failed in their expectations, and are obliged to curtail their operations for the ensuing year. *Chowan*: Although most profitable, the low price has caused several farmers to fail. Farmers begin to learn by experience that cotton will not do to depend upon. *Catawba*: One acre will produce 350 pounds of lint, at 14 cents; \$49; cost of fertilizers, \$6.30; preparing ground, cultivating, and gathering, \$18; net profit, \$24.70. *Moore*: Almost the only medium of money circulation among the farmers.

**SOUTH CAROLINA.**—*Williamsburgh*: About the only crop. Some few farmers who did their own work or hired on specially favorable terms may have cleared enough to pay taxes after supplying their families. *Chesterfield*: The crop was below the average, and the price scarcely sufficient to pay the cost of production, leaving the planter with no margin to support his family or as compensation for his services and interest on investment. Even those who did their own work have failed in most instances to pay for supplies consumed in making the crop. *Lexington*: Most profitable, but even that has fallen very far below the profits of the previous year. *Laurens*: The all-absorbing crop. A good and full crop was made; but little margin to the producer. *Chester*: The only product to which our people look for profit; yield average, but price too low to be remunerative. *Barnwell*: Notwithstanding the low price, and the failure of many planters and the bankrupting of a large portion, those who managed the business in a business way with their own capital realized a larger per cent. on investment than those engaged in other branches. From actual experience you have the following statement: Five hundred acres of land, at \$4 per acre, \$2,000; work-animals, \$800; implements, \$300; total capital, \$3,100; laborers sufficient for this farm, 200 acres in cultivation, working on half time, supporting themselves, make for the proprietor 30 bales of cotton, of 500 pounds each, worth \$60 per bale, \$1,800. Deduct for fertilizers, \$300; use of work animals, \$250; of implements, \$50; annual repairs, \$225; taxes, \$75; total, \$900; clear profit, \$900. The feed of the work-animals is replaced by their work in addition to the cotton, and the cotton-seed and manure pay for ginning, bagging, and ties.

**GEORGIA.**—*Hall*: Before the war not 100 bales of cotton were made in this county. We have marketed this year over 5,000 bales, most of which was grown here. *Brooks*: Not, however, so remunerative as it would have been had not the planters bought so largely of fertilizers. *Whitfield*: I planted 4 acres; used 500 pounds of Stone-wall guano, which cost \$20, and raised 3 bales, 500 pounds each. A neighbor planted 20 acres, common upland, without using any fertilizer, and raised 11 bales, averaging 500 pounds. Another planted 22 acres without manure and raised 15 bales. Another planted 1 acre, using stable-manure, and raised 2,200 pounds of seed-cotton. *Gordon*: Our poorest land for the past two years has yielded more per acre than our richest land in cereals. *Upson*: Many who have managed their farms well and had a little money ahead have lost it all, and those who were in debt are worse in debt than ever. We do but little in the way of diversifying or rotating crops. Upon an average we plant

about two-thirds of our land in cotton and the remaining third in corn, and call that our crop. *Muscookee*: It did not pay the cost of production. *Forsyth*: In several instances lands which were worn out and would not produce 200 pounds seed-cotton per acre, by the use of fertilizer made, after paying for fertilizer, \$20 per acre. Some did even better; in one instance one acre of old, worn-out land, after deducting cost of guano, netted \$70. *Douglas*: Cotton is made a specialty by many to the neglect of making meat and bread, and, to my knowledge, but few have made money the past year, and those are the few who did not use any commercial fertilizers, and raised their own meat and bread. *Dooty*: Planters expected to realize 18 cents for their cotton, and made heavy liens for their provisions. At the maturity of the liens, cotton was selling at 11½ to 13 cents, hence a large number were forced into bankruptcy to protect themselves against their heavy liabilities. Others sold off a portion of their stock, and are farming on a smaller scale this year. *Wilkes*: Cotton was the crop. Those who raise most supplies, and devote the rest of their time to cotton, have, not only in the past year, but in the olden times, succeeded best. They were before the war, and still are, the money-lenders outside of banks and regular capitalists. *Earle*: On 8 acres four laborers, with two horses, made 16 bales, besides corn, fodder, oats, pease, and potatoes to run the farm another year. This, however, is above an average. *Putnam*: A larger crop made than ever before—about 9,000 bales. *Columbia*: Less guano used, less cotton and more food-crops will be the motto this year. *Madison*: Commercial fertilizers pay a better percentage in Northeast Georgia than in any other portion of the State, from the fact that we are too far north for fruit on cotton, (without such stimulants,) owing to the shortness of the season. With the aid of fertilizers we make fine yields. It does not require much skill to raise 300 pounds of lint-cotton on poor land.

**FLORIDA.**—*Tallahassee*: The county has not more than made a living for the past two years. *Madison*: Has been deemed most profitable. No statistics are or can be given which show this to have been the case, except that almost every farmer planted more or less cotton, generally as much as he could tend. The larger farmers have been falling behind every year, and a majority of the larger farms are cursed with liens for the last and previous years. There now appears to be a determination on the part of planters to make their farms self-supporting, as has been the case heretofore with the smaller farmers who did not use colored labor extensively.

**ALABAMA.**—*Clarke*: For the last two years it has failed in amount of production, and prices have been low, particularly the last year, and, therefore, instead of a paying crop, it leaves the planters largely in arrears with their factors. *Montgomery*: Either corn or hay might have been made more profitable than cotton, but provision-crops are of secondary consideration in this county. *Conecuh*: The only thing that has been cultivated on anything like a large scale, and I am fearful that it will be so for years to come. *Lauderdale*: The only branch followed for profit; about two-thirds of the land cultivated is planted in cotton. *Randolph*: Nearly every one planted his best lands in cotton, bought fertilizers extensively, to be paid for in cotton by the first of November, at 15 cents per pound, (instead of which many subsequently agreed to pay cash, with 2 per cent. per month added, in anticipation that cotton would be higher.) They also made and used home fertilizers. The summing up of the whole is, we made a good crop, at large expense, and realized considerably less than cost. Corn is selling at \$1. This last year has taught many a lesson I hope they will not forget. *Franklin*: Almost exclusively relied on here for money. A simple statement of the cost of production will show that, at present prices, it is cultivated at a loss. *Butler and Pike*: As a rule farmers mortgage their stock, lands, and growing crop to procure supplies with which to make cotton, and at the end of the year are in a worse pecuniary condition than at the commencement. *Limestone*: It will not pay the expense of growing. *Blount*: A vigorous effort was made last year to raise a large crop of cotton. The crop was good; about \$150,000 worth was raised in the county, mostly by white labor. But the price scarcely covered the cost of production. *Calhoun*: The best and only paying crop.

**MISSISSIPPI.**—*Pike*: The crop resulted, in most instances, in a loss to the cultivator. *Grenada*: Every other crop has been unprofitable, owing to neglect and bad culture, and the cotton crop short and unprofitable, owing to disorganized labor, bad culture, &c. *Kemper*: Did not return the cost of production. *Yalabusha*: Has not proved very profitable the past year. *Madison*: The majority of the farmers are in debt, and to a certain extent are compelled to cultivate cotton, to hand over to the merchants whom they owe, as the latter advance the supplies on the condition that the cotton be shipped to them. *Attala*: We consider the cotton crop the most profitable, yet we must acknowledge that this seems unreasonable. While the cotton crop requires the labor of the entire year, corn, sugar-cane, and potatoes, sweet and Irish, can be raised by half the labor. The difference in result is that the cotton crop, great or small, can be sold for cash, while the other products cannot, and herein is the secret of the rage, as we call it, for cotton. *Claiborne*: No branch profitable, save in a few instances in which the labor was done, or directed and controlled, by white men. *Smith*: The principal branch, but do not think, as now followed, it is profitable.

TEXAS.—*Parker*: Owing to the continual depredations of the grasshoppers until the season was too far advanced for corn, oats, &c., no other crop was profitable. *Hood*: Yielded the largest return per acre. Wheat and all cereals were seriously damaged by late freezes and grasshoppers. *Montgomery*: Nothing else is raised for export, and not more cotton the past year than enough to cover expenses and purchase breadstuffs. *Fort Bend*: The only branches followed with a view to profit are cotton mainly, and sugar to a limited extent; both of which have proved unprofitable in the last two or three years, involving planters more and more. *Stil*: We have made at least 5,000 bales, which have sold at \$60 per bale, \$300,000.

ARKANSAS.—*Sebastian*: Being the main staple, producing it at the prices that have been paid for it, 9 to 12 cents in the lint, is a losing business. We do not raise a sufficiency of corn, wheat, rye, oats, and potatoes for home consumption. *Jackson*: That it is more profitable to plant all cotton and purchase corn North is believed and practiced by many of our oldest and most successful planters; it is, however, the opinion of the majority that it pays better to raise all the planter needs at home and less cotton. *Sharp*: Where the soil is rich and not sandy, corn pays as well.

## CORN.

The cases classed under this head are for the most part limited to corn produced and sold directly in the market. Extensive returns one year ago, in response to an inquiry respecting the relative profit on corn when sold in the market and when fed on the farm, so as to return an equivalent for what it takes from the soil, and to diminish the cost of transportation by concentrating its value, seemed to show, so far as weight of testimony from experience and observation can, that farmers who practice feeding out the corn they raise get a larger profit than those who practice selling it. As a rule, this conclusion is sustained not only by results of annual statistics, but still more decidedly by contrasted results, on farms and in pockets, after practice for a series of years. In regard to the relative profit in producing corn and cotton, the return from Green, N. C., reports that corn can be produced with some profit at 80 cents per bushel, while cotton, at 13 cents per pound, will not clear expenses, and adds: "Cotton is now selling at 12½ cents, and corn very readily at \$1." Another return from a county where much more cotton than corn is produced, expresses the opinion that the greater expense in producing the former, and the greater fluctuations in the price, make the profits, in a series of years, "far inferior to those of corn."

PENNSYLVANIA.—*Clearfield*: We know of many fields which, according to the accredited number of acres, yielded from 100 to 120 bushels of ears to the acre the last season, though these figures are considerably above the average.

VIRGINIA.—*Washington*: One man states that he raised 800 bushels on 8 acres. *Orange*: On some farms 40 and 50 bushels of corn per acre were harvested, and in one instance 90 bushels per acre were gathered from 12 contiguous acres in a field of 25 or 30 acres. *Middlesex*: The average price in this county for three years has not fallen below 80 cents. This may be accounted for in part by a local demand caused by the absence of thousands from the farms, who are seeking a living on the vast oyster-beds of every river in this section. *James City*: The cost and profits of cultivating an acre of corn and an acre of oats of the same soil and fertility were as follows: Total cost of cultivating and harvesting the corn, \$13.12; returns, 3 barrels of corn, \$24; shucks and fodder, \$7; profits, \$17.88. Cost of cultivating and securing the oats, \$9; returns, 3,000 pounds of oats, at 60 cents per 100 pounds, \$18; profit, \$9.

NORTH CAROLINA.—*Clay*: The leading crop. *Mitchell*: I planted on good upland, without manure, 8 acres; gathered, November 1, 240 bushels; placed it in a crib by itself, and on the 17th of February it measured 232 bushels; worth, at 75 cents, \$174; cost of cultivating, &c., \$34.80; net profit, \$139.20. *Haywood*: As a general thing the wheat crop is the most profitable, but last year it fell off about two-thirds of a crop, leaving the corn crop in advance of all others. *Burke*: Our principal crop for market which is sure, and pays generally very well. *Pamlico*: The price is about 80 cents per bushel, and the yield generally good. *Gum*: While corn was selling at 80 cents per bushel, cotton was selling at 13 cents per pound. Corn can be produced at some profit at 80 cents, while cotton at 13 cents will not clear expenses. Cotton is now selling at 12½ cents, and corn very readily at \$1. *Polk*: The principal crop. *Savily*: Though much more cotton than usual has been produced, the

greater expense in its production and the great fluctuations in price make the profits far inferior to those of corn. Where a planter made 100 barrels of corn with great ease, and could sell the crop for \$500, he would have been obliged to make 10 bales of cotton of 400 pounds to the bale, which would have overtaken his available labor and capital. *Greenville*: Last season a man and his wife, with a team of bulls, planted four acres in cotton, worked the land well, manured in the row from the barn-yard 19 wagon-loads, and gathered 647 pounds of cotton in the seed, at  $3\frac{1}{2}$  cents, \$22.62 $\frac{1}{2}$ . The same land, with one-third less labor, put in corn, would have produced 15 bushels per acre, which, at 75 cents, (corn is now 90 cents,) would have brought \$45; 500 bundles of fodder, at \$2.50 per 100, \$12.50; shucks, (one load sells for \$10,) \$20; total, \$77.50.

GEORGIA.—*Fannin*: Corn occupies about two-thirds of the land under cultivation. There are other things that pay better, but they are raised on a small scale. Irish potatoes are very profitable; we raise 150 to 200 bushels per acre, worth 50 cents per bushel at home. Also cabbages, which are worth 5 to 8 cents per head, or 3 to 4 cents per pound. *Towns*: The principal crop raised in the county. *Jefferson*: He who neglected to make corn, relying upon cotton to pay for his fertilizers and furnish his supplies, had no cause for surprise to find himself unable to make both ends meet. This has been the practice and experience of hundreds of our planters.

ALABAMA.—*Saint Clair*: On lands which have been in cultivation continuously for thirty-nine years, I made 70 bushels of white corn to the acre; turned the land over in October, 1872, 10 inches deep; planted April 10; plowed and hoed three times. In addition to the corn I raised a quantity of cow-peas and a large number of pumpkins, but from experience I think the production of red clover, millet, and red-top or timothy pay me better, in proportion to the labor, than anything else. *Henry*: A few farmers made an average of over 20 bushels per acre. *Clay*: Corn has been more profitable than cotton for the reason that the farmers bought largely of counterfeit guano. Many of them did not make enough cotton to pay for the guano they used.

TEXAS.—*Anderson*: Being in the cotton-belt, it is natural for each cultivator to plant cotton, which is grown with great ease and facility; and even with miserably demoralized conditions of labor, the product of 1873 reached 10,000 bales, of 450 pounds each. Yet not an ounce of guano or other fertilizing material has ever been applied, except that, in isolated instances, barn-yard manure is carelessly applied, usually by the planters' children. But in regard to profit there is no question that maize yields the greatest. The average stands thus: Preparing, planting, and thinning 5 acres of corn, eight days' labor, \$8; plowing, six days, \$9; gathering corn and fodder, eight days, \$8. Total expenses, \$25. Yield of corn, 150 bushels, at 75 cents, \$112.50; fodder, 1,500 pounds, at \$1 per 100, \$15. Total, \$127.50; net profit, \$102.50. Preparing, planting, and thinning 5 acres of cotton, fifteen days labor, \$15; cultivating, twelve days, \$18; hoeing three times, ten days, \$10; gathering, fifty days, \$50; incidentals, \$10. Total expense, \$103. Yield, 5,000 pounds seed-cotton, 3 cents, 150; 120 bushels of seed, 25 cents, \$30. Total, \$180; net profit, \$77. *Atascosa*: From the fact that it has not required so much labor, and is less subject to worms. *Victoria*: The yield with ordinary culture has been 40 bushels per acre, worth \$30. One man with a good team of two horses or mules, can cultivate 30 acres with ease. *Upshur*: Last year our best lands produced about 22 bushels of corn per acre, worth \$1 per bushel, \$22; total cost of production up to sale, \$8; net profit, \$14, (or 175 per cent. in the outlay.) Our best cotton-land produced about 1,000 bushels of seed-cotton per acre, which will give 333 pounds of lint-cotton, worth 12 $\frac{1}{2}$  cents, \$41.62; 20 bushels of seed, worth \$2; total expense of producing up to sale, \$25; net profit, \$18.62, (or 74 per cent. on the outlay.) *Uvalde*: Our soils are best adapted to corn, and is surrounded by military posts which consume more corn than it produces, giving us the advantage of a near market.

ARKANSAS.—*Crittenden*: One hand can work fifteen acres; can easily raise 30 bushels per acre, worth 75 cents, \$337.50. Hire of hand and other expenses, \$275; net profit, \$62.50. *Madison*: Hogs that cost in February, 1873, \$1.35, after taking the mast in the fall, and being fed 5 bushels of corn each, sold readily for \$10. *Little River*: Experience since the war puts the maximum of cotton per hand at 6 bales, which at present prices would be worth \$324. The same hand would be able to attend to 20 acres of corn, which would require his attention for only a few months in the year. This 20 acres would produce 600 bushels, which, at \$1, would yield \$600; difference in favor of corn, \$276.

TENNESSEE.—*Decatur*: Worth 80 cents to \$1. *Hancock*: Yielding 25 bushels per acre, worth 50 cents per bushel.

WEST VIRGINIA.—*Jefferson*: On a field of 14 acres, 510 bushels of corn were raised, at a cost of 16 cents per bushel; the corn at time of gathering was worth 40 cents per bushel, yielding a clear profit of \$122.40, being \$8.74 per acre. The corn crop of 1873 aggregated 474,250 bushels, and was produced at an average cost of 20 cents per bushel, leaving a profit of \$7 per acre. The profit on the wheat crop will not exceed an average of \$5 per acre. *Cabell*: A farmer of this neighborhood received for raising corn \$13.50 per acre, the landlord taking two-fifths, the renter three-fifths; another received \$12 per acre, receiving one-third for rent. Tobacco generally does better, but this year has proved an exception.

KENTUCKY.—*Shelby*: Corn-fed hogs sold at 4 cents per pound, gross, equal to 40 cents per bushel for corn; after this a demand sprung up from distilleries, and the price advanced from 30 cents to 50 cents, and even to 60 cents per bushel, and at this last price our large surplus was disposed of.

OHIO.—*Pickaway*: The yield of corn upon well-managed farms amounted to from 40 to 75 bushels per acre. Some fields yielded 100 bushels per acre. The price realized from this crop will average 45 cents per bushel, and the product of an acre \$20.25 exclusive of the fodder, which is worth from \$1.75 to \$2 per acre. The cost of producing this crop and disposing of it will amount to an average of \$3.50 per acre, leaving a profit of \$13.50. Corn fed to hogs will average about the same. *Logan*: Corn has yielded the largest margin over expenses. Cost of raising 35 bushels of corn on one acre of land, \$9.50; value of corn, at 50 cents per bushel, \$17.50; value of fodder, \$1.50; total, \$19; deduct expenses of raising, and a clear gain remains of \$9.50.

INDIANA.—*Vanderburgh*: From 60 to 100 bushels of corn are raised on the river-bottoms. The yield in the interior is comparatively small, and 30 bushels to the acre is as much as the uplands will average. *Madison*: With us corn averages 38 bushels per acre, selling at an average price of 40 cents per bushel, making a value per acre of \$15.20. Wheat will yield 10 bushels per acre, at a selling-price of \$1.10 per bushel. The surplus corn is fed to hogs and cattle. Average price of hogs, (gross,) \$3.80 per hundred; price of fat cattle, 3 cents per pound, gross. *Ripley*: I have sold corn at the crib this winter for 60 cents per bushel, and wheat at \$1.50 per bushel, my corn averaging 50 bushels per acre, and wheat 15 bushels per acre. The average for corn (for the whole county) would be 30 bushels and for wheat 10 bushels per acre. No other branch of agriculture here pays so well, except a few isolated cases of hop-raising and haying. *Hamilton*: One great advantage in raising corn is that a man may avoid all high wages and expensive machinery; he may gather the crop at his leisure. At the present high price of corn there would be no profit in feeding it to hogs. *Martin*: Corn may be considered the main crop, and the average value per acre is greater than anything else cultivated here. The corn is principally fed to hogs, and they are mostly sold to agents who purchase for Cincinnati packers. *Franklin*: The best feeders here get from 10 to 16 pounds of pork to the bushel of corn; this at 5 cents per pound, will yield the producer from 50 to 80 cents per bushel for corn. The best corn-lands yield an average of 50 bushels per acre, giving a cash value per acre from \$20 to \$40, for the produce of the land, less the cost of production, interest and tax, but still yielding a balance in favor of the farmer greater than from any other crop. *Gibson*: Even at the low price of pork for the last two years, I have found more clear money in feeding corn to hogs and selling them for others to fatten. For example: I sold 75 stock-hogs for \$469.43, while the corn they ate at 45 cents per bushel, and the pasturage at \$1 per month, amounted to \$307.20, making a difference of \$162.23 in favor of the hogs. Corn and pork necessarily go together, and have proved the most profitable. *Miami*: There is but very little difference in the relative expense of raising our two principal crops—wheat and corn; of the latter we had about 30 bushels to the acre, and it has been selling for 50 cents per bushel; of the former we had about 15 bushels to the acre, selling at \$1.35 per bushel, and I believe this statement approximates the facts of the case for the past three years, although I am well aware the prevailing opinion of our Wabash Valley farmers is in favor of the corn-crop.

DAKOTA.—*Minnehaha*: The total expenses of raising 480 bushels of corn on a ten-acre field amounted to \$104.37; the crop sold at 60 cents per bushel, or \$288 for the crop, leaving a net profit of \$183.63. On a ten-acre field 250 bushels of wheat were raised. The crop sold for \$187.50, and the expenses footed up \$105.50, leaving a balance of \$82 for a profit. The crop of corn could be market d at home, but the wheat must be taken hence for a market, and which would make the difference in favor of the corn s ill greater.

ILLINOIS.—*White*: Raising corn has paid better this season than any other crop, and is now in demand at 50 cents per bushel, shelled and sacked. Our wheat-crop was very light, and not of good quality; the average price per bushel was about \$1.30, and the same wheat brought \$1.50 a month ago.

MINNESOTA.—*Redwood*: All other products excepting corn have fallen off 50 per cent. in consequence of the grasshopper. Corn is now worth 60 cents per bushel, whereas wheat fetches only 75 cents; corn can be consumed at home, and wheat has to be shipped to a market.

IOWA.—*Wayne*: Corn with us is worth 40 cents per bushel, or \$16 per acre; the total expenses for raising the same amounts to \$3.50, leaving \$7.50 net profit. *Hardin*: We raise from 35 to 50 bushels of corn to the acre, and are selling it at from 40 to 45 cents per bushel, realizing about \$15 per acre. *Polk*: The average yield of corn is 45 bushels to the acre; this at present is worth 40 to 42 cents per bushel, or, say, 41 cents, and we have \$18.45 per acre. Wheat with us averages 9 bushels per acre, \$1 per bushel, equal to \$9 per acre. Oats yield \$16.50 per acre. *Mt. Coupin*: Corn fed to hogs realized 50 cents per bushel, most of our hogs selling at \$5 per hundred. Wheat-crop of 1873 was light, and paid but little over expenses. *Cass*: Raising corn and feeding cattle

and hogs. Stock-cattle sold in November at 4 cents per pound; hogs,  $3\frac{1}{2}$  cents per pound; fat cattle are now worth  $5\frac{1}{2}$  cents per pound, and fat hogs 5 cents per pound. We feed our cattle on shock-corn, that is, the corn, fodder and all. We keep two hogs to take up the waste or litter of each steer. Thus our stock at the cost price in November, and at the present prices of fat stock, will make us 60 cents per bushel for our corn, which we consider a good price, where one hand can cultivate 40 acres of corn, making 50 bushels to the acre, equal to 2,000 bushels; this, at 60 cents per bushel, would foot up \$1,200, a very profitable return for 40 acres of land, and the labor of one man.

MISSOURI.—*Ralls*: Corn pays a profit from \$12.50 to \$15 per acre; wheat, from \$9 to \$9.90 per acre; and oats from \$9 to \$10.50 per acre. *Dallas*: Notwithstanding the light yield of our corn, still it was the most profitable crop that we had, as the price per bushel has been in advance of the prices obtained for several years past; also where the crop has been used in making pork and the pork packed at home, it promises to pay very well.

KANSAS.—*Linn*: One man can farm 50 acres of corn, which if fed to growing stock nets more money than any other work. *Riley*: Careful accounts for the past five years kept on one farm have shown the wheat account in debt \$80, while the corn shows a profit of \$110. *Cloud*: The raising of corn, which has been sold to feeders at 20 and 25 cents per bushel, and according to their own statements they will realize 60 cents per bushel. *Woodson*: One farmer states that he cribbed 1,100 bushels of corn from 25 acres, for which he has been offered 25 cents per bushel. The cost of an acre he reckons as follows: preparing ground, including plowing, harrowing, and laying out, \$2; planting, 50 cents; cultivating, \$1; picking, \$1.50; total, \$5. The crop averaged about 40 bushels to the acre, and at 40 cents per bushel would be worth \$16 per acre, less the expenses, \$5 per acre, leaving a profit of \$11 per acre.

## WHEAT.

The simplicity of the process of cultivating and preparing for market, the comparatively small amount of labor and expense required, a constant cash market, and the quickness of the returns—that is, the short interval between the outgo for seed and labor and the income from sale of the crop—are among the reasons advanced in favor of wheat as a desirable and profitable crop. The drawbacks are that it is a very uncertain crop, and, as it is never fed out on the farm beyond what is needed for family use, it is constantly taking from the soil without any return, and hence, where cultivated as a specialty, there is apt to be a steady decrease in the average yield.

PENNSYLVANIA.—*Lawrence*: I give the result of my experience on 10 acres of clover-sod; plowed under in August, 1872, and on September 14, drilled in with Fultz wheat. Expenses: Plowing, \$30; harrowing twice, \$10; drilling, \$7.50; 10 bushels of seed-wheat, \$20; harvesting and thrashing, \$55; interest on 10 acres, at \$100 per acre, 6 per cent., \$60; total, \$182.50; returns, 230 bushels of wheat, \$1.75 per bushel, \$402.50; profit, \$230. *Lycoming*: The crop was remarkably good. *Lebanon*: Average yield about 20 bushels per acre, which, at \$1.60 per bushel, and the straw \$10, makes \$42 per acre. Some of the best farmers averaged 25 bushels per acre. Corn comes next; best farmers averaged about 50 bushels per acre, which, at 55 cents per bushel, and fodder \$12, equals \$39.50. *Northampton*: My own crop was greatly in excess of that of 1872, in quantity, quality, and weight; every bushel has exceeded in weight the legal standard, and it is so generally in the whole county.

MARYLAND.—*Montgomery*: I put \$500 worth of fertilizers on my crop; had 1,300 bushels, at \$1.80 per bushel, \$2,340, leaving \$1,840 for labor, seed, and profit, and a part of the effect of fertilizers for after crops.

VIRGINIA.—*Northumberland*: When Peruvian or fish guano have been applied, say 200 pounds of the former and 400 of the latter, the yield has been 20 to 30 bushels per acre. *Essex*: The average yield of wheat was about 5 bushels per acre, worth at \$1.60, \$8; straw, \$2; cost of production, \$4.70; net profit per acre, \$5.30. The yield of wheat on improved lands was 15 to 25 bushels per acre. I was at much pains to ascertain the result when a good dressing of barn-yard manure was given, and the yield was never less than 15 bushels per acre. The application of commercial manures did not give the yield that was expected.

NORTH CAROLINA.—*Forsyth*: Price, from \$1.25 to \$2.

TEXAS.—*Basque*: The average of yield of wheat per acre is 20 bushels, and average price \$1.25—\$25. The expenses per acre: 1 bushel of seed, \$1.25; seeding, \$2.25; harvesting and thrashing, \$5.50; total, \$9; net profit, \$16. Wheat is also much better in this region for being pastured, and is worth about \$6 per acre as a winter pasture.

But a few months in the year are required for cultivating and saving it, so that a plenty of time is allowed for other crops, repairing fences, and other farm-work. One acre of cotton will, on the average, yield about 400 pounds of lint after deducting toll at the gin, which, at the average price of 9 cents, gives \$36. Expenses—breaking ground and planting, \$3.50; cultivating, \$4.25; picking, \$15; hauling to gin, bagging, and ties, \$6; hauling to market, at an average of thirty miles, \$3; total, \$31.75; net profit, \$4.25. And but little time can be had for other crops and work on a farm where cotton is the staple.

**WEST VIRGINIA.**—*Barbour*: The raising of wheat leaves a net profit of \$14.50 per acre. *Mason*: One field of wheat of 180 acres produced an average of 25 bushels per acre, and sold early in the season at \$1.25 per bushel, or \$31.25 per acre. Another crop of 225 acres produced 22 bushels per acre, and sold at \$1.50 per bushel, or \$33. Another field of 90 acres yielded 23 bushels per acre, and sold at \$1.40 per bushel, or \$32.20 per acre. A fourth field of 75 acres gave an average yield of 20 bushels per acre, and sold in October at \$1.50 per bushel.

**OHIO.**—*Madison*: Average yield of wheat 22 bushels to the acre, and worth \$1.25 per bushel, or \$27.50 per acre. Average value of corn would not amount to \$10 per acre this year.

**MICHIGAN.**—*Kalamazoo*: The yield per acre of winter-wheat varies from 10 to 25 bushels. The excess over about 15 bushels per acre (an average crop) is usually in the exact ratio of the additional tillage given. I think a uniform yield of 25 or even 30 bushels can be obtained, provided the land is in good heart and thoroughly cultivated. *Washtenaw*: In this county the average of the wheat-crop for the last three years would be \$40 per acre each year. *Richland*: Winter-wheat yields in this county from 16 to 30 bushels per acre, and is always worth \$1.25 per bushel.

**MINNESOTA.**—*Le Sueur*: The average yield of our principal crop, wheat, is 20 bushels to the acre, and the value per acre is \$19. The expenses of raising the same are: plowing, \$2; seed, \$1.80; seeding, \$1; harvesting, \$3.50; for thrashing and marketing, \$3.50—total expenses, \$11.80; profit per acre, \$7.20. *McLeod*: On 22 acres of land 319 bushels of spring-wheat were raised, at a total cost of \$229.60. The 319 bushels sold at 90 cents per bushel, amounting to \$287.10, leaving a profit of \$57.50. *Douglas*: Wheat brings 75 to 80 cents per bushel; average yield per acre, 21 bushels. The yield was considerably reduced last year by bad seed. *Houston*: The average yield of wheat is probably about 18 bushels per acre; the price at the different railroad-stations since December averaged \$1.06 per bushel. I estimate all over 15 bushels per acre as profit. There is no doubt that farmers here devote too much of their attention to wheat-growing for the good of their land, or even present profit. Sheep, corn, clover, and other grasses, with stable-manure and proper rotation, are the means to restore and preserve the fertility of our soil.

**IOWA.**—*Tama*: Some of our farmers average 15 to 16 bushels of wheat to the acre. Such crops were on new-breaking or fall-plowing, with 50 to 100 acres in wheat, and a market-price of 90 cents to \$1 per bushel. Many of our farmers did well. *Delaware*: The average cost of raising one acre of wheat, and yielding 17½ bushels, is about \$11.45, including seed, seeding, harvesting, thrashing, hauling to market, and interest on the land; the average price per bushel would be about \$1—giving \$17.50; and, after deducting the expenses, leaving a profit of \$6.15 to the farmer. *Boone*: Wheat averaged 20 bushels per acre, and sold at \$1.25 in market, and this is a high estimate for the past season. Oats, barley, &c., have been somewhat less remunerative; whilst corn averaged, say, 55 bushels per acre, and sold in the crib at 55 to 60 cents per bushel. Estimating the corn at 50 cents, we have per acre for corn \$27.50, and per acre for wheat \$25. *Sioux*: Wheat is almost exclusively our principal crop, but was destroyed last year by the grasshoppers.

**MISSOURI.**—*Pettis*: Wheat-culture decidedly the most profitable. Taking the average of 22 bushels of wheat to the acre, the profits of a ten-acre field would be as follows: Dr.: Drilling, \$3; harrowing, \$4; plowing, at \$2 per acre, \$20; cutting and harvesting, \$20; thrashing, at 10 cents per bushel, \$22; interest on land, \$20; seed, \$24; taxes on land, \$5; total cost, \$118. Cr.: By 220 bushels of wheat, at \$1.15 per bushel, \$253; straw, \$1 per acre, \$10; total receipts, \$263. Less the amount of expenses, \$118, leaves a profit of \$145, or \$14.50 per acre. *Cape Girardeau*: The raising of wheat was the most profitable upon the whole. *Bollinger*: Wheat has been most profitable in the northern section of our county and the most productive in the southern section, and is used principally for feeding to hogs and cattle.

**KANSAS.**—*Marshall*: Spring-wheat has been most profitable of grains. Until the two past years winter-wheat has been considered most remunerative. Spring-wheat has yielded from 15 to 30 bushels per acre, and has proved a great success. *Jefferson*: Winter-wheat, taken one year with another, has upon the whole proved most successful. *Lyon*: One of my correspondents states that he raised 550 bushels of wheat off 35 acres. This was worth about \$750. *Labette*: At this date wheat is worth \$1.50 per bushel in Saint Louis, and it costs 25 cents per bushel to ship it there, so it takes one-sixth of the whole value to get the crop into market; whereas corn costs about the



same price to ship, and when in Saint Louis brings about 75 cents per bushel, thus costing one-third of the value to ship. Cost of cultivating 966 bushels of wheat on 40 acres of land, \$473; part of the crop, 550 bushels, brought \$1 per bushel, amounting to \$550; and 416 bushels brought \$1.25 per bushel, or \$520; total, \$1,070; leaving a net profit of \$597.

NEBRASKA.—*Otoe*: The exceedingly favorable season having been happily adapted for the growth and maturing of wheat, it has proved our most profitable crop. *Jefferson*: Wheat the principal crop of the county; oats and barley do almost equally well. *Thayer*: The yield of spring-wheat was from 18 to 20 bushels per acre, and is now worth \$1 per bushel. *Antelope*: Spring-wheat has been the most remunerative. *Madison*: Wheat-raising is the only branch there is any profit in; all the other crops were failures.

CALIFORNIA.—*Santa Clara*: This is emphatically a wheat-producing county. *Napa*: Wheat-raising has greatly predominated in Napa County for the past year. It is estimated that the production of this cereal will reach 10,000 tons; this estimate is based upon statistics furnished by warehousemen, middlemen, and from other sources.

OREGON.—*Lane*: There is no doubt that the raising of wheat has been the most profitable both in the aggregate and in individual examples. In fact, some branches, and those not a few, are neglected by our people in order to avail themselves of the immediate results of selling wheat.

UTAH.—*Washington*: Our wheat-crop has been particularly profitable the past season owing to a majority of the farmers having sown in the fall.

NEW MEXICO.—*Taos*: Wheat has proved most profitable during the past year in our farmers' valley.

MONTANA.—*Lewis and Clark*: Wheat, although somewhat damaged by the grasshopper, has proved most profitable of the crops.

## DIVERS CROPS.

A considerable proportion of the returns of the Central and Western States indicate no positive preference for particular crops, but express the true idea of successful general agriculture, which embodies a wise selection of a variety of crops in rotation, chosen with reference to soil or market or other modifying circumstance. Many discussed the obvious advantages of general cropping over restriction, more or less exclusive, to a speciality. As this investigation has to do rather with the comparative profit of the various crops comprising the rotation than with the relative profitableness of specialties and general farming, these extracts are mainly confined to such comparisons, for the purpose of showing what branch of the rotation is most prominent at the present time.

RHODE ISLAND.—*Newport*: Farmers living within three or four miles of the city find it most profitable to give most of their efforts to producing milk. Some of them add more or less of market-gardening. A large number, who are too far from the city to carry milk profitably, make most of their profit by selling hay. A third class, whose land is adapted to growing early potatoes, have made this most profitable the past year. The small size of the farms, and the high price of labor, rent, manure, &c., render it almost impossible to make any profit by growing grain, stock, wool, or pork.

CONNECTICUT.—*Hartford*: The paying crops are tobacco and garden-vegetables, and grass and hay turned into milk, sold in the cities and manufacturing villages. On account of the high price of labor few other farm-products pay.

NEW YORK.—*Eric*: Potato raising has been the most profitable, according to the area occupied. The yield has ranged from 100 to 300 bushels per acre, and the price from 70 to 80 cents per bushel. F. R. Davis sold, July 20, from one acre 300 bushels of early rose for \$240. (The ground had been planted with potatoes on the sod the year before and yielded about the same.) Expense of cultivating, including seed and 25 loads of manure, at \$1 per load, \$60. On the 25th of July the acre was sown to turnips. *Warren*: On farms adapted to grass, making butter and cheese; on light soils, corn and potatoes. We have dairymen who report \$60 worth of butter and cheese per cow. I raised \$75 worth of potatoes per acre last season. *Schenectady*: In some sections the hay-crop has been the most profitable. The potato-crop yields the most money per acre of any crop raised the past season. In some sections the white peach blow has netted \$100 per acre. *Otsego*: The staple product of the county, hops, has probably been the most successful with those who, by reason of favorable location, diligence, and care, have secured a good crop—600 to 800 pounds per acre. The price has raised from 25 to 50 cents, according to quality and date of sale. *Oneida*: Hops in the

southern part of the county and dairying in the northern. The town of Sangerfield had about 1,000 acres in hops, the estimated yield of which was 500 pounds per acre. The price per pound in the fall was 40 to 50 cents. But Germany and England, with their cheap labor, have been able to send over large quantities, in consequence of which the price has been reduced to about 25 cents. *Ontario*: Hop-growing, wool-growing, stock-raising, and fruit-producing, each has its ups and downs. *Wayne*: Tobacco paid largely. Among grains, barley paid best. *Genesee*: Wheat, which generally takes the lead, has lost that rank this year in most of the county. Barley, apples, wool, pork, beef, products of the dairy, and eggs, would each have claims for pre-eminence with different farmers. The farmers as a whole will add something to their wealth out of the last year's crops. *Onondaga*: We have a mixed agriculture, perhaps as much so as any county in the State. The dairymen undoubtedly have done better than any other class of farmers, especially those who have raised hops in connection with dairying. The amount cleared from each cow has varied from \$40 to \$70. Much depends on location, and very much on the skill and industry of the manager. Hops have sold for from 35 to 45 cents per pound. One farmer cut about 100 acres of meadow, and sold from it 200 tons of hay at \$17 per ton—\$3,400. An Irish farmer, owning 60 acres, came recently to pay interest due me. He paid, principal and interest, \$500, and has paid to others over \$200—over \$700—all from this year's profits. He raised wheat, barley, oats, corn, and potatoes, besides keeping stock necessary for the farm. *Reusselaer*: The cultivation of potatoes and hay is the most profitable, except fruit, not much of which is raised. *Columbia*: The principal crops were hay and rye. The large number of mills for the manufacture of straw-paper make rye one of the most profitable crops we can raise. Our ready access to market makes the hay-crop also very profitable.

**NEW JERSEY.**—*Camden*: The branch most followed is gardening upon a pretty large scale, and the success is so various that from a crop of tomatoes one will sell \$250 or \$300 worth per acre, while the crop of another near him will not pay the cost of cultivating and marketing. On small, well-cultivated farms many average in the amount of sales \$100 per acre, and on large ones scarcely more than half of that. Dairy-farming is receiving considerable attention. The best results are shown in the more rapid improvement of the farms devoted to it, owing to the increased size of the manure heap. The average sales on these farms will not exceed \$50 per acre, leaving the net proceeds at about \$10 per acre, exclusive of the manure. *Cumberland*: Farming more diversified probably than in any other county in the State. In some portions a great deal of attention is paid to the raising of "truck" for the Philadelphia and New York markets, and where the soil is adapted I think this is the most profitable branch of farming. Some pay considerable attention, not to the raising, but to the fattening of stock, others mixed-husbandry.

**PENNSYLVANIA.**—*Bucks*: Within twenty miles of Philadelphia, the growing of grass for hay. A farmer, who combines intelligence with industry and energy, has, the past year, marketed \$1,204.66 worth of hay from a farm of 95 acres, besides keeping a stock of 25 to 30 head horses and cattle. His sales of hay for four years have averaged 42 tons, and in value \$1,157. He states that his farm, valued at \$150 per acre, has yielded him over 10 per cent., after deducting interest on land, stock, and all expenses. More remote from the city the dairy becomes the chief source of profit. For a 100-acre farm, 15 cows are a fair stock, and the average profit per cow ranges from \$50 to \$60. In this case the hay and grain are mostly consumed on the farm, and the way is opened for fattening market and winter pork, which is for the most part remunerative. In the absence of the dairy the growing of early lambs for market shows a fair profit. The account of a neighbor who, in the fall of 1872, bought 50 ewes, stands thus: for the 50 ewes, \$4.50 per head, \$225; for a Southdown buck, \$15. Received for 51 lambs, \$306; 150 pounds of wool, \$75; 45 ewes in the fall, (5 having been lost,) \$225; value of the buck on hand, \$16; showing a profit of \$382. This can be relied on if the lambs can be got into the market early. In cost of keeping, 6 ewes are considered equal to 1 cow. This branch of farming requires less labor than a dairy. The chief drawback is danger from dogs. Potatoes and fruit are next in profit. The cultivation of the latter, except apples, is limited, but of the former is becoming general. *Butler*: Within the last two years developments have proved this county to be the largest and best oil-district in the world; consequently towns and improvements have sprung up as if by magic, scattering millions of dollars among land-owners. This has caused an unprecedented demand, at high prices, for every article the farm can produce for man or beast. *Mercer*: Cattle, cheese, and butter—our iron-manufactories and oil-producing regions near by make a cash demand for the above. *Franklin*: Wheat and corn. These are the staple products, and the evidence that they are profitable is the certain prosperity of our farmers. *Lucerne*: The population of the county is estimated at 200,000, about three-fourths of whom are engaged in mining and shipping coal, or business connected therewith; consequently farm products of every kind find a ready market at good prices, and the result is that farmers are more disposed to raise a variety of products than to adhere to a few. While the great west fills our market with grain to repletion, truck has no competition. *Washington*: If it were not for depriving the farm of manure by selling its pro-

ducts instead of feeding them, raising hay and grain for sale would seem to have been the most profitable the past year; indeed for several years past. But we shrink from this method because we think a man in pursuing it would be just hauling his farm off to the city. *Dauphin*: Trucking, in connection with general farming, has perhaps, on the whole, been the most profitable with us. *Elk*: By the majority hay for sale would be said to be the most profitable. Latterly butter-making has paid about as well. Among the minor crops potatoes are the most remunerative. The high price of labor renders all other plowed crops unprofitable, except what can be raised without hired labor.

**MARYLAND.**—*Cecil*: Growing cereals is the principal business of agriculture in this county; a few combine with this grazing and dairying. These are considered more profitable.

**VIRGINIA.**—*Botetourt*: Find it profitable to grow wheat, corn, tobacco, grass, oats, and a good stock of cattle. Wheat, tobacco, and corn are our great money-crops. *Page*: On the 8th and 9th of April I sowed, broadcast, 4 bushels of Excelsior oats on 3½ acres, from which I thrashed 180 bushels, weighing 49 pounds per bushel. At the same time, and in the same field, I sowed 5 bushels of Norway oats, from which I thrashed 230 bushels, weighing 38 pounds per bushel. *King and Queen*: Wheat and oats. The wheat-crop was not a large yield, 6 to 8 bushels per acre, but the price, \$1.50 to \$1.75, made it a profitable crop. The oat-crop was more marked in its results, making 2 tons to the acre, and selling to the lumber-men in our county at \$1.25 to \$1.30 per 100 pounds. *Westmoreland*: The chief crops are corn, wheat, and oats, with a little of stock-growing, fruit, truck, and some few try tobacco.

**NORTH CAROLINA.**—*Yancey*: Corn and wheat. *Warren*: Cotton and tobacco are the only crops made for sale. *Bertie*: Mixed farming was without question the only profitable mode of agriculture. Cotton is the only crop here that commands ready money, and the farmer who produces his provisions for his farm and then as much cotton as his lands and labor will permit, is the only successful worker of the lands. *Franklin*: Cotton can be profitably cultivated here if farmers raise their own supplies. Mr. Henry Pearn made last year 40 bags, 430 pounds each, on 2½ acres of land; and 176 barrels of corn on 32 acres. His profits were largely in excess of his outlay. Most farmers, however, cultivate cotton to the exclusion of everything else, and the result is that it takes the proceeds of their cotton to buy supplies. *Gaston*: The cereals and cotton the important products, and unquestionably the most profitable, where the economy of the farmer is directed to the production of all supplies the land will produce; cotton takes less from the land than the cereals, is most easily marketed, and most profitable for market. *Robeson*: Ours are mixed crops, though not so much so as they should be. *Mecklenburg*: Farmers who cultivate corn, wheat, oats, rye, and cotton have made the most money.

**SOUTH CAROLINA.**—*Fork*: One acre of our best uplands, well fertilized, will yield one bale of cotton, worth, at 15 cents, \$67.50. After deducting cost of production, including labor, \$22.50; horse-power, \$10; implements and manures, \$10; preparing for market, \$6; seed, &c., \$4; total, \$52.50; the planter receives, net, about \$15 per acre from his best lands. The same acre of land, planted in Irish potatoes in February or March, with careful culture, will produce 200 to 350 bushels. Taking the lowest estimate, 200, the proceeds are worth at the lowest rates, \$150. Manure, labor, harvesting, and marketing (in bulk) can be effected at a cost not exceeding \$75, leaving a net profit of \$75 per acre. In the same way I might satisfy any one familiar with the climate and locality of the larger profit in the production of cabbages, onions, fruits, &c. The result of inquiry leads directly to the answer that the largest profits are obtained from diversified agricultural industry. *Union*: Whenever our best farmers plant altogether cotton, the profits are not so great as when a farmer of the same ability plants mixed crops. Many planted almost entirely cotton. Sales brought 9 to 14 cents. Our intelligent farmers are waking up to the necessity of improving the land and considering that a part of the year's profit. When they do that, and get some of our old fields, now worth \$4 to \$10 per acre, to be worth \$50 per acre, then our people will begin to open their eyes to their best interests.

**GEORGIA.**—*Johnson*: We are small farmers and try to make our own bread, pork, potatoes, sugar, and sirup, and after this, produce as much cotton as we can for market. We sell some wool, pork, beef, and poultry, but in quantities scarcely worth mentioning. *Meriwether*: Those planters have done best and made most clear money who have raised provisions at home and only made cotton their surplus crop. They, almost without exception, have done well. *Pike*: Grain and grasses. The few who have clover in cultivation realized a good income from it. The yield was as high as 2 tons per acre at the first cutting, and it was worth as much per acre afterward for grazing cattle and hogs. On three acres of clover and orchard-grass, I grazed last season 20 hogs from the 10th of March to the 15th of August, not feeding them more than 5 bushels of corn. During the same time I grazed three milch-cows, but exclusively at night. All these failed to keep down the clover till warm weather set in. The 3 acres were worth to me at least \$125, and full as much the year before. Besides, my land is

thoroughly enriched by the clover and pasturage, as one would say by looking at the wheat in it now. I put no manure on except 40 bushels per acre of cotton-seed when seeded in the spring of 1871. *Marion*: The farmers have managed badly; planted mostly cotton to the exclusion of corn and small grain. The past season has taught them a lesson by which they ought to be governed in future. *Schley*: Tropical cane, sirup-making, sweet-potatoes. One mule or horse and two hands will make more clear money upon half the acres planted to sugar-cane, sweet-potatoes, (the best of all crops), and the small grains, than can be made with whole acres in cotton. *Liberty*: West India sugar-cane and sweet-potatoes. From 8 to 14 barrels of sugar per acre have been made. Valuing one barrel at \$30, the products of one acre would amount to from \$240 to \$420. The yield of sweet-potatoes successfully cultivated is from 300 to 500 bushels per acre, and the value per bushel from 50 cents to \$1; averaging, if we have 400 bushels, at 75 cents, \$300. The yield of corn is about 10 bushels per acre, at \$1, \$10; of cotton, about 100 pounds of lint-cotton, at 15 cents, \$15; of rice, about 20 bushels, at \$1.25, \$25. *Harris*: No branch has been very profitable, but where they have all been combined more profits and benefits have been realized, and especially where about one-third has been planted in cotton and the other two-thirds in corn, wheat, oats, potatoes, barley, &c. *Catoosa*: In my personal experience last year, 2 acres in clover and timothy mixed yielded about 11,200 pounds of hay, worth at our village \$1 per 100 pounds. No manuring whatever was applied.

FLORIDA.—*Gadsden*: Cuba tobacco and the Scuppernong grape. With respect to the latter, I am informed by a reliable producer, who has been the pioneer in this branch in this county, and who now has a vineyard in full bearing, that 1,500 to 2,000 gallons of wine to the acre is not an extraordinary estimate, where the vineyard has been favorably located and properly cultivated. A person recently from Georgia has established, within the past year, a vineyard of 140 acres, with the design of extending it to still larger proportions. *Orange*: Corn is reported as the most profitable in the southern section of the county. In other sections orange-culture is acknowledged to be the most profitable. My sub-correspondent reports that he has realized a little over \$1,000 clear from the orange-crop of one acre, and not a full crop at that.

ALABAMA.—*Walker*: The corn and cotton crops are nearly equal in value. *Greene*: There is no doubt that the cotton-crop is the most profitable one that can be raised here, if raised as a surplus crop. As long as we draw our corn and meal from the West it is impossible that the country prosper, and at the present price of cotton it is simply ruinous. *Bullock*: The cereal or provision crops. The majority of farmers followed in the old ruts, trying to retrieve their broken-down fortunes by planting too much cotton to the neglect of the provision-crops.

MISSISSIPPI.—*Hinds*: Fruit-culture and hay. H. O. Dixon harvested three tons of hay to the acre and sold it in Jackson for \$30 per ton; he cultivates clover, timothy, and orchard-grass; many are planting the grasses this year. *Newton*: Cotton and sugar-cane. We always plant cotton, not specially on account of the money there is in it, but because it will always command the money. With Louisiana sugar-cane, some of our farmers have made 250 gallons of fine sirup to the acre, readily disposing of it at 80 cents to \$1 per gallon. The land that produced the 250 gallons would not have made \$25 if planted in cotton. All who can get seed will plant the cane this season.

TEXAS.—*Red River*: While we claim to be a cotton country, wheat and oats succeeded with us better than any other crops, because they matured before the season could injure them. *Navarro*: Grain-growing; evinced by a general appearance of thrift around farmers who have been engaged in growing grain over and above those who have devoted their entire time to producing cotton. *Titus*: Heretofore the cotton-crop, with prices ruling from 15 to 18 cents, has been most profitable; but now prices are down to 10 to 13 cents, with a poor and unsettled labor system, consequently farmers cannot afford to risk increased acreage; the result was a general resolve to grow grain and stock, making cotton a surplus, and the season just closing finds them with a surplus of grain, with plenty of pork of their own raising, and abundance of hay and roots for wintering their stock. *Smith*: Of the two general crops, corn and cotton, corn has paid the best; all provision-crops have paid better, and always do pay better, than cotton; wheat, though grown in a small way, has been the most profitable crop; a field of 12 or 15 acres yielded 23 bushels per acre, and the wheat was sold at \$2 per bushel, in specie. *Wood*: The small grains. All surplus grains have found a ready sale at good prices, while it cost but a small per cent. of these prices to raise them.

ARKANSAS.—*Franklin*: The cereals have yielded the largest per cent. of profits, although this branch has been much neglected for cotton, which, from the high price of labor, has resulted in a loss to the cultivator. Labor the past year cost the farmer, besides board, \$15 to \$20 per month. I will put it at \$18, and the aggregate expenses of cotton-crop for one hand foots up \$182.04. The average product per hand, after deducting toll for ginning, will be 1,725 pounds of lint, yielding at 12 cents \$207.36; net profit, \$25 32. The aggregate expenses of a corn-crop for one hand, \$120; product, (at an average of twenty acres, twenty-five bushels per acre,) five hundred bushels at 75

cents, \$375; net profit \$255. In the foregoing estimates no allowance is made for rent of land or wear and tear of machinery. *Scott*: Corn, wheat, oats, potatoes, cotton, and sorghum are grown. Cotton-planting is decreasing, and grain, fruit-growing, and stock-raising are on the increase. The amount of wheat sown last year is doubled this year. *Independence*: The farmers in the county engaged in the production of diversified crops, as wheat, corn, oats, cotton, with pork and beef, are among the most thrifty and prosperous in the United States, while those devoting all their labor and capital to the production of cotton are embarrassed with debt, harrassed with unpaid laborers, and their houses and farms are untidy and without those tasteful adornments which go so far to make rural employment attractive. *Hempstead*: The production of home-supplies has been less unprofitable than anything else. *Marion*: One of my neighbors has a farm of about fifty-five acres; he planted eighteen acres in cotton and the remainder in corn and oats. His wheat was so poor that he plowed it up and planted the land in corn. He raised an abundance of corn to supply him for the year, and about 19,000 pounds of seed-cotton. He has three boys able to do farm-work, and two girls, (and girls are generally good cotton-pickers.) He therefore picked out all his cotton without hiring, which he sold at gin at \$1.75 per 100 pounds, yielding \$332.50, and he has left a surplus of some \$200 in cash, besides a sufficiency of corn and meat for the ensuing season.

**TENNESSEE.**—*Smith*: Those farmers among us who have diversified their products have been doing best for the past few years. Tobacco-growing brings more money than any other branch, but that it has been most profitable, taking in account the wear and tear and exhaustion of soil, I think hardly any one at all informed believes.

**MINNESOTA.**—*Sherburne*: A profitable season. One farmer sold, without decreasing his stock, as follows: Cattle to the amount of \$370; cheese, \$255; butter, \$250; wheat, \$150; corn, (22 acres,) 1,100 bushels, at 60 cents per bushel, \$660; pork, \$70; potatoes, &c., \$100; total amount sold, \$1,855. *Blue Earth*: We have an average yield of 40 bushels of oats per acre, with an average price through the month of February of 45 cents per bushel, which gives us \$18 per acre, against 15 bushels of wheat per acre, at an average price of 97 cents, giving us \$14.55 per acre. My own personal experience was 1½ tons of flax per acre, at \$12 per ton; total \$15; 57 bushels of oats per acre, at 42 cents per bushel; total, \$23.94; 15 bushels of wheat at 90 cents per bushel, \$13.94. The cost of harvesting and marketing these crops will not differ materially.

**IOWA.**—*Calhoun*: The cost of raising 224 bushels of wheat on 22 acres of land, including plowing, seeding, cutting, shocking, stacking, thrashing, &c., amounted to \$144.40; the 224 bushels sold at an average price of 80 cents per bushel, amounting to \$179.20, deduct amount of costs, \$144.40, and a balance of \$34.80 remains for a profit. On 22 acres of land 660 bushels of corn, at an average of 30 bushels to the acre; the total expenses for harrowing, cultivating, husking, cribbing, &c., amounted to \$130.25; the product sold at 40 cents per bushel, amounting to \$264, giving a profit of \$133.75. Three hundred bushels of oats were raised on 10 acres of land, at an average of 30 bushels to the acre; the total expenses amounted to \$51; the crop brought 30 cents per bushel, netting \$90, showing a balance of \$29 in favor of the farmer. *Jaylor*: Corn marketed in beef and pork yields from 35 to 55 cents per bushel, whereas the grain itself brings in our market but from 10 to 35 cents per bushel. Beef-cattle are worth from \$4.75 to \$5 per hundred weight, and hogs from \$4 to \$4.75 per hundred weight, at present time. *Marion*: The wheat-crop has been worth \$13 per acre; sorghum, \$18.75 per acre; potatoes, \$25 per acre; corn, \$12 per acre; oats worth \$10, and rye \$9.75 per acre. I mean, of course, that the profits of the crops were worth the specified amounts. *Des Moines*: The growing of corn, and feeding of the same to cattle and hogs, is the most profitable, not only in this county, but in all this region of country. Twenty-five bushels of corn will ordinarily grow a 300-pound hog, which will not cost over a dollar to ship to Chicago; whereas it costs \$3.25 to ship the 25 bushels of corn to Chicago, and the hauling of it to the station. *Jasper*: Raising corn and feeding same to stock; the average yield is about 35 bushels per acre, the majority of fields yielding 40 bushels to the acre; market price about 35 cents per bushel. Mr. C. H. Parker fed during the winter 33 head; averaged 1,250 pounds when commenced feeding, two years old past; has 80 head of hogs following, the hogs averaging 100 pounds in feed lot; cattle cost 4 cents per pound in lot; hogs 4 cents per pound; the cattle sold to deliver at 6 cents per pound, and hogs 4 cents per pound; now, the account stands thus: cattle have increased in weight 350 pounds each, hogs 150 pounds each; by feeding 100 bushels of corn to the steer, value of steer is increased in weight \$96; original cost, \$50; 2½ hogs to a steer, gain 150 pounds each at 4 cents per pound, foot up \$15, plus the \$46 profit on a single steer, gives a total net profit of \$61 on feeding of 100 bushels of corn. *Johnson*: One instance of an acre of timothy for seed yielding the owner \$22 profits. The wheat-crop comes next in order, yielding 12 bushels to the acre, and selling at \$1 per bushel; oats yield about 40 bushels to the acre, and sell for 30 cents per bushel. *Grundy*: Almost exclusively wheat and corn; we are following the old rules, traveling in the old ruts, no improvements; the people are poor, and no opportunities to experiment. We are wearing out our lands

by constant cropping, and making the farmers poorer each year, except in the natural advance in the price of land. There were 1,000,000 bushels of wheat raised in this county last year, and now they are out of seed-wheat for the next year, and no money to buy with.

MISSOURI.—*Iron*: Grass and wheat. *Caldwell*: Corn and stock. *Greene*: To some, wheat; to others, tobacco, corn, wool-growing; depending on culture, time of sale of products, &c. For instance, one class of men put in their wheat in a poor, shiftless manner late in the season, and, as a result, harvested about five bushels per acre, and sold at from 75 cents to 80 cents per bushel. Another class in the same neighborhood, soil, &c., put their wheat in thoroughly, with deep plowing, so that the drought did not affect them, and, as a result, harvested from twenty to twenty-five bushels per acre, and not being satisfied with the price early in the season, and being thrifty farmers and able to hold their produce, are now selling their wheat at from \$1.20 to \$1.30 per bushel. The same holds good as to corn. One person to whom I sold 80 acres last spring, at \$15 per acre, put in his sod-crop so thoroughly that his first crop will sell for enough to pay for the whole tract. *Harrison*: The raising of hogs and corn. There has been from 20,000 to 25,000 hogs sent from this county, at from \$3 to \$4.25 per hundred. The corn sold has brought from 20 cents to 35 cents per bushel. *Ray*: The raising of corn and grass, and feeding the same to cattle and hogs for market. In some localities tobacco has proved very remunerative. Wheat raised principally for home consumption. *Bates*: Grain-growing and stock-raising. Mr. J. L. Henry, from a capital of \$4,000 invested in cattle, realized in one year a net profit of \$1,875, and this is not an isolated case. *Mercer*: Corn, grass, and wheat are about equally productive, but, upon the whole, wheat has paid the best. *Ripley*: Cotton in southern and corn in northern part of the county. Cotton yields from 1,000 to 1,200 pounds to the acre, while the product of corn is from 25 to 50 bushels per acre, and is worth from 25 to 50 cents per bushel. The yield of wheat is from 10 to 15 bushels per acre, and sells from 80 cents to \$1 per acre; but for want of transportation and mills none is grown except for home consumption. *Winnebago*: Butter, cheese, and wheat have paid the best; feeding of first-class cattle and sheep has been profitable also. I shipped one car-load of sheep only, of 64 head; weighing 137 pounds each; netted 6 cents per pound at home, amounting to \$8.22 each. From 50 acres of wheat, \$600, or \$12 per acre.

CALIFORNIA.—*Mendocino*: Sheep and hops. Sheep-raising has been the leading business of profit for the year 1873. On the 1st of April, 1873, there were 167,000 sheep, old and young, in this county; these were valued by the assessor at \$422,186. As an investment in this business we must add the cost of range, not less than 80 per cent. of the value of the sheep, making in all \$1,000,000 invested in the sheep and wool business of this county. I learn from B. F. Forsythe that on the first of January, 1873, he had \$6,000 invested in this business; during the year he sold wool to the amount of \$1,500; wethers, \$800; increase of stock, \$1,000; expenses of herding, shearing, taxes, &c., \$1,000; and which amount deducted from the receipts leaves \$2,300 profit on an investment of \$6,000. I believe this is about an average of the profits, even where the business is carried on more extensively. In short, the profits may be always set down safely at 30 per cent. The climate of this county is also peculiarly adapted to the production of hops; the total cost of raising one acre of hops amounts to \$181; the yield will average 1,200 pounds, at 35 cents per pound, \$420; net profit, \$239. *Alameda*: Wheat, fruit-drying, and beet-sugar. I have been informed there were fields of wheat, of from 50 to 100 acres, that yielded 40, some 50, and others even 60 bushels to the acre; these of course were rare instances, the exceptions. There is a large fruit-drying establishment in operation here, likewise an extensive beet-sugar manufactory. *Contra Costa*: Grain-farming, wheat and barley. The yield was better than expected, and prices realized were higher by  $\frac{1}{2}$  to  $\frac{3}{4}$  per cent. per pound on former years.

OREGON.—*Union*: Wheat has this year paid a greater profit than any other product. Stock-growing, however, is the chief employment and the greatest source of profit.

NEVADA.—*Esmeralda*: Wheat, barley, and hay. The soil is very rich and deep, not having been long enough worked to require manure for fertilizing.

UTAH.—*Morgan*: Wheat, oats, barley, and potatoes. We found an excellent market in California for our wheat. Barley sold from 85 cents to \$1 per bushel.

NEW MEXICO.—*Doña Ana*: Wheat has produced the most of any crop in this valley. The grain is remarkably heavy, reaching from 60 to 65 pounds to the bushel. The Mexican farmers do not sow more than 45 pounds of seed to the acre, and under their unscientific method the yield is from 15 to 40 to one. Sheep and cattle are reared under the care of herders, and the business is the most profitable of any.

#### DAIRY HUSBANDRY.

MAINE.—*Penobscot*: Especially commends itself to farmers at a distance from market. *Franklin*: Especially cheese-making. More cheese-factories to be erected this spring, and to the satisfaction of those who supply milk.

VERMONT.—*Addison*: Butter and cheese. A few have realized much the largest profit in raising Spanish or American Merino sheep. *Franklin*: C. S. McAllister, of Enosburgh, made the past season, from 60 cows, about 150 pounds of butter per cow, and sold it at prices averaging for the season 34 cents per pound, making a gross income of \$51 per cow. Am not informed of the cost of packages, salt, and other expenses. W. H. McAllister, of the same town, reports an income of \$2,000 from 40 cows, besides milk, cream, and butter for a family of twelve. *Washington*: One farmer, from 17 cows, sold the past year 3,078 pounds of butter for \$1,050, besides supplying his family with milk and butter, and selling several calves for veal, making the income \$68 to \$70 per cow. The same farmer had 20 ewe sheep; grade, Southdowns; the wool and lambs from which sold for \$130. It cost as much to keep these sheep and lambs as three cows, which would have afforded \$200. *Rutland*: Since the opening of the Pacific Railroad we have not been able to compete with western wool-growers. The last year's sales of wool reached only about 40 cents per pound, while our dairies have paid from \$45 to \$75 per cow. *Caledonia*: One farmer made 3,000 pounds of butter from 15 cows, which sold at home for \$1,000. Good, early-cut hay will pay \$20 per ton if fed judiciously to good dairy cows; one hundred Merino ewes will average 85 lambs, worth \$3 per head, and 600 pounds of wool, worth 48 cents per pound; making \$543, or \$5.43 per head. This has been done by one of our farmers for the last five years.

MASSACHUSETTS.—*Middlesex*: Raising milk for the Boston market. Market-gardening and raising field-crops for market are branches gradually extending.

CONNECTICUT.—*Litchfield*: Making butter and cheese and selling milk.

NEW YORK.—*Delaware*: In this county no branch compares in profit with butter-making. At the meeting of our agricultural society in January last, statements, attested by oath, were presented by two competitors for premiums on the largest quantity of butter per cow made the past season. These were 228 pounds and 232. In the one dairy there were under and in the other over eight cows. *Chemung*: Most profitable and most certain of prompt cash returns. One dairy of 12 cows yielded \$82 per cow from April 1 to December 1. In well-manged dairies a fair average has been \$50 to \$60 per cow. *Dutchess*: Sending milk to New York. Where cows are kept the large amount of manure returned to the soil improves it continually, whereas the selling of hay robs the land. *Chautauqua*: The manufacture of cheese by the co-operative system of cheese-factories has proved the most successful branch of farming in this country. Several dairies have yielded a net income of \$55 to \$63 per cow. The growing of potatoes was very successful, and netted a much better profit than any grain. *Allegany*: The yield per cow of milk sold at the factories ranges from \$32 to \$60, while the calves and the milk, earlier and later than the factory season, will about pay for pasturage. Western corn, ground and fed with hay and straw, has been largely used for feed through the winter. *Steuben*: A good dairy will net \$50 per cow in butter, as that sold through the season for not less than 30 cents per pound, and at present 50 cents is paid for a prime quality. Buttermilk is estimated to be worth 4 cents per quart for feeding pigs or moistening feed for the cows. *Tioga*: Statistics show that butter-making has been the most profitable; 20 cows made 3,200 pounds of butter, which sold at 40 cents. *Jefferson*: A neighbor who carried on a farm on shares, says: Of the 190 acres in the farm, 30 are woodland; of the remaining 152 acres, 40 were cultivated in grain, corn, and potatoes; 40 were in meadows, and 72 in pastures. From 19 cows kept, butter and cheese were sold to the amount of \$765; value of milk, butter, and cheese used by two families, \$200; expenses for labor, &c., on the farm, \$400, two-thirds of which, \$266, should be charged to the dairy. This being deducted leaves a profit of \$6.24 per acre for the 112 acres in meadow and pasture. The grains, corn, and potatoes produced on the 40 acres were worth in the aggregate \$300. Deducting \$133, one-third of the expenses, leaves only \$4.17 per acre. Furthermore, credit should be given for the increase of stock, as, besides the cows, a dozen calves and young heifers and three colts were pastured and fed with hay; also the comparative effect on the land, which is more exhausted by raising grain. *Cattaraugus*: J. J. Humason milked last season 115 cows. He practiced feeding of the skimmed milk to the cows during the entire season, from March to January. He made 20,830 pounds of butter; average per cow, 181 pounds; average price, 32 cents per pound; average value per cow, \$57.92. This can be much improved upon by a closer selection of cows adapted to the butter-dairy. Smaller dairies yield larger products per cow.

NEW JERSEY.—*Sussex*: The cows are mostly ordinary or native. Farmers in the milk business here find it more profitable to buy than to raise their cows. One, from 13 cows, sold, the past season, milk to the value of \$960, averaging about \$74 to the cow, besides supplying the family with milk. Many of our farmers are not convenient to railways or creameries, and are, therefore, engaged in making butter and pork. At this they have done very well. Still, the milk business brings in quicker returns, involves much less labor, requires less hired help, and is, therefore, more profitable when the dairyman is convenient to the cheese-factory or railroad.

PENNSYLVANIA.—*Erie*: The manufacture of cheese by factories, taking the produce of a large number of farmers together, has produced results of economy and profit.

*Tioga*: First, because it can be carried on with less labor; second, because of the uniform high prices of butter and cheese, while all other farm products fluctuate; third, it improves the farm more than grain-growing. I give the statistics of my own dairy of only 9 cows: Value of the cows, \$450; interest for one year, \$27; pasturing, \$108; wintering, (including 1,350 pounds of meal fed,) \$168.61; cost of making 1,450 pounds of butter, 3 cents per pound, \$43.50; total, \$797.11. Returns: 1,450 pounds of butter, 34 cents per pound, \$493; 9 veals, \$72; 900 pounds of pork, 7 cents per pound, \$63; value of the cows on hand, \$450; total, \$1,078; net profit, \$280.89. The above is a fair average for the county; some large dairies do better. The butter, sold some time ago, is now worth 40 cents, which would add \$87 to the profits. No other branch will pay as well for the amount invested. *Montgomery*: Farmers living on the railroads, which traverse our county in almost all sections, generally prefer selling their milk, as that requires far less labor in preparing for market than butter. Labor is becoming a great consideration with us, not only on account of difficulty in procuring it, but of the high price it commands. *Chester*: A dairyman reports that on a farm of 140 acres he keeps 30 cows, which yielded 6,566 pounds of butter, sold at 43½ cents net, or 218¾ pounds, and \$95.70, per cow. *Philadelphia*: The milk business, and next to this the more bulky crops which cost too much to bring from long distances.

**MARYLAND.**—*Carroll*: I keep 16 cows, from which I sell 25 gallons of milk daily the year round, at 18 cents net per gallon; making \$1,642.50 in addition to the use of milk and butter in a family of twelve. Previous to the opening of the Western Maryland Railroad, no milk reached Baltimore from this county; now we are sending 800 to 1,000 gallons daily. We probably make 1,000,000 pounds of butter per annum. Within eight years the dairy business has increased 20 per cent.

**MICHIGAN.**—*Oakland*: During the month of April we milked and made from 5 Durham cows 160 pounds of butter, which brought 35 cents per pound, making \$56; and, after deducting the express-charges to Detroit, which were \$1.60, leaving \$54.40 for one month's income from 5 cows. During the year 8 Durham cows made 1,312 pounds of butter. The average price for the same was 28 cents per pound, making \$367.36, or \$45.92 per cow; add to this the price of 5 calves, sold for \$12.50 per head, (and the rest would have brought the same if sold,) and you can see that the income annually from each cow is \$58.42. *Wayne*: Dairying has been decidedly the most profitable branch of industry in this county. Several instances have occurred where parties have run in debt for an additional farm, and in a few years have paid up everything. In one instance a neighbor purchased a farm, running in debt \$10,000, and in less than five years paid up for it.

**WISCONSIN.**—*Green*: There are over twenty cheese-factories in this county, of sixteen towns. A number of them make the common American cheese, but several are engaged in the manufacture of the variety known as Limburger. *Sheboygan*: During the past year the manufacture of cheese in our county amounted to 1,000,000 pounds, having 2,888 cows for its source. A considerable amount has also been made by the small manufactories.

**IOWA.**—*Muscatine*: One of my correspondents, giving his experience in dairying, expresses his preference for butter-making. He says: "I have milked 20 cows during the past season; average value of cows last spring, \$20 each; raised 20 calves, averaging \$8 for each; sold \$300 worth of butter, besides supplying my own table. Pasturage for the cows cost about \$60. The milk fed to pigs has more than paid all other expenses and the labor bestowed upon them."

#### STOCK-RAISING.

**MAINE.**—*Oxford*: Almost the only source of profit to the farmer. The local markets afford a demand for all the beef and early lambs he can supply. *Piscataquis*: Sheep more easily kept and yield more profit on the capital invested than neat stock.

**NEW HAMPSHIRE.**—*Carroll*: Cows as high \$50 per head. Sheep that could have been bought last spring for \$2 per head are selling for \$4 and \$5, to say nothing of the wool-clip, which sold for 40 cents per pound. Horses high, also working-oxen. A pair bought last spring for \$90 can now be sold for \$130. *Cheshire*: Where suitable pastures can be procured. One farmer on a river-farm of 40 acres, with a hill sheep-pasture of 50 to 60 acres, (costing not over \$10 per acre,) keeps 150 Spanish merino sheep, 3 cows, and 2 horses. Last year, besides keeping his flock good, he sold of wool and increase to the amount of \$800, and that is about his annual income. Raising young cattle comes next in profit, requiring but little outlay and little assistance where labor is so high that it eats out all the profit.

**PENNSYLVANIA.**—*Westmoreland*: Perhaps the breeding and rearing of horses might claim pre-eminence, especially since the importation of the large English Lincoln horses. These are now extensively bred, and sell readily at prices, for the best specimens, ranging from \$500 up to \$3,000. The French "Percherons" are also making their way among our farmers, but are not yet so popular as the others.

**MARYLAND.**—*Kent*: Sheep and hay.



**VIRGINIA.**—*Floyd*: The raising of horses, cattle, sheep, and hogs; our grain, hay, &c., being consumed at home, as we are too far from the railroad to ship them. The animals we raise, when in good condition, always sell for cash at remunerative prices, while the grain and hay do not. *Prince William*: The growing of steers; but not so much so as in the past five years; 25 to 50 per cent. has been realized on the purchase-price. *Grayson*: Grazing cattle. *Smyth*: The principal business of the farmers of this county. *Highland*: And has been almost from the first settlement of our isolated county. A great abundance of horses, cattle, and sheep are sold annually from the county. *Stafford*: In flocks of about 50 head. One farmer has realized annually \$3 per head for three years. Next to sheep, stock-raising.

**NORTH CAROLINA.**—*Cherokee*: Covers all, or nearly all, the profit in the county. *Ashe, Jackson*: Beef-cattle. They are pastured on the mountain-commons for six or seven months, are very fat in the fall, and bring cash at Charleston.

**GEORGIA.**—*Gilmer*: The raising of beef-cattle. The mountain-range furnishes free pasturage in summer; and our county, being an elevated, mountainous region, is entirely free from Spanish fever, or any infectious disease of cattle. This business is taking the lead, owing to our great inconvenience from market for other products.

**IOWA.**—Stock-raising and feeding. Three years ago I bought five common steers for \$35. I kept them about eighteen months, at a cost of not more than \$35 more, making the total cost \$70. I sold them off the range for \$145, netting \$75 profit. *Appanoose*: Cattle are a great source of revenue; steers fed six months generally take on 300 pounds gross, and, in addition, sell for 2 cents per pound gross more than they cost in the fall; and each steer feeds 2 hogs, which will take on 150 to 200 pounds each during that time.

**MISSOURI.**—*De Kalb*: Raising stock is the best business, and has proved most remunerative to the farmer, from the fact the pasture costs nothing and they are wintered in the stalk-fields with some hay and a very little grain. *Saint Clair*: Stock-raising, decidedly. To own a farm here and not raise stock would be a poor investment indeed. During the past year I sheared 29 head of sheep, of a very common and inferior stock, mostly old ewes. I sold \$25 worth of wool, made 15 yards linsey, have plenty of stocking-yarn on hand, and raised 17 lambs. *Nodaway*: Stock-growing has paid at least 70 per cent., and has brought \$800,000 into the county. *Stoddard*: Calves are plenty each fall for \$2 per head; \$1 worth of corn-meal will winter each, with the feed in the range; at one and one-half years old they will sell at \$5 or \$6 per head; at two and one-half years old they will bring from \$10 to \$12 each, and the actual cost of each not over \$4 or \$5.

**KANSAS.**—*Brown*: Stock-raising and feeding cattle and hogs. The price of corn was very low up to about September; at present it is worth four times as much as a year ago. *Ellsworth*: Stock-raising as a general thing, and it will usually pay 30 per cent. upon the investment. *Nemaha*: Raising stock. Fattening cattle for the Eastern markets in spring is a very profitable business, but it has been pursued mostly by middlemen, speculators, and millers. The non-producer invests his capital in some tens or hundreds of steers; also for corn and hay; hires his help for a mere pittance, and plays the gentleman himself, and more than doubles his money in five or six months, and in many cases pays no taxes, but migrates from place to place between the time of assessment and collection; and the same producer of those products suffering for want of means to prosecute his business successfully and to improve this wild country. *Doniphan*: Stock-raising and stock-feeding has been the most profitable branch of agriculture, although wheat and barley, owing to good prices, have proved quite profitable during the last season. But the profits and losses of agriculture depend more upon the individual than anything else. *Butler*: Stock-raising. Some would buy two-year-old steers for \$12, and in six months sell them for \$25, and often for more. *Republic*: The most reliable branch is the raising of stock. *Nemaha*: Feeding stock, especially cattle and hogs. The cost of feeding cattle is balanced by the hogs fattened following the cattle. While the hogs have been fed thus on corn, at a price ranging from 15 to 25 cents per bushel, pork has been sold at from \$3 to \$4.50 per head, gross.

**COLORADO.**—*Weld*: Stock-raising has been the most profitable here. As yet this business is pursued to a greater extent than any other. *Douglas*: The grazing of cattle, sheep, and horses. No more grain is raised than is necessary to supply our own immediate wants.

**UTAH.**—*Rich*: Our income from stock-raising and butter-making has heretofore been our chief dependence, but for the last two years, since the grasshoppers left the county, we have benefited as much probably by raising small grain. Its value as a marketable article is not so much to us, living so far as we do from any railroad, but for home-consumption it is of great value, as formerly we had to go to a distance to purchase it, and then freight it.

**WASHINGTON.**—*Walla-Walla*: Sheep-raising, for the reason that sheep graze all the year round without feeding.

**DAKOTA.**—*Hanson*: Stock-raising; first, on account of distance from market; second, fine grazing and excellent meadows of red-top and blue-joint, yielding from

one and a half to two tons per acre. Good water can be found in the creeks, rivers, and springs that abound in this vicinity. Young stock generally graze the year round. Wheat and oats yield good returns.

**TEXAS.**—*Nueces*: Wool-growing. Some of those who were formerly engaged in raising cattle and horses, and had followed it for years, and could scarcely make ends meet, have purchased sheep, and have been enabled, from the sale of wool and mutton sheep, to purchase land, build comfortable dwellings, and get around them a few comforts in a short space of time. A few crosses of the Merino or Mexican (the foundation of all our flocks) will produce a sheep that will average 4 pounds of unwashed wool per year; those more highly improved produce from 7 to 8 pounds. The average price of such improved wool is about 20 cents per pound, specie, sold at Corpus Christi. The expense for care and attention of a flock of 1,200 ewes, adding shearing, &c., and hauling to market, 4,800 pounds wool, is less than \$250, coin. The increase from 1,200 ewes, when well taken care of, will average 80 per cent. per annum, allowing 20 per cent. for losses, which increase can be sold, at 18 months old, at \$2, coin, per head. Hence we have 4,800 pounds of wool, at 20 cents, \$960; 960 increase, at \$2 per head, \$1,920; total, \$2,880; expenses as stated above, \$250; interest and taxes on sheep and land, \$400; total, \$650; net profit, \$2,230, gold. From those more highly improved better results are realized.

**INDIANA.**—*Wayne*: The long-wooled variety of sheep will yield 10 pounds of wool per annum in the dirt, worth from 35 cents to 40 cents per pound, a greater profit than can be produced from any other stock at present.

**WISCONSIN.**—*Columbia*: Without any foreign fertilizers is constantly enriching our soil and increasing our yield, while raising cereals impoverishes.

**MINNESOTA.**—*Isanti*: One flock of 70 sheep, well taken care of, sheared 260 pounds. This was sold at 33 cents, netting the sum of \$85.80. This was from the wool alone. Now, add to this the increase from the lambs, and the profit was nearly 50 per cent. upon the investment.

**CALIFORNIA.**—*Mendocino*: Sheep-raising. *Stanislaus*: Wool pays all the expenses of sheep-raising, and the increase is net profit, and the increase will average 80 per cent. Next follows wheat and barley, providing speculators do not succeed in forming "rings," and depress the price in the San Francisco market.

**UTAH.**—*Salt Lake*: Wool-growers fared the best, though they were not able to realize 50 per cent. of the ruling prices of former years. From 1,000 sheep, valued at \$3,000, wool was clipped to the amount of 5,000 pounds, selling for 22½ cents per pound, amounting to \$1,125; increase of lambs, 650, at \$1 each, \$650; total, \$1,775; total expense of herding and shearing for one year, \$570, leaving a net profit of \$1,205 on the investment.

#### MARKET-GARDENING.

**MASSACHUSETTS.**—*Dukes*: The county is rapidly gaining popularity as a watering-place. The demand for early produce is large and it commands high prices. There are now on Martha's Vineyard about 1,000 cottages, owned by summer visitors. No farmer gives his whole attention to this branch, but it is not uncommon for one to sell \$200 worth of early produce from a single acre.

**RHODE ISLAND.**—*Kent*: The most profitable branch of farming in this State, particularly on the borders of the Narragansett Bay and along the Blackstone and Pawtuxet Rivers, where our principal manufactories are situated.

**NEW YORK.**—*Kings*: The county is almost exclusively engaged in raising vegetables for the New York and Brooklyn markets. Early cabbage, with squash for a second crop, was perhaps the most profitable crop. Most of our early crops have brought good prices. Our late crops have not paid us for our labor.

**NEW JERSEY.**—*Hudson*: Our farmers are selling or leasing their farms to market-gardeners, who are doing a large and lucrative business.

**VIRGINIA.**—*Accomack*: Trucking, particularly in sweet and Irish potatoes. *Princess Anne*: One barrel of Early Rose potatoes was planted on less than one acre. Cost of seed, \$5; 1 bag of guano, \$7; 25 loads of barn-yard manure, \$25; labor, \$10; rent of land, \$5; digging and transporting, \$30; total, \$82. Yield: 30 barrels, sold at Norfolk at \$5.50 per barrel, \$165; net profit, \$83. The same land was planted in corn, which yielded 8 barrels, sold at \$3 per barrel, \$24. The fodder paid for the cost of cultivation; making the net profit on less than an acre, \$107. *New Kent*: Trucking. All the large farmers turn their attention almost exclusively to grain, and after paying expenses for labor, taxes, &c., do not have sufficient left to pay the interest on their lands at assessed value. The small farmers, with a small amount of labor, and without capital, manage to make a living by trucking. I have known as much as \$250 made on one acre in cabbages, and other vegetables in proportion. *Gloucester*: Vegetables and strawberries have been very remunerative. *Nansemond*: Trucking. It has not yet become general, but is on the increase.

**KENTUCKY.**—*Jefferson*: A large number of Germans are engaged in the market-gar-

dening business very successfully. They haul from the city (Louisville) the stable manure during winter months, and their care and labor is rewarded with good yields.

DAKOTA.—*Pembina*: Market-gardening has proved most remunerative during the past season, having had a ready sale for onions at \$1.25 to \$2 per bushel; carrots, parsnips, and beets, 75 cents per bushel; cabbage, 10 to 25 cents, and everything else in proportion. All the garden-vegetables growing finely on new ground, and without manuring. One of our best farmers raised last season, on a flat of 70 square rods, 264 bushels of large red onions, every onion in the patch weighing half a pound. Our soil also produces some of the largest and finest root-crops.

## POTATOES.

NEW YORK.—*Saratoga*: The only export from the county; have been a very good crop and brought excellent prices.

GEORGIA.—*Lumpkin*: Quite a number of farmers raised 150 to 200 bushels of sweet-potatoes per acre. It costs not more than \$15 per acre to raise and house them, and they sell for at least 50 cents per bushel. *Charlton*: The question lies between sweet-potatoes and the sugar-crop. Considering the outlay necessary to make sugar, sirup, and molasses, I decide in favor of sweet-potatoes. They are produced, collected, and housed with ordinary farm-implements, without additional outlay of money, which, to the poor man, is a strong argument in favor of this crop. Of the yam variety I have grown on one acre 330 bushels of large, fine, yellow yams. The land was sandy, (no clay,) on a hill-side facing south-southeast.

ALABAMA.—*Russell*: Sweet-potatoes. Farmers have sold their surplus potatoes readily at \$1 per bushel, which paid much better, according to acreage, than cotton.

MISSISSIPPI.—*Warren*: Sweet and Irish; the average value being about \$1 per bushel, and the yield 75 to 90 bushels per acre.

TEXAS.—*Grayson*: Sweet-potatoes, though the crop is a limited one. The expense and yield per acre are about as follows: Seed, \$5; preparing ground and planting, \$10; cultivating and harvesting, \$15; total expense, \$30. In an ordinary season the yield is 150 to 200 bushels, worth 50 cents to \$1 per bushel, leaving a profit of \$120 to \$170 per acre. The expense of cotton, including gathering, &c., is about \$20 per acre, and it is a good crop that yields 400 pounds of lint per acre, which, at 12 cents, leaves only \$28 profit.

WEST VIRGINIA.—*Warren*: Potatoes, as a field-crop, are growing in importance every year, yielding, when properly manured and cultivated, 100 bushels per acre, worth now in our local market \$1 per bushel. Hay is next in order of profit, yielding, with no outlay for manure, and comparatively little labor, one and a half tons per acre, worth at home \$18 per ton.

KENTUCKY.—*Kenton*: Potatoes are produced at the rate of 70 bushels per acre, and are worth \$1.25 per bushel, or \$87.50 per acre.

INDIANA.—*Steuben*: The average yield of potatoes is 125 bushels to the acre; price during the winter 60 cents per bushel; this spring \$1 per bushel, or an average price of 75 cents per bushel, or a total of \$93.75 cents per acre; cost of production, seed, and labor, \$29.40, leaving \$64.35 for a clear profit.

## HAY.

Except in locations where an equivalent in manure is obtained in market for the hay sold, the principal reasons in favor of and against producing it as a market crop are tersely stated by one of our correspondents thus: "If it were not for depriving the farm of manure by selling its products instead of feeding them, raising hay and grain for sale would seem to have been the most profitable the past year, indeed for several years past. But we shrink from this method, because we think a man, in producing it, would be just hauling his farm off to the city."

MAINE.—*Sagadahoc*: Quite a good home-market in the villages that dot the county. *Waldo*: Large quantities shipped at fair prices. *York*: One-half the land in the county is pasture and one-fourth field; seven-eighths of the field is mowed. All last season the pastures were fresh, and the hay-crop was abundant and well secured. Young cattle and farm-oxen gained 25 per cent. I consider the pasturing and hay of more value than all other farm products combined; seven-tenths of my income is from grass and hay, while the proportion of expense is less than is required for other crops. From 30 tons of hay, worth \$369, fed to my young cattle, the sales were \$300, values remaining the same; from 24 tons, worth \$360, fed to 12 cows (butter at 30 cents) the

sales were \$436. My conclusion is that when the "gude wife" is a good dairy-woman butter-making is very profitable, but when hired men manage the dairy it is poor business.

MASSACHUSETTS.—*Franklin*: Hay and grazing; some say tobacco, but in a long race I doubt it. *Plymouth*: Our principal branch grass and hay, but our most profitable crops are vegetables and small fruits. Strawberries are found to afford more profit in this county than tobacco in the Connecticut Valley. *Berkshire*: Has become the staple crop, owing probably to the high price of labor. In raising and curing grass all, or nearly all, the outlay for extra labor is limited to haying-time. When the crop is secured the outlay ceases until the next hay season. Meadows are now kept up more by top-dressing than formerly, and of course less plowing and less labor are called for. The market for hay is good at all seasons at remunerative prices and ready cash.

CONNECTICUT.—*New London*: Since September 1, 1873, hay has been selling for \$28 to \$30 per ton, and at that price farmers can make more by raising hay for market than any other produce. Next to hay is the potato-crop. Some farmers who planted their potatoes early sold the crop as high as \$3 per bushel, and from that down to \$1. Of farm-stock, sheep have paid the best the past year on the capital invested.

NEW YORK.—*Seneca*: From 15 acres, first cutting, I gathered without damage 41 two-horse loads of hay, consisting of small red clover, Alsike clover, and timothy. I think the hay would weigh at this time 40 tons. Eight loads, estimated at 8 tons, in one mow, recently sold at \$15 per ton in the mow. Forty tons at \$15 per ton equals \$600; cost of cutting and storing, \$2 per ton; net profit, \$520; value of second cutting, after thrashing out the seed, which offsets all expenses, \$40; net profit per acre, \$37.33. *Rockland*: Gathered in fine order, at comparatively small outlay, and sold within the county for \$30 to \$35 per ton. *Fulton*: Particularly so where farmers sold soon after harvesting, when hay netted them from \$22 to \$26 per ton.

PENNSYLVANIA.—*Cambria*: Cannot compete with the West in growing grain even for our own home market. Good cultivators lose no opportunity to buy manure to top-dress their meadows, many of which are seldom if ever cultivated. *Lehigh*: The average yield is 1½ tons per acre, with a ready market at the numerous furnaces, iron-ore pits, and slate quarries, at an average price of \$25.

VIRGINIA.—*Henrico*: The production of forage in its various forms, hay and grass edominating in amount. Within the last three years the amount of forage grown in the county has been greatly increased—perhaps more than doubled. Three or four years ago it was not uncommon to see baled hay from the city brought from the North or West, being hauled into the country to be consumed by farmers on farms that, devoted to grass, would produce nearly an average of two tons of hay to the acre. Now, a day seldom passes that we do not see wagon-load after wagon-load of baled hay going into the city, till we begin to wonder where it all comes from. And yet it is more profitable to grow winter-oats for forage than hay. Winter-oats will average a product of over 2 tons of forage to the acre; 4 tons to the acre are not uncommon, and more than that has been grown on every acre of a twenty-acre field.

GEORGIA.—*Burton*: One and a half to three tons per acre, at a cost of about \$6 for saving and marketing; getting the hay at 25 cents per 100 pounds. Nothing else pays so well.

ARKANSAS.—*Yell*: The German millet hay in the bottom-lands; three tons per acre have been the average, worth \$30 per ton in the stack on the ground. Cost of producing, \$13 per acre; clear profit, \$77.

TENNESSEE.—*Carter*: Clover and other hay-crops. The clover averaged two tons per acre, worth \$10 per ton; cost of getting it ready for market not more than \$8 per acre; profit per acre, \$12. Nothing else did as well in proportion to outlay. *Sumner*: The greater part of this was produced from Hungarian grass. Some of our farmers sowed as much as one hundred acres, producing two tons per acre, and worth in stack or rick, \$14; making a net profit of \$18 per acre. *Bedford*: Our meadows produced about two tons per acre, worth \$15 per ton, and less labor required to raise it than any other crop. *Obion*: One of my neighbors on thirty acres raised eighty tons of hay; paid out, besides the labor of himself, some \$21 for expenses. The eighty tons, at \$20, are worth \$1,600. Others have similar results. *Greene*: Each year brings more conviction that more hay and grass, and less growing of grain, add to the profits of our farming. *Giles*: Worth \$20 to \$22 per ton.

WEST VIRGINIA.—*Wayne*: Timothy for hay principally raised and the most profitable. The value per acre of corn, wheat, and oats, when harvested, was from \$8 to \$25; the amount of timothy was about 2 tons to the acre, and the price being \$17 per ton, or more than \$34 per acre, and the cost of culture much less than the other crops. *Mineral*: A good crop of hay will produce 2 tons to the acre, and worth at least \$25 per ton, or \$50 per acre. Corn, average crop to the acre, 35 bushels, at 60 cents per bushel, \$21; oats, 35 bushels to acre, at 70 cents per bushel, \$24.50; wheat, an average crop 15 bushels to the acre, at \$1.25 per bushel, \$22.50. From this showing, it is evident hay is the most valuable.

KENTUCKY.—*Lawel*: Twenty acres in meadow yielded 30 tons of good hay, and

this, at \$10 per ton, is worth \$300; deduct \$100 for cutting and stacking, will leave \$200 profit on this crop.

OHIO.—*Tuscarawas*: Hay-crop has yielded  $1\frac{1}{2}$  tons per acre, with a selling price of about \$15 per ton, making nearly a net profit of about \$18 per acre. Wheat yielded a profit of about \$10 per acre, and corn \$5 per acre. *Hardin*: The raising of hay has been the most profitable, and the expense of securing it much less than many other crops. *Williams*: A farmer here cut 22 tons of hay off of 12 acres; the hay was worth \$12 per ton at the meadow. The pasture was worth at least \$2 per acre in the fall, making a total of \$200. Adjoining this meadow was another 12-acre field of equal fertility, which was sown to wheat, and produced 17 bushels per acre, and worth \$1.25 per bushel at time of thrashing, amounting to \$255. The cost of cutting and curing hay was \$2.50 per acre, while the cost of plowing the ground, harrowing, sowing, and harrowing again twice, was \$32.50, and the cost of seed, 18 bushels, at \$1.50, (at time of sowing,) would amount to \$27. The hauling in and thrashing (including cutting) cost 16 cents per bushel, amounting in all to \$134.80, leaving a balance of \$120.20.

MICHIGAN.—*Mecosta*: The average crop of hay here is 1.25 tons per acre, the average cost of harvesting the same \$3 per acre, and the average price per ton up to this date is \$18, which leaves for the use of the land \$20.04 per acre. This is making no allowance for manuring and preparation of the soil, which is much less than for any other crop raised.

INDIANA.—*Cass*: A neighbor of mine sold 55 tons of hay (raised on 30 acres of land) at \$15 per ton, making a total of \$825; the expenses, including interest on land, taxes, mower for cutting, raking, hauling to barn and to market, footed up \$370.50, leaving a clear margin for profit amounting to \$454.50 in favor of the crop. *Brown*: Our land yields from 1 to 2 tons per acre of timothy hay, without any artificial manuring, and would produce more by being manured. The hay sells readily at \$7 to \$10 per ton at home.

ILLINOIS.—*Grundy*: Timothy grass seed most profitable; the average yield is 4 bushels per acre, and the average price \$3. *Hancock*: The steady market price of hay, economy in harvesting and marketing, are inducements in favor of this branch of farm products. The usual yield is 2 tons per acre on good meadows, bringing from \$12 to \$15 per ton. An inferior grade mixed with clover, red-top, &c., does not bring so much by \$3 to \$5 per ton in the Saint Louis markets.

IOWA.—*Jefferson*: As much as \$16 per acre has been realized this year from timothy alone, which, taking into account the amount of labor, is very productive.

COLORADO.—*El Paso*: Hay seems to yield the greatest percentage for the amount of outlay, and the necessary labor to produce and market it. I know a farm that cost some \$2,500, that produced this year \$2,000 worth of hay, (natural grass.) We have a blue-grass here that is far superior to the best timothy that can be produced in the States. The farm referred to, next year, will produce \$3,000. Cattle are also profitable; it is no uncommon thing for a spring calf that is slaughtered to dress 200 to 300 pounds, taken from the range, and never having tasted grain.

## FRUIT-GROWING.

NEW JERSEY.—*Atlantic*: The light soil of this county will probably prevent it from ever becoming devoted to farming, in the ordinary sense, as the raising of grass, grain, stock, &c. Some have turned their attention to the culture of small fruits, mostly strawberries. M. D. Lake has 15 acres in this fruit. The severe drought last season cut the crop short, and he, to avoid loss from this source in the future, has constructed a large reservoir contiguous to his field. This he fills with water drawn from a well by wind-power. He designs to distribute the water by cart and sprinkler, similar to those used for streets. Egg Harbor City, a German settlement, is largely engaged in grape-culture, (turning the grapes mostly into wine,) and Hammerton in the culture of strawberries. Lately pear-culture is receiving much consideration. Large orchards have recently been set out. The few orchards in this fruit now in bearing have paid better per acre than any other crop. One of our principal pear-growers, Mr. D. Colwell, manures his orchard once in two years with stable-manure and leaves composted and spread broadcast, and gives clean culture. From a portion, in which the trees are about 14 years old, 160 to the acre, the average yield the past season was 1 bushel per tree, worth \$3 per bushel. Blackberries come next in profit. My crop, probably a fair sample, paid \$125 per acre clear of all expense, except cultivating and hoeing, the cost of which does not equal, or certainly does not exceed, that of corn. They were three and four years old, planted on new land, and never manured.

DELAWARE.—*Sussex*: Especially peaches and small fruits; pears and apples are also grown at a profit. *Kent*: The adaptation of the soil and climate to the growing of a large variety of fruit-products, running through the season from May to December, and the facilities for reaching the Philadelphia, New York, and Boston markets, have induced agriculturists to engage largely in cultivating all kinds of small fruits, as

well as grapes, pears, apples, and peaches. The peach-crop of 1873 was by no means a full one, yet there were shipped from this county nearly 575,000 baskets, (three-fourths of a bushel,) and there were used in canning and fruit-drying establishments 160,000 baskets, making 735,000, which, at an average of 75 cents per basket, amounts to \$551,250. Almost every farm of any pretensions has now its market-orchard.

MARYLAND.—*Dorchester*: With intelligent, judicious culture, care in preparing for market, and marketing, peaches and strawberries have netted \$100 per acre. *Talbot*: This county being in a central position between Baltimore, Wilmington, New York, Philadelphia, and Boston, and having daily connection with these cities, we have found peaches a paying crop the past season, (one of unprecedented drought, and, consequently, very short crops of corn and early potatoes.) On account of the short crop of peaches in more extensive peach-growing sections, peaches in this county have paid from \$75 to \$100 per acre.

VIRGINIA.—*Albemarle*: Grape-culture. The climate and soil of our mountain-slopes seem particularly adapted to the growth of the vine. Some of our vineyards paid as high as \$600 per acre; a great portion of the crop being shipped to New York to the early market, and the remainder put into wine. *Patriek*: The most profitable as regards money or lucrative income; other farming for home consumption.

MISSISSIPPI.—*Hancock*: Fruit—oranges, grapes, pecans, &c. There is scarcely a home in the county where for a few years past more fruit has not been planted than is needed for their own consumption.

WEST VIRGINIA.—*Morgan*: Apples.

OHIO.—*Hamilton*: Strawberries. *Lucas, Sandusky*: Apples.

CALIFORNIA.—*Tuolumne*: In the foot-hills, or northern and eastern parts of the county, fruit and vine raising. Plum-culture is the most profitable at present. Dried pitted-plums sell readily in San Francisco at 18 to 22 cents per pound. Half an acre of young trees last year produced 2,500 pounds dried pitted-plums; deducting 13 cents per pound for drying, boxing, freight, commissions, &c., about 7 cents per pound is left for a profit, less the expenses of cultivation. *El Dorado*: Fruit-raising; in my immediate vicinity wine and brandy are made, in another locality the manufacture of raisins is carried on extensively.

## TOBACCO.

MASSACHUSETTS.—*Hampshire*: Has been the staple crop; remains unsold.

CONNECTICUT.—*Tolland*: The crop as yet remains almost wholly unsold, although in the adjoining county of Hartford it has sold well. Market-gardening and the raising of strawberries I think may yet supersede tobacco-raising. *New Haven*: Where the soil is adapted to it, paying double the amount any other crop does. One acre of good tobacco will sell for from \$250 to \$300.

MARYLAND.—*Charles*: In several instances 5,000 pounds per hand have been made, and in some cases bringing 10 cents per pound. *Saint Mary's*: For the last few years tobacco has been considered by farmers the most profitable, but I much doubt if it will be much longer. The price has decreased much the last two years. There are a few peach-orchards in the county which were very profitable the past year; in some cases exceeding \$200 per acre. *Howard*: Our farmers think there is more money in tobacco and hay than any other products, though the price which some have obtained for their wheat the past season, \$1.80, makes it a remunerative crop.

VIRGINIA.—*Nelson*: The common experience of farmers and planters in the county is clear and definite on this question. *Pittsylvania*: The main staple, and brings remunerative prices. *Louisa*: Beyond comparison. As in tobacco-culture, the area is comparatively small; we can manure heavily at small cost. The cultivation requires but little horse-labor, and as the women and children needed in the process can be hired for not more than one-third of men's wages, there is a very important saving in this respect, the average price paid for laborers in tobacco being 25 cents per day. Our soil and climate also are especially adapted to tobacco. *Campbell*: Supposed to have been, but as the bulk of the crop will not be disposed of till May or June next, there is some uncertainty. The prices paid at present are scarcely remunerative. *Spottsylvania*: A good acre of tobacco will yield 1,200 pounds, at 10 cents, \$120; a good acre of wheat, 25 bushels, at \$1.75, \$43.75. *King William*: The only farmers among us who have done well for a year or two are those who have either made tobacco a speciality or have largely divided its culture with that of the cereals. *Buckingham*: The absorbing crop in the county, and although prices have ruled much lower than we expected, it has paid better than any other crop. A good hand can cultivate 3 acres in tobacco; average yield last year, 650 pounds; 1,950 pounds, at 9 cents per pound, gives \$175.50. The same hand could cultivate 5 acres in corn; average yield, 19 bushels; 95 bushels, at 59 cents gives \$56.05; difference in favor of tobacco, \$119.45. *Lunenburg*: I consider the system a bad one, and a cause of the general poverty of land and people. With the best farmers in the county the net profit on tobacco is but little more than suffi-

cient to pay taxes and other necessary expenses, leaving nothing to compensate for impoverishment of the land. *Charlotte*: The only reliable and paying crop in this county. *Rockbridge*: One tenant of mine made \$330 on 4 acres. His family, consisting of a wife and three children, under 12 years of age, helped him work his crop. *Mecklenburgh*: Decidedly. It is the only crop we can cultivate that will pay well after deducting expenses to market. *Goochland*: Decidedly. The crop was a heavier one than for many years, and the quality as a general rule is good. *Fluvanna*: Our farmers concur in the opinion that tobacco pays better in the general than any other crop. *Caroline*: Beyond all question. *Henry*: Because no other crop will bear transportation.

**NORTH CAROLINA.**—*Stokes*: A good hand can raise from 1,500 to 1,800 pounds, if skillful in managing, which will bring 20 to 30 cents per pound. At the same time he can make a superabundance of corn, wheat, rye, oats, hay, beef, pork, and vegetables for family supplies. *Person*: The only branch in the county followed for profit. *Caswell*: Almost the only crop relied on as a source of profit.

**GEORGIA.**—*Decatur*: The cultivation of Florida or Cuba tobacco (used, I am informed, for wrapping) has undoubtedly been the most profitable.

**TENNESSEE.**—*Montgomery, Jackson, Dickson*: One acre will produce 800 pounds, which, at the low price of 6 cents, gives \$48. One hand will work and house the tobacco on 6 acres. The hand, horse, and plow will cost \$20 per month for 6 months.

**WEST VIRGINIA.**—*Tyler*: One acre of new ground planted in tobacco will yield 800 pounds; at \$3.75 per hundred, will give \$30. One acre planted in corn will yield 20 bushels; at 45 cents per bushel, will give \$9, showing an excess of \$21 per acre in favor of tobacco. Again: one acre of old ground (sod) in tobacco will yield 1,200 pounds; valued at 4 cents per pound, will give \$48. The same ground planted in corn will produce 40 bushels, at 50 cents per bushel, amounting to \$20, showing a balance again in favor of tobacco of \$28 per acre. *Mercer*: Ten acres of raw land planted in tobacco yielded a crop of 10,000 pounds; and this, at an average value of \$10 per cwt., gave the producer \$100 per acre.

**KENTUCKY.**—*Graves*: There were about 8,000 acres in cultivation with tobacco last year, at an average of 700 pounds per acre, making a total of 6,300,000 pounds produced in this county. *Christian*: Tobacco rarely fails, and the average price is from \$5 to \$10 per hundred. Three thousand pounds to each hand is considered a good yield, and requires about one-half of the hands' time. *Davies*: Our land often produces 1,500 pounds of tobacco per acre, ranging in price from \$3 to \$10 per cwt. *Lewis*: In one instance a farmer cultivated 1,500 pounds of tobacco to the acre, and realized \$22.50 per hundred; this, however, was on superior tobacco-land. Land that will grow tobacco without the aid of fertilizers can be bought for \$10 per acre. *Adair*: Tobacco yields more actual money than any other crop. Grain is generally fed to stock, such as mules, cattle, and hogs, and they have not commanded good prices. Parties taking mules South have lost money.

**OHIO.**—*Adams*: Tobacco pays from \$50 to \$125 per acre, and the cost of producing amounts to only from \$18 to \$30 per acre. *Vinton*: We calculate on 1,100 pounds of tobacco to the acre, and even at the present low price would be worth \$33.50, and the cost would not be more than \$18 to put it in the market.

## AGRICULTURAL IMPROVEMENT.

The second question propounded in the March circular embraced three leading points: First, economy and efficiency of labor; second, systematic and rational processes for its employment; third, advanced intelligence and skill in its direction.

From the replies of our correspondents, we gather fresh evidence of the fact that the amount of muscular force in the country available for agricultural labor is relatively if not actually diminishing, and that it bears a smaller ratio to the work expected of it than formerly. Every year it becomes a more costly element of production. This is a very troublesome fact, but it has a deeper significance than the mere derangement of existing social settlements. More generous remuneration for manual toil is a tendency in the direction of a higher civilization. It implies the elevation of the laborer to a more independent and dignified social position and a higher development of individual manhood. The temporary inconveniences which result from this elevation of the laboring classes will, of course, bear heavily upon vested interests, but such collisions have marked the course of civilization in every stage.

To adjust the economic disturbances created by the increased price of

labor, it is not necessary to roll back the tide of progress and reduce labor to the mere mechanical thing which it was in the past and which it still is in oriental countries. Such labor could not meet the want of the present age if it could be secured. Unskilled labor is annually becoming a greater drug in the labor-market. The increased demand for intelligent and effective *work* will call forth its own supply. A laboring population that cannot meet this demand will, of course, be displaced by more energetic competitors. The chronic complaints of inefficient and unreliable labor from almost every quarter indicate the presence of temporary abnormal conditions which cannot long resist the spirit of progress. The evil will work its own cure.

The change in the conditions of production, resulting from the enhanced cost of labor, is a practical question which American farmers are trying to solve by practical methods. Three sources of relief are contemplated in our March returns. First, it is well known that, in the past, labor, like other elements of production, has been wastefully used. To stop this waste and to redeem its resulting loss is now a prominent concern among our farmers. Secondly, it is now seen that human labor is too costly and valuable to be wasted upon the heavier mechanical tasks of agriculture. The laborer is no longer the mudsill of society. The forces of nature, mechanical, chemical, and vital, have been more generally called into requisition, indefinitely increasing the amount of motive-power available in production. Several years ago the London Times estimated the steam-power, propelling, manufacturing, and mining-machinery in England at double the muscular force of the entire human race. In later years the more elaborate forms of mechanism have been applied in an increasing degree to agriculture. The laborer, relieved from the drudgery of elementary toil, is gradually exalted to the labor of direction. The scope of progress in this direction seems to be practically unlimited. This exaltation of labor, combining a small proportion of costly intelligence with a great mass of cheap, dead, mechanical power, will ultimately cheapen production, as it already has done in manufactures, and remove the difficulties of our present transition stage of agriculture. Thirdly, economic science has detected an enormous waste of productive power in the slovenly farming of the present day. Fertilizing principles are allowed to escape into the atmosphere, or to be washed away by the rains, which, if carefully saved, would have restored the declining fertility of the soil. Farmers in all parts of the country are awakening to this suicidal course, and now intelligent efforts are being put forth to arrest this fatal drain upon our natural resources. But the same economical principles are applied to all branches of farming enterprise from its highest generalizations to its minutest details. The management of the farm, the direction of the labors of cultivation, is now no longer a mere hap-hazard matter. Here is found scope for the highest practical intelligence and for the finest administrative talents. The system of farming which ignores these elements of power will necessarily fall behind, and those parts of the country cursed with its presence will continue to export their labor and capital to more energetic regions until they are left exhausted and helpless. A few such counties are found in every portion of our country. In some regions the rule of this old and asphyxiated conservatism is just beginning to be broken; but the great majority of our reports indicate progress of some kind, while in many cases the most advanced scientific improvements have been successfully inaugurated and have already shown their normal results. The method of co-operation, of intelligent comparing of results and processes, and of diffusing intelligence by the press, and



by oral discussion, is applied in a grander scale than ever before known. Special skill and remunerative results are developed *pari passu* with general intelligence in progressive counties. This cannot fail to excite emulation in less favored communities and to stimulate a more effective handling of natural resources, thus enlarging the scope of production and adding to the general happiness of the whole.

New England, with limited agricultural resources and devoted especially to manufacturing industry, has long felt the drain of her agricultural population to the richer lands of the West and South. The presence of a large consuming population has largely directed cultivation to special branches, thus breaking up its completeness as a co-ordinate branch of industry and creating a class of conditions not the most favorable to improvement. Yet even here cheering aspects of the problem are frequently presented, though the superior attractions of other industries have exerted a depressing influence upon agriculture by withdrawing capital, labor, and intelligence.

In the Middle States, where agriculture is practiced less in subordination to other pursuits and on a more complete and independent system, our reports of improvements are far more numerous and important.

Stationary communities are comparatively few. The growing insufficiency of labor is here a matter of serious concern. In some cases the difficulty is hopefully and successfully met by the employment of more labor-saving machinery and by better tillage. In other cases crops requiring an excessive amount of labor are abandoned and large areas lately in grain are put down in grass. The cheese-factory exercises an important influence in diversifying production in a large number of counties.

Maryland is more closely assimilated to the Middle States than to the South Atlantic coast States with which it is usually classed. Lingering traditions of the old system of labor still resist progress in some counties. In others the proper employment of the freedmen is still an unsolved problem. The system of working on shares has resulted in a serious deterioration of the soil. In other counties, however, the evidences of progress are unmistakable and cheering. Montgomery County, for instance, has doubled its rate of production per acre. In Virginia, the oldest agricultural community of the Union, and in the States farther south, the extremes of conservatism and progress are in still greater contrast. The cotton mania still holds sway over common sense in many counties in spite of the lessons of experience. In some parts of South Carolina the freedmen are purchasing homes and are energetically improving them. In some parts of Georgia there is a growing attention to improved culture and implements, but elsewhere is visible the same inertia that has paralyzed progress in the past.

Of the Gulf States Florida reports a general absence of improvement. Alabama and Mississippi are more hopeful; several counties report improvements in general knowledge and in practical skill in farming. Improved implements and processes of culture have been introduced and a better understanding between laborers and employers noted. In Texas the progress of improvement is more general in consequence of an enormous immigration; the population is rapidly changing and old traditions are fading out. In the inland States, Arkansas, Tennessee, West Virginia, and Kentucky, the indications of progress are far more numerous and hopeful than in the Gulf States. There is a healthy tendency in some counties toward mixed husbandry. Improved breeds of farm-animals and processes of culture are of frequent mention. Enterprises in fruit-culture are quite promising. Improved farm machinery

has been extensively introduced, thus opening up an escape from labor-difficulties.

In the States north of the Ohio River improvements have been thorough and wide-spread in the use and economy of labor, in improved processes of culture, and in general and special farming intelligence. Draining and underdraining in single counties, during the past year, have added thousands of acres of swamp-lands to the productive area, and have improved the fertility of thousands more. The difficulties of the labor question are felt here as elsewhere, but they are met with intelligent and persistent effort, the good results of which are already visible. In some newer counties where cultivation is yet in its infancy, and in some older counties where it labors under old traditions, our correspondents reluctantly report no visible progress; but even in these cases the advance of ten or twenty years is quite marked.

West of the Mississippi the extent of newly-settled land, and the brief period of its cultivation, preclude the gathering of many lessons from experience, while the abundance of a virgin soil has prevented the necessity of improvement from being felt, yet the spirit of progress is strongly developed in numerous localities. There is already a partial substitution of recuperative for exhaustive culture. The increase of agricultural reading, and the popular anxiety to secure the latest and best processes of culture, are auguries of good.

On the Pacific coast agriculture has been compelled to adapt itself to new natural conditions and resources. In many counties this problem is treated with a sober and scientific intelligence, from which permanent and satisfactory results have already sprung. Here, also, the labor question has been prominent, and the necessity of improvement sharply impressed by circumstances. Our reports from the Territories show an unexpected adaptation of new processes and implements, even upon the frontiers of civilization.

The following notes from our correspondence will give some idea of the state of improvement in different States:

MAINE.—*Sagadahoc*: Nearly all of the improved implements are now extensively used in this county. *Waldo*: Increased use of machinery in agriculture. Agricultural publications all more largely patronized, better stock is being introduced, and farmers are taking a higher social position. *Penobscot*: The severe drought of the previous years cut short the hay-crop, and we were forced to make a little take the place of much, hence we gave our stock about two-thirds as much hay as formerly; the stock was healthier, and did better every way. *Franklin*: Gradual introduction of labor-saving machinery. *York*: No improvement; the young men go into other callings. *Androscoggin*: Not noticeable. *Oxford*: None.

NEW HAMPSHIRE.—*Sullivan*: Improved machinery, so far as adapted to our rough, high land; nice new residences, with clean grounds, painted fences, and improved out-buildings. *Cheshire*: Improvements shown in a comparison of the mode of making hay at the present time with the method pursued twenty years ago, when a man with 50 acres of grass would employ about five hands, with their scythes and hand-rakes, five or six weeks to secure it, while it would now be secured in much better condition by three men with a mowing-machine, hay-tedder, horse-rake, and hay-caps, in twenty days. The saving is equally as great by the use of improved machinery in the cultivation of crops. *Carroll*: The day is not far distant when the men who till the soil must do it scientifically, or they will fail of a competence. *Strafford*: Not worth naming. *Bellnap*: Very little. *Coo's*: But for the machinery already introduced our land would be turned to pasture or forest.

VERMONT.—*Addison*: Improved condition of farms, buildings, and neat stock. *Franklin*: Marked improvement in our dairy products, the result of more systematic and rational processes, and of advanced intelligence and skill; the improvement of our dairy-stock has been very considerable, both by rational breeding and by judicious purchases from abroad. *Washington*: Greater use of machinery. *Rutland*: Improved machinery, but declining cultivation. *Caledonia*: Improved dairying. *Essex*: Improved machinery.

MASSACHUSETTS.—*Plymouth*: Improved farming utensils are in use, but the general condition of farms and farmers is much the same as many years ago. Farms are not so

valuable here as they were twenty-five years ago. *Franklin*: Underdraining and economy. *Bristol*: No systematic farming. *Middlesex*: Improved machinery, but great lack of rational processes in farming. *Berkshire*: Better care of domestic animals; they have better shelter, stables of more equal temperature, and more care is taken to keep animals out of storms; two objects accomplished by this—economy in feed and health of stock.

**RHODE ISLAND.**—*Kent*: Few farms in the county admit of machine-work on an extended scale. Young men that have advanced intelligence and skill leave the farm for the workshops and other congenial occupations. *Newport*: A ton of hay is secured at less than one-half the amount of manual labor that was formerly required.

**CONNECTICUT.**—*New Haven*: New buildings are put up for curing tobacco; considerable attention given to the question of manures for that crop. *New London*: We are slow to take up improvements. *Litchfield*: Considerable awakening to the necessity of improvement. *Tolland*: The least said the better. Manufacturing, our leading industry, fixes the status of labor.

**NEW YORK.**—*Saratoga*: Gradual improvement in stock; better breeds grown. *Steuben*: Farmers are evincing a higher appreciation of their calling by better tillage, fences, buildings, and ornamental surroundings. *Sullivan*: There is a gradual change in the direction of smaller areas under culture, with better tillage and consequently larger yields per acre; more money is brought into the county, and times easier than some years ago. *Onondaga*: Improvement in preparation and fertilization of soil and in culture; more gypsum and barn-yard manure used, and the truth more fully realized that the best-worked lands pay the best. *Otsego*: There are numerous factories in the county, using the milk of from 100 to 400 cows, and generally giving satisfactory results. *Schenectady*: A flourishing agricultural society, and also a farmers' club, together with the increased circulation of agricultural papers, evince greater interest in the subject of farming. *Chemung*: Increased attention to the proper gathering of the hay-crop. *Genesee*: Progress is slow, but the present time is far ahead of thirty years ago. A day's labor produces enough more now than then to leave a balance after counting the cost of teams and machinery, which have in part superseded human muscle; also in general intelligence and culture of the mind, farmers have greatly advanced. *Erie*: The land is worked more thoroughly and more manure used than formerly. *Livingston*: Steam is being introduced for thrashing.

**NEW JERSEY.**—*Hudson*: The reclaimed lands in this county are doing well, and fair crops have been realized. Some energetic efforts are being made to induce the youth in this county to enter the agricultural college. *Sussex*: It is generally remarked that farmers are hiring less help than formerly and are abandoning those branches of husbandry which involve the outlay of much money for wages. The character of farm-laborers, if measured by the amount and the quality of the work done by them, has been gradually depreciating for several years. *Warren*: The price of labor being so high, the farmers are putting more of their land into grass.

**PENNSYLVANIA.**—*Mercer*: Land is rising in value; improved farm-implements used; general aspect of the county improving. *Tioga*: General use of the modern improved agricultural implements; a great saving over the old system of hand-labor; nearly all the stock kept on the farm, consuming less feed and producing more manure. *Pike*: Actual experience has demonstrated the advantage of a four years' rotation; commencing with corn and potatoes, plow in clover about the last of April, plant about the 15th of May, 3 feet apart, in rows each way, manure in hill with wood-ashes, compost of poultry-droppings and gypsum, one-third of the former and two of the latter, plowing frequently in dry weather; second, oats following corn and potatoes; third, timothy and clover, or wheat and rye; fourth, hay and pasture. *Centre*: Soiling of cattle to a limited extent has been practiced with satisfactory results; whenever the system of pasturing ceases in our grain-growing districts, agriculture will, it is thought, nearly, if not quite, double in its increases. *Butler*: Better dwellings, barns, and out-buildings. *Cambria*: Many farmers yet cut sixty to eighty acres of grass with the scythe; commercial manures are almost unknown; lime is not used to any considerable extent on account of its cost, (20 to 25 cents per bushel.) *Bucks*: Regular rotation of crops. *Chester*: New and improved butter-boxes, prints, workers, churns, and new pans; also new feed-cutters, steam-engines for power and cooking, and a gradual improvement in care and manner of feeding stock is apparent. *Dauphin*: Labor-saving machinery and systematic processes, especially with regard to feeding stock; some of the farmers are demonstrating the utility of cutting up their corn-fodder and feeding it, mixed with grain. *Fulton*: Improvement in the efficiency of labor by procuring every kind of machinery for farm purposes; also in erecting houses, barns, &c., with a view to convenience, comfort, and saving labor. *Clearfield*: The stump-machine has been introduced in many parts of the county, preparing the farms for the use of the mowing-machine, reaper, and horse-rake. *Elk*: Clover more sown as a fertilizing crop; agricultural papers more generally read; perceptible improvement in the conversation of farmers in regard to their calling, all of which are evidences of progress. *Washington*: Steady advancement in the choice of farming utensils. *Westmorland*:

Universal introduction of machinery, operated either by horse or steam power, in the out-door labor of the farm; and within doors, in sewing, washing, churning, cooking, scouring, &c. *Lehigh*: On account of the high price of labor, farmers are obliged to have all kinds of machinery.

DELAWARE.—*Kent*: Considerable improvement in farm-implements; farmers' clubs and other associations discuss agricultural questions with interest and intelligence.

MARYLAND.—*Saint Mary's*: Except in a few instances there is little evidence of improvement; very many of the farms being worked upon shares, often by freedmen, the result being rapid deterioration of once-line estates. The labor system is bad, and getting worse. *Howard*: There is much evidence of awakening energy among our people. Turnpike companies are being formed, new buildings being erected, &c. *Montgomery*: The evidence of improvement consists in the fact that crops have increased 100 per cent. upon equal areas on many farms. Close attention is given to experiments with different fertilizers. *Carroll*: Very few farmers are without some of the improved machinery, such as reapers, drills, thrashers, &c. Steamers and thrashers are generally owned by individuals who go from farm to farm. *Washington*: More improved machinery used; better plowing done.

VIRGINIA.—*Campbell*: Owners of small farms doing their own work are doing well; those depending on hired labor are doing poorly. Freedmen object to hiring by the year because it looks too much like slavery. This has induced the more extensive introduction of labor-saving machinery. *Stafford*: General desire for rotation; more clovering. *Henrico*: Improvement sure, though slow; Virginians are not a fast people in anything. *Lunenburg*: Considerable improvements by new-comers; old settlers still plow the old ways. A northern man has built a barn of the most approved pattern. *Nansemond*: No perceptible improvement. *Prince Edward*: Labor unreliable. *Albemarle*: General advance; fatter cattle and hogs. *Smythe*: Improved implements and culture. *Essex*: Indications of retrogression in practice; some awakening, but no advancement. *Clarke*: No improvement. *Gloucester*: No general improvement. A few are raising larger crops of wheat and corn. Field-pease fully equal to guano in preparing the ground for wheat. *Botetourt*: Very few farm in the old way; less land and more grain is now the motto. *Floyd*: Use labor-saving machinery of all kinds; greater efforts to improve lands by the home-fertilizers. *Loudoun*: Some persons cultivate less land and grow larger crops per acre, bringing it sooner into grass, feeding all on the farm and marketing their grain on foot in cattle, sheep, and hogs; thus making more manure, and saving the freight and hauling grain. *Princess Anne*: Fruit and vegetables are engaging more attention, and large orchards of young apple, peach, and pear trees are now growing. *Grayson*: Some machinery introduced. *Northumberland*: Gradual but slow introduction of improved labor-saving machines, and this is restricted by the stringent circumstances of our farmers. *Nelson*: Increasing use of improved machinery; cutting up lands into smaller farms; more thorough culture; seeding a large quantity of the various grass-seeds. *Pittsylvania*: Mixed husbandry is being slowly introduced, especially by Northern settlers. *Washington*: Very striking evidence of improvement in making manures. *Prince William*: About one-half of the farmers are advancing in systematic and rational farming, rotation of crops, husbanding and application of domestic manures, the seeding their lands in grass, &c. *Buckingham*: There has been a decided advance in the last year or two in efficiency and reliability of the colored population in this county. The men have become more settled in their habits, and devote themselves to agricultural pursuits. Many of them are now skillful and very efficient laborers. The educated young men have shown a most wonderful aptitude in adapting themselves to the changed condition of the labor system since the war. *Orange*: More general introduction of improved farm-implements and light horse-power mills for preparing grain and provender as food for stock; better plowing, subsoiling, ditching, and preparation of the soil. *Fluvanna*: This county is not improving. As a general rule the lands are getting more and more unproductive; both large and small farmers are inattentive to grass and manures. The small farmers who cultivate their own land are doing the best, and some of them lay up money. *Goochland*: But few of our farmers are able to provide themselves with labor-saving machines, &c.; consequently have advanced but very little in intelligence and skill in this particular. *Patrick*: No improvement in economy and efficiency of labor; no efforts made to produce or patronize labor-saving advantages. We have no active, enterprising intelligence in our community. We work the good old way; "as our grandfathers did, so do we."

NORTH CAROLINA.—*Jackson*: Gradual improvement in agriculture; increase of good machinery each year. A small valley in the county which at the close of the war produced 600 bushels of wheat now yields 3,000; and its hay-crop is doubled. There is a growing disposition to plant more orchards, and raise more grass and wheat and less rye and corn. Sheep and cattle are encroaching upon hogs and horses. *Burke*: Our system of labor has greatly improved, and is still improving. Since emancipation the false idea that labor was disgraceful is yielding to a more healthy public opinion, and a better day is fast approaching. Pecuniary embarrassments since the war have

retarded the introduction of improved machinery; but by the introduction of select seeds through the Agricultural Department, and better culture of smaller areas, much progress is being made. *Ashe*: Increasing use of mowers and horse-rakes. This is a grass county, and the farmers sow more and more clover and grass, and are improving their lands and stock. *Haywood*: Great improvement in the management of farms. Permanent barns and shelters are being prepared for stock, and the high table-lands seeded to grass for pasture. More and more attention given to saving and proper manipulation of manures for fertilization. Dairying is on the increase, and sustains one cheese factory, besides furnishing large quantities of butter for the southern market. *Craven*: Modern machinery, better fertilization and preparation of the soil, and still more by the determination to raise more hay and all home supplies, instead of importing them. *Stanly*: Compared with the condition of things ten years back, there has been visible progress. *Warren*: We have economized labor to considerable extent in the cultivation of cotton, especially by the introduction of plows, cotton-choppers, gins, &c. The experience of the last six years is beginning to change the policy of buying fertilizers and making cotton to the exclusion of other crops. *Stokes*: Slowly introducing labor-saving machinery; a few intelligent agriculturists settling among us; great improvement in the quality of tobacco; the land is peculiarly adapted to raising the finest quality, and can be bought at \$5 to \$10 per acre. *Randolph*: An increased reclamation of wet, swampy lands for several years, by putting in under-drains and ditches of proper depth. Several reapers and mowers and a few seed-drills have been introduced, but harvesting is generally performed with the old-fashioned cradle and scythe. *Pitt*: Efforts to systematize and economize our labor almost fruitless. A few individual examples have had a fine influence. *Robeson*: In some instances the yield per acre is much larger than formerly, and our people are beginning to learn the advantages of manuring and cultivating well. *Franklin*: The tendency is to cultivate less land, and improve what they do work and to diversify the products of the farm. *Davidson*: Increased use of labor-saving machinery.

**SOUTH CAROLINA.**—*Williamsburgh*: Better preparation of lands, better cultivation, and better implements. *York*: One planter says: "Twenty years ago, with thirteen laborers, my father produced on his plantation 12 bales of cotton; last year, with seven mules and about ten field-hands, I produced 96 bales on the same plantation." *Caldwell*: The people are awakening to the necessity of improvement, but have made but little. *Chesterfield*: The planters of cotton have made great advancement in the quantity of production per acre since the war, and as far as possible, with the labor and improvement, have reduced the cost of production. *Lexington*: Colored laborers are purchasing homes and devoting all their spare time to the improvement of the same. Their children, too, are going to school, and making commendable progress in their studies. *Laurens*: From the scarcity of labor, our people work less land, but manure it better, and raise more. *Barnwell*: The labor is about the same as since 1865, but farmers have learned to deal more economically with it, from necessity, and to raise a greater product per acre. *Greenville*: Boys are learning to plow and to mow; girls spin, weave, knit, wash, cook, and sew. There is more care taken in the neatness of working-costumes, substantial, home-made boots and shoes. The more nice dressing, the greater the desire to work for the means to purchase good clothing. The use of wheat-bread and butchers' meat is increasing.

**GEORGIA.**—*Harris*: Farmers more thrifty and less inclined to run in debt; laborers more disposed to hire by the year; more interest in fertilizers. *Jefferson*: Improved implements and fertilizers. *Decatur*: No improvement. *Catoosa*: No improvement. *Putnam*: Colored labor better; little work by white men, but when they have worked with economy and industry they have done well. *Early*: Freedmen doing much better; fruit-culture enlarging; farmers' clubs organized; agricultural papers more circulated. *Worth*: No improvement; few agricultural works read; follow the old ways. *Cherokee*: No improvement. *Dooly*: Medium grade of planters succeed best. *Douglas*: The results of the last three or four years of recklessness are inducing reflection. *Forsyth*: Improved implements, but not much improvement in labor. *Liberty*: Plantation system passing away; white men doing their own work; the new rule is small areas, thorough tillage, thorough fertilization, mixed husbandry. *Twiggs*: Labor more intelligent and reliable. *Upson*: Labor emigrating; more industry and application; more manures and better implements. *Schley*: Raise more for home consumption. *Bartow*: None. *Gordon*: Better fertilization. *Marion*: Less cotton and more grain. *Brooks*: Better understanding between employers and laborers. *Pike*: Marked improvement in preparing lands; this found to be economy of labor; freedmen largely emigrating. *Meriwether*: More grain-raising and manuring. *Dawson*: Some improvement in culture, and more in economy. *Carroll*: More grain. *Floyd*: Some improved implements and culture. *Johnson*: Tenants more industrious and economical. *Warren*: None. *Stewart*: Considerable reclamation of land.

**FLORIDA.**—*Columbia*: No improvement in farming; in fact we are making less per acre, and spending more in doing it, than we did ten years ago. The vast amount of timber and stumps on the land prevents the use of many of the labor-saving machines of modern invention, and consequently most of us are treading in the footsteps of our

forefathers. *Jefferson*: A little promise of improvement is visible in the fact that the laborers are more inclined to work for stated money-wages than heretofore, in which case the labor can be better controlled. A good sign, also, is the better care bestowed on fences. *Gadsden*: The only evidence of improvement in economy and efficiency of labor observable is to be found in the increased caution now practiced in the selection and employment of farm-laborers. *Orange*: This county is fast improving in consequence of the immigration from other States. *Lery*: There is no system used in either planting or cultivating crops. The same tools that were used a thousand years ago are still in use; and very little improvement in anything, though farmers are beginning to plant more oats, and less corn and cotton. *Santa Rosa*: The capital and industry of the county being almost exclusively confined to the channels of mercantile, timber, and lumber business, there is little to note under this head. This county is a principal source of supply to the port of Pensacola. *Madison*: Correspondents think that labor was more reliable the past year than in former years.

ALABAMA.—*Crenshaw*: Farmers are relying more on home-made fertilizers, and less on imported than formerly; they have found the latter greatly adulterated. *Bullock*: There are the most gratifying evidences of improvements; farmers and their families are retrenching their expenses of all kinds, and practicing the most rigid economy possible in all domestic matters; they are reducing their agricultural operations. *Saint Clair*: I notice our people are purchasing and using better implements than heretofore; many are engaged during the winter in making and saving manures; by this means, and by the use of improved seed, some are making twenty-five hundred pounds of raw cotton per acre, where formerly they got but seven or eight hundred. *Walker*: We have a colony of intelligent Englishmen and Northern men settling in the county, which is doing very much to systematize the labor. *Greene*: The preparation for putting in the next crop is much more general and thorough than is usual at this time of the year. *Henry*: I am very confident that the great failure of the cotton-crop of 1873 is now rapidly effecting a change for the better in our system of farming; less cotton will be planted, more of the small grains, and more thought and attention be given to every department of the farm. *Montgomery*: I may say in general terms that our system of labor is evidently improving; it is more reliable, and, therefore, more efficient; I have found the system of paying wages in money by the month the most satisfactory and attended with less trouble in the end. *Blount*: There is much improvement in economy and advancement in agricultural knowledge among our farmers, and if the means of applying their skill was possessed, a brighter era would dawn upon us; the negroes have nearly all gone to other regions, and their places have not been supplied; a large increase of our agricultural force by immigration seems to be the only hope for the future. *Perry*: The freedmen and laborers are more efficient in their duties than usual; more land has been cleared, more fencing done, and more ditching accomplished in the last two months than was done in any two years since the war. *Calhoun*: The principal improvement in farming is the procuring of better tools and implements of husbandry and the preparing of home-made fertilizers.

MISSISSIPPI.—*Hancock*: The great mass of colored people within the county have shown their good sense by obtaining, settling, and cultivating small homesteads. *Clai-borne*: Very little more attention is being paid to manuring land, and to improved seed and implements. *Jefferson*: There seems to be a gradual awakening from our improvident habits. Labor is hardly more efficient than formerly. There seems to be a decided improvement in the mode of cultivation. *Jasper*: There seems to be some spirit of improvement in the county, manifest mostly in fencing and farming buildings. *Tishemingo*: The farmers of this county have advanced some in cultivating the soil, selection of seed, and husbandry of fertilizers. *Lauderdale*: There is no great improvement in the efficiency of labor, but there is generally an improvement in agriculture, more attention to fertilizers, and a reduction in the area of cotton; more small grain sown; more corn will be planted. "Grangers" have done much. *Newton*: Our labor is becoming more reliable every year. With improvements making in soil, implements, and seed, I hope for good results.

TEXAS.—*Bosque*: There has been considerable introduction of improved gins, cotton-presses, and other machinery; also of various patent fences. *Victoria*: The evidence of improvement consists in the introduction of improved implements, and more thorough culture, resulting in increased yield per acre. *Fannin*: Introduction of labor-saving machinery and payment of liberal prices for labor during the busy season instead of low wages for the whole year. *Lavaca*: Better implements are being introduced, and a slight improvement in tillage. Greater breadth is given to oats and rye, but the majority of farmers do not deviate from the old routine of corn and cotton. *Montgomery*: Our farmers have found out that they must vary their crops, and during the winter a large area has been sown in choice grasses, barley, and rye for pasturage, and nearly all are now planting oats. *Waller*: The strongest evidences of improvement are larger food and forage crops, very materially lessening the cash expenses of the farm, increased interest in agricultural literature, greater care in the selection of field-seeds, the saving of manures heretofore wasted, planting of fruit-trees of

choice varieties, and the establishment of a large nursery. *Hamilton*: Our labor system is very crude and inefficient, and wholly inadequate to the demand. The labor is performed entirely by whites, there not being a dozen freedmen in the county. Farmers are introducing better breeds of horses, cattle, and hogs. *Grimes*: Most of our wealthy farmers rent their lands to freedmen by the acre, and feel no interest in the mode of culture so that they get their money. There seems to be a disposition to plant more oats for feed, to save hay, and to take better care of their stock. *McLennan*: The most rational process of planting and cultivating cotton which has come to my knowledge is as follows: Flat-break the ground, lay off the drills the usual distance with a narrow plow, drill in the seed as usual, and cover with a turning plow, harrowing afterward. When up check off with a "sweep" across the drills, two furrows with the sweep, making a middle this way as wide as the drill. The after-culture consists of one hoeing and continual use of the sweep, passing between the rows both ways. The advantage of this process is in saving labor with the hoe. *Bee*: Improved stock of all kinds being introduced, and barns and stables for shelter in winter being erected. At the close of the war there was not a single pasture inclosed in the county, but now there are about twenty, averaging 500 acres each. *Nueces*: There is a growing desire to purchase land and resist the encroachments of wandering herds of all kinds of stock, realizing the fact that a man is entitled to whatever benefit he can derive from his own land upon which he pays taxes. *Brazoria*: The negroes, who form the bulk of our laborers, are leaving the towns and villages and returning to their former pursuits of agriculture, and are paying more attention to the raising of breadstuffs and other provisions than heretofore. Many are securing homes and small farms, and have commenced the year apparently with the determination of doing better in the future. There is less idleness and drunkenness among them than at any period since their emancipation; and it is to be hoped that favorable crops and prosperous times will prevent a return to their former bad habits. *Hill*: I cannot claim that economy and efficiency of labor have accomplished any very remarkable results, but yet in the preparation and management of the land, and the proper direction of labor, there is much evidence of progress. The lands have been kept in better condition and freer from weeds, which evinces increased interest.

ARKANSAS.—*Franklin*: There is some advancement in economy, efficiency of labor, in systematic processes in advanced intelligence, and skill. This county lacks more in means than in skill. *Scott*: Ditching has been done in many parts of this county, causing lands heretofore unproductive to produce well. Attention is now being directed to fruit-growing more than ever before, both for market and home consumption. Cotton-planting is decreasing in amount, and grain, fruit-growing, and stock-raising is on the increase. *Stowe*: Considerable improvement in the preparation of the ground before putting in crops, by deep plowing and harrowing, the last year, with very satisfactory results.

TENNESSEE.—*Giles*: Less cotton and more grass; more labor-saving machinery. *Greene*: Improved wheat culture. *Feutress*: Not much. County has but partially recovered from the war. *Dickson*: Better implements and processes of culture; farmers' associations increasing. *Obion*: The best implements introduced. *Davidsen*: More clovering; better plowing; diagonal plowing has produced excellent results, stopping the washing of land. *Dyer*: Freedmen averse to any crop except cotton, which brings ready money. *Cooke*: Improved implements and processes of culture. *Perry*: Farms subdivided; manure husbanded; more grass; more systematic rotation; better tools; more general discussion; more diversification of crops. *Wilson*: Improved machinery; scarcity of labor compels it. *Washington*: Considerable awakening and promise of substantial reforms. *Bedford*: More grass. *Blount*: Better machinery and improved processes. *De Kalb*: Smaller farms; better manuring; greater economy in labor. *Hancock*: Rotation more generally practiced. *Monroe*: Better implements and farm-buildings; better culture and more economical management. *Meigs*: Best farmers importing better implements. *Sumner*: Lack of labor has induced the general use of machinery; more systematic rotation; improved appearance of farms. *Robertson*: Improved implements and live stock, with a more judicious rotation; labor-system unsatisfactory. *Grundy*: A Swiss colony has set a noble example of recuperative culture. Few other farmers have got out of the old ruts; dilapidated buildings and farms, and general poverty of soil apparent. *Henry*: Labor-system unsettled; most of the laborers crop on shares, and change homes every year. Most of them make a support. *Jefferson*: Improved implements and processes of culture; more manuring. *Stewart*: Better houses and clothing; better stock under better shelter. *Serier*: None. *Carter*: Less advanced than before the war. *Fayette*: None. *Loudoun*: Better machinery and more manure. *Polk*: Improving the fertility of lands; rough surface forbids the general use of machinery. *Bradley*: Farmers beginning to see the need of fertilizing. *Smith*: Improvements in stock, grain, and grass-raising. *Rhea*: Better implements; more grass. *Campbell*: Considerable improvements in machinery and in winter-stabling of stock. *Lincoln*: Considerable improvement in preparing soil for wheat and corn. *Hardin*: Labor system about the same, but more labor-saving ma-

chinery. *Coffee*: Very little. *Cannon*: Labor system imperfect; more manure saved. *Anderson*: None.

WEST VIRGINIA.—*Brooke*: Slow and gradual improvement in fencing, roads, bridges, &c.; none in methods of saving and increasing manures, nor in the draining of land. *Taylor*: None; labor demoralized, beyond what the farmer and his own family can do. *Putnam*: All our farmers show a marked improvement in the general introduction of farm-implements, the sowing of clover and grass seeds, and in the greater care of manure and other fertilizers. *Harrison*: None. *Mercer*: More attention given to the use of fertilizers, plowing under crops in a green state, and introduction of improved machinery. *Berkeley*: By the growing of young cattle for their manure and the introduction of mowing and reaping machines. *Upshur*: Very little. *Marion*: Great improvement in sowing of clover and timothy; our best farmers sow all their wheat-fields in timothy when they sow their wheat and cross it in the spring with clover. *Tyler*: Some attention given to rotation of crops and to clover and grasses, but the means are sparingly used. *Grant*: For want of a rational system our best farming lands on South Branch of the Potomac are being rapidly exhausted, as shown by the reduced annual yield. General introduction of labor-saving machinery. *Fayette*: Some talk of sub-soiling. *Boone*: Some rotation. *Cabell*: A few cases of intelligent soil recuperation. *Lincoln*: None. *Kanawha*: Some advancement. *Barbour*: None. *Tucker*: Producing more of our own bacon and flour. *Jackson*: Large amount of improved machinery introduced. *Morgan*: Improvements in fruit culture. *Wayne*: None. *Mineral*: Little or none. *Jefferson*: Some improvement visible.

KENTUCKY.—*Oldham*: Better machinery and higher inducements to skilled labor. *McLean*: None. *Logan*: Large increase of labor-saving machinery. *Hopkins*: Very little. *Shelby*: None. *Kenton*: Improved machinery; better preparation of soil for crops. *Jefferson*: Considerable extension of market-gardening by new settlers. *Henry*: Very little; farmers run too much in the old ruts. *Adair*: Farmers hold too much land. *Scott*: Freedmen will only work by the day, and hence are not to be depended on for cropping; they are anxious to become land-owners and labor for themselves. *Mercer*: None. *Spencer*: Increased use of labor-saving machinery as labor declines in effectiveness. *Johnson*: A small improvement in fruit-raising. *Lincoln*: Slow and steady improvement of labor. *Lewis*: The establishment of manufactures over this county, comprising seven saw-mills, two stone mills, spoke, hub, stave, barrel, and cooperage manufactories; six new turnpike-roads, two railroads in operation and a third organizing; six new churches and twelve new school-houses. Two-thirds of the capital and seventy-five per cent. of the mechanical labor came from abroad. Since the abolishment of slavery the population and resources of this county have doubled. *Metcalf*: More bartering of produce for groceries. *Daviss*: A partial abandonment of the old system; old lands are brought back to usefulness and a systematic rotation generally adopted. *Russell*: Farmers here follow in the steps of their fathers; never manure their land; plant in corn and tobacco as long as it will produce anything, then clear up more land and treat it in the same manner, until all the land is completely exhausted, then sell out if they can, and if they cannot, leave all behind them and go west. At least one-third of the lands in this county are worn out and turned out to grow up in briars and bushes. *Breckinridge*: A few young farmers are progressing. *Boone*: None visible. *Meade*: Farmers are working harder, saving more manure, and getting all the improved machinery they can purchase. *Graves*: Some organizations for improvement, but no tangible results as yet. *Hart*: No results as yet; some efforts to secure improvement by organization. *Livingston*: None.

OHIO.—*Pickaway*: The best farmers in the county have reduced the cost materially of raising their principal staple, corn, by using improved implements, especially the so-called breaking-plow. *Shelby*: Improving the land by under-drainage with drain-tiles. The low grounds of the county being the most productive, their value is enhanced and productiveness increased by a systematic and thorough drainage. *Vinton*: A few farmers have commenced plowing their fallows for wheat in June, and seeding with the drill instead of the old mode of plowing in September, and sowing broadcast and harrowing in. We find by the former mode we can raise from 50 to 100 per cent. more than by the old mode, and only 75 per cent. of seed to the acre is used. *Champaign*: The employment of more farm-machinery, and a cultivation of less area, and doing it in a more thorough manner, the high price of labor and produce forbidding the hiring of more help. *Tuscarawas*: Some improvement in field-culture, and closer economy in saving crops; more home comforts and better farm-implements; farm-labor declining in effectiveness. *Marion*: Much draining and under-draining of later years; better breeds of live stock, especially Norman horses. *Licking*: Some improvement in implements. *Franklin*: Most of the hard work done by machinery. *Highland*: Backwardness in introducing machinery and in saving manure; too little clover. *Williams*: No facts of interest. *Warren*: Gradual improvement each year; wonderful advance compared with twenty years ago; better implements and processes of culture. *Medina*: Dairying greatly on the increase, so that few raise grain to sell. Less sneering at "book-farming" than formerly; greatly increased circulation of agricultural journals.



*Madison*: Nothing remarkable. *Logan*: Increased desire for improved farm-implements. *Hardin*: Great numbers of farm machines; sales increasing every year. *Ashland*: Crops put in in better style; great extension of machinery. *Geauga*: Gradual improvement for years; farmers' clubs and other organizations; great advance in agricultural intelligence. *Lorain*: Great improvement within three years, especially in draining and in general economy of work; but little waste; some farmers formerly wasted more than they now feed. *Fayette*: Great improvement in implements. *Sandusky*: Improved machinery. *Meigs*: General use of improved machinery. *Lucas*: Improved machinery, under-draining and tree-planting by roadsides. *Morgan*: Mixed husbandry; more live stock fed on the farm. *Hancock*: Most of the labor done by machinery; under-draining; improved rotation; protecting birds. *Adams*: Better tillage and more thrift. *Carroll*: Improved machinery and economy of labor. *Hamilton*: More judicious rotation and selection of crops. *Richland*: More labor-saving machinery, and consequently more leisure for mental culture. *Butler*: Increased economy of labor, but not any more efficiency in labor itself; no observable increase of intelligence or skill in farming. *Delaware*: Thousands of acres drain-tiled every year, bringing into cultivation the swampy lands; increase in economy of labor, if not in farming skill.

**MICHIGAN.**—More labor accessible on account of stagnation in lumbering enterprise. Farmers too prone to loan their money at interest. *Ottawa*: Many are purchasing labor-saving machines. *Oakland*: Increased economy of labor; arrangements have been made which enable one man to take care of double the amount of live stock. *Branch*: Steady improvement. *Fan Buren*: Increased economy of labor; increased cereal productions. *Gratiot*: Increased tile-draining. *Kalamazoo*: Great changes in twenty years. *Macomb*: Improved machinery. *Shiawassee*: Improved machinery and more systematic rotation. *Mason*: County new; land cleared and seeded in grass as fast as practicable. *Cass*: More and better farm-implements; improved buildings and more intelligent care in selection and treatment of animals; wind-mills extensively employed to raise water for live stock. *Ionia*: Contrary to our ancient custom, we now raise clean wheat; our cultivated crops are in the main attended to; our domestic animals are much improved and better cared for; valuable fruit-trees have increased in number and are much better cared for; our fences and buildings are made more substantial and convenient; grass-seed is sown on fields that used to be bare; many of our farmers are free from debt, and have something ahead. Much has been and is being done in the way of draining, manuring, and clearing the fields of stumps, stones, and other rubbish, and the plow is going down deeper and is doing much better work. *Lenawee*: Last year 1,000 bushels of corn were raised in this county on 20 acres of land at a cost of \$334.40; the crop brought 80 cents per bushel, or \$800 less the total expenses of \$334.40, leaving a profit of \$465.60. *Washtenaw*: Systematic rotation of crops; the use of plaster as a fertilizer, and the extensive use of manures, indicates the advance of the past ten years.

**INDIANA.**—*Randolph*: Farmers are taking more pains in putting their ground in order and manuring more than heretofore. Greater attention is also paid to introducing improved farm machinery. *Greene*: None. *Switzerland*: Our farmers are now realizing the damaging effect of the continually cropping and exporting of hay and the close selling of nearly all the straw raised. The exhausted condition of the lands from selling off all the hay and straw has had the effect of turning the attention of the farmers to a more systematic manner of farming. *Union*: Draining the soil, improved labor-saving machinery, the introduction of thoroughbred short-horns, and Cotswold and merino sheep, are among the improvements. *Knox*: A more thorough preparation of the soil for the reception of the seed, a more general use of fertilizers, and a general alternating of crops. *Martin*: Farmers are taking more interest than formerly in their business. *Harrison*: The saving and application of barn-yard and special manures, and the introduction of more labor-saving machinery. *Daviess*: None. *Marion*: More care in the preparation of the ground, putting in their crops at the proper time, the judicious selection of seeds, and attention to improved breeds of stock and their proper care. *Putnam*: Our farmers are intelligent and economical, but rather conservative. *La Porte*: There is a general waking up as it were to the necessity of curtailing expenses and doing business on a strictly cash basis. *Brown*: Some of our farmers are sowing down most of their land in clover and grass, and turning their attention to stock-raising. *Fanderburgh*: None. *Miami*: Marked general improvement in roads and farms. *Noble*: More machinery; most of the grain thrashed by steam. *Howard*: Improved culture; more reading of agricultural journals. *Tipton*: Better improvements. *Warren*: Gradual improvement in scientific culture. *Steuben*: A spirit of improvement; some draining. *Fountain*: Some improvement in farm and stock management; shelter and feed better. *Jennings*: Saving in corn-culture by the corn-drill and double-plow. *Gibson*: More economy in management. *Washington*: Improved machinery. *Union*: Draining and labor-saving machinery. *Rush*: Great results from machinery. *Madison*: Very little. *Randolph*: Better tillage. *Franklin*: Increased yield through drainage and better tillage.

ILLINOIS.—*De Kalb*: Great increase in labor-saving machinery. *Franklin*: More general rotation of crops. *Cass*: Improved machinery, culture, and economy. *Ogle*: Improved machinery; wind-mills for watering stock. *Efingham*: Rotation of crops; feed more produce on the farm. *Crawford*: Rotation and better tillage. *Rock Island*: Better tillage. *Henderson*: Improved implements. *Tazewell*: Better stock and seed; more grass-crops. *Putnam*: Increased attention to rotation. *Henry*: Increased association of farmers; better machinery. *Ford*: Mr. Sullivant farms 40,000 acres on an improved tenant-system with good results. Tenants pay a rent of two-fifths of their produce. His own farming is excellent. *Clarke*: Improved machinery and more careful plowing, putting in of seed in a better manner, the greater extension or more general use of clover, a more careful economy in the application of manures, and a general interest manifested by farmers as to the best and most approved modes of agriculture. *Hancock*: A marked tendency toward the improvement of stock is manifested; also more attention to fertilization; clovering, manuring, and rotation of crops. *Saint Clair*: Better tillage. *Boone*: An inclination to raise more stock and less grain, thereby saving considerably for hired help. *Monroe*: It is seen in the increased number of good machines, in soiling, clovering, and manuring; in the increasing quantity and quality of the different crops. *White*: Better implements; more clovering. *Sangamon*: The proper preparation of food for cattle, and the erection of suitable accommodations for poultry, and the introduction of improved breeds. *Mason*: This was originally known as a corn-producing county only, but it is observed that where corn had been planted on stubble-timothy or clover ground (the latter the best) there has been from 20 to 40 per cent. gain in the crop of corn, both in yield and quality. *Edwards*: Better farm-houses, barns, and shelter for all kinds of stock, that are being erected; also better market facilities. *Wayne*: More attention generally paid to rotation of crops, proper cultivation, and more careful about going into debt than heretofore. *McLean*: Working more themselves, and hiring less help; another indication is the increased subscriptions to agricultural newspapers. *Menard*: Increased care in the saving, preparation, and application of manure, and in alternating crops of grain and grass. *Randolph*: More attention to rotation of crops, using more clover-seed, plowing in swards in last of July and first of August; the use of improved implements, whereby one man can perform the labor of two. *Fayette*: Gradual increase of machinery. *Clinton*: Better shelter for stock; more economy; improved implements. *Carróll*: Better breeds of live stock, unusual experiments at rotation, better implements. *Piatt*: Better tillage and tools. *Vermilion*: Better machinery and processes of culture. *Richland*: More general use of machinery. *Pope*: More thorough culture; better tools. *Marion*: Very little. *Hancock*: Marked improvement in live stock, also in fertilizers, but not much of increased science or skill. *Winnebago*: More stock fed; more grass and clover; better implements. *Livingston*: Farmers working more themselves. *Mercer*: Progress constant, but gradual.

WISCONSIN—*Lafayette*: Better tillage and increased yields per acre; better implements and greater economy in management. *Washington*: More clovering, with satisfactory results. *Pierce*: General improvement in circumstances of farmers. *Milwaukee*: Most of the farmers foreigners; no improvements. *Fond-du-Lac*: Greater economy and more association. *Dodge*: Clovering, soiling and sheltering animals; more careful observation of results. *Keweenaw*: Great improvement in machinery, culture, and economy. *Juneau*: None. *Jefferson*: More stock-raising, dairying, cheese-factories, farmers' clubs, &c. *Jackson*: Smaller farms, more profitable culture. *Columbia*: Great improvement in machinery and skill. *Dane*: Great improvement in live-stock, less grain-growing, more intelligent treatment of economical questions, more farmers' clubs. *Dodge*: Sowing clover, plaster and salt with small grain, providing comfortable quarters for all kinds of stock, cutting clover for hay early, and plowing in the after or late crop for purposes of fertilization, careful noting of results following experimental operations. *Douglas*: A spirit and evidence of a closer, better, and more thorough cultivation of small tracts, rather than a skimming over of large tracts. Cultivators are beginning to avail themselves of the advantages of deep plowing, good ditches for draining, and the free use of manures. *Calumet*: Improved machinery, deep plowing, green manuring, underground drainage; also the evidences of advancement in the intelligence and skill, in the more general prosperity of our farming population, their increased crops, and superior grades of stock. *Vernon*: More attention is paid to the raising of stock, and seeding in of clover and grass; the necessity of preserving the fertility of the soil is beginning to dawn upon the minds of our farmers. *Wood*: None. *Green*: The introduction of agricultural machinery, and the ability of the farmer to make proper use of it; the use of horse-power in the cutting of wood.

MINNESOTA.—*Houston*: The cost of the harvest, owing to high prices of labor and harvesting-machines, &c., is the principal drawback to the profit of grain-raising here; we have been paying \$200 for a machine that could be manufactured for probably \$120. Some farmers fail to raise oats and corn enough to feed their stock. Last spring I sold 1,200 bushels of corn, mostly to farmers. *Isanti*: There is a cry of hard times when, by a judicious outlay for machinery, a saving of at least one-half paid for labor might

be effected. One case in point: Mr. A., a number of years ago, was always in the habit of putting up about 100 tons of hay. This took four men for a period of four weeks, at a cost of \$130 and board. This year he put up 118 tons, using a good mower and steel-tooth rake, with two men and one boy, in a period of two weeks, at a cost of \$48 and board. Of course his team was engaged all the time, but in the former case his team was engaged half the time in stacking. *Dodge*: Harvesters are used to a great extent, and many farmers secure a wheat crop of from 1,000 to 1,500 bushels with the ordinary help required on the farm the season through. *Watonwan*: The method is the most slovenly imaginable. Wheat follows wheat year after year, in some cases for fifteen years in succession. All the improved farm-machinery is used, for which the farmers go in debt, and when not in use let it "lie around," so that by the time it is paid for it is worthless, and again go in debt for more. Many of the first settlers are selling out, and their places are being supplied with a better class of farmers. *Waseca*: The use of harvesters for cutting grain and mowers for cutting grass saves not only 100 per cent. in labor, but more than that in expense; and then plowing early in the fall and plowing deep in ridges, and sowing early, increases the crop nearly 50 per cent. *Sibley*: No farmers here, only robbers of the soil. *Fillmore*: Gradual improvement every year. *Chippewa*: Less machinery bought of agents. *Douglas*: More rotation; mixed husbandry; farmers' clubs. *Martin*: Improved tillage. *Jackson*: Economy of labor; more machinery. *Le Sueur*: Nothing important. *Sherburne*: More attention to manure. *Noble*: None. *Crow Wing*: More culture on less land.

**IOWA.**—*Cherokee*: Improved harvesters and corn-planters. *Tama*: Improved harvesters. *Hancock*: None visible. *Audubon*: Too much in the old way. *Hardin*: Better shelter for live stock; increased fruit-culture; better implements. *Buena Vista*: Very little. *Buchanan*: Progress slow. *Jasper*: More economy; labor becoming more intelligent and reliable. *Guthrie*: Labor-saving machinery. *Allamakee*: Improved tillage and general intelligence. *Jackson*: Grinding and cooking of grain fed to stock. *Pocahontas*: Increased amount of machinery; too often bought on credit. *Ringgold*: None worthy of mention. *Mitchell*: Efforts to introduce mixed husbandry; more attention to stock-raising; dogs still restrict sheep husbandry; cheese-factories are springing up very numerous. *Calhoun*: The community are beginning to buy more on the cash principle, and they therefore buy more sparingly; they are beginning to seek and to get the best kinds of seeds and improved stock. *Fayette*: There has been some improvement as regards the rotation of crops. *Taylor*: A strong effort being made to get out of debt, and do on less until things are paid for. A greater degree of attention paid to the cultivation of the different grasses and fruits; comfortable dwellings and barns are springing up throughout the county. *Jefferson*: A greater care is manifest to keep land in a good condition. Farmers begin to realize the fact that something must be done to maintain the fertility of the soil, and there is an effort made to feed as much as possible of what is raised upon the farm. *Jackson*: Grinding and cooking the grain fed to cattle and hogs, and also the cooking of many of the bulbous roots before feeding. The practice is also being adopted of saving and applying fertilizers to the land. *Bremer*: Perhaps in no ten years (prior to the last two) of the world's history have those engaged in agriculture made so much advancement in knowledge relating to the business affairs of life. *Floyd*: A strong evidence of advancement is from the fact of farmers turning their attention more to the raising of stock, in place of continually raising wheat. *Carroll*: The more general introduction of new and improved implements of agriculture. *Iowa*: Improved machinery, rotation of crops, and better and more systematic cultivation; also the purchase and introduction of improved stock. *Grundy*: But little advance is shown. The farmers burn their straw, to get it out of the way for the next crop.

**MISSOURI.**—*Caldwell*: The great increase of agricultural papers, which are freely subscribed for and read, and the remarkable increase in numbers of the patrons of husbandry. *Gasconade*: A growing disposition to substitute horse-power for human muscles; the better cultivation of the various crops, including manuring, plowing, and harvesting; better system of rotation, and a more general adaptation of the means on hand to the ends in view. *Lawrence*: An effort to cultivate the same amount of ground in a better manner, raise more grain to the acre, &c.; also an attempt to secure the productions of the soil in a better shape than formerly; the building of better barns and farm buildings generally. *Clinton*: A desire to use improved machinery and to cultivate less land, and to produce the same amount of crop. *Washington*: Much attention has been paid to barn-building for the protection of stock and safety of farm-products; manures are carefully saved and judiciously applied, and interest is felt in the procuring of the best fertilizers for renewing worn-out or exhausted land. *Reynolds*: But little systematic farming; there is not a single seed-drill in the county. *Dallas*: From the appearance of the farms it is evident an advance has been made; there is more system and skill displayed in farming; the farmers are beginning to realize the fact that there is something more than hard work necessary to successful farming, and for this purpose they are using their brains more. *Daviess*: Much of our wheat is put in with a drill and rolled afterward, and it is nearly all cut with reap-

ers. The only fertilizer in use among us is obtained from the barn-yard. *Osage*: The ground is plowed deeper, and better pulverized, and full crops sown earlier; the use of the drill for seeding is more used. *Callaway*: An increasing determination to get the best farming tools, to facilitate work, and to economize labor. *Lincoln*: I have noticed farmers are becoming more careful of their straw, ricking it up in good order for winter use; and the better farmers have built barns, sheds, and other places of retreat for stock in inclement weather; also a desire is manifested for a better and more improved class of stock by purchasing of the best known breeds. *Pettis*: More labor on less land has become the motto of many of our farmers; and manure, but little noticed a few years previous, has during the last season come extensively into demand, and ere long will be an article of commerce. *Mercer*: At present almost every farmer plows his ground well before sowing, then puts it in with a wheat-drill, and the result is that an acre of land thus treated now produces more than three acres under the old system of broadcast sowing and afterward dragging a brush or harrow over it; in this way the frost destroyed much. *Livingston*: Improved machinery and breeds of live stock. *Franklin*: Cleaner culture; less land under plow; better machinery; more and better agricultural reading. *Phelps*: Eastern farmers are trying to introduce rotation. *Howard*: Very unsatisfactory. *Carroll*: Improved implements enable one man to cultivate well fifty acres of corn, double the former ratio. *Nodaway*: Improved stock, tools, and methods of culture. *Jackson*: Improved machinery. *Taney*: None. *Stoddard*: Improved machinery. *Ripley*: Improved machinery and tillage. *Ballinger*: Improved machinery. *Callaway*: Unreliable labor remedied by getting the best implements. *Cape Girardeau*: Some improved machinery. *Stone*: Unreliable labor has compelled economy. *Saint François*: None. *Pulaski*: None visible. *Newton*: None. *Wright*: Better tillage. *Saint Clair*: Better rotation. *Douglass*: None. *Christian*: Some new machinery. *McDonald*: None. *Ray*: Not very decided. *Polk*: Only in isolated cases. *Harrison*: Improved machinery. *Clay*: Very little. *Boone*: None. *Audrian*: None. *Ralls*: None. *Iron*: Slow and gradual.

KANSAS.—*Doniphan*: A decided improvement in all kinds of machinery, seeds, stock, &c. *Ellsworth*: A great improvement in stock by crossing the native and Texas cattle by thoroughbred Durhams. *Nemaha*: The best variety of seeds are sought after; animals for the improvement of stock have been bought at a high price and introduced into different sections of the county; grain is better protected, and straw better secured and made available for feed and manure. Orchards, groves, and vineyards are being planted. *Jackson*: The most economy is apparent in feeding their grain to stock, thereby driving their crop to market on foot. *Washington*: The introduction of sheep, and a more mixed husbandry, the making of cheese, and the use of new and improved farm-machinery. *Wilson*: New and improved machinery, and the use of the drill particularly. *Chase*: More corn raised than usual, and therefore more cattle and hogs fattened; and instead of sending two and three year olds to Illinois, we keep them at home, fatten them ourselves, and send them to market as beef-cattle. *Bourbon*: Greater variety of crops. *Lyon*: Better implements; more manure saved. *Cowley*: Better tillage. *Reno*: Better implements. *Howard*: None. *Republic*: A few save more manure. *Seagwick*: Farming a more settled business. *Linn*: Not worthy of note. *Labette*: Improved machinery. *Clay*: Improved machinery. *Morris*: Improved machinery and a better kind of labor. *Brown*: But little as yet. *Cloud*: Nothing special. *Riley*: Very little. *Jefferson*: Improved machinery has enabled farmers to hold their own through the panic. *Marshall*: Improved culture, machinery, and economy. *Butler*: Better culture and machinery. *Atchinson*: Farmers gaining wealth.

NEBRASKA.—*Lancaster*: Improved machinery. *Merriek*: Grain-drills. *Webster*: Improved machinery. *Antelope*: Great efforts to secure the best implements; county newly settled. *Nemaha*: Combining for the purchase of implements. *Otoe*: Gradual, yet perceptible progress. *Madison*: Great efforts to secure best machinery. *Burt*: Increased use of "headers" in harvesting; great saving thereby. *Jefferson*: We are testing the best ways of getting the best yield for the least labor. *Cass*: There is but little system, efficiency, or economy of labor practiced here. Every one pursues such a course as he thinks will pay him best with the least labor. If a man does not sow from 60 to 80 acres of small grain, and plant and cultivate from 40 to 50 acres corn, all with one team, he is considered as doing a small business. *Gage*: Orchards are beginning to spring up in all directions, and stock-raising to consume the spontaneous productions of the pastures. These are prominent evidences of advancement. *Richardson*: Our farmers have commenced building barns to save fodder and grain; also they have begun to use improved machinery. *Cedar*: A tendency toward a rotation of crops and the use of domestic fertilizers.

CALIFORNIA.—*Klamath*: Improved machinery. *Santa Clara*: Many of our practical and intelligent farmers have commenced summer following their lands, the yield being from 25 to 30 per cent. increase. The soil of this State, particularly of the valley lands, can only be successfully cultivated in this way. *San Diego*: We have all the modern improvements, and are endeavoring to farm systematically, and with due

economy. *El Dorado*: Not much. *Amador*: The most marked improvement is the method of dry sowing; the ground being plowed and sowed during the three or four months following the harvest, or before the winter rains have made the ground soft, the grain remaining dormant the while. By this process a large area of land is put in before the winter rains have softened the ground. It is believed this method has advantages over summer fallowing; inasmuch as the first rains cause the ground to become exceedingly mellow, while not infrequently summer fallow is rendered hard and clammy by the late spring rains. *Lake*: But little. *Contra Costa*: The use of improved machinery, also improved methods of tillage, rotation, manures, and adaptation of crops to conditions. *Tuolumne*: None. *Douglas*: A greater desire on the part of farmers to obtain accurate information in respect to their calling; hence, the agricultural papers are being freely subscribed for and read. *Stanislaus*: Little or none.

OREGON.—*Josephine*: None. *Douglas*: Little or none. *Lane*: Large use of grain-drills and gang-plows. *Wasco*: Improved breeds of live stock. *Linn*: Great improvement in wheat-culture; the drill becoming common.

NEVADA.—*Esmeralda*: Not far enough advanced to have much improvement.

TERRITORIES.—*El Paso, Colo.*: There is a general and manifest desire for improved methods of agriculture, and for that which will most develop and advance the interests of farmers. *Weld, Colo.*: As an evidence, we have organized a territorial stock-growers' association, with auxiliaries in each county, for the protection of the stock interest, with a system of "round-ups" each spring, which greatly facilitates the handling of stock, and finding of strays. We are also improving our system of irrigation, and acquiring more system in farming under that system. *Douglas, Colo.*: The greater care of stock, and the introduction of improved breeds. *Box Elder, Utah*: Labor-saving machinery has relieved the farmer from bondage, and given him time to improve in intellectual culture. There is an improvement in building, field and garden culture, securing good breeds of stock, and also connecting various branches of home manufacture with farming. *Rich, Utah*: We are distant from a market, and have not much to sell, and cannot, as yet, procure the most economical means, to any extent, for building up or improving; still, we are fast advancing, all things considered. *Iron, Utah*: Drilling has proved to be a saving of one-third the seed, and an increase of from five to ten bushels per acre. *Taos, N. Mex.*: None whatever; our people are a long ways behind the present progressive age; the old plow is used in all cases; they never pretend to fertilize their land by manuring or otherwise, but depend solely on irrigation for supplying the deficiency in the fertility of the soil, and yet, with all their primitive manner of pursuing their avocation, they reap yearly golden harvests of all kinds of grain. *Doña Ana, N. Mex.*: The few American farmers here use plows purchased in Saint Louis, and a marked improvement appears in the productiveness of their land, and the destruction of the noxious weeds. Mexican labor is cheap and unskilled, and great difficulties are found in inducing the laborers to learn to use the labor-saving tools; still, a marked improvement is apparent among them, as they are brought into contact with the American farmer. Considerable skill is shown by some enterprising Americans in growing grape-vines, whereby the yield has been nearly doubled over the Mexican method. *Santa Ana, N. Mex.*: Labor is the same as it has been for the past fifty years; the Mexicans do not improve much in making labor as easy as possible. *Walla Walla, Wash.*: Farmers are building better dwellings and larger and more convenient barns, and are also building comfortable public school houses at almost every cross-road. *Lincoln, Dak.*: Much has been saved by the proper use of the various kinds of farm-implements, seeders and harvesters particularly. The land in this county is all new, the most of it having had only two crops taken from it. *Missoula, Mont.*: The land here being new, and naturally very productive, no particular system has been adopted.

## PRACTICAL RESULTS OF ASSOCIATION.

The March returns contain many facts illustrating the saving resulting from co-operation the past year in purchasing supplies or selling products; the advantage derived from association in "extending" or manufacturing raw products, the accomplishment of which could not be undertaken by single individuals, as in flour-milling, pork-packing, wool-working, butter or cheese making, and similar enterprises. These statements lead to the belief that many millions of dollars have been saved to the farming interest by the simple initiation of union for protection, a beginning of what should result not only in greatly enlarging the va-

riety and profit of rural labor, in a larger reliance for cash receipts upon products of high value in proportion to weight and cost of transportation, but in simplifying and reducing the cost of necessary exchanges, and disseminating progressive and beneficent ideas in agriculture. The gradual reduction of prices from the war-rates which prevailed a few years ago, with the accompanying necessity for retrenchment year by year becoming more imperious and threatening, has compelled a thoughtfulness, a spirit of inquiry, a discovery of burdens and crushing evils, and a search for a remedy, which has led inevitably to association and combination by societies, open and secret, rural clubs of various kinds, all animated by the purpose of obtaining relief. It is only a phase of the mighty impulse that is moving for the elevation of labor and its protection against the aggressions of organized capital throughout the world. It was logical, if not inevitable, that the movement should reach the great foundation-interest in productive industry, so extended and so isolated, after rather than before its organization of the various forms of artisan labor in the great centers of population.

In the New England States there is scarcely life enough in agriculture, overslaughed as it is by the magnitude and wealth of other industries, and depleted by emigration to richer soils, to originate associative effort; yet an active interest has been aroused in many places, and practical results have followed. Co-operative dairy enterprises, hitherto almost unknown in this region, are multiplying, especially in Maine and New Hampshire; and in Massachusetts a strenuous but not yet successful combination has been initiated against the gigantic and fraudulent monopoly of the milk-supply organized by dealers and sustained by railroads. In some portions of Massachusetts agricultural machinery is now purchased directly from manufacturers at a saving of 30 per centum, and the avoidance of the intervention of middle-men in purchases of nursery-stock has saved 33 per centum. In Vermont, something has been done in wholesale purchases of corn and other supplies from the West, saving 10 to 15 cents per bushel in corn, and a dollar per barrel in flour.

In the Middle States there is evidence of greater activity of the associative idea, and some beneficent results have already been achieved. A few extracts will illustrate the direction of the effort:

NEW YORK.—*Allegany*: A saving of 20 and 30 cents per bushel upon corn has been made by co-operation in buying by car-load or boat-load. The manufacture and sale of cheese is also effected to advantage by combined effort. *Ontario*: Probably from one to three thousand dollars was saved by grape-growers combining in shipping their fruit as freight, instead of expressing in detached lots. *Olsego*: Co-operation in sales of cheese have saved to the farmer  $1\frac{1}{2}$  to 2 cents per pound, equal to the amount paid for manufacturing.

NEW JERSEY.—*Cumberland*: Co-operation has not benefited the farmers in this county, except in the purchase of their guano last fall for wheat; by combining they were enabled to get their guano at wholesale prices, and it is thought saved \$5 per ton. In the township of Fairfield, the farmers and some other citizens have put up a co-operative canning establishment at the village of Cedarville. *Sussex*: Some years ago the cheese-factories or creameries were started on the co-operative principle, but that has been abandoned, the farmers preferring to sell their milk at a fixed rate, and to allow the men who run the factories to make the profit or suffer the loss as the case may be. As a general rule the farmer selling milk gets the price of a pound of butter for every twelve and a half quarts. *Camden*: By co-operation, vessel-loads of fertilizers are purchased, at a saving of about \$5 per ton.

PENNSYLVANIA.—*Lehigh*: There is no necessity for co-operation in this county; there is always a ready market for products, and ample chance to purchase supplies. *Cambria*: A cheese-factory is about being started on a small scale to manufacture the milk of 70 to 100 cows into some German style of cheese. *Bucks*: The milk-producers in this county are about forming a combination, with a view to selling and delivering their own milk. *Lebanon*: We have one establishment for preserving eggs. The

building is a three-story stone house, 50 by 80 feet. The two lower stories are each 7 feet high, and are intended for the eggs: the upper story is 11 feet high, and is now filled with ice tightly packed, holding about 1,000 tons; the second and third floors are not tight, permitting the cold from the ice to descend. The walls are  $2\frac{1}{2}$  feet thick, lined inside, and filled in 1 foot thick with sawdust. The capacity is about 5,000 barrels. The eggs are purchased during the summer, and preserved packed in oats to ship for winter use. Eggs from Ohio are the best, bringing a cent per dozen more than any other, having a larger proportion of yolk than others. Those of Pennsylvania and Indiana are the next best. The eggs are all shipped to the New York market. *Washington*: Being convenient to market, and having access to many points for tools and machinery, are two reasons why a system of co-operation has not been adopted in this county. Another is the diversity of agricultural industry. This is a grazing county. There are 427,000 head of sheep, 30,000 head of cattle, 12,000 head of horses; 1,862,000 pounds of wool and \$870,000 worth of beef are produced; 450,000 bushels of wheat, and 67,000 tons of hay are produced from 410,000 acres of improved land, supporting a large population of mechanics, miners, and manufacturers.

In the Southern States the rule of individuality has been too predominant heretofore to admit of associated effort, but the idea is now entertained in many a southern community, and the reason is anxiously sought why mines are not worked, the grasses of mountain pastures utilized in dairying, a home supply of bacon and lard provided, an abundance of beef and mutton supplied, and twice the amount now realized in agricultural products easily obtained from a fertile soil and fructifying climate. The fact is beginning to be seen—though few as yet perceive the truth—that all the cotton which the world will take will never aggregate one-fifth the sum which should represent the agricultural production of so large a population and so fine a soil and climate as are found in the cotton States. Not that there should be less of cotton, but more of all things else; far more produced by the present amount of labor, and far more labor employed that is idle or worse than useless. The labor of the negro, when left to his own control, is often next to worthless, but usually efficient when intelligently and wisely directed by the farm proprietor. The association of a sagacious and sensible planter as manager, with labor represented by former slaves, has never failed of the best results. But there is a form of “co-operation” which has been a curse to this region—the aid extended to the landholder by the merchant who advances money and goods on the security of a lien on the crop, taking a mortgage at ruinous interest on the possibilities of the year’s income. As a correspondent expresses it, the beneficence of this aid is seen in purchasing pork at \$5 per hundred and in selling bacon to the planter at \$15. There is a tendency in many parts of the South to introduce the manufacture of cotton-yarn and cloth from cotton, machinery for wool-working, and various other enterprises in the extension of the raw material of agricultural production. Cotton-manufacturing especially has been found more profitable, perhaps, than in any other manufacturing region. Not only is the cotton there, but unemployed labor needed for its manufacture, and an open market for the goods manufactured.

The following extracts are selected from returns:

VIRGINIA.—*Botetourt*: Farmers are beginning to organize for co-operation, and I think that they have intelligence enough to sell their own produce to consumers and shippers, and thereby save the very large amount that now goes into the pockets of the middle-men. The fine flour-mills are kept constantly in motion. A large amount of flour is shipped from the county to the eastern markets. *Campbell*: To carry successfully an association of this sort requires more or less ready money, and this but few of the farmers have. Most of them about a year behindhand, and depend upon their commission-merchants to advance upon the growing crop, in order to obtain groceries, fertilizers, &c. *Prince William*: Some two or three years since there was an organization, called the Piedmont Produce Association, formed for co-operation, which promised great results; but after trial it did not give satisfaction to the people of the county, and it was abandoned. *Craig*: There has been no co-operative association the last year. One has recently been formed, but its fruits are yet to be developed. *Patrick*:

No benefits have resulted from co-operation except from the sale of brandy, and that so small as hardly to be noticeable; our citizens consume what they make. The small quantity of wheat grown is consumed at home. *Lee*: Our farmers are woefully deficient in any concert of action in disposing of their agricultural productions or the purchase of their yearly supplies. The raw material is not worked up in this county beyond the demand for home consumption. The pork, grain, and wool are sent chiefly in flat-boats down the river to Chattanooga; the pork and horses find their outlet to the east, being sold in North Carolina and Eastern Virginia. The cattle are driven to the blue-grass part of Kentucky while they are young. *Goochland*: Many of our people have been materially assisted by the co-operation of merchants, who sell them seeds, fertilizers, &c., on the faith of their crops, to be consigned to them for sale at maturity. By this arrangement much has been saved which otherwise could not have been realized. *Fairfax*: An association of farmers, known as the Richmond Milk and Produce Association, was organized two years ago. An agent was appointed in Washington to receive and sell the milk to retail dealers, and return the cans. Under discouragements which more or less always attend new enterprises, though some were peculiar to this, the association has steadily prospered in strength and usefulness. The great want is direct railroad communication with Washington by a "truck" train at night, so that milk, fruit, and vegetables prepared one day will reach the consumer the next morning. For milk there should be some other mode of reaching the consumer than through the retail dealers. They generally sell at a hundred per cent. advance on cost. Many of them then make another profit, by skimming or watering, sometimes both, thus defrauding the consumer, and doing great injustice to the dairyman, upon whose shoulders a good part of the opprobrium is thrown of bringing to market an inferior article. A rigid inspection of milk is of service, but I know of no adequate remedy for the evil complained of, except by the organization of associations in the cities, who, through their agent, could buy directly from the agent of the farmers. *Albemarle*: About twelve months ago five farmers, in the immediate vicinity of Charlottesville, organized a co-operative club, calling it the Belmont Farmers' Club. From the success of this the whole county has been aroused, and now there are eight clubs, and a county association, composed of delegates from the various clubs. The Belmont Club now numbers 70 members, and represents capital to an amount of more than a million dollars. Though we have not yet been able to reap the full benefit of co-operation in buying and selling, yet we are doing so to some extent. The saving to some of our members up to January, less than twelve months, had been over \$200, and many have saved largely in the purchase of seeds and spring fertilizers, besides getting much better articles than are generally sold by small dealers. There has been no movement since the war that has given so much encouragement.

**NORTH CAROLINA.**—*Moore*: There is commendable improvement in flour-milling, both by steam and water power, and in quality the flour will compare favorably with that made elsewhere. *Robeson*: Not much flour-milling or wool-working, but the people seem to be more alive to the importance of cotton-manufacture, and in some instances arrangements have been made, and are being made, to that end, water-power being abundant. *Greene*: Previous to the introduction of the Patrons of Husbandry, in August or September last, there was no co-operation in selling products or buying supplies. Since that time they have united, to a limited extent, in purchasing cotton-bagging, ties, and pork, saving, in the aggregate, two or three thousand dollars. The granges are now discussing the subject of buying pork, commercial fertilizers, &c., and also that of direct shipment of cotton to foreign ports by the State grange.

**SOUTH CAROLINA.**—*Union*: In purchasing supplies and fertilizers, a few of the granges have saved from 5 to 10 per cent. by ordering in quantity and paying cash. This has affected only a small part of our county. I believe that one-half of our laborers depend on liens to give them their supplies this year. I will add, as to labor, that a few foreigners have immigrated to us. I know more of the Italians than any others. They labor well, particularly those from the middle and north of Italy; but they have no families, and, of course, we cannot expect them to settle down and make the best of citizens. We need immigrants who will take root here, and make part and parcel of the nation. *Barnwell*: There are three organized granges in this county, but they have not yet been successful in practical results. *Marion*: We are beginning to derive benefits from co-operative buying. The trouble is that too few of the farmers are in condition to avail themselves of its benefits. A few individuals did co-operate in buying fertilizers last year, and by so doing saved \$150 on \$1,000 worth purchased. *Greenville*: Efforts are being made to establish country stores, to enable the farmers to supply themselves with better and less expensive tools, groceries, dry goods, &c. Home-manufactured cotton, wool, flour, and timber are increasing among the white people.

**FLORIDA.**—*Levy*: There is no co-operation among the farmers of this section, jealousy and distrust ruling the people, keeping them from uniting to send for supplies, or helping each other in any way. *Santa Rosa*: This county is not a field to be looked to for progress in the line indicated. The manufactures are confined to lumber, except the usual workshops of a community.



GEORGIA.—*Gordon*: We have had no co-operation in selling or purchasing in our immediate section. We have a very fine flour-mill recently fitted up, which has a capacity to grind all the wheat raised in our county. A cotton-mill is in process of construction in the county, that will use much of the cotton raised, which is said to be the most lucrative investment in the country. *Upson*: By co-operation in purchasing supplies, we were able to save 25 per cent. on bagging and ties, 60 per cent. on shoes, and from 90 to 110 per cent. on iron, and everything else in proportion. Co-operation is, with us, in its infancy, and consequently our operations are not very extensive. There is some little agitation upon the subject of manufacturing our own cotton. *Liberty*: Co-operation is not only impracticable but oppressive to the South. For instance, the last season was disastrous to our southern products, and the granges of the West have co-operated to enhance the prices of bacon and flour. This may be a blessing in disguise, however, and force the South to abandon cotton-culture and devote her attention to cereals. *Dooly*: There is as yet no co-operation among planters. Every man acts for himself, independently of everybody. When cotton is "up," a majority of planters sell early, but the past cotton season they were forced to sell in consequence of the heavy liens resting over them. Our State legislature has repealed this "lien-law," which never should have been upon our statute-book. *Early*: I am glad to say that we have a cotton-factory of 1,100 spindles, established since the war, consuming about 500 pounds of cotton per day. Nothing manufactured at present but yarns, which supply the home demand, besides shipments to other points. It has one of the best water-powers in the Southern States, and is capable of running an almost unlimited amount of machinery. *Macon*: In my own neighborhood forty or fifty planters have united and purchased several thousand dollars' worth of meat, flour, sugar, coffee, lard, &c. By so doing we have saved \$5 per thousand on bacon, \$10 per thousand on flour, \$20 or \$30 on sugar, and so on, on nearly every article purchased in this way. *Brooks*: There has been no co-operation in selling products or purchasing supplies in this county the past year to an extent worthy to be mentioned. There is a cotton-factory, run by steam, of fifteen hundred spindles, at Quitman, in this county, in successful operation, which also cards, spins, and weaves wool. It is regarded as a good thing for our county. No other efforts have been or are being made toward "extending" or manufacturing the products of the county.

ALABAMA.—*Saint Clair*: Our people sometimes send to the manufacturers and purchase articles in quantity at the makers' wholesale prices. *Lauderdale*: We have two cotton-factories, started within the last two years, which consume about 1,000 or 1,200 bales, and make a good market for country produce.

MISSISSIPPI.—*Smith*: In selling we make a saving of \$1.53 per bale. In purchasing supplies we save about 20 per cent. *Claiborne*: By selling through our grange agents we have realized better prices, and save in commissions and charges equal to three-eighths of one cent. per pound in cotton. By buying through them we save from 20 to 40 per cent. *Hinds*: The farmers buy by the wholesale as long as they have the cash, and I believe a great revolution (an economic one) is now inaugurating. The merchants fear it, and are feeling its effects. I am glad the financial crisis is upon us. I am as much of a sufferer as any one, but it will save us from debt. The lesson is a severe one, but needed. I am satisfied many thousands of dollars have been saved by co-operative buying. *Attala*: It is believed that \$10,000 have been saved by co-operative movements the last year. *Panola*: The farmers have been benefited to some extent in the sale of their cotton and the purchase of supplies. *Rankin*: Associations for co-operation in purchasing supplies are extremely popular. The problem they undertake to solve is a hard one, viz: If one man with no money can purchase no supplies, how much can a thousand such men purchase? *Lauderdale*: In this county the Patrons of Husbandry have saved a considerable amount by establishing an agency at Meridian. In this they are obtaining their supplies, and even dry goods, at retail at a fixed percentage on wholesale cost, ranging from 2½ to 10 per cent. The whole amount saved in this way in the county by the agency here and by purchasing from other agencies must amount to \$50,000. *Newton*: In some instances planters who were unincumbered in their business have shipped their cotton to grange agents, and saved from \$2.50 to \$10 per bale. The saving is greater in buying than in selling. Parties have had flour delivered at \$7 per barrel that would have cost them, if bought, \$10, and there is a proportionate saving in other articles.

TEXAS.—*Fannin*: An organization was formed in November, 1872, to ship and sell cotton and purchase supplies. The cost of supplies was 15 to 25 per cent. less than retail prices, but the cotton remains unsold. *Uvalde*: Co-operation in the sale of beef has been of most advantage—say 20 per cent. profit; in farm-produce say, 15 per cent. Stock-drovers, Government contractors, and farmers have realized by co-operation during the last year, \$1,500. *Hill*: Little if any advantage has been gained by co-operative selling, but in the purchase of farming utensils, dry goods, &c., a very great saving has been made, and farmers are organizing to increase the benefits.

ARKANSAS.—*Lafayette*: We co-operate with nothing, and make no effort to extend anything else than our credit.

TENNESSEE.—*Grainger*: As to co-operation, there is nothing of that here; we are too far behind the times for that; the people here do not know that it is necessary to bring the plow, loom, and anvil together; time will cure this. *Giles*: We buy machinery, seeds, agricultural implements, &c., at a saving of 25 to 50 per cent. The building of flour and cotton mills, and other manufacturing establishments, is receiving attention, and strongly, by our best planters and agricultural press. We have recently had No. 1 flouring-mills and factories for manufacturing wool established near us; formerly our wool was sent to Bowling Green, Ky., or to New Albany, Ind.; we not only find it a convenience, but a great saving to have our products manufactured at home. Without specific data, I would say that at least \$100,000 were saved to my county last year by co-operative efforts. It is the only time during my life (fifty-three years) that the farmers had any concert of action or co-operative movement. *Greene*: Efforts are not yet matured for co-operation in selling products and purchasing supplies; but a determination to do so was sternly manifested, and has been so rapidly organizing that, outside of any co-operation, supplies can be purchased at a reduction greatly below prices prevailing a very few months since; reduced prices are attributable more to prospective co-operation than to any as yet in practice. *Haywood*: One cotton-mill has been erected at Brownsville the past year, with 100 looms, and the very best improved machinery, which promises to do well and is a step in the right direction. *Bedford*: Commenced organizing in our county last fall, and are just now, this year co-operating in the purchasing of supplies and farm-implements; they are making a saving now of 25 to 33 per cent. *Monroe*: There is no co-operation among farmers here yet. Flouring-mills are plenty, but do not grind more than one-fourth of the wheat-crop, *i. e.*, the surplus, for the want of capital. No woolen-factories in the county, but parties at Sweetwater are endeavoring to get up capital to erect a cotton and woolen factory. *Sumner*: We have already had decided gains in the purchase of many articles, but they have not assumed proportions sufficiently definite to base a report upon. They will work good if they have not too much steam for the burden to be propelled. *Washington*: Something has been accomplished in the way of co-operation in buying and selling. A few of our neighbors bought salt and plaster last season, and on a car-load saved thirtydollars. At another time they bought molasses at 44½ cents per gallon, that would have cost them 90 cents to \$1 if bought at retail. *Montgomery*: The system was begun at the latter part of the year. In one instance the farmers saved \$200,000 in storing their tobacco. *Grundy*: Several efforts have been made during the past year to form different co-operative establishments, but so far as I am aware they all died on the start. *Fayette*: In the sparsely-settled South it is much more difficult to obtain concert of action than in the Northern States. The negroes are also a drawback; they are all engaged in agriculture, but have as yet neither the means nor the inclination or ability to assist such movements, neither have they the inclination or the brains to improve. We are working and hoping and praying that before another twelvemonth will expire we will have better news to communicate. One large flouring-mill recently erected in the neighborhood, but the wheat is brought from abroad.

In the Western States, however, the co-operative movement has been general and active, involving nearly every county, and, in its economic aspects, decidedly beneficial. The saving by association for purchase of supplies has been large; the benefits of combination for sales of products have not been so positive. If wisdom and calmness continue to rule the efforts of farmers to secure the benefits of association the results will be cumulative and beneficent; diversity of production will obviate extreme fluctuation in price; manufacturing industry will compete for surplus labor in agricultural districts; the legitimate profits of producers will not be eaten up by locust-like hordes of non-producers, and agriculture will prosper.

WEST VIRGINIA.—*Wayne*: The only co-operative system practiced here is between the farmer, his hogs and his cattle, when he hitches up his team and drives through his corn-fields after they are ripe, and gathers a part of the crop, and then the hogs come in and gather the remainder; after them the cattle follow, and such of them as can subsist during the winter on the fodder that the farmer and his hogs have left standing. *Randolph*: There has been no saving either in selling of products or purchasing of supplies. No efforts have been made toward improvement. No flour-making except for home-consumption, no pork-packing, no woolen-factory, and all for want of intelligence and skill, enterprise and capital. *Nicholas*: Nearly all our products are manufactured here at home and for home-consumption.

OHIO.—*Logan*: I estimate that 28 per cent. of the farmers of this county have joined co-operative associations, and that they have realized a considerable saving. *Cham-*

*paign*: Our granges have received from manufacturers proposals for the sale of their farm-implements at lower rates than they sell the same to their agents. Sewing-machine manufacturers have done the same, the reduction in some cases being as much as 50 per cent. *Geauga*: There are from one to three co-operative cheese-factories in every township in the county; some of the factories are owned by individuals, who buy the milk from farmers at a price agreed on; others work up the milk of their patrons at a stipulated price per pound of cheese. Other factories are owned by the community, and men are hired to work up the milk. *Hancock*: Machinery has been purchased co-operatively, and on this one item alone 40 per cent. has been saved to the purchaser. Benefits have also accrued from co-operative selling, but the precise amount saved not well known, but may be safely estimated in thousands. *Morgan*: One "farmers' club" (numbering about fifty farmers) have saved \$1,000 the past year by purchasing their goods and supplies in quantities, and the sale of their home-commodities in quantities and shipped together.

**MICHIGAN.**—*Hillsdale*: No co-operative institutions here. We have several quite extensive flouring-mills in the county, manufacturing for export. We have one woolen-mill with a capacity of 120,000 yards per annum, valued at \$170,000, and have improved their spinning by adding a self-operating attachment at a cost of \$2,500. We have also one cotton-mill just started, and we think it will be a success, with a capacity of 70,000 yards per month. The cheese-factory at Reading is said to be the most successful in the county, and the largest in the State. Three years ago we had one in almost every neighborhood, but they have nearly all failed. Our grazing lands are not sufficiently compact to render the business generally profitable. Our butter is said to yield us more money than our wheat; four packers have paid out \$75,000 for butter during the past year. Our poultry and egg trade is also very heavy.

**INDIANA.**—*Ripley*: The only co-operation here is for purchasing milk for the Cincinnati market. We have a number of flour-mills, but none on an extensive scale. Our hogs are all shipped to Cincinnati, and the same may be said of cattle and sheep. But one woolen-factory in the county, running about six or seven looms. *Gibson*: A farmers' club established here; succeeded in purchasing for its members \$185-reaping-machines for \$155. The greater part of our pork is packed at home; but the greater part of the wheat-crop is shipped off. *Miami*: We have the largest woolen-mill in the State; owned by a company; our flour-mill is not sufficient to work up one-fourth our crop; our pork-packers have not cut up more than one-fourth the product of the county. The foundations of an extensive pork-packing establishment are now being laid, to begin operations next fall. *Pike*: We have one carding-machine, four grist-mills and a dozen saw-mills. There has been no extension of manufactures of any sort. If we had a railroad we could furnish millions of bushels of good coal, as we have thousands of acres of coal near the surface, from 3 to 10 feet in thickness. The flour manufactured to ship amounts to only 200 or 300 barrels per year; 20,000 hogs are driven annually to Cincinnati and other markets. *Brown*: Flattering reports are spread of the beneficial effects accruing from the organization of granges of patrons of husbandry; they have been but two months in existence, and in another month the county will be thoroughly organized and ready to begin operations. *Stark*: The co-operative movement is spreading rapidly throughout the county; in the selling of produce and purchasing of supplies a reduction has been obtained of at least 10 and 15 per cent. on supplies, and 25 to 30 per cent. on farm-implements, and, at the same time, obtained 10 per cent. more for their produce. *Morgan*: A large and extensive pork-packing establishment has been erected within the past year; 12,000 hogs were slaughtered the first season; the saving to the people of this county, by this enterprise alone, has not been less than \$35,000 during the season.

**ILLINOIS.**—*Mercer*: Some of the earlier granges think they save from 10 to 20 per cent. in their stores and goods. Arrangements are now perfected to purchase at wholesale prices, saving in some cases 50 per cent.; in fact we save for ourselves the former profits of the middle-men, and some think more. I believe as the result of co-operative action that the farmers of this county have already saved four or five thousand dollars, and will be enabled to save five or ten times that amount next year. *Lee*: Co-operation has, to a large extent, secured cash payments for all farm-implements, at wholesale prices. The granges are raising large reserve-funds, for the purpose of making their county and State purchasing-agents dictate prices to manufacturers, by buying largely at one time and paying cash, and in many instances saving to the farmer 50 per cent. *Fermillion*: Purchases are being made through the grange organizations, mostly through a county purchasing-agent; farm-supplies, sewing-machines, farming implements, wagons, fruit-trees, &c., are being purchased at wholesale prices, from 25 to 30 per cent. less than formerly. No benefit has yet been derived from the granges in the selling of farm-products. *Boone*: Co-operation yet in its infancy, still some benefit in the purchasing of supplies. As to manufactures, we have five or six thriving cheese-factories, three wagon-factories, one carriage-factory, carding-mill, flax-mill, and plenty of grist-mills. *Fayette*: In some communities they have been purchasing family supplies and some farming implements during the past

year, and they claim a saving of 30 per cent. on all such purchases. *Sangamon*: Co-operation has grown rapidly during the last twelve months; arrangements have been made with merchants and manufacturers for special rates. Two rolling-mills have been established near Springfield, and several new and profitable coal-shafts have been opened; two new lines of railroad have been run through the middle of the county. *Massac*: A large proportion of the wheat raised in the county was manufactured into flour and shipped; nearly all the pork raised last season was packed in the county and will be sold as bacon.

**WISCONSIN.**—*Dodge*: Co-operation has benefited members or patrons, in the sale of wool an increase of 15 or 20 per cent.; in the sale of sheep, 20 or more per cent. *Fond du Lac*: An average saving of at least 20 per cent. is claimed by those who have had the privileges of the co-operative movement. *Adams*: Some sections report a saving in the purchase of machinery and supplies, of \$100 and over; a saving has also been made in the selling of products; one of my correspondents says: "I believe our town has manufactured and sold 150 barrels of buckwheat-flour." *La Fayette*: Commodities are purchased from 25 to 40 per cent. less than formerly demanded; the total saving in the county from the movement may be safely estimated in thousands. *Outagamie*: A reduction of 50 per cent. in the freight on plaster delivered to us, and a saving of from 35 to 40 per cent. on farm-implements. *Green*: There are mills enough to manufacture all the wheat raised in the county into flour, yet this is not done, most of the wheat going to Milwaukee. One woolen-mill is in operation that consumes 20,000 pounds of wool annually.

**MINNESOTA.**—*Dakota*: A saving of from \$20 to \$100 per family in the purchasing of groceries and dry goods; a flouring-mill has also been built by co-operation. *Houston*: The members claim that they save from 10 to 15 per cent. in the purchase of farming implements, machinery, goods, supplies, &c.; a large flouring-mill has been put in operation during the past summer, and the result is a better market for good wheat. *Dodge*: We have got a reduction on our groceries and dry goods, but not on our machinery, nor have we got a cent more for our produce. A company has been formed in Claremont, in this county, who are building a flouring-mill to be propelled by wind-power; the company is composed of farmers who propose to grind their own wheat, and if it should be successful others will soon follow. *Martin*: The granges have saved their members from 25 to 30 per cent. on their purchases, and an increase on their sales of about 10 per cent. On purchases alone I think the granges have saved the farmers of this county at least \$10,000, and an increased value of \$5,000 on their sales during the past year. *Douglas*: Have only had four months' experience in co-operation; in purchase of supplies we save about 18 per cent., on machinery 30 to 40 per cent. *Wasca*: Probably \$20,000 have been saved by the granges concentrating their trade with one merchant and thus keeping the prices down.

**IOWA.**—*Delaware*: No marked change in selling, but in the buying of agricultural implements there has been some saving, some say as much as 20 per cent., others claim 10 per cent., but the great bulk of implements are still purchased in the usual way. *Boone*: Co-operation has not been of such a character as to result in any material benefit to any portion of our producing population. Useful and remunerative manufactories are but in their infancy, and as such their utility to the country and their profit to themselves must necessarily be somewhat limited. *Johnson*: The co-operative movement has had the effect to produce a more uniform price for the farmer, and by purchasing for cash gives the advantage of low prices; in this way the producer has saved 20 per cent. in sales and purchases. *Poweshiek*: A saving of 10 per cent. in the purchase of dry goods. *Cathlam*: I think we have better prices for our grain and stock, and we certainly get our machinery from 20 to 50 per cent. less than we ever did before. *Jefferson*: The only effort made in this county has been the establishing of "grange stores," the proprietors of which agree to sell for a certain per cent. less than the customary profit, on condition that the farmers' organization shall deal exclusively with them. This has effected a slight saving on their purchases. *Green*: But little has been done here except in the way of purchasing general merchandise; arrangements have been made with dealers to furnish us goods at from 10 to 15 per cent. profit on wholesale cost. *Guthrie*: We have saved from 30 to 50 per cent. in purchasing of our plows and other farm-implements; heretofore we paid from \$5 to \$6 for shoeing a span of horses, we now pay from \$3 to \$4 for shoeing a span. *Buena Vista*: The price of coal has been reduced from \$6.50 to \$4.50 per ton; the community has saved \$1,500 this way. *Hardin*: The farmers from this point shipped six car-loads of hogs last fall, realizing about \$50 per car-load over what buyers were paying. We are running a warehouse at this place, and have shipped over forty cars of wheat, several of oats, &c.; parties in other points of the county have also shipped considerably. In return for our hogs our agent brought us groceries at a saving of 25 per cent. Sewing-machines are bought by members for \$54, whereas the regular price in the market for the same machine is \$90; we save from 15 to 40 per cent. on our implements and almost every article we need; in this locality alone I might safely assert we have saved at least during the past year, \$2,980. *Plymouth*: Some little has been saved, by co-operative effort, in the pur-

chase of goods by the granges of this county. *Polk*: All our supplies, groceries, &c., are purchased by the car-load and at a considerable saving to the consumer; also encourage all kinds of manufactures among our own immediate neighbors and throughout the State. Besides the amounts saved in our purchases, we have been obtaining 10 per cent. in advance of our former sales. *Iowa*: Five per cent. saved in shipping, 15 per cent. saved on farm implements, and 50 per cent. on groceries and supplies. *Tama*: A large saving in purchase of farm-machinery. *Grundy*: A great scarcity of money prostrates everything; with all the demand at home and abroad for wheat, it can be had for 85 cents per bushel.

**MISSOURI.**—*Boone*: We are now aiming to get up a large manufactory of implements for farm use; a large woolen-mill is near completion, and a pork-packing establishment of average capacity is in operation. *Gasconade*: Most of the grain is either consumed in the county or manufactured into flour, meal, &c., at the various mills. Wool is generally manufactured into cloth at home, and large quantities of wine are made each year. *Greene*: By their meetings, farmers have been brought more into contact with each other, which no doubt has, in many ways, been of benefit to them, learning what is best in the methods of each other. During the past year there has been put in operation a first-class cotton-factory, costing some \$125,000, a good woolen-mill, and also quite an extensive cotton-factory; and there will, in all probability, be a large pork-packing establishment in operation this approaching fall. But all these enterprises are either joint-stock companies, or carried on by private individuals. *Harrison*: The co-operative movement did not commence until late in the season; but it has shipped 1,000 head of hogs at a saving of from 80 cents to \$1 per head. The purchasing of supplies has just been inaugurated, and already promises a handsome advance in this county. *Lawrence*: The Grangers are beginning to reap the benefits of co-operation in a few things, such as the shipping of horses, which is beginning to pay very well, and the bringing down of the prices of a few articles considered necessary. No new effort has been made toward manufacturing home productions in pork-packing nor wool-working. This county, however, possesses the resources for immense wealth if properly assisted by skill and capital. *Moniteau*: The Patrons have, in a small way, been testing the benefits of their system in purchasing agricultural-implements and family supplies. The implements have been purchased at a reduction of 15 per cent.; but arrangements have been so perfected that, by the next crop-season, they can be had for 30 per cent. less than formerly. Family supplies are bought at 15 per cent. less than formerly. I estimate the total saving of the county at \$10,000 during the past year. A woolen-mill is talked of; also a grain-elevator, and a pork-packing establishment will be ready for the next hog-crop. *Clinton*: Last spring some of the enterprising farmers of this county and the one adjoining county (De Kalb) formed themselves into a joint stock company, with a capital of \$30,000, divided in 1,000 shares. The object of this company is to procure cheap supplies and farm-produce, and save to themselves the profits of the middle men. A small woolen-factory has lately been put into operation, and the question of "extending" the products of our county is freely discussed. *Washington*: We have, as individual enterprises, excellent flouring-mills, for the manufacture of all our wheat and corn; beef, mutton, and pork find a ready market at our furnaces and mills, at better rates than the Saint Louis market affords, hence nothing is shipped to the general markets. *Newton*: A reduction in the cost of supplies of from 5 to 50 per cent; and one-half or two-thirds of the farmers belong to the granges. *Saint Francois*: Eight or ten granges have been established, but as yet no practical benefits have been realized. *Reynolds*: All our corn, wheat, pork, &c., are taken to the railroad, about twenty miles distant, and sold by the merchants of this place, who buy whatever the farmer has for sale, pay for their purchases in goods and then ship the same at stated. *Osage*: Machinery is purchased for 10 per cent. less, but there is no great amount of manufacturing here. The total amount saved from co-operative effort is perhaps not far from \$8,000. *Callaway*: As yet not much has been done, except to effect a saving in the purchasing of supplies, as we had but very little to sell; but our groceries, farm-machines, sewing machines, &c.; are now got at greatly reduced rates. *DeKalb*: But a comparatively small saving has been the result, as merchants have sold as cheaply as the co-operative stores could, and in that way a saving has been effected for all. No efforts toward manufacturing any raw material. *Pettis*: No higher prices have been realized in selling through the influence of the grangers; but in buying, the saving has been from 30 to 50 per cent., and the total estimated aggregate amount saved is put down at \$75,000 in this county alone. There is not sufficient wheat raised in the county to supply the mills that are at present in operation, Wheat is brought in from adjoining counties and flour is extensively exported. Our hogs are all shipped to Saint Louis and Chicago, and bacon is reshipped the next summer season. One woolen factory is running, but for home consumption only.

**KANSAS.**—*Reno*: The benefit derived from co-operation in the purchasing of supplies has been of great advantage to many farmers; 20 per cent. has thus been saved; there is an effort to build a first-class mill, to be run by water-power, and it will be in readiness for our next crop. *Cowley*: In once instance the farmers united and appointed

an agent from their number, and he sold 1,000 bushels of corn at 40 cents, instead of 35 cents, that others who sold individually were receiving at the time. We are in an extremely flourishing condition, and possess some of the best natural advantages in the State—good streams and heavy belts of timber affording excellent protection to stock. *Neosho*: An effort is being made by the grangers to purchase one of the best flouring-mills in the country. *Butler*: A saving of 25 per cent. on farm-implements. *Doniphan*: The greatest benefit derived thus far from granges and farmers' unions is the organized determination to improve upon the present system of agriculture, and to resist all extravagant and useless expenditure that bear so heavily upon the farmer. But when we see the large number of acres on most farms growing to weeds year after year, with heavy expense of tax and fencing, the useless waste of animal food that should have been utilized, the vast quantity of farm-implements and machinery rusting and rotting on the ground, and then consider that much of this had been purchased with borrowed money, at ruinous rates of interest, the problem seems very plain. *Douglas*: The most good accomplished by the granges has been a toning down in the prices of all sorts of goods, and a large amount of money thus saved. *Franklin*: It is estimated that during the last year at least \$5,000 were saved by purchasing farm-implements and machinery through the influence of the Patrons of Husbandry in this country.

NEBRASKA.—*Merrick*: The Grangers are doing away with quite a number of middle men; they are really purchasing all their supplies at an average of 15 per cent. cheaper than outsiders. *Hall*: About \$1,000 saved in the purchasing of trees; blacksmithing has been reduced 30 per cent; hardware, 10 per cent.; groceries, 5 per cent.; we have also been able to obtain increased prices for our produce. *Otoe*: So far as it has been tested, co-operation has been of great advantage to the farmer, both in saving the profits realized by the middle men in the sale of farm products, and also those which are realized by agents in the purchase of farm machinery and implements, as well as instruments and utensils for household use. *Cass*: Farmers claim they saved from 20 to 30 per cent.; merchants are beginning to give us better terms on staple goods. *Nemaha*: At least \$5,500 was saved by the farmers holding on to their hogs and thus forcing speculators to come to their terms.

CALIFORNIA.—*Alameda*: The co-operative movement as yet has not amounted to what many had anticipated either in this county or State, and it is a mooted problem whether, for the present, much advantage will grow out of the movement, particularly in the handling of the grain-crop on this coast, which has to find a foreign market. The "wheat ring" of this State controls eight-tenths of the capital that can be obtained to handle the grain-crops of the Pacific coast. Through their agents in Europe, Australia, and other foreign countries, they are and have been chartering ships six and eighteen months in advance, and should a stray ship come into our ports, they will bid the charter so high as to forbid all competition. *Stanislaus*: The little co-operation we have had here has certainly had the effect of sustaining the price of wheat and kept the speculators from realizing the large gains they have hitherto enjoyed. A few farmers joined in erecting a large warehouse in the city of Stockton and receiving on storage, at a low figure, hundreds of tons of wheat, and those in need of funds to pay debts or expenses pledged their warehouse receipts to moneyed men at a low rate of interest, thus obviating the necessity of crowding their products upon the market and depressing the prices. Thousands of dollars were thus saved to those who took advantage of the measure.

OREGON.—*Lane*: Merchants are reducing the price of farm-implements and other things, so there will not be much difference when the co-operative measures will be introduced. *Douglas*: Through the State agent at Portland we can purchase farm-machinery at a reduction of 15 to 35 per cent. less than formerly.

TERRITORIES.—WASHINGTON.—*Walla-Walla*: The co-operative system of buying and selling has not been sufficiently tested yet in this county. We have already several good flour-mills in operation, one woolen-factory, and are now getting ready to establish a manufactory for manufacturing sugar from beets.

UTAH.—*Box Elder*: From wool raised in this county, mixed with a little cotton-yarn, there has been manufactured, by the aid of machinery, nearly sufficient cloth to supply all the people of the county in that line, but some has been sold to the neighboring county, and the hides have been manufactured into leather, which our shoemakers have made into boots and shoes. All this has been done by co-operative system, represented by a large number of farmers, who have saved thousands of dollars to the county. *Salt Lake*: Our co-operative system during the past year has been very discouraging, chiefly through mismanagement, though other and more deplorable causes have contributed largely to the disaster befalling an association established under most favorable auspices, and heretofore yielding fair and satisfactory dividends. *Rich*: We co-operate in fencing our fields, and thus save time and means, and also, to some extent, in purchasing supplies, but none in selling. We have now three flour-mills, five saw-mills running, three more in course of erection.—*Weber*: Through co-operative effort the following shipments of products

have been made: Wheat, 126,000 bushels; barley, 19,000 bushels; oats, 9,000 bushels; dried peaches, 160,000 pounds. Total value, \$175,200. *Iron*: We have a store on the co-operative plan, owned by the people, in shares of \$25 each, and which declared a dividend of 25 per cent. last year. We also have a co-operative stock-raising company, with a dividend of 50 per cent; also, a co-operative sheep-herd, which has declared a dividend of 50 per cent. A co-operative tannery is also in operation. All these associations are of vast benefit to the people and have saved them thousands of dollars, and they have also kept us out of the clutches of rapacious middle men and speculators. *Morgan*: We have a co-operative mercantile company, embracing mechanics as well as farmers, for the purpose of disposing directly of our produce, and purchasing our goods, implements, and machinery wholesale.

DAKOTA.—*Lincoln*: Nothing has been made from co-operation in selling products, but in purchasing supplies about 10 per cent. has been saved. Two flouring-mills have been put in operation during the past season. They will flour about one-fourth of the wheat raised in the county during the past season. *Bon Homme*: Two flouring-mills have lately been brought into the county, but not yet completed.

## QUALITY OF THE COTTON-CROP.

A special circular, addressed to our regular corps of correspondents in the cotton States, intended mainly to obtain the local views of planters as to quality of the fiber of the last crop, causes of injury, and incidentally other peculiarities of the season, makes the following inquiries:

1. At what date did picking commence in your county, and what date would you fix as an average for a series of years? How much later (or earlier) the last year?
2. At what date did the first killing frost occur this season, and what is the average date for the recurrence of such frosts?
3. At what date did the cotton caterpillar make its appearance?
4. What is the quality of the fiber in comparison with an average quality, and what the cause and character of injury of that which is injured? What portion of the different grades?

The responses have been very general, including a large portion of the cotton-growing area. It was not expected that there would be either a uniform or accurate classification, which might perhaps be better reported by commission-merchants of the several cotton-markets; but the peculiarities of the cotton of different localities, and their various causes of damage to the fiber, can only be properly set forth by the planters themselves.

In analyzing these returns the idea is forced upon one's attention that the cotton-planters, like the average fruit-grower, dairyman, or other rural specialist, loses immensely by lack of system and thoroughness, as well in culture as in preparation for market. It is easily demonstrable that immense sums could be saved by a slight elevation of the standard of skill and care in picking and ginning. At present low prices little more than half a cent per pound would make ten millions of dollars in a crop of four million bales. A great difference in grades is inevitable, but it is easy to increase the proportion of the high grades. A glance at this variety, and the difference in prices, as shown by the last quotations in the New Orleans market, will illustrate this view: Low ordinary,  $8\frac{3}{4}$  to  $9\frac{1}{3}$  cents; ordinary,  $10\frac{3}{4}$  to  $11\frac{1}{3}$  cents; strict ordinary,  $11\frac{5}{8}$  to  $11\frac{7}{8}$  cents; good ordinary, 13 to  $13\frac{1}{4}$  cents; strict good ordinary,  $13\frac{1}{4}$  to 14 cents; low middling,  $14\frac{1}{2}$  to  $14\frac{3}{4}$  cents; strict low middling, 15 to  $15\frac{1}{4}$  cents; middling,  $15\frac{1}{2}$  to  $15\frac{5}{8}$  cents; strict middling,  $15\frac{3}{4}$  to 16 cents; good middling,  $16\frac{7}{8}$  to 17 cents.

Nearly three hundred cotton counties are represented in these returns. Divided into three classes, those returning quality as average, those expressing various grades of superiority, and those with indications of average quality inferior to that of a series of years, we find the percentages represented by each of these classes to be respectively 36, 37, and 27. This would indicate a quality for the entire crop a little above an average. The injury by caterpillars to the earlier pickings cut short the top crop, which is inferior and liable to be stained, while the fine weather of the autumn ripened more thoroughly the middle crop.

The reports of quality, in comparison with an average for a series of years, are, in North Carolina, divided very nearly equally between the three classes, average, below average, above average, with a slight preponderance in favor of the latter. In South Carolina the number in each of the three classes is exactly equal. Georgia reports an advance in quality, 27 per cent. of the reports being below and 40 per cent. above average. In Florida the average reports are not numerous, the other two classes being equal in number. In Alabama, average reports are 40 per cent. of the whole number; above, 36 per cent.; below, 24 per cent. Mississippi, average, 45 per cent.; above, 22; below, 33. In Louisiana scarcely any of the reports indicate superior quality; those below average slightly predominate over the average reports. Decided superiority in quality is reported from Texas, nearly half of the reports being above average, and very few below. Only 22 per cent. of Arkansas reports are below average, 43 above, 35 average. More than half the Tennessee reports indicate superior quality, the remainder average.

The causes of injury are various, the more prominent being the ravages of worms in stopping the development of the bolls and staining the fiber; the destruction of the plant, or beating out the fiber, or reducing its grade with dirt and "trash" by heavy storms of rain or wind; premature decay arising from imperfect cultivation, superabundant moisture in the soil in the spring, drought in summer, and the train of diseases which accompany low vitality of the plant from whatever cause; and, finally, the effect of frost in arresting the development of half mature fiber and in discoloring it. The relative influence of each cause, in damaging the crop of 1873, as indicated by our correspondents, may be stated in the following order in the different States:

*North Carolina.*—Rains, frost, worms.

*South Carolina.*—Rains, frost, worms.

*Georgia.*—Worms more than all other causes combined; rains, frost, drought, high winds.

*Florida.*—Storms of rain, worms.

*Alabama.*—Worms, rains, frost.

*Mississippi.*—Worms, spring rains, drought, frost.

*Louisiana.*—Worms, rains, high winds.

*Texas.*—Worms, rains, drought, frosts, bad gins and inexperienced ginners.

*Arkansas.*—Rains, worms, drought, frost.

*Tennessee.*—Drought, frost, rains, plant-lice, a cold and wet spring.

In the Gulf States the greatest injury thus appears to have been wrought by worms, excepting only Florida, where the devastating storms in September and October, particularly that of September 19, proved more destructive than the caterpillar, which was abundant and sufficiently injurious. Though the main damage by insects was done by the caterpillar (*Anomis xyliæ*), there was much loss occasioned by



the boll-worm, (*Heliothis armigera*), and some injury in localities by the the cotton-louse, or *Aphis*.

The theory of our entomologist, which he deems to be sufficiently verified by some years of study in the field, as to the movement and spread of the caterpillar is, that in the more northern portion of the cotton-belt the frosts of winter destroy the insect in all its stages, unless in situations of unusual protection, but that in the more southern portion, where severe frosts rarely occur, they survive the risks of winter, and as they increase, by their repeated generations during the summer, they migrate northward in the fly-state (the perfect insect) to "fresh fields and pastures new." This would account for the general prevalence of the insect on the Gulf coast, and its comparative scarcity and late appearance in more northern regions, which facts are by no means singular in the records of the past year, but in accordance with the history of former visitations. Their first appearance in Florida was noted in June, while in North Carolina they generally came too late to do much injury; indeed, their presence is rather desired in September by many northern cultivators, that the leaves may be partially stripped and the growth of weed checked for the better maturing bolls before the coming of October frosts. Very few of the Tennessee counties report injuries by cotton-worms, and those are either in the first or second tier of counties from the southern line, and in no case is the injury reported of any great severity. In Georgia several southwest counties reported the presence of worms in June, as Stewart, Schley, and Sumter; in July the counties infested were farther north, but considerably scattered. A similar state of facts is presented in returns from other States, sufficient to show that their earliness of appearance, and therefore serious multiplication in subsequent months, bears a marked relation to the degree of winter temperature of different cotton-growing districts. Still, it is impossible to trace closely every step in their progress northward, from the fact that the caterpillar and boll-worm are not generally distinguished in the reports, but are usually included under the term "worms."

These returns also include a record of the time of commencing the first picking, a statement of the average date for a series of years, the date of recurrence of the first killing frost, and the average date of the first destructive frosts. The statements of the different counties of each State, so far as reported, are recorded and an average made, which is presented in the following table:

States.	Date of first picking.		Comparison with last year.		Killing frost.		Appearance of worms.
	1873.	Usual date.	Days earlier.	Days later.	1873.	Usual date.	
North Carolina .....	Sept. 16	Sept. 9	.....	10	Oct. 21	Oct. 21	Aug. 29
South Carolina .....	Aug. 30	Aug. 23	.....	8	Aug. 22	Oct. 25	Aug. 28
Georgia .....	Aug. 27	Aug. 26	.....	4	Aug. 22	Oct. 25	Aug. 22
Florida .....	Aug. 13	Aug. 9	.....	1	Oct. 30	Nov. 8	June 28
Alabama .....	Aug. 26	Aug. 28	.....	3	Oct. 20	Oct. 19	July 28
Mississippi .....	Aug. 27	Aug. 23	.....	6	Oct. 22	Oct. 23	July 21
Louisiana .....	Aug. 27	Aug. 17	.....	8	Oct. 23	Nov. 4	July 22
Texas .....	Aug. 26	Aug. 15	.....	18	Oct. 29	Nov. 7	July 28
Arkansas .....	Sept. 11	Sept. 17	.....	3	Oct. 24	Oct. 22	Aug. 23
Tennessee .....	Sept. 5	Sept. 11	.....	5	Oct. 15	Oct. 16	Aug. 16

These figures indicate about an average forwardness of the plant in Georgia, with a constantly increasing retardation westward, from Alabama to Texas, though singularly enough the date of the five States differs only by a single day, all but Texas and Alabama having the

27th of August as its date of commencement, which is later than usual for the Southwestern States. But in the next tier of States in the Mississippi Valley, in which the commencement (the average for all counties) is usually deferred to September, the usual date is anticipated six days in each, though Tennessee was still eight days behind Mississippi, and Arkansas fourteen days. The cotton counties of Tennessee being almost confined to the Tennessee Valley and the area lying between the Tennessee and the Mississippi, the date is made earlier than the average for Arkansas, though the bulk of the Arkansas product is made from counties which would average as early a date of picking as those of Tennessee. Pulaski County, Arkansas, returns a comparison with several recent years, which is as follows:

	1873.	1872.	1871.	1870.
Picking commenced.....	Sept. 10	Aug. 25	Sept. 1	Aug. 25
Date of killing frost.....	Oct. 23	Nov. 24	Nov. 11	Nov. 17

The recurrence of killing frosts appears to have been later in Arkansas than usual, as late in North Carolina, varying little from usual average dates in South Carolina, Georgia, Alabama, Mississippi, and Tennessee, and decidedly earlier in Louisiana, Texas, and Florida. On the whole, the average date appears to be somewhat earlier for the entire crop, but the fine weather for ripening and picking in November and December far more than counterbalanced this small disadvantage, and added a material amount to the aggregate of cotton to be gathered.

This is given as approximate data on these subjects. It would take very careful and long continued observation and record in all of the counties to establish true averages; and the local variation is so wide, and the change from one year to another is so great, that successive periods of definite length, as quinquennial or decennial, might never be found to agree very closely with each other.

The following extracts, giving the pith of some of the most noticeable explanations concerning the quality of fiber and causes of injury, will illustrate the general tenor of the returns upon these points.

**NORTH CAROLINA.**—*Harnett*: Not as good as average on account of rains. *Greene*: As good as I ever saw it. Very little yellow cotton, and the yield of lint in seed-cotton never better. *Montgomery*: Fiber a little less than an average. Damage caused by much rain during the maturing season, and on account of rust the lower grade worth nothing. *Beaufort*: Pronounced above an average. Amount of inferior grades smaller than usual. On account of caterpillar, and other causes, there is no top-crop, hence nearly all the bolls were fully matured before opening; also, more manure was used and better cultivation than usual. *Pamlico*: About 100. No injury; 20 per cent., low middling; 60, good ordinary; 20, ordinary. *Lincoln*: 100. Opened early and almost all at once, and not much rain, so that there is very little difference in the grades. *Franklin*: Better than an average. *Polk*: Cotton opened better than usual, and there is less yellow this season. *Gaston*: Character of fiber good, and the per cent. of yield from seed large. Only injury is from frost, which, on account of lateness of crop, will be considerable. *Bertie*: About an average and none injured, except the very late. It runs low middling and good ordinary, about equally divided. *Mecklenburgh*: Better than the average; less stained than for ten years. A large proportion is low middling. *Davidson*: Quality below average. Cause of injury lateness of fruitage, the longer warmer days being necessary; abundant rains, causing a too rapid and large growth of weeds at the expense of fruit. At least one-third of crop injured. *Pasquotank*: Fiber is of average quality. *New Hanover*: Appears to be lighter, compared with the average of former crops. The cause must be rust and caterpillar. *Stanly*: Longer and finer in every variety cultivated. Wind and rain, by throwing out and soiling, have injured the first opening to a small extent; but the late opening bolls, yielding the lowest grade, have not suffered much. *Gates*: About an average. Injured by caterpillar and early frost. At least one-third ordinary.

*Cumberland*: Average; some injured by frost and heavy rains. Twenty-five per cent. stained or yellow. *Wake*: Not quite so good as last year. Caterpillars and wet weather caused some injury. *Rutherford*: Lint cotton is better than common, owing to dry warm weather for picking. *Pitt*: Twenty per cent. over an average. Injured by being caught by frost before full maturity. Proportions, 90 good, 10 injured. *Camden*: Poor; not more than 75 per cent. *Onslow*: Second grade. *Warren*: Equal to the best average. There is but a small proportion of inferior grades, as our seasons were good and the frosts late. *Granville*: Above average. Too much rain in August damaged the crop a little, not much. *Tyrrell*: Fiber harsh compared with other years. *Guilford*: Good in comparison with an average. But little cotton is injured in any way.

**SOUTH CAROLINA.**—*Georgetown*: Fiber good in the early picking. Heavy and protracted rains in September damaged the remainder. *Richland*: Unusually good. Cotton did not open until well matured generally. Much is injured by yet remaining in the fields. *Orangeburgh*: As good as usual. About one-fifth stained from rains. Middling three-fifths, low middling two-fifths. *Edgefield*: Will compare favorably with an average. Much is short from effects of rust and caterpillar. To classify, would say, five-eighths good, middling, three-eighths lower grades. *Greenville*: Finer. *Lexington*: About an average—not quite equal to last year. Excessive rains caused injury by rotting the bolls and staining the fiber. Proportion, 1st grade, 60 per cent.; 2d, 35; 3d, 5. *Clarendon*: Something above an average. Rain injured the first picking, but a favorable change in the weather gave a much better quality. Taking the crop as a whole, the quantity and quality fall below an average. *Fairfield*: Good as usual. *Marion*: Perhaps four-fifths will be of superior quality. The remainder will lack maturity. *Cheraw*: About an average. Only two or three grades in the market; low, middling, and ordinary. About one-eighth will be ordinary. *Barnwell*: Not quite an average, in consequence of unfavorable picking season. Middling, one-fourth, lower middling, one-fourth, ordinary, one-half. *Chester*: Average, one-third, low middling and above; one-third, good ordinary; one-third, ordinary. *Williamsburgh*: Not equal to ordinary average. Too much wet weather injured the early picking, making it dingy and trashy. October pickings injured by immature bolls, having imperfect seed. The larger part of the crop is low middling, some middling, and strict middling, the boll and ordinary. *Marlborough*: Quality of fiber equal to the average. *Newberry*: Better this season than usual. The cause of short staple is drought. The only injury to the staple this season is from stain on red lands.

**GEORGIA.**—*Spalding*: An unusual proportion of good cotton. Only injury sustained was stain caused by worms and one severe storm. *Richmond*: Below average, owing to irregularity of season and loss of leaves by caterpillar; about one-fourth will average Liverpool middlings; balance lower grades. *Charlton*: Equal to an average. Injury sustained is one-fourth to one-third of the crop, caused by the caterpillar, which fell mostly on the inferior grades. *Dawson*: The fiber is over average. *Whitfield*: An average. No injury and consequently no low grades. *Early*: Much below average. Causes: Wet weather while the bolls were maturing, imperfect cultivation, poor land, storms, and worms. Staple dirty and inferior; one-fourth ordinary, one-half good ordinary, one-fourth low middling. *Dooly*: First picking is an average of former years. Last picking considerably damaged by storms, caterpillars, and frost; would say 15 per cent. *Columbia*: Fine, perhaps above an average. No particular injury; mostly damaged by wind and rains. *Clayton*: Equal to an average. Injured by caterpillars and storms. *Effingham*: Good as last year in quality. *Calhoun*: Is an average. Low middling, one-fourth; ordinary, one-half; low ordinary, one fourth. *Worth*: An average, but lighter. Injury was done by the caterpillar cutting the leaves, and then a rain on it, by which the open bolls were badly dyed or stained. We have a new cotton called the "Mexican." It has a leaf like the "negro-killer," and "sweet-potato vine," and is called by some "Negro-killer cotton." It is a pretty good cotton and can be improved. No caterpillar or insect will touch it. Very scarce, and I could only obtain two dozen seeds. *Oglethorpe*: Fiber 10 per cent. better than last year, and above the average. *Gordon*: Better than an average. A very small proportion stained by frost. *Monroe*: About average. Perhaps three-fourths low middling, balance inferior. *Troup*: Fiber much shorter than usual. Neither the seed nor fiber matured well. *Schley*: As good, except what we call "motes," which is unmaturing seed, caused by caterpillars stripping the foliage and thereby stopping the maturing of the bolls and causing premature opening. *Stewart*: Twenty per cent., low middling; 35 good ordinary; 25 ordinary, and 20 below ordinary. *Sumter*: Far above an average. Very little injured. *Forsyth*: Better than an average. But two grades this season: nine-tenths first quality; not more than one-tenth injured by caterpillar and frost. *Campbell*: Above average. Slightly stained by frost, about ten per cent. *Johnson*: Late picking injured about 25 per cent. by caterpillars. *Madison*: Not an average on account of caterpillar and early frost. *Upson*: Fiber extraordinarily fine of the cotton that matured before caterpillars struck it. The green and unmaturing bolls that were stripped by caterpillars were seriously injured; the fiber short and poor, and

the seed unfit for planting. About one-third good, one-third medium, and one-third poor. *Hall*: More good cotton than we ever had; but little yellow cotton. *Butts*: Better than usual. *Putnam*: Rather better than average. Some litter from the caterpillar. *Cherokee*: Almost all of the first grade; probably one pound of inferior to fifty of good. *Cobb*: Said by buyers to be better than common. Some trash, caused by worms, and some yellowish, caused by frost. *Hart*: Nearly all good middling, there being little or no yellow cotton. Long dry fall, favorable to picking. *Marion*: First picking good. Second picking injured by caterpillars, about one-third, and third picking one-half. *Wilkes*: Good; probably above average. One-half to two-thirds good; remainder injured by being blown out, standing in the field too long, and stained by rain and frost. *Jefferson*: About 90 in comparison with an average. Excessive rains and caterpillars caused some injury. The late bolls nearly all lost from these causes. *Brooke*: Quality of fiber is an average; probably above. Nearly one-half damaged by storm; gathered from the ground and full of sand, dirt, and trash. *Macon*: What we have always sold as low middling cotton has been classed this year as good ordinary. Planters are inclined to think this is a result of the money panic, rather than a difference in the fiber. *Taylor*: Bottom, or first crop, average quality. Middle, or second, about 87½; top, or third, not more than 10, average. Worms damaged middle crop, and nearly completely destroyed the value of the third. *Warren*: Fiber perhaps an average compared with former years since we commenced the use of commercial fertilizers. *Floyd*: Better than average quality, but does not sample so well because of the gluten or slime left by worms. Fibers unusually long and strong; not injured by the worm. One-half to five-eighths appears to be damaged somewhat by stain, which imparts a dead, dull appearance. *Fulton*: Equal compared with average. *Murray*: At least 15 per cent. above an average. No injury. *Houston*: About one-tenth inferior on account of immaturity, caused by caterpillars. *Muscookee*: Full average. Later picking deficient on account of the foliage being stripped by caterpillars, and bolls opening prematurely. *Bartow*: All of 5 per cent. better. More good cotton this season than usual, as we have the most favorable fall for a number of years.

FLORIDA.—*Jefferson*: Storms blew much of it out, and it was injured by trash and sand. Grades, about one-half good ordinary, a little low middling, balance ordinary. *Jackson*: Better quality than usual; classed in the market as "good ordinary;" a few bales reach low middling and occasionally middling. In one part of our county, on account of storms and heavy rain, the cotton is stained by the red soil. The litter occasioned by the worm injures the appearance, the rust retards the growth and causes imperfect development of yield, injuring appearance and staple. *Gadsden*: There is a marked superiority in the quality of the fiber, whether considered with reference to length, strength, or fineness, over the average of the crops of former years. It is attributed to favorable weather which marked the close of the growing season, bringing the bolls to a fuller maturity, and consequently a more perfect development of the fiber. *Columbia*: Ten per cent. inferior, and rain in September the cause. All of the bottom crop or lower grade injured. *Suwannee*: About one-fourth of the crop badly injured by storm of September 19; the remainder fully an average. *Orange*: Equal an average; injury was caused by storm of the 6th of October. The lint was blown out of the bolls and made trashy. Much that was open was destroyed by a severe storm on November 15. *Wakulla*: Supposed to be a little below the quality of last year. Causes, too much wet weather and too little cultivation. The gale on the 19th of September damaged one-fourth of the crop. *Leon*: Divided into two grades—"storm cotton" and "before the storm cotton"—about one-half of each; former sandy and trashy; latter about as usual. *Levy*: Greater proportion of lint to seed; staple not so fine, though stronger; only injury was from rust; about four-fifths medium fair, one-fifth fine. *Putnam*: Better, owing to planting improved seed. Deteriorated fiber, caused by inferior seed and impoverished land. Seed not improved will naturally deteriorate, and land impoverished by continual cultivation and no manure, will cause rust, which has seriously damaged the staple. Common, 80; fine, 20.

ALABAMA.—*Oxford*: Fully equal to former years, but our cotton merchants say that ours is nearly all classed as low middlings, this year not more than 10 per cent. of the amount below middlings. *Macomb*: Fiber is inferior to an average quality; cause, injury done the plant by the worms. Usual proportion of different grades. *Butler*: The cotton fiber is of average quality. Some cotton is injured by rain and being picked trashy. About two-thirds of our cotton will classify as ordinary, one-sixth as low middling, and the other sixth as inferior. *Lucrèce*: Strict good ordinary to low middling, with an occasional bale of middling. Last year (1872) it was ordinary. This is the classification of our most intelligent merchants. *Limestone*: The first picking much better than usual. About half the crop will be inferior, owing to the trashing of the worms, and will be much stained by the excessive rains in the latter part of October, and the first of this month. *Saint Clair*: The injury is caused by boll-worms and caterpillars. The worm bores into the boll, and causes it to stain and rot. The caterpillars impoverished the late bolls, and prevented them from maturing, and thereby stained the cotton, and damaged the fiber. In many instances the caterpillar ate up

the bolls, and in others bored holes. *Perry*: Above average. But little strict middlings. One-half middlings, and the balance low middlings, and ordinary. The sandy lands always produce the best grades of cotton. *Bibb*: Inferior. The caterpillar cut off the leaves before the cotton matured. *Maveno*: On the upland excellent, strong, and of good length. On the bottom lands, short and weak—injured by worms—much of it opening prematurely. One-tenth low middling; seven-tenths good ordinary, and two-tenths ordinary. *Crenshaw*: Ravages of worms caused some trash, but not more than usual. Three-fourths of the crop good; one-fourth from good fair to inferior. *Choctaw*: About as good as usual. *Blount*: Better than average. Less yellowed by late opening and exposure than usual. *Greene*: Twenty per cent. middling; 50 per cent. low middling; 30 per cent. good ordinary. *Walker*: Better than an average season. It is nice and fine. *Montgomery*: Fair average, there being no top or late cotton. No inferior fiber, except from neglect or delay in picking. *Bourbon*: Full average. After the first picking the yield of lint from the pound of seed-cotton was most remarkable, being in some instances, as much as two-fifths per pound of lint, whereas the average is not more than one-third. *Henry*: Caterpillars and storms injured the fiber. The proportion of grades is about one-tenth low middling; one-half good ordinary, and the remainder ordinary. *Conceh*: Cotton crop never was gathered in better condition, and the fiber will compare with previous years. All cotton from this county (with few exceptions) sold the present year has been classed as low middling. Mobile merchants say that the fiber or staple is short. Know of no causes for short fiber save the ravages of the caterpillar and dry weather during its maturity. Have only two grades, low middling and spotted; very little of the latter. *Lauderdale*: Very good, except on some few lowlands, where it rusted. Rust wilts the plant, and neither seed nor lint comes to maturity. The grades are about one-fourth to three-fourths. *Tuscaloosa*: Fiber of the bottom crop good; the balance of the crop not so good on account of ravages of worms. Two-thirds good; one-third indifferent. *Clarke*: About the same. First picking injured by excessive rains. Grades, one-quarter ordinary; three-quarters low middling. Prices ruling now, 13½ to 14 cents. *Randolph*: Better than common. The difference this year is slight. The damage was on bottom lands.

MISSISSIPPI.—*Jasper*: Quality below an average; supposed to be caused by the wet season. The greatest amount of grade "ordinary." *Marion*: Not as good as usual. Cause, the early date at which the leaves were destroyed. Most of our cotton classes low middling, say nine-tenths. *Madison*: Fiber is an average quality; about low middling. *Lee*: Worms and drought killed the top crop. All opened early, and consequently the grades are lower than formerly. No yellow or frosted cotton. *Winston*: Above average, from the fact that there has scarcely been any rain to injure the cotton during the last ten or eleven weeks: *Clarke*: One-third middling, one-third low middling, and balance good ordinary. On this question I have depended on cotton-buyers for information. *Smith*: About the same as last year. *Warren*: Five per cent. better than last year, owing to the better maturity of the bolls before opening, and about equal in quality to an average crop. *Grenada*: Fiber shorter and lighter, owing to a too-hurried maturity, brought about by a sudden transition of the crop from a very wet season to an excessively dry one, and the crop laid by in the wet. *Clairborne*: All cotton coming to market here was much above the average. *Attala*: Is equal to an average quality. Worms, and extreme seasons of rain and drought, have caused the injury that has occurred, which is mostly to the poorer grades—about one-fourth of the crop. The other portion would have been fine could it have been saved from trash and dirt. *Leflore*: Average; no injury. *Tishomingo*: Good average, except shorter through drought. But little of highest grades, if any; middling, two-thirds; one-tenth good middling; remainder, ordinary. *Kemper*: More good cotton this year than usual. *Newton*: A little better than an average; no injury; one-half, low middling; one-quarter, good ordinary; one-quarter, middling. *Amite*: The fiber this year is inferior, especially where the caterpillar ravaged. One-third of crop injured. Common staple the only grade raised. *Tunica*: About average. Proportions about equal from good middling to low ordinary. *Jefferson*: Not so good on account of worms. Great deal of immature cotton opened after the leaf was stripped. Stained from worm-excrement. *Jones*: Quality somewhat below an average. *Rankin*: Fiber a full average. An unusually small proportion has been injured by frost and long exposure. About 80 per cent. of the crop saved in good condition. Four per cent. frosted, and 16 injured by exposure. It will rate at about 60 per cent. middling, 20 low, and 20 ordinary. *Wilkinson*: Fully one grade lower on New Orleans classification. Staple shorter from too much cloudy weather or want of sunshine to mature; 45 per cent. good ordinary, 40 low middling, and 15 middling. *Panola*: Inferior cotton opened rapidly in September, faster than it could be saved, and a rain-storm on the 27th of September materially injured the entire crop.

LOUISIANA.—*Concordia*: The quality of the fiber is average, but the cotton does not class as high as average, owing to the fact that it is filled with pieces of straw and leaf, caused by worms, and which is not taken out by the gins. It is what we call *trashy*.

*Union*: Good, fair quality, in early matured crop; later crop, short staple; proportion, 1 to 3 of latter pickings. *Rapides*: From low middling to middling; fiber stained by rains. *Avoyelles*: About 25 per cent. less than an average, on account of very wet season, and early destruction of leaf by worms; about a general proportion of all grades. *East Baton Rouge*: Ninety per cent.; classed as low middling. *Franklin*: Our cotton may be properly put in two classes—that which fully matured prior to September 1, and that which did not. The first, embracing 60 per cent., is about average; the second, amounting to 40 per cent., 30 per cent. below average. *Tangipahoa*: Various grades nearly same as usual, perhaps 10 per cent. a lower grade. *Yalobusha*: There will be a larger proportion of nice cotton than usual, as the fall was favorable and crop gathered early. All saved before the heavy rains which fell on the 22d and 23d of November is nice cotton and of good fiber. *East Feliciana*: Not good, owing to heavy rains. *Morehouse*: The cotton picked up to middle of October is fine or low middling to strict low middling. All picked after that time is injured by heavy rains and winds, and is rated as good ordinary; 20 per cent. of the former damaged, and 10 per cent. of latter.

*TEXAS*.—*Bosque*: Quality of fiber better than average. Top crop slightly injured by frost. *Sabine*: Better than last year. Injured some by rain and worm; 50 per cent. injured. *De Witt*: Better than the average of former years, owing partly to the introduction of improved seed. Our cotton is not classified here by brokers, but there is great uniformity in the staple. The bulk of it is classed in the market as "good ordinary." *Smith*: Above average. New Orleans classification: one-eighth low middling, one-eighth strict good ordinary, one-half good ordinary, one-eighth ordinary, and one-eighth low ordinary. *Titus*: Two-thirds will compare favorably with an average of last year. One-third inferior. The freeze of October 20 caught the plants with an excessive growth and flow of sap, followed by a light rain which extracted and dripped the frozen sap upon all of the cotton not gathered, staining it badly. *Anderson*: 10 per cent. better; 20 per cent. stained by frost. *Kaufman*: In comparison with an average 10 per cent. better than last year. Injury was caused by excessive rains followed by drought. *Henderson*: Above average. Our cotton averages middling to low middling. *Liberly*: Possibly not an average, owing to not selecting the best seed. Peelor and Dickson planted in about the usual quantities. But little sea-land. *Burnett*: Very good; none injured; 45 per cent. middling, 40 low middling, 10 good ordinary, and 5 ordinary. *Grimes*: Fully equal to an average, where cotton has been properly picked and housed. Fully 25 per cent. is low middling, and over 40 per cent. good ordinary to low middling, and 35 per cent. good ordinary. *Washington*: Fiber fair, but cotton light. Ordinarily 1,500 to 1,600 pounds seed-cotton makes a 500-pound bale. This year it takes 1,700 to 1,800 pounds. The quantity of seed-cotton that would have turned out nine bales last year would only turn out eight this year. *Bexar*: The season having been so favorable the quality is 10 to 15 per cent. above an average. Nothing has injured the crop. Our best planters say we shall average 2,500 pounds on every three acres. *Freestone*: one-fifth ordinary, three-fifths good ordinary, and one-fifth upper grades. Improved in preparation for market, and gradual improvement in varieties planted. *Caldwell*: For many years it has taken from 2,000 to 2,500 pounds seed-cotton to make a 500-pound bale of lint. This year it only takes 1,600 to 1,800 pounds of seed to make 500 pounds of lint. *Lamar*: Matured later this year. Late rains caused the fruit (bolls) to hang on the stalks very late without ripening, which is unusual for a dry season. *Cooke*: Quality of fiber about an average. *Austin*: One-fourth to one-third of the cotton raised in the county by white labor may be classed as middling to good middling. The better grades of cotton are only produced by white (mostly European) labor; that raised by negroes always classed as inferior. *Lavaca*: The first picking, as a general thing, is the best and cleanest, consisting of about one-half to three-fourths of the crop. Later on, the winds and storms blew much out on the ground, where it lies too long and is damaged. This season, however, the rule is reversed. Owing to the wet summer and early fall the first picking was much stained and rotted, the bolls next to the ground being entirely lost where the plant was rank. The present picking is a grade better than the first. *Cherokee*: Frost, and a yellowish hue therefrom; also 25 per cent. that will not open. Strictly middling, 50 per cent.; good ordinary, 25; low middling, 25. *Williamson*: Not quite an average. Rains and worms stained the fiber, particularly the last picking. The lower grades injured the most. About one-third of each crop will class as good ordinary, low middling, and good; but little inferior. *Bell*: Better than formerly, owing to introduction of improved varieties, Hurlong, Golden Prolific, &c. *Dallas*: Considerably above an average. Have had light rains this fall, consequently the cotton is but little stained or trashed. Larger proportion of it will class as good middling, and but little inferior. *Limestone*: The bulk of the cotton produced here will class "good ordinary" as known in commerce. About one-tenth will class low middling. *Fort Bend*: Crop exceedingly short; but what little there is the fiber is good and not surpassed by any previous year. *Goliad*: Crop this year better than an average. *Blanco*: Average quality of

fiber is low middling. Injury was caused by caterpillars and frost. Proportion of good grades, seven-eighths. *Collin*: Full average. Only injury caused by frost, which is about 15 per cent. of the crop. *Matagorda*: Fiber fair; late cotton immature and stained. Most of this little crop is nicely saved, and will class good ordinary to low middling. *Comal*: The fiber in this county ranges from good ordinary to low middling. Very little difference in the grades, owing to the care with which the Germans handle their crops. *Rusk*: About two-thirds is of good average quality; the remainder below average, as the bolls opened prematurely from hot sun and want of foliage. *Fayette*: Full grade below average, caused by caterpillars and wet weather. Do not classify cotton until it gets to market. Strict ordinary this year. *Nacogdoches*: Fiber about the same. Clear of dirt, but not as good as the ginning of last year. *Upshur*: Superior to the average. Growing-season better than usual, but too short. Injured by frost, being later than usual by two or three weeks, owing to too much rain in the early growing-season, and boll-worm, which caused an overgrowth of the weed and too much sap in the young bolls. There are but two grades this year; all cotton ripe before the heavy frost is of the first grade; all that was not is of the second, and is stained yellow. The first grade will be about five-sixths of the entire crop. *Leon*: Better than average. Worms and hot weather injured a small proportion. One-half good ordinary, some low middling, rest inferior to ordinary. *Burleson*: Equal to former years. Largest proportion good ordinary.

ARKANSAS.—*Bradley*: Two grades above last year, or about 103. Some dirty cotton from heavy rains. *Little River*: Average. After frosts opened cotton in October, continued beating rains materially damaged the fiber. *Sebastian*: Good, and equal to general average; generally produced on uplands; very little grown on bottom-lands. *Izard*: There are only two grades of cotton here. First picking, coming under the head of strict good ordinary; later picking, inferior. *Jefferson*: Fiber above an average. *Franklin*: Below average; drought principal cause, also heavy rains in September. Classed: Stained, ordinary, good ordinary. *Boone*: Fiber full average. *Columbia*: Below an average quality on account of the large proportion of bolls that were not matured when the worm destroyed the leaves; consequently opened badly, and lint short and yellow. About 75 per cent. is of lower grades. *Pulaski*: The fiber of all cotton opening before the frost is of average quality. Causes of deterioration in 1873 were drought and appearance of boll-worm in August; heavy rains occurring about September 1, followed by rot and rust, early-killing frost October 23d, which cut the crop short at least 10 per cent. *Montgomery*: Fiber fully up to the average; some think a little finer and longer. *Greene*: Better than the average; about 75 per cent. is of the best quality. *Arkansas*: Best ever seen here. *Cross*: Better; about 105. Middling, one-eighth; low middling, three-eighths; ordinary, one-half. *Marion*: The fiber is a full average. *Baxter*: Is not as good as last year by 25 per cent.; produced by drought. *Union*: Shorter; caused by caterpillar, drought, and rust. *Drew*: Generally better than usual. *Independence*: Fiber is as long and fine as usual, and has been secured in better condition than common. *Perry*: Considerable injury was received from the frost, say 12 per cent. *Crittenden*: Good average; some stained by the frost; better handled, and consequently less bad cotton than usual. *Hempstead*: Shorter than usual in places where the leaves were lost before the full development of the bolls, but the early bolls are as good as usual. The grades will be almost as usual; good ordinary, a small proportion of low middling, and possibly twice as much ordinary; say good ordinary, 85 per cent.; low middling, 5; ordinary, 10. *Fulton*: Would have been above average but for the black rust; that not injured by the rust is the best fiber I ever saw in this county; proportion, two-thirds in favor of better grades. There is comparatively no yellow or frost-bitten cotton, and the crop being light and the fall favorable, it is pretty well gathered. *Searcy*: The fiber is better than common. It is long and white, and will equal any cotton ever raised this far north.

TENNESSEE.—*Dyer*: Better than an average, and not more than one-twelfth injured by the frost. *Maury*: Fiber better than last year; less injured by frost, and in this respect a better quality. *Lawrence*: Above an average, and has not been damaged. *Hardin*: Fiber is fully equal an average; no injury, except too much drought in July. *Davidson*: About an average; the season for picking has been very good; have put up fifty bags of very handsome fiber. *Lincoln*: Full average this year. Heavy rains caused some little injury; about one-eighth of crop slightly damaged. *Cannon*: Quality very fine; no yellow cotton; all good. *Lauderdale*: At least one grade above an average. Low middling, one-fourth; good ordinary, one-half; ordinary, one-fourth. *De Kalb*: Average quality. *Bedford*: Fiber is a good average; the season has been good for picking. *Perry*: Better this year than usual. *Haywood*: Superior. Frost followed by a rain always stains cotton; one-fourth is stained this year. *Decatur*: About average; crop light on account of drought. *Gibson*: The fiber this season of superior quality to any crop for several years. The only injury was by drought in August, which caused many of the bolls and blooms to fall off, and hastened the maturity of those that remained. The larger proportion will be classed as low middling, and there will be less of the "flower-pot" or dirty cotton.

## THE TOBACCO-CROP.

Tobacco is a special crop, very irregular in its distribution and fluctuating in extent of local breadth, and hence specific investigation is necessary even to obtain comparative estimates of quantity. Though it is produced in all the States, there were only fourteen States in 1870 (on census authority) that produced (each) as much as 1,000,000 pounds, while several counties in tobacco States yield each two, three, to five millions of pounds. Kentucky and Virginia are credited with more than half of the crop, the former State alone 40 per cent. of it. Only seven States separately exceeded 10,000,000 pounds, Kentucky Virginia, Tennessee, Ohio, Maryland, Missouri, North Carolina, in order of precedence. Yet in point of fact the product was much greater than indicated by the census, the fear of taxation doubtless preventing a full return. As an instance of deficiency, the national census of Ohio makes a total of 18,741,923 pounds. In 1869 the State assessors returned for the same year 38,953,206 pounds; and undoubtedly neither census obtained a return of the entire production. These seven States produced about 85 per cent. of the tobacco grown.

Few people apparently realize the small area actually occupied by the crop. Allowing 100,000,000 pounds increase over the 262,735,341 pounds reported by the census, twenty townships of land yielding 800 pounds per acre will suffice. This is the size of a medium county. This fact affords an explanation of the necessity of care in preventing great fluctuations in the breadth of production, and shows how easy it would be to glut the market and ruin prices.

A recent inquiry was directed to our correspondents in counties producing not less than 100,000 pounds, for an actual census or careful estimate of the quantity harvested in 1873, the average price, the number of acres cultivated, and the quality of the crop. Returns have been received from a large proportion of them; and as tobacco is a crop so restricted in its breadth, and so peculiar and variable in its qualities and yields, it is deemed best to give the details from each county instead of our usual condensed statements by States. It will also illustrate the immense labor, of which the public generally have no idea, of tabulating, averaging, and analyzing returns of the more extended and general crops. If any of these county returns are inaccurate, an opportunity is thus afforded for correction.

One county in New Hampshire, Cheshire, in 1870 returned 97 per cent. of all the tobacco reported for the State. Its estimate is now 200,000 pounds, instead of 151,189 pounds in 1870, and the quality is good. It is on the Connecticut River, adjoining Franklin County, in Massachusetts.

Three counties in Massachusetts, on the Connecticut, returned in 1870 all but 23,610 pounds of the 7,812,885 pounds made in the State. Franklin estimates 25 per cent. increase on 1870, 40 per cent. better than the crop of 1872. A reduction is indicated in Hampshire, but the quality is good. A small increase in Hampden, "some very good, but much the larger portion low grade; color very uneven, caused in part by drought checking the growth, in part by a too large proportion of special fertilizers and too little barn-manure, but principally from too late setting." The price is low, averaging 10 cents per pound.

Connecticut grows some tobacco in every county, though Hartford is credited in 1870 with 5,830,209 pounds of the 8,328,798 pounds reported. Hartford this year reports 6,000,000 pounds, grown on 3,239 acres, worth 24 cents per pound, of a "fair quality, but not equal to the best on account



of extreme drought at planting time, which caused late maturing and injury by early frost; and some did not cure well on the poles on account of extremely cold winds in November." "Leaf very fine" in Litchfield, but some white stem and frosted leaf. "The crop is a good average compared with former years" in Tolland.

Onondaga, Chemung, and Steuben, in New York, are the only counties reporting 100,000 pounds in 1870, when the aggregate was 1,884,048 pounds of the 2,349,798 pounds in the State. The estimate for the three in 1873 is 2,324,730 pounds, grown upon 2,387 acres. In Onondaga "there are now on hand the crops of 1872 and 1873. The quality of the crop of 1873 is generally good, of all that got an early start. It was very dry at setting time, and many failed to make their plants grow, in consequence of drought and grubs. Some fine tobacco-land was set three or four times over, and such tobacco is of a low quality." A material reduction in breadth is prophesied for the present year. In Chemung "its comparative quality may be represented by 90, and the cause is bad color, caused by unsuccessful curing in sheds, and in some localities from injury by hail before maturity." The crop is grown in Steuben "along the valley of the Conhocton River, and is not so perfect in the leaf as the Connecticut."

Three counties in Pennsylvania, Lancaster, York, and Bucks, produce nearly all the tobacco grown. An immense increase is shown in Lancaster, from 2,692,584 pounds in 1870 to 13,683,600 pounds in 1873. The estimate is based on returns of the assessor of internal revenue, "who reports 30,010 cases, at an average of 360 pounds per case, or 13,683,600 pounds as the crop of 1872. The tobacco interests had been increasing, from 1871 to 1872, from 31,800 cases for 1871 to 38,010 for 1872." Low prices have prevented further increase, it is thought, and our correspondent makes the estimate the same as 1872. The prices received are \$15 per hundred for wrappers and \$5 for fillers, or an average of \$13, according to the proportion of the grades. The crop in Bucks is not disposed of; the average price last year was 16 cents. That planted early is of good quality, but the late, which was three-fourths of all, is very poor, owing to excessive droughts in the earlier stages of growth and too frequent rains while it was maturing, making a narrow leaf and woody stems. "Nine-tenths of the tobacco raised in this county is grown in the immediate vicinity of the old William Penn mansion, in Falls Township, taking the place of wheat. In 1870 and 1871, and previous to that time for several years, it was our most profitable crop; now the market is overstocked, and many farmers just commencing to cultivate it will suffer serious loss unless the price should advance considerably."

The official returns of tobacco in Maryland make a total of 15,785,339 pounds in 1870, against 38,410,965 pounds in 1860. Five counties, which supply about 60 per cent. of the total, report an increase of about 20 per cent. on the last census crop. The following extracts from correspondence are given:

*Prince George's*: Sales last year (of the crop of 1872) were from 3 to 13 cents per pound. Some place the probable price of the crop of 1873 at 5 to 14 cents per pound, or an average of 9½. *Carroll*: Quality is generally good. *Howard*: The production is on the increase in our county, although last year was a bad planting season, on account of a protracted drouth, which prevented early planting. *Charles*: The comparative quality of the crop on hand is above an average. The last season having been a good one, the tobacco was housed early, and we had a fine fall for curing. *St. Mary's*: The crop of tobacco for 1873 was exceedingly varied in this county; in some portions very fine in quality, in other parts very little planted for want of rain. *Montgomery*: The comparative quality is rather less than fair, though there is some very fine in certain localities, depending upon early planting and the quality of the soil. Late

planting was besieged by the horn-worm, which greatly injured and in some measure destroyed certain lots.

Returns from twenty-four counties in Virginia, which, in 1870, averaged one million pounds each, and together produced about two-thirds of the crop, indicate a crop in 1873 larger by 30 per cent., or 48,000,000 pounds in the entire State. Most of the counties make unfavorable reports of quality, though a few make it better than usual. The average value as reported is 7 cents 8 mills. A few particulars are culled from returns :

*Nelson* : The quality is inferior to that of the two preceding years, and results from a scarcity of plants and want of a favorable season for planting in good time, the weather being very dry about the time the plants were large enough to set out. The latter part of the summer was too wet, causing much of it to fire; and having been planted late, much of it had to be cut in a green state, or get frosted by standing out. *Franklin* : Quality is good. Cause, early planting and close attention, peculiarity of soil and climate. *Roanoke* : Not very good on account of drought. *Dinwiddie* : Quality poor, caused by late planting and excessive wet season, causing the crop to spot and drown. *Botetourt* : The quality is very fine on our warm limestone land, but not so good in the grass region. *Pittsylvania* : Common quality. Season of 1873 unfavorable for quality but not for quantity. *Louisa* : Hardly average; cause, drought last summer. *Floyd* : Not so good as in 1872, on account of drought in summer and early frost. *Charlotte* : Quality not so good, owing to prevailing drought during last summer. *Prince Edward* : Quality of the crop of 1873 below the usual average; cause, insufficient labor. *Lunenburg* : Average quality. Late rains in early part of the season caused a less quantity, but does not affect quality. *Albemarle* : Quality much better than usual, owing to the very excellent season and the late frosts. Many farmers were enabled to cure their tobacco better than ever before. *Rockbridge* : Good shipping. Our lands not adapted to finer grades. *Mecklenburgh* : About 75. Too dry in the early part of the season and too wet in the latter. *Patriek* : Inferior to previous year. *Chesterfield* : Much inferior tobacco, owing to the wet spring and early frost. A great deal had to be cut before maturity. Wherever early planting and a good stand were obtained, the crop was good; brought \$11.50 and \$12 per hundred in the Richmond market. The high price of fertilizers and low price of tobacco will deter many of our planters from raising as much as usual in 1874. *Goochland* : Good. Many farmers cut their crops before maturity, owing to indications of an early frost, which made the quality of such crops indifferent. *Flucanna* : The quality of tobacco made last year is better than usual. *Caroline* : Best sun-cured crop on the market. *Henry* : Inferior, caused by late growth.

Ten counties in North Carolina which produced 8,666,948 pounds of the total 11,150,087 in 1870, make returns which aggregate very nearly the same in 1873. The quality averages very well with that of former crops; some a little better, two below average. In Surry about one-tenth is very fine, "perhaps as fine as any raised in the United States, soil and climate being so well adapted." The Davie correspondent reports good quality, and claims for his county thorough cultivation, adaptability of soil, careful handling, assorting, and packing. Caswell, long noted for its fine, yellow tobacco, and for producing more than any other county in North Carolina, has a small crop, only 2,000,000 pounds, not of average quality, and worth 9½ cents instead of 10 to 11, the usual price. Drought during the summer months prevented thorough maturation. It is the money-crop of the county. Rain in August and September deteriorated quality in Granville. A part of the county of Stokes had a fair crop, being affected by drought, which delayed growth and prevented full development.

There is no county in South Carolina or Georgia that reports 100,000 pounds, and but one in Florida, Gadsden, which produced 118,799 pounds of the 157,405 pounds reported in the census of the entire State. It is the Cuba tobacco which is exclusively grown here. Only 50,000 pounds are returned as the crop of 1873, worth 38 cents per pound. The area planted is estimated at 80 acres, yielding a little over 600 pounds to the acre. When labor was abundant to clear the richer hummock land, years ago, the average product was 800 pounds. The re-

marks relative to this peculiar tobacco region may be worth giving more at length :

*Gadsden* : The Gadsden " wrapper-leaf " was always in high repute, and extensively used in the manufacture of cigars, being in size, fineness, and texture fully equal to the best Cuba, and far superior to the Connecticut seed-leaf. Where the variety known as the Cuba-filler has been tried, it has succeeded finely in this county, possessing that delicate and peculiar aroma so highly prized in the Havana cigars. We need but the capital to manufacture our tobacco into cigars (thus affording us a home-market for the raw material) to make the cultivation of it the most profitable crop that is grown. It is a singular fact, but nevertheless true, that of all the counties of the State, many of them abounding in the very finest soil, Gadsden is the only one that has succeeded in making the Cuba tobacco a staple market-crop. Prior to 1860 it rivaled in net returns the great staple cotton, and from the indications of the present year, it is about to resume its former status among the agricultural productions of this county. Whether this success is attributable to any peculiarity in the elements of the soil I am not able to determine, but this fact is worthy of note, that, except immediately on the banks of the Apalachicola River, which forms the western boundary of the county, there is an entire absence of the rotten limestone, which so largely pervades the other sections of the State. I will only add that for the immigrant, or new settler of limited means, there is no crop so well suited to his condition as the Cuba tobacco. To produce a given result there is a less area of land required than is demanded for the production of any other field-crop. The cultivation, housing, and preparation for market is simple, and the labor so light that it may be participated in by every member of the family, male and female, over six years of age. The growth of the plant is so rapid, and its arrival at maturity so quick, that it need never interfere with any of the provision crops, and but slightly with a moderate cotton crop. In illustration, and confirmatory of the above statement, I give the experience of a citizen of this county who

known to me as a truthful and reliable man. In 1872 he cleared one acre of good pine-land, and after breaking it up and applying \$8 worth of commercial fertilizers in the hills, planted it in Cuba tobacco. The crop was sent to New York, and the net returns of sale amounted to \$320.90. In 1873 he added another acre, making two acres, and planted it again in tobacco. The crop of two acres was sold in New York, and netted \$760. The two acres in tobacco did not interfere with the making of an abundant supply of provisions and the usual amount of cotton for market. What this resident has done any able-bodied, industrious immigrant may do, especially should he be so fortunate as to be blessed with a house full of children. Our pine-lands, of the quality producing the above results, may now be bought at from \$1 to \$3 per acre, upon accommodating terms of payment, and are rapidly becoming the most popular farming-lands in the county.

The Southwestern States do not grow tobacco as a market-crop. Tennessee returned, as the crop of 1869, according to the census, 21,465,452 pounds. Nine counties, which contributed more than two-thirds of that quantity, now report about 7 per cent. increase, or 15,820,000 pounds, grown on about 26,000 acres, and worth 6 cents per pound.

The following extracts are presented :

*Sumner* : The census of 1870 gives the crop of 1869 as 909,568 pounds. Since then at least two-thirds of that portion of the county that produced tobacco has been cut off, making us much less prominent in its growth. *Weakley* : The crop of 1873 was moderately good, but badly worm-eaten. Cotton-planting has to a great degree superseded tobacco-culture, and, consequently, what we do make does not receive the attention it did in years past. *Smith* : It is only because the tobacco-lands in the county are the most fertile in the world that they continue to yield the quantity and quality they do. Tobacco-growers here are noted for making no improvements of any kind, neither in horses, barns, fences, nor stock. *Robertson* : About one-fifth of the crop of 1873 is fine tobacco, and four-fifths inferior quality. The crop was seriously damaged by worms and drought. More of the crop planted on thin land than usual, owing to the wet May and June. The farmers got behind with their work, and could not mature the land or cultivate the crop as usual. *Wilson* : Rather an inferior crop; full one-half lugs and inferior leaf. *Dyer* : Quality good. Cotton has almost entirely superseded tobacco for the want of reliable labor. *Jackson* : Comparative quality equal to, if not better, than last year, where it was set out in time and properly cultivated, but not so good where it was planted late, because it had to be harvested before it was fully matured. *Obion* : Medium. Our county has nearly abandoned the raising of tobacco. For the last few years our farmers have given much of their attention to cotton. *Montgomery* : Good body; more worm-eaten than usual.

Tobacco is not a prominent crop in West Virginia. About 2,000,000 pounds are reported for 1869, of which nearly two-thirds were grown in Putnam, Kanawha, Fayette, Cabell, and Mercer, in the order named. A slight increase in estimates is apparent in the crop of 1873. Average price, as reported, 8 cents 4 mills. Kanawha has taken the place of Putnam as the first tobacco county, and has a good crop of medium quality. Putnam has declined, in consequence of reduction of prices, from 472,765 to 290,000 pounds, but the quality is rather better than average. The correspondent says that "the soil and climate of Putnam, especially that part of it lying in the Kanawha Valley, produces one grade of tobacco, black-wrapper, equal if not superior in quality to any part of the West; at every tobacco fair held in Cincinnati the black-wrapper grown in this county took all the premiums that were offered for that grade."

Kentucky stands at the head of tobacco-growing States in respect to quantity. Returns from forty-three counties which reported 75,294,305 pounds in 1869, of the total return of 105,305,869 pounds, now return estimates of last year's crop, aggregating 109,050,475 pounds, grown on 150,214 acres, and valued at 6 cents per pound. These counties represent above 70 per cent. of the production, and if the remaining counties have made a similar increase, the total for Kentucky would be about 140,000,000 pounds. The following extracts are made:

*Taylor* : A loss of 10 per cent. in quality, owing to unfavorable season. Early part of season too wet, and latter part too dry, making the crop gummy and bitter. *Fleming* : The quality of soil, and experience and care in culture and harvesting makes it comparatively good. *Hardin* : The quality is below an average, and was attributable to drought and an unusual number of worms, together with a not sufficient amount of labor to cultivate it properly. *Hart* : The worms were very destructive to the crop last year, being more numerous than ever before known; hence there is a very large proportion of the crop of 1873 that is of inferior quality. *Graves* : Quality not so good as last year by 3 per cent.; damaged by worms. *Carroll* : Inferior in quantity and quality, owing to the late planting and drought. *Meade* : Too much rain in fore part of season and drought; grasshoppers also injured the crop. *Edmonson* : Light and short; too wet in the spring and early part of the summer. *Boone* : Good, when planted early, well taken care of; bad, when planted late, badly cultivated and handled. *Pendleton* : Quality poor; drought and lateness of setting. *Breckinridge* : The quality will rank about 90 per cent., it being lighter than usual, which is ascribed by the planters to the drought in the latter part of the season. *La Rue* : Inferior; caused by worms, and unpropitious weather during the season of growing. *Logan* : Leaf very fine and large; larger proportion of seeds than usual, owing to rainy weather in the spring, and to the destruction of worms in September. *Hopkins* : Second rate, owing to early wet season and the ravages of worms. *Daviess* : Decidedly inferior; too much rain during early season, and great drought afterward; crop fully 25 per cent. less than in 1872. I have a complete statement of the names of purchasers and shippers of the crop actually grown in the county in 1872, with the amount purchased by each person in pounds, from their books, and, enormous as it may seem, the amount reaches 12,087,000 pounds; this I know to be reliable. *Christian* : Medium; occasioned by worm-cut and partial drought. *Kenton* : Medium; caused from the season of planting and early drought. *Union* : Indifferent; caused by worms and wet weather. *Hickman* : Heavier, but more lugs; caused from heavy rains during planting-season and drought afterward. *Ballard* : Extremely cold, dry spring; grasshoppers and other insects destroyed plants; worms and wet weather caused the crop to be small and of inferior quality. *Casey* : Generally good; somewhat injured by bad handling and curing. *Warren* : From 8 to 10 per cent. better than 1872; very fine season last fall. *Callaway* : Barely average; wet spring, dry summer, and worms. *Webster* : Not a medium crop on account of the drought and worms. *Simpson* : Tolerably good; soil not richly adapted to tobacco. *Cumberland* : Medium; caused by careless handling. *Owen* : Hardly an average crop in quality, but above an average in weight; not so good as usual, because it cured imperfectly on account of the wet season. *Shelby* : The quality of tobacco is peculiar to the soil upon which it is grown. The growth of timber indicates the qualities of tobacco expected to be grown;—for instance, white-oak and hickory produces the cutting-leaf; average yield per acre 500 pounds. Sugar-tree and beech, the latter growth predominating, produces what is known as light-wrappers; average yield per acre, 750 pounds. Sugar-tree, black-walnut, ash, interspersed with scattering beech, produces the heavy manufacturing leaf; aver-

age yield per acre from 1,000 to 1,100 pounds. *Green*: Medium crops, but injured by worms. *Adair*: The bulk of the crop is light, wants body and weight, and is inferior in point of quality. Heavy tobacco, made on old ground, sells well. *Bracken*: Comparatively good; injured to some extent by the dry weather immediately after and during the latter part of the planting-season, and a little by early frost. *Harrison*: Generally second rate, strong, heavy tobacco; our hill-lands only cultivated in tobacco. I believe there was more raised in 1873.

In Ohio, Montgomery stands first in production, in the census of 1870, among tobacco counties, returning more than one-fifth of the aggregate quantity in the State. Ten counties, which were credited with nearly two-thirds of the State product, now report more than that aggregate, or 19,952,263 pounds. The comparison, however, with assessors' returns for 1869 would not show an advance. The crop of Montgomery in 1872 was 8,178,543; the estimate for 1873 is the same.

*Montgomery*: The quality is of an average compared with past years; causes of good quality are, plenty of fertilizers, favorable seasons, good cultivation, hanging it on twine or hooks, good sheds, and good weather for curing. The causes of bad peculiarities or qualities are, planting on poor land, hanging on sticks by splitting the stalks, letting it get too ripe before harvesting, dry weather during curing process. *Brown*: Good. The tobacco of this county sells in Cincinnati at this time higher than any tobacco from the West. We have a limestone soil well adapted to the raising of tobacco. *Darke*: Pretty good. Raisers, having acquired experience, it is better handled. *Monroe*: Not quite an average in quality, on account of being planted late and growing slowly during the month of August. *Morgan*: A full average as to quality. *Belmont*: Generally good. *Preble*: Good; season was favorable, and no hail or other casualties. *Adams*: The quality is about average, the white tobacco very good. Causes of bad quality are late planting, sun-burn, and a few crops frosted. *Edwards*: Good quality, but worm-eaten. A portion of the crop was abandoned to save the rest. *Franklin*: Medium. Great want of suitable buildings for curing purposes.

ILLINOIS.—*Pulaski*: Medium. Land good, but attention poor. *Wayne*: Fair. Injury was caused by worms being worse than common. *Williamson*: The quality was rather inferior, owing to drought. *White*: Better than average.

Returns from Missouri show an increase of about 35 per cent. over those of the census. The following extracts are made from the reports:

*Saint Charles*: Not as good as the crop of 1872, on account of drought in the setting-out season, and the abundance of worms. *Monroe*: Quality and yield poor—33½ less than an average, on account of an unusual protracted drought and early frost. *Franklin*: Below average because of drought and insects; also a failure of interest in its culture. *Howard*: Inferior. The drought and early frost injured the crops generally. *Carroll*: Poor; one-half badly frosted. *La Fayette*: Ordinary to indifferent; cause, dry season. *Ray*: Light in weight, but good color; caused by the dry season.

Tobacco is not a prominent crop in Wisconsin, being grown mainly in Rock and Dane Counties. The former, which is credited with 645,508 pounds in 1869, now returns 2,800,000 pounds, grown on 2,400 acres, and worth 4 cents 7 mills per pound.

The following is a summary, not of estimates of all the tobacco grown in the State, but the aggregate quantity reported, and the aggregate reported by the last census for the same counties:

States.	Pounds, census of 1870.	Pounds, estimated for 1873.	Number of acres, 1873.	Price per pound, 1873.	Value.
New Hampshire.....	151, 189	200, 000	150	<i>Cents.</i> 15	\$30, 000
Massachusetts.....	7, 289, 775	7, 875, 000	3, 220	11.4	475, 500
Connecticut.....	7, 410, 177	7, 750, 000	4, 639	22.3	1, 727, 500
New York.....	1, 884, 048	2, 324, 730	2, 387	10.3	167, 462
Pennsylvania.....	2, 843, 956	14, 575, 200	12, 146	13	1, 778, 868
Maryland.....	9, 103, 690	11, 372, 000	12, 930	8.1	925, 040
Virginia.....	24, 802, 192	32, 345, 107	54, 316	7.8	2, 530, 967
North Carolina.....	8, 666, 948	8, 600, 870	15, 783	8.9	765, 358
Florida.....	118, 799	50, 000	80	38	19, 000
Tennessee.....	14, 823, 916	15, 820, 000	26, 058	6	960, 700
West Virginia.....	1, 326, 238	1, 384, 925	1, 517	8.4	116, 642
Kentucky.....	75, 294, 305	109, 050, 475	150, 214	6	6, 187, 517
Ohio.....	11, 943, 728	19, 952, 263	21, 720	5.8	1, 162, 122
Indiana.....	4, 530, 601	7, 485, 000	9, 469	4.4	353, 075
Illinois.....	2, 506, 771	2, 686, 952	2, 922	4.9	133, 062
Wisconsin.....	645, 508	2, 800, 000	2, 400	4.7	131, 600
Missouri.....	3, 476, 176	4, 678, 004	6, 506	5	234, 215
Total.....	170, 818, 017	248, 950, 526	326, 457	.....	17, 698, 628

The above summary is made from local returns, as follows :

County.	Pounds, census of 1870.	Pounds, estimate for 1873.	Number of acres, 1873.	Average price per pound, 1873.	Value, 1873.
NEW HAMPSHIRE—Cheshire.....	151, 189	200, 000	150	<i>Cents.</i> 15	\$30, 000 00
MASSACHUSETTS—Franklin.....	2, 473, 265	3, 000, 000	.....	12	360, 000
Hampden.....	1, 095, 923	1, 155, 000	770	10	115, 500
Hampshire.....	3, 720, 587	3, 720, 000	2, 450	.....	.....
Total.....	7, 289, 775	7, 875, 000	3, 220	11.4	475, 500
CONNECTICUT—Tolland.....	531, 399	750, 000	500	25	187, 500
Litchfield.....	1, 048, 569	1, 000, 000	900	10	100, 000
Hartford.....	5, 830, 209	6, 000, 000	3, 239	24	1, 440, 000
Total.....	7, 410, 177	7, 750, 000	4, 639	22.3	1, 727, 500
NEW YORK—Stenben.....	150, 540	124, 730	387	14	17, 462
Chemung.....	475, 905	700, 000	500	(*)	.....
Onondaga.....	1, 257, 603	1, 500, 000	1, 500	10	150, 000
Total.....	1, 884, 048	2, 324, 730	2, 387	10.3	167, 462
PENNSYLVANIA—Bucks.....	151, 372	891, 600	743	.....	.....
Lancaster.....	2, 692, 584	13, 683, 600	11, 403	13	1, 778, 868
Total.....	2, 843, 956	14, 575, 200	12, 146	13	1, 778, 868
MARYLAND—Prince George.....	3, 665, 054	4, 500, 000	7, 000	9.5	427, 500
Charles.....	2, 102, 739	3, 500, 000	5, 000	7	245, 000
Montgomery.....	630, 000	650, 000	930	8	52, 000
Saint Mary's.....	2, 522, 917	2, 522, 000	.....	7	176, 540
Howard.....	182, 960	200, 000	.....	12	24, 000
Total.....	9, 103, 690	11, 372, 000	12, 930	8.1	925, 040

\* Not sold.

County.	Pounds, census of 1870.	Pounds, estimate for 1873.	Number of acres, 1873.	Average price per pound, 1873.	Value, 1873.
<b>VIRGINIA—Franklin</b> .....	1,696,549	3,000,000	4,000	<i>Cents.</i> 10	\$300,000
Buckingham .....	609,937	1,012,921	1,352	6 <sup>00</sup> / <sub>100</sub>	67,101
Brunswick .....	1,121,480	841,110	.....	5	42,055
Nelson .....	1,199,182	1,125,000	1,650	8 <sup>1</sup> / <sub>100</sub>	95,625
Pittsylvania .....	4,282,511	4,600,000	10,000	8	368,000
Campbell .....	1,761,901	2,418,400	3,023	8	193,472
Botetourt .....	196,459	500,000	1,250	10	50,000
Louisa .....	930,226	1,500,000	2,000	6 <sup>1</sup> / <sub>2</sub>	97,500
Spotsylvania .....	132,502	700,000	1,500	7	49,000
Floyd .....	157,467	200,000	2,857	10	20,000
Charlotte .....	1,964,736	1,600,000	(*)	6	96,000
Prince Edward .....	960,700	1,400,000	2,000	7	98,000
Lunenburg .....	963,673	855,000	2,100	6	51,300
Albemarle .....	1,781,619	2,000,000	1,600	6	120,000
Rockbridge .....	186,469	200,000	400	6	12,000
Mecklenburgh .....	2,166,628	3,000,000	5,000	7	210,000
Patrick .....	323,886	442,676	1,884	8	35,414
Chesterfield .....	194,510	200,000	400	7 <sup>1</sup> / <sub>2</sub>	15,000
Goochland .....	405,215	700,000	2,350	7	49,000
Fluvanna .....	894,023	1,500,000	2,600	8	120,000
Caroline .....	417,848	800,000	1,000	12	96,000
Henry .....	1,129,617	3,000,000	6,000	10	300,000
Dinwiddie .....	844,504	550,000	950	5	27,500
Roanoke .....	280,550	200,000	400	9	18,000
<b>Total</b> .....	<b>24,802,192</b>	<b>32,345,107</b>	<b>54,316</b>	<b>7.8</b>	<b>2,530,967</b>
<b>NORTH CAROLINA—Warren</b> .....	751,045	500,000	600	9	45,000
Orange .....	530,442	1,000,000	.....	8	80,000
Surry .....	254,286	320,000	750	13	41,600
Forsyth .....	232,262	1,000,000	1,000	8 <sup>1</sup> / <sub>2</sub>	85,000
Davie .....	247,555	480,000	800	10	48,000
Caswell .....	2,262,053	2,000,000	4,000	9 <sup>1</sup> / <sub>2</sub>	190,000
Granville .....	2,134,228	1,422,819	5,340	8	113,825
Stokes .....	844,145	682,491	1,365	12 <sup>1</sup> / <sub>2</sub>	85,311
Person .....	1,227,150	1,000,000	1,428	6	60,000
Guilford .....	177,782	195,560	500	8 <sup>1</sup> / <sub>2</sub>	16,622
<b>Total</b> .....	<b>8,666,948</b>	<b>8,600,870</b>	<b>15,783</b>	<b>8.9</b>	<b>765,358</b>
<b>FLORIDA—Gadsden</b> .....	118,799	50,000	80	.38	19,000
<b>TENNESSEE—Sumner</b> .....	909,568	300,000	700	4.5	13,500
Weakley .....	2,599,590	1,000,000	2,000	7	70,000
Smith .....	2,250,202	3,500,000	4,375	6	210,000
Robertson .....	2,103,322	2,500,000	4,166	7	175,000
Wilson .....	332,901	400,000	667	4	16,000
Dyer .....	412,440	100,000	100	8	8,000
Jackson .....	713,578	1,300,000	1,800	5	65,000
Obion .....	645,937	920,000	250	6	13,200
Montgomery .....	4,856,378	6,500,000	12,000	6	390,000
<b>Total</b> .....	<b>14,823,916</b>	<b>15,820,000</b>	<b>26,058</b>	<b>6</b>	<b>960,700</b>
<b>WEST VIRGINIA—Putnan</b> .....	472,765	290,000	400	8	23,20
Mercer .....	117,429	200,000	200	10	20,000
Kanawha .....	412,469	549,925	367	10	54,992
Cabell .....	135,410	250,000	450	7	17,500
Fayette .....	188,165	95,000	100	10	950
<b>Total</b> .....	<b>1,326,238</b>	<b>1,384,925</b>	<b>1,517</b>	<b>8.4</b>	<b>116,642</b>
<b>KENTUCKY—Hickman</b> .....	570,287	1,000,000	1,800	5	50,000
Robertson .....	1,648,200	2,713,700	3,800	7	189,959
Crittenden .....	1,970,776	2,371,822	.....	.....	.....
Ballard .....	2,863,455	954,485	700	8	76,353
Casey .....	145,982	250,000	.....	3	7,500
Warren .....	2,035,139	2,071,800	4,160	4.5	93,231
Marshall .....	1,416,282	1,782,726	1,782	7	124,790

\* Not ascertained.

Counties.	Pounds, census of 1870.	Pounds, estimate for 1873.	Number of acres, 1873.	Average price per pound, 1873.	Value, 1873.
<i>Cents.</i>					
KENTUCKY—Callaway .....	1,924,502	2,500,000	5,000	5	\$125,000
Hancock .....	1,679,384	2,096,580	2,995	5	104,829
Webster .....	3,511,649	5,500,180	7,850	5	275,009
Muhlenburgh .....	1,821,988	2,000,000	4,000	6.5	130,000
Simpson .....	1,072,401	1,200,000	2,000	7	84,000
Cumberland .....	1,304,366	1,265,435	1,700	8.5	107,561
Owen .....	2,890,670	4,000,000	5,000	6	240,000
Shelby .....	240,435	275,000	370	6	16,500
Henry .....	1,375,364	2,089,090	2,611	.....	.....
Green .....	1,375,091	1,912,200	2,400	7	133,854
Adair .....	1,231,665	1,800,000	2,500	4	72,000
Bracken .....	4,188,039	5,000,000	5,000	10	500,000
Harrison .....	281,704	1,702,370	2,000	.....	.....
Union .....	2,096,260	4,450,000	5,000	4.7	209,150
Butler .....	1,008,582	1,000,000	.....	6	60,000
Kenton .....	360,983	800,000	1,600	6	48,000
Hopkins .....	3,012,053	5,000,000	6,500	3.5	275,000
Daviess .....	6,273,067	9,000,000	12,000	5.7	513,000
Christian .....	5,384,137	15,000,000	30,000	6	900,000
Oldham .....	301,285	350,000	400	7	24,500
Grayson .....	859,760	1,500,000	2,500	4.7	70,500
Trimble .....	688,465	1,351,930	1,400	6.5	87,875
McLean .....	2,262,037	3,636,565	5,196	6.5	236,376
Logan .....	2,707,571	4,332,112	7,220	5.8	251,262
La Rue .....	368,100	800,000	1,600	4.7	37,600
Boone .....	279,740	348,500	410	5	17,425
Pendleton .....	1,651,593	3,000,000	4,000	5	150,000
Breckinridge .....	3,338,471	3,500,000	.....	6.2	217,000
Graves .....	4,774,195	6,000,000	8,000	6.5	390,000
Carroll .....	669,875	400,000	800	8	32,000
Meade .....	539,000	596,000	.....	6.5	38,740
Fleming .....	305,954	499,980	600	8.5	42,498
Hart .....	2,313,212	2,500,000	3,570	5	125,000
Livingston .....	1,086,578	900,000	450	5	45,000
Taylor .....	1,209,830	1,300,000	2,600	5	65,000
Hardin .....	284,178	300,000	700	7	21,000
Total .....	75,294,305	109,050,475	150,214	6	6,187,517
OHIO—Brown .....	2,687,743	2,972,019	4,095	12	356,642
Darke .....	167,989	300,000	.....	6	1,800
Monroe .....	2,845,525	3,000,000	4,225	3	90,000
Montgomery .....	3,963,183	8,178,543	8,475	6	490,712
Athens .....	207,839	147,227	277	4.6	5,889
Vinton .....	110,739	152,621	173	4.7	7,173
Washington .....	1,041,125	2,293,367	2,386	3.5	80,267
Morgan .....	486,125	1,300,000	.....	3.7	58,100
Adams .....	102,473	120,000	250	10	12,000
Preble .....	330,967	1,488,466	1,779	4	59,539
Total .....	11,943,728	19,952,263	21,720	5.8	1,162,122
INDIANA—Vanderburgh .....	167,150	250,000	294	5	12,500
Pike .....	1,119,356	2,000,000	2,500	4	80,000
Perry .....	224,125	235,000	425	4.5	10,575
Spencer .....	3,019,970	5,000,000	6,250	5	250,000
Total .....	4,530,601	7,485,000	9,469	4.4	353,075
ILLINOIS—Pulaski .....	157,000	50,000	70	7	3,500
White .....	135,045	80,000	100	4	3,200
Edwards .....	133,150	205,000	292	6	12,300
Franklin .....	387,382	415,000	560	6	24,900
Wayne .....	541,605	400,000	500	5	20,000
Williamson .....	1,152,589	1,536,952	1,400	4.5	69,162
Total .....	2,506,771	2,686,952	2,922	4.9	133,062
WISCONSIN—Rock .....	645,508	2,800,000	2,400	4.7	131,600



Counties.	Pounds, census of 1870.	Pounds, estimate for 1873.	Number of acres, 1873.	Average price per pound, 1873.	Value, 1873.
MISSOURI—Monroe .....	187,091	800,000	1,600	Cents. 3.5	\$28,000 00
Saint Charles .....	146,754	146,946	-----	7.7	11,314 00
Ray .....	199,355	250,000	333	3	7,500 00
La Fayette .....	113,735	75,000	90	3	2,250 00
Lincoln .....	891,727	650,000	800	7	45,500 00
Stoddard .....	118,534	108,000	75	4	4,320 00
Carroll .....	256,578	1,000,000	1,428	3.2	32,000 00
Howard .....	788,132	945,758	1,800	3.5	33,101 00
Franklin .....	783,270	702,300	380	10	70,230 00
Total.....	3,476,176	4,678,004	6,506	5	234,215 00

This showing indicates an increase of 41 per cent. over the census figures of 1869; and if the same proportion of increase may be assumed for what is not here represented, it points to a crop of about 370,000,000 pounds.

## FOREST-CULTURE IN THE AUSTRIAN COAST PROVINCES.

From a report prepared by Simon Scharnaggl, royal inspector of forests in Trieste, and published by the Austrian Ministry of Agriculture, it appears that the destruction of forests upon the Adriatic is clearly recognized as the cause of the frequent droughts, failing harvests, and consequent poverty of the people of those regions. The total area of the coast provinces is 1,385,476 joch,\* or 1,970,562 acres. About 23 per cent. of this area is designated as "*Karst gründe*;" that is, land incapable of plow-culture on account of its irregularity of surface. For many years the Austrian government has been anxious to restore the luxuriant forest-growth that once covered this class of lands, as well as to re-afforest other portions of these provinces. In 1857 the mayor of Trieste planted a tract of barren Karst near Brassovizza with Austrian pine at a considerable expense, but with entire success. Other partial experiments demonstrated the practicability of re-afforesting the Karst. In 1864 the imperial government commenced systematic operations by appointing local directors and by establishing nurseries for the growth of young trees. Serious embarrassments were felt from the lack of practical knowledge in these local directors, and in numerous failures in obtaining tree-plants; but by the concentration of tree-raising at a few central nurseries, and by profiting from the lessons of experience generally, the enterprise has become quite promising.

A powerful impulse was given to the movement by a convention of Austrian foresters in 1865, who, after a thorough examination of the Karst, came to the conclusion that the whole of this region was capable of improvement, and that the forests would re-appear in a few years if the ravages of live stock and wood-choppers could be restrained. They appealed to government for aid, and proposed several judicious measures to secure the right kind of trees for replanting and the right methods of culture. The government responded to this petition in 1868

\*.A joch is 1.4223 acres.

by the appointment of a professional forester and by the establishment of nurseries of forest-trees. Of these, two were established at Mount Sermin, and one at Gortz for deciduous trees, and one at Rodik, 1,600 feet above sea-level, for conifers. These nurseries have furnished an ample supply not only for the karst, but also for portions of the Crown lands in other regions. Their production during four years was as follows:

Year.	Conifers.	Deciduous trees.	Mulberry and fruit trees.	Total.
1869.....	813, 100	543, 700	48, 300	1, 405, 100
1870.....	1, 892, 800	1, 918, 000	178, 400	3, 989, 200
1871.....	3, 302, 666	6, 806, 266	370, 660	10, 479, 292
1872.....	3, 909, 466	6, 247, 676	660, 599	10, 817, 241
Total for four years.....	9, 918, 032	15, 515, 636	1, 257, 959	26, 690, 831

These trees were furnished to the royal foresters superintending different sections of the Crown lands, and sold at cost to individuals and communities applying for them. They are also furnished gratis to private parties who promise to use them for public benefit. Two and a half million of trees have already been set out, and the demand transcends the supply. All the Crown lands have applied for trees and for instruction in replanting.

The coast-nurseries are best for deciduous trees, giving them a longer season of growth without risk of injury from the winter. Many sorts make a growth sufficiently rapid to plant the second year. Locusts average in one year a height of 3 feet; rock maples, 1 foot; ashes, lindens, and elms, from 6 inches to a foot; fruit-trees, from 1 to 3 feet, with well-developed roots. Deciduous trees are more vigorous than conifers, especially in the Karst, where the bora and sirocco prevail. They are also less liable to injury from pasturing and from fire.

Among deciduous trees the oak, the elm, and the ash have been found to be the most vigorous growers; among conifers the Austrian pine is the most eligible. The latter, though an excellent shelter and timber tree, is not a favorite among forest-growers.

The Karst region, embracing 284,870 acres according to the tax-rolls, is mostly owned by the townships, but a small proportion being in private hands. The lands are mostly used for pasture, and are closely grazed by the numerous flocks and herds, which furnish almost the sole income of the inhabitants outside of the vine-growing districts of Gortz and Volusca. The Austrian pine having been found unfavorable to the growth of grass, the people of the Karst have conceived a special aversion to it. In 1872 several townships taxed themselves to re-afforest their lands, but stipulated that only ash-trees should be planted. They stated that they could not wait eighty years for the Austrian pine. They received 70,000 ash-trees, not one of which appears to have died. The pine and larch (*Abies pectinata* and *Larix Europæa*) have proved to be well adapted to the higher regions, within the zone of the red beech, ranging from 1,800 to 4,000 feet above sea-level. Below these limits the elm and flowering-ash seem to combine the qualities that enable them to resist both storm and drought. The last named is excellent for vine-poles and wagon-timber, but its leaves are inferior to those of the common ash for fodder, inasmuch as they contain too much tannin for cattle. The ailanthus was almost a total failure, but the box-maple (*Acer negundo*) and the Canadian poplar have succeeded very well. From 50,000 to 60,000 mulberry and fruit trees have been distributed with excellent results.

The severe droughts of the Karst region are unfavorable to the growth of tree-seeds, except the chestnut, walnut, and others which admit of being planted deep enough to secure the requisite moisture. The best results have been obtained with Austrian pine two years old and deciduous trees one and two years old, set in holes a foot square and from 3 to 5 feet apart. A man can dig eighty to one hundred holes per day, and a woman can set four hundred to six hundred plants per day. Grass and weeds are beneficial in shading the soil and giving shelter from the wind. It is useless to raise mounds around the base of the trees, as the heavy rains wash them away. Fencing against live stock is desirable. The digging of the holes is paid for by a special tax, and the nurseries furnish all the trees necessary to fill them. Formerly each district was permitted to transplant its own trees, but the wretched manner in which this was done caused the government to take the supervision in its own hands and to employ only skilled laborers. The Karst is divided into four sections, each under the authority of a forester appointed by the government. The general direction, including the management of the central nurseries, is confided to an inspector residing at Trieste.

The foresters are appointed by the minister of agriculture on recommendation of the governor, and receive a salary of 1,200 gulden per annum, with an increase of 100 gulden every five years till the whole reaches 1,800 gulden. They are also allowed rations and traveling expenses. Their duties embrace the enforcement of the forest laws, and the regular visitation of the forests according to a plan devised by the governor and the local authorities. They are also to assist private enterprise as far as possible, and to use their utmost influence to extend forest-culture. They are expected to watch closely, and frequently report the practical workings of the measures taken for re-forestation of the country; to lay out, build, and control timber-slides; to give instruction in forestry; to prepare estimates for the local government, also tables of statistics and blanks for local officers; to superintend all forest operations, including nurseries; to keep a record of their action; to prepare estimates for the government, and to give all practical information on forestry to private individuals and societies. The system contemplates not merely a routine official action on the part of these officers, but also an intelligent and spontaneous co-operation with every effort that shall be made by all parties for re-forestation of the country. Subordinate foresters are appointed to carry out their measures and to perform the details of forest duty.

Forest legislation and the administration under it have become already a very considerable branch of jurisprudence of a very practical character. It has not yet been found necessary to use compulsory measures, as the spontaneous demand for forest-culture has so far exceeded the means provided by the government; yet a few districts refuse to have anything to do with it. The policy of the ministry is to bring all steep slopes and all bare places under the jurisdiction of the foresters, for the purpose of replanting them in woods. The forests already standing are under close supervision, and many wasteful abuses have been corrected.

According to history and tradition, this whole Karst region was once covered with oak-forests. Previous to the twelfth century it furnished piles, ship and building timber for the republic of Venice during her brilliant maritime career. The previous spoliations of Aquilegia, a prominent stronghold of the old Roman Empire, had but slightly affected the immense resources of the forests then existing. Venice plundered the Istrian forests systematically, and reduced that previously fertile

region to barrenness and poverty. An old description of the manor of Piffenburg states that a squirrel could travel for three miles along the Istrian coast upon the branches of trees; a few bushes now occupy the site of that luxuriant vegetation. The former fertile landscape is now replaced with naked cliffs and bare rocks, upon which an intense sunshine permits no springing plants. The numerous rivulets, dry for most of the year, become, during the remainder, roaring torrents, carrying the soil into the sea.

The denudation of these forest areas has been still more active in modern times. The plain of Volusca was stripped a hundred and fifty years ago. The oak ship-timber was carried to Fiume mostly for exportation to Italy. The red beeches are still numerous on the mountains. The woods in Castelnovo were destroyed during the current century. The red beeches being only valuable as fuel, were too remote from Trieste to be disturbed till all nearer supplies had been exhausted. At the close of the last century these woods furnished hiding-places for the bandit population, but the French invasion broke up their predatory habits, and they turned their attention to the destruction of their former forest covert, which is now nearly exhausted. The once dreaded dark beech wood of Tschitchen has disappeared, leaving but a few stakes on a barren, stony coast. But little is grown in the way of crops. The people have a great aversion to farm-labor, preferring a nomadic life, with a precarious support from teaming, charcoal-burning, &c. The women perform the small amount of farm-labor, and are in the degraded condition characteristic of semi-nomad populations.

The abrogation, in 1824, of restrictions upon the export of ship-timber, imposed for the benefit of the royal navy, caused the removal of the large trees from the coast regions by English and French merchants. In Istria, and in the Gortzer, and Trieste-Karst but little snow now falls, and great flocks of sheep and goats sweep all the young growing trees, except the cedars, and these are taken for fuel.

A special difficulty in re-afforesting the Karst region is found in the singular dryness of the soil. The underlying masses of chalk are split, seamed, and honeycombed with numerous cavities, through which the rain-water from the surface is absorbed. In some small tracts the nummulitic sandstone decomposes rapidly, leaving a surface stratum much more retentive of moisture than the chalk-beds. The leading character of surface-soil, however, is a red ochreous loam mingled with fragments of limestone, which dries out very rapidly. On the mountains and higher summer pastures may be found a dark-brown soil, largely composed of humus, the remains of ancient forest-growth, from which, however, the soluble mineral constituents have been removed. Exposure to sun and rain, since the destruction of the forests, has deprived this humus soil of its fertility, and crops can be raised from it only by copious mixture with the underlying ferruginous clay. Without this preparation neither grass-seed nor tree-seed will grow on it.

The lack of moisture cannot, here, be compensated by irrigation. The only river—the Recca—in passing the Karst region disappears in a subterranean channel at St. Cauzain, and re-appears at Duino, on the coast, as the Timavo. In long droughts water for domestic use is often transported several miles. The droughts usually begin in April and last till September, with the exception of occasional showers in August. Then the moist sirocco alternates with the desiccating bora, with intervening spells of agreeable weather. The spring bora, after damaging the fruit-bloom, frequently absorbs the entire moisture left by the winter. For forest-culture it is important that operations should

commence in early spring, before the last rains. But this is often difficult; the ground may be too wet, and if delayed till sufficiently dry the baking of the late muddy soil prevents the growth of both seeds and plants.

The Karst region, ten miles long, and embracing twenty-nine square miles, has but one small wood. A few bushes and alders scattered over naked, stony fields, are the only subsisting representatives of a once magnificent forest-growth. The soil has much strength, and if it could be protected against the destructive extremes of temperature, &c., it would soon be covered with vegetation. Its dry seasons are, however, especially favorable to vine-growth.

The leading kinds of timber indigenous to this region are the Turkey oak, (*Quercus cerris*), elm, (*Ulmus campestris*), and ash, (*Fraxinus ornus*).

The last-named surpasses all others in tenacity of life under extremes of drought. In the Gortzer Karst the hop hornbeam (*Ostrya vulgaris*) and the common hornbeam (*Carpinus betulus*) are found. Three varieties of the maple, (*Acer campestris*, *A. pseudo-platanus*, and *A. platanoides*), the linden, (*Tilia grandifolia*), and the red beech, (*Fagus sylvatica*), begin at an elevation of 2,000 feet. Near Duino, on the coast, the holly-oak (*Quercus ilex*) and the *Celtis centralis* are frequently planted in the borders of the fields. Even on the poverty-stricken mountain-pastures the locust (*Robinia pseud-acacia*) and two species of poplar (*Populus nigra* and *P. pyramidalis*) have been successfully grown. Of fruit-trees, the walnut, (*Juglans regia*), the cherry, (*Prunus avium*), and the pear, (*Pyrus communis*), succeed best. The first two grow along the roads. The chestnut is very successful, especially near Volosca and Loverano. The white mulberry (*Morus alba*) is widely distributed. Sumac yields considerable material for tanning.

The rapid rise in the price of fuel presents great temptation to excessive chopping. Vine poles in 1870 were worth 3 florins per cental; in 1872 the price was 7 florins. Charcoal is largely manufactured in Castelnovo. The *Celtis australis*, a small tree, is largely exported for whip-handles and wagon-timber. It grows in the fence-corners, attaining a height of 7 or 8 feet. Such a tree is worth in Trieste from 2 to 2½ gulden. In spite of the scarcity of wood-growth there is a considerable export of fire-wood. The annual production of fuel in the Karst amounts to about two and a half millions of cubic feet, principally oak and red beech.

Of districts outside the Karst the first embraces the higher mountains, chiefly the bold and steep declivities of the southwestern part of the Julian and Carnian Alps. Its average elevation is 6,427 feet above sea-level, and it is well watered by springs. Yet even here the destruction of the forests has produced the same irregularity of rain-fall; the streams in winter become torrents, while in summer destructive droughts are frequent. The soil is especially favorable to conifers, but their growth is restricted by merciless chopping and by the grazing of goats, of which over 15,000 are kept in the mountains. The red beech mingles with the pines, firs, and larches in the higher portions. Lower down the rock-maple, elm, and ash begin to appear, and still lower the oak becomes the predominant type. The hazel and the barberry are common in the valleys. The land here is mostly in commons. Some small pieces are owned by the government. It has been found that its subdivision into individual proprietorships has been detrimental to the growth of wood. On the crown-lands and in a few private domains, forest-culture prevails; but elsewhere, the same reckless destruction is observable as in the Karst. Chopping is now forbidden during the

growing-season as well as the grubbing of stumps. The annual production of woods amounts to over 3,000,000 cubic feet, about half of the home consumption.

The second district, outside of the Karst, embraces Capo d'Istria, Pisano, and Pinquety, with several neighboring sub-districts and some adjacent islands. The soil is deeper and less absorbent of water. The denudation of forest-areas here also manifests its mischievous consequences in the same irregularity of rain-fall as in other sections. The summer sun heats the bare and stony soil, producing a radiation which disperses the rain-clouds and causes destructive droughts. Anciently Istria was a fertile country, ranking next to Campania, for productiveness among the old Roman provinces. Then vast forests covered its hills, which remained comparatively intact till the middle ages. Venice, after the conquest of Pola, in 1150, A. D., extorted heavy supplies of piles, ship-timber, and fire-wood.

But the axe of the woodman was less destructive than the teeth of the goats, which were introduced by thousands into the forests. Their ravages were so serious that, in 1754 and 1760, Venice enacted that these animals should be destroyed on sight by the foresters; these enactments were but partially executed, and not less than 5,000 still roam over these depleted forests. A Crown-forest of oak in the fertile Quieto Valley has, by the annual floods of seventy years, received deposits of mud from 5 to 7 feet thick, greatly injuring the timber. This land yields but 6 florins per joch; as meadow it would yield 40. It should be exchanged for some of the denuded mountain-tracts. The oak is the prevalent type of tree-growth. On the mainland the durmast (*Quercus pubescens*) and on the islands the evergreen varieties (*Q. ilex* and *Q. cerris*) are found. Of these the first two are excellent for ship-timber. The common and cork oaks, (*Q. pedunculata* and *Q. suber*,) the water-beech, (*Ostrya vulgaris*,) and common hornbeam, (*Carpinus betulus*,) are spread over the country; they grow slowly and furnish but indifferent timber and fuel. The mountain and field maples, (*Acer pseudo-platanus* and *A. campestre*,) the flowering ash, (*Fraxinus ornus*,) the cork-barked elm, (*Ulmus suberosa*,) and the French maple are occasionally found. The undergrowth represents a southern flora, viz: wild olive, (*Phytrea angustifolia*,) red-berried juniper, (*Juniperus oxycedrus*,) &c. The locust (*Robinia pseud-acacia*) has been largely and profitably grown in old fields for vine-poles; it yields biennial crops more valuable than the best grain-crops. The ailanthus has been successful on only a few tracts. The derangement of the conditions of growth has also affected the habits of the people, indisposing them to farm-industry by its imperfect returns. They live chiefly by gathering wood and raising live stock, both of which pursuits are destructive of the timbered areas and intensify the influences which discourage agricultural production. The report complains of the number of ecclesiastics on the islands, numbering one for each two hundred and eight inhabitants, and exercising a deadening influence upon the industry and welfare of the people.

Forest-culture is here at a low ebb. The yearly product of timber per joch (1.4223 acres) ranges from 20 to 60 cubic feet; in the better managed state-forests the yield is 80 cubic feet and above. The wood is cut every 7 or 8 years on the mainland and every 8 to 12 on the islands. If the time were doubled the production would be much more than doubled. The law now forbids the cutting of timber during the flowing of sap, but close vigilance is required for its enforcement. Sheep and goats do more injury than the axe. The woodland is mostly owned by the township. The produce of the forests amounts to nearly 6,000,000 of cubic feet, about half the home-consumption.

The third district outside of the Karst is the plain of Turlani, which extends westward to the Italian frontier. This region, no less than the preceding, shows the effect of forest destruction. The rich soil is peculiarly adapted to deciduous trees; of conifers the *Pinus pinea*, formerly common, is now found only on the coast. Most of the land is devoted to cultivation, being held by large owners. The fuel necessary for the inhabitants is chiefly furnished by trimmings from vines, mulberries, and roadside trees. Willow-culture furnishes the basis of a profitable industry in basket-making. A joek of well-set willows will yield an annual cutting worth from 25 to 34 florins. On the coast a large area of unproductive sand-hills, subject to malaria, might be greatly improved in its sanitary character by the growth of poplars. In this vicinity a small village now represents the old Roman stroughold of Aquilegia, once called the second Rome.

#### FOREST-CULTURE IN FRANCE.

A recent report presented to the Central Society of Agriculture of France recommended the award of a gold medal to M. Jules Mion, President of the Tribunal of Commerce of Upper Marne, for the re-planting of forest-trees upon his estate, Val-Barisien. This tract, of 296 acres, is traversed by the little river Suize, with a channel about a mile long from south to north. The valley is very straight, and bordered in the south and west by rapid declivities which in summer were formerly parched by heat, and in winter denuded of their light top soil by rains. M. Mion first cut down the poplar and willow groves, which obstructed the current and favored inundations. He diminished the flow of the stream by weirs, removing the talus. Some hills previously used as sheep-pasture were first planted with resinous trees, which he made to grow by extra care in spite of the drought of 1846. He afterward cleared the valley of its rubbish and enlarged the river-bed, obtaining from 500 to 600 cubic meters of rich earth with which to reinforce the scanty soil of some portions of his farm. He continued his tree-planting not only upon the declivities but also the poorer portions of the more level land.

In 1869 the total area thus replanted amounted to 133 acres, of which  $5\frac{3}{4}$  acres, planted in 1845, were of large and full growth. Over 70 acres planted at the same time had been several times destroyed by the illicit introduction of sheep, and hence had to be replanted. Resinous trees, twenty-two to twenty-six years old, presented stems 27 to 30 feet high and nearly 3 feet thick at the base, the soil being calcareous and poor, with a broken subsoil and a rapid southern declivity. The northern exposures, with an argilo-calcareous subsoil and a topsoil varying from 3 to 12 inches, showed a more active growth. It was not rare to find box-trees from 30 to 60 feet high with stems between 2 and 3 feet in circumference.

The trees selected were the *Pinus sylvestris*, the black pine of Austria, the *Epicea*, and the larch. They were first planted a little over a yard apart, or at the rate of about 4,000 per acre, but were subsequently thinned out to about double that distance apart. The ground was trenched with the plow for the seed, which was drilled. At first, M. Mion used plants three years of age, costing from 6 to 9 francs per thousand, but he subsequently planted the seed. His oldest plantations now give him enough seed to maintain or renew his plantations. The expense amounted to about 100 francs per acre, not including the ditching, which adds about 25 per cent. to the aggregate. The land before

planting rented at about 2 francs per acre, and its value was estimated by M. Mion at about 40 francs, or \$8 per acre. The improvements have raised the investment to 180 or 200 francs per acre. The owner, perhaps extravagantly, anticipates that in fifty years the value of the tract will have risen to 4,000 or 6,000 francs per acre, yielding a revenue of nearly 100 francs independent of the annual products of these plantations derived from clearings necessary for the development of the plants.

These tree-plantings have covered with a beautiful vegetation the rocks and hill-sides formerly so desolate. The city of Chaumont and the Baron Fraville have in the same manner embellished the country. M. Mion found strong opposition in his own tenant-farmer, on which account he took the cultivation into his own hands, replacing sheep with milch cows. He reduced the area under cultivation to about 165 acres, which he rendered much more productive by a judicious culture. By care in preserving manure and by the growth of forage-plants he was able to raise the wheat-crop to 26 or 27 bushels per acre.

From the results of this enterprise the inspector of forests of the arrondissement of Chaumont concludes that the bare, unproductive, and valueless hill-sides of the Upper Marne may be replanted with resinous trees, assuring a good return upon the investment. This opinion is endorsed by several of the most intelligent agriculturists of the Upper Marne.

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## CHEMICAL MEMORANDA.

BY WM. MCMURTRIE, CHEMIST.

All analysts who have had any experience in making determinations of tannic acid in different materials can, doubtless, very well appreciate the difficulties which have heretofore been met in securing results for which complete accuracy can be claimed, on account of the unsatisfactory character of the methods which have thus far been employed. Fully appreciating these difficulties myself, I have endeavored to devise a method which would, in a measure at least, remove the difficulties in question, and at the same time be free from all complication which might have a tendency to vitiate the results. Probably the most convenient method given in the works on chemical analysis for making these determinations is that of Löwenthal, described in Fresenius' Quantitative Analysis, fourth English edition, page 673, depending upon the oxidation, with a standardized solution of permanganate of potassa, of tannic acid and sulphindylate of potassa, and decoloration of the latter by means of this reaction.

In this method the tannic is extracted from the material with water, and in its use, therefore, there is great danger that the results may be vitiated by the presence of gum, sugar, &c., which are soluble in water, and which may also be oxidized at the expense of the permanganate of potassa, and it was with this difficulty that I was called upon more particularly to contend. In one of the varieties of wood I have examined, gum, as well as some coloring matters soluble in water, are present in considerable quantities. These substances are, however, to a great extent, insoluble in sulphuric ether, while the tannic acid is quite easily soluble in this menstruum. I have, therefore, made use of it in my



analyses. My method is as follows: After the material to be examined has been finely pulverized by grinding in a steel drug-mill, and thoroughly dried, it is digested several days with about twice its volume of sulphuric ether, the solution decanted, and the residue well washed with ether as long as anything may be removed. When this operation is complete, the solution and washings are united, and the ether removed by distillation. It may be collected by condensation for further use. The residue remaining from this distillation is treated with water until the final washings fail to produce any coloration with salts of iron, the entire solution thoroughly mixed and made up to a given volume. The solution thus obtained may contain very small quantities of coloring matter, which are seldom sufficient to be taken into account, but it is completely free from many of the troublesome impurities found in solutions made by extracting with water directly from the material.

Very nearly the same method has been applied by Julius Löwe\* to the preparation of pure tannic acid from sumac. For this purpose he, however, makes use of acetic ether, and reverses the treatment; that is, he exhausts the material with water and removes the tannin from the solution by agitation with acetic ether, from which it is said the tannic acid may, by distillation of the ether, be obtained in a pure state. He recommends the use of acetic ether on account of its being less inflammable than sulphuric ether.

My attention was particularly directed to this subject by the receipt of samples of the wood of mesquite, (*Algarobia glandulosa*), Osage-orange, (*Maclura aurantica*), and live-oak, (*Quercus virens*), from Mr. J. M. Wilson, Seguin, Guadalupe County, Texas. It was desired that the comparative value of these woods as tanning materials be determined, since it is believed that they contain considerable quantities of tannic acid. The different parts of the woods, which had been previously air-dried, were carefully separated and finely pulverized. They were then subjected to digestion with twice their volume of sulphuric ether for ten days in closed flasks. The solution was at the end of this time decanted and the method above described was followed throughout.

The analyses resulted as follows:

	Percentage of tannic acid.	Percentage of other material separated by ether, insoluble in water.
Live-oak, white-wood.....	0.30	0.90
heart-wood.....	0.125	2.505
Mesquite, heart-wood.....	6.21	0.60
white-wood.....	0.50	6.70
bark.....	0.50	1.84
Osage-orange, heart-wood.....	5.87	6.93
white-wood.....	0.30	4.90
bark.....	0.10	13.10

It will be seen from the above table that the heart-woods of the mesquite and Osage-orange contain tolerably high proportions of tannic acid; nearly as high, indeed, as many varieties of barks used in tanning,

\* Fresenius Zeitschrift für Analytische Chemie, t. xii, p. 128.

and in the Southwest, where these trees grow abundantly, there is no doubt that they may be found of great value in this branch of industry. The live-oak contains so small a percentage of tannic acid that it will be found of little value. There was extracted from the Osage-orange a yellow resinous coloring matter, soluble in ether and caustic potassa, which we have not yet examined, but which we shall at some future time make the subject of an investigation. It is possible that it may be found useful as a coloring matter.

*Experiments with beets.*—In his experiments upon the effects of different fertilizers upon sugar-beets, the results of which have lately been published, Professor Goessman, of the Massachusetts Agricultural College, has found that beets do much better as a second crop upon soil to which farm-yard manure has been applied, the potash and other mineral elements of plant-food being then in a more favorable condition for assimilation by the root. He found that beets grown as a first crop upon land which had received an application of farm-yard manure gave a lower percentage of sugar than those grown under other conditions. The most favorable application seemed to be kainit and superphosphate of lime, or even sulphate of potassa alone.

In order to show the results of Professor Goessman's experiments in this particular, we append the following table exhibiting the percentage of cane-sugar found in the juice of roots grown from different seeds under the influence of various fertilizers.

Kind of fertilizer applied.	Freeport, Ill.	Sutton's English.	Electoral college-farm.	Vinton's college-farm.
Fresh horse-manure .....	11.96	9.71	9.42	7.8
Blood guano, without potash .....	10.99	9.17	10.10	10.20
Blood guano, with potash .....	12.55	10.01	13.24	10.50
Kainit. with superphosphate of lime .....	13.15	10.91	12.16	10.50
Sulphate of potassa .....	14.52	12.47	14.32	12.78
No manure; second year after application of stable manure .....	13.49	.....	12.78	12.19

Deherain's late experiments prosecuted on the experimental farm connected with the school of Grignon, show results somewhat similar. Of all the fertilizers with which he experimented, principally phosphatic and nitrogenous, one manufactured by MM. Coignet, of Paris, containing 30 per cent. of dried bone phosphate, and 50 per cent. of dried animal matter, and yielding 6 to 7 per cent. of nitrogen, gave the best results. The yield was very much increased, and the beets contained an average of 12 per cent. of sugar. This result corresponds more nearly to the results obtained by Professor Goessman by application of blood-guano and potash, than those obtained by application of blood-guano alone. The fertilizer of Coignet, however, doubtless contained more phosphoric acid than the blood-guano employed by Goessman, and the increased percentage of sugar may be due to this fact. Or, since Deherain remarks that unfortunately for his experiment the soil at Grignon is very rich, it is possible that all the potash which was needed by the crop, and which had to be applied artificially by Goessman in his experiments, was supplied by the soil itself. We therefore consider it evident that this compound is necessary to the successful cultivation of the crop in question, and where it is wanting in the soil it should in all cases be contained in the fertilizer applied.

*Extraction of crystallizable sugar from molasses.*—In 1848 Dubrunfaut showed that the sugar contained in molasses was crystallizable and identical with ordinary cane-sugar. He then devised a method for its separation, depending upon the precipitation of the sugar with baryta, and decomposition of the insoluble sucrate of baryta thus formed by means of a current of carbonic acid gas. This method has been practically applied by M. Tillois, at Courriers, and as described by M. Boudard the method is as follows:

The molasses is treated with a concentrated solution of baryta, and the sucrate of baryta thus formed, after being allowed to settle, is separated from the supernatant liquor by decantation of the latter, mixed with a small quantity of water, and placed in large wooden vats, provided at the bottom with spiral tubes pierced with small holes. Carbonic acid gas is forced through these tubes and from them through the mass. The saccharine liquid, which is quite clear after the carbonate of baryta formed has subsided, is drawn off, and the carbonate of baryta freed from any remaining liquor by placing it in strong sacks, and submitting it to careful pressure. The clear saccharine liquid is then submitted to the ordinary processes of evaporation and crystallization, and the carbonate of baryta remaining at the close of the process is, by calcination, reduced to caustic baryta, and is then rendered fit for use in subsequent operations.

*Strange growth of potatoes.*—A curious fact with regard to the growth of potatoes is recorded by M. Charles Rabache, in which it appears that the tubers were planted in pure sand, in the bottom of a cave which was quite dark, and provided with little or no ventilation. When spring approached the tubers germinated, and after a given time small nodules appeared upon the roots, developing into tubers of fair size. The stems grew quite long, and were perfectly white except at the extremities, which were directed toward the opening, and therefore somewhat exposed to the action of diffused light. The tubers, though smaller, were in every way similar to the original, having the same color and taste, and showing the same composition upon chemical analysis, and the volume and weight of the entire product, stems and tubers, was three times that of the original tuber.

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## BOTANICAL NOTES.

BY DR. GEORGE VASEY, BOTANIST.

**CIRCULATION OF SAP.**—The most important contribution to our knowledge of this subject is a lecture of Prof. W. S. Clark, president of the Massachusetts Agriculture College, delivered before the Massachusetts State board of agriculture, at Fitchburgh, December 2, 1873. The lecture presents a concise summary of the principal theories and conjectures on the subject, details a series of carefully conducted experiments made at the college, and gives the author's conclusions thereon.

The lecturer premised a brief but clear statement of the structure and functions of plants so far as they relate to the subject in hand.

We condense and present below some portions of the lecture, which seem to be of the most general interest.

Numerous hypotheses have been advanced to account for the circulation of sap through the operation of some merely chemical or physical

forces, but their very multiplicity exposes their unsatisfactory character. Malpighi was of the opinion that the contraction and expansion of air in the ducts under the influence of heat and cold pumped up the sap, but this could not be without valves to obstruct its reflex action which do not exist, since they cannot be found, and since willow or rose cuttings will do as well with one end up as with the other. Moreover at the period of greatest pressure, there is often no air in the tree, but every cell and duct is gorged with sap, as has been fully shown in the experiments at the college.

Knight, without any good reason, assumed the pith-rays, extending from the center to the circumference of the stem, to possess irritability, and by their contraction and expansion to compress and dilate alternately the fibro-vascular tissue and so cause it to act somewhat like a force-pump.

Du-Petit-Thouars, rejecting all mere physical forces, advanced the hypothesis that the original force is a vital one, but that in the spring, after a period of repose, the buds under the influence of the sunshine, begin to expand, and by the absorption of sap, which they exhale, create a vacuum or suction which puts the fluids in motion throughout the entire plant. Exhalation and chemical changes, then occurring, keep up the flow till the fall of the leaves in autumn. This, however, entirely fails to account for the familiar fact that the sap is often pressing into trees, like the birch, with tremendous force, several weeks before there is the slightest activity in the buds.

Dutrochet discovered the principle called osmose, which causes unlike fluids separated by a thin septum to flow together with different degrees of rapidity. Thus, if a solution of sugar be separated, by a thin membrane from pure water, the water will pass through into the sugar freely, while a minute portion of the sugar will enter the water, the result being a large increase in the volume of the sugar solution. This force, under favorable circumstances, will overcome the force of gravitation so as to cause the rise of water in a tube to a considerable height.

The general principle of osmose has been almost universally adopted, without any considerable attempt at demonstration by physiological experiments, as the chief cause of all the motions which occur in the contents of vegetable cells, such as the absorption of water by the rootlets, the ascent of the crude sap to the leaves, and the general transference of all nutrient matters to the parts where they are deposited and assimilated. There are many difficulties in the way of accepting this charmingly simple hypothesis. Among these may be named the fact that there are found in the different adjoining cells of plants entirely distinct substances which do not mingle, as in the brilliant petals of flowers, where superimposed layers of cellular tissue contain fluids of unlike colors. The cambium, also, which evidently does not penetrate the sapwood, readily finds its way through hundreds of feet of its proper conducting medium. Again, the organic contents of plant cells are almost exclusively colloids, and the proof of their easy and rapid transmission through imperforate membranes is yet to be discovered; neither is there sufficient evidence of any such exudation of organic matter from the rootlets, where osmose is imagined to occur, as is required by all that is known of this principle in its operation upon lifeless matter.

Ordinary absorption and capillary attraction have been thought to assist in producing the phenomena of the motions of sap, though no one regards them as sufficient of themselves, since they not only lack the requisite power, but also that peculiar ability, manifested by the living plant,

to select from the soluble materials of the soil just those substances which every species needs for its peculiar constitution.

Herbert Spencer has attempted to demonstrate that the compression and dilatation of cells and ducts, caused by the swaying of stems and branches in the wind, is an important aid in promoting the flow of sap. When we consider that many trees grow where the wind scarcely affects them, and that plants flourish in glass-houses, where they are never disturbed in this way, we shall see that this hypothesis is of small account. There is also here, as in the hypothesis of Malpighi, a need of valves to prevent regurgitation, and we have during the present season demonstrated that detached living roots, entirely underground, exert an enormous force merely by their power of absorption.

In 1720 Rev. Stephen Hales, an English clergyman, made some experiments on the absorption and exhalation of water by plants, and on the force with which absorption was exerted. He applied mercurial gauges to several different grape-vines, and obtained, as the maximum pressure exerted by rising sap, a force sufficient to sustain a column of mercury 38 inches in height, which is equal to a column of water 43 feet high. To learn how far this might be true, and what were the facts concerning the spring flow of sap in our forest-trees, and especially in the sugar-maple, in regard to which scarcely any accurate observations had been made, we began some investigations at the agricultural college last March, the results of which may be summarily stated as follows:

A gauge was attached to a sugar-maple March 31, which was three days after the maximum flows of sap for this species, so that further observations are required earlier in the season to complete the record, and determine with certainty the maximum pressure which it exhibits in the spring. Of the record made the following facts are specially interesting:

First, the mercury was subject to constant and singular oscillations, standing usually in the morning below zero, so that there was indicated a powerful suction into the tree, and rising rapidly with the sun until the force indicated was sufficient to sustain a column of water many feet in height. Thus at 6 a. m., April 21, there was a suction into the tree sufficient to raise a column of water 25.95 feet. As soon as the morning sun shone upon the tree the mercury suddenly began to rise, so that at 8.15 a. m. the pressure outward was enough to sustain a column of water 18.47 feet in height, a change represented by more than 44 feet of water. On the morning of April 22 the change was still greater, requiring for its representation 47.42 feet of water. These extraordinary fluctuations were not attended by any peculiar state of the weather, and happened twelve days before there were any indication of growth to be detected in the buds. These observations are quite new, and as yet wholly inexplicable, but will receive further attention at a future time.

On the 20th of April two gauges were attached to a large black birch, one at the ground and the other 30 feet higher. The next morning at 6 o'clock the lower gauge indicated the astonishing pressure of 56.65 feet of water, and the upper one of 26.54 feet. The difference between the indications of the two gauges was thus 29.92 feet, while the actual distance between them is 30.20 feet, so that they corresponded almost precisely as if connected by a tube. In order to learn whether the same principle would prevail if the other gauge was moved, it was raised 12 feet higher. The same correspondence continued through nearly all the observations of the season, notwithstanding the gauges were separated by 42.20 feet of close-grained birch-wood. The sap-pressure continued to increase until, on the 4th of May, it represented a column of water

84.77 feet in height, which is believed to be the highest pressure of vegetable sap ever before recorded.

To determine, if possible, whether any other force than the vital action of the roots was necessary to produce the extraordinary phenomena described, a gauge was attached to the root of a black birch-tree as follows: The tree stood in moist ground at the foot of the south slope of a ravine, in such a situation that the earth around it was shaded by the overhanging banks from the sun. A root was then followed from the trunk to a distance of 10 feet, where it was carefully cut off one foot below the surface, and a piece removed from between the cut and the tree. The end of the root, thus entirely detached from the tree, and lying in a horizontal position at the depth of one foot in the cold, damp earth, unreachd by the sunshine, and for the most part unaffected by the temperature of the atmosphere, measured about one inch in diameter. To this was carefully adjusted a mercurial gauge, April 26. The pressure at once became evident, and rose constantly, with very slight fluctuations, until at noon on the 30th of April it had attained the unequalled height of 85.80 feet of water. This wonderful result showed that the absorbing power of living birch-rootlets, without the aid of any of the numerous helps imposed upon them by ingenious philosophers, such as osmose, exhalation, dilatation, contraction, oscillation, capillarity, &c., was quite sufficient to account for the most essential of the curious phenomena connected with the circulation of sap. Unfortunately, in an attempt to increase the capacity of the gauge, the bark of the root was injured, and this most interesting experiment terminated. There can be little doubt that future trials, carefully conducted, with suitable apparatus, will achieve still more marvelous results.

The original experiment upon the grape-vine, the story of which has come down to us through a hundred and fifty years, was repeated May 9, and a pressure of 49.52 feet of water obtained May 24. This is 6½ feet higher than was observed by Hales.

The peculiar features of the pressure of the vine-sap are: Its lateness in the season; its apparent independence of the weather; its uniform and moderate rise day and night to its maximum; its very gradual decline to zero, without any marked oscillations; and its constant and almost unvarying suction of 4.5 to 6.5 feet of water manifested from June 20 to July 20, when the observations ceased.

In conclusion, we may as well admit that life is still a special force, and not to be resolved into any other sort or combination of attractions or repulsions, whether called electricity, osmose, or any other name.

There is, obviously, need of much more investigation and definite knowledge concerning the phenomena of vegetable nutrition and development; and it may be well to remember that we are everywhere surrounded by objects for scientific research, demanding our utmost talent, patience, and skill, but sure to give ample and profitable results to every diligent inquirer. We are often inclined to encourage ourselves to remain in ignorance and idleness by dreaming of grand opportunities for study in some far-off time or place; but let us all keep in mind the fact, so familiar to every thoughtful student of nature, that within the limited circle of our vision lie concealed more mysteries than with our best endeavors we can ever solve.

**ROCKY MOUNTAIN GRASSES.**—The collection of grasses made in the Rocky Mountains of Colorado, last year, by the botanists of Lieutenant Wheeler's expedition is the largest and completest, perhaps, ever obtained in that region; and although most of the species are well known to science,

there are some peculiar and interesting forms which are deserving of notice. The collection is quite full, also, in several difficult genera, and serves to increase and make more satisfactory our information respecting them.

One of the rarities of the collection is a very diminutive species of *Vilfa*, which may be characterized as follows:

*Vilfa minima*. Culms erect, branched at the base; spikes very slender, erect, terminal, and lateral; lateral ones partly included in the sheaths; flowers alternate, few, half a line long, pointed; glumes membranaceous, obtuse, about half as long as the flowers; palea nearly equal in length; stamens, three; leaves mostly radical, short, strongly nerved, lower sheaths inflated. This grass is from one to one and a half inches high, slender and delicate, and was found growing on wet shores around Twin Lakes, Colorado.

*Sporobolus asperifolius*, N. and M., occurs in a very luxuriant form, many of the specimens having 2-3 flowered spikelets. Many of these have the grain affected with a black smut, (*Tilletia caries*, Tul.) This seems to be an abundant grass in some localities. The genus *Calamagrostis* is represented in the collection by 5 species, viz, *C. Langsdorffii*, Trin.; *C. sylvatica*, D.C.; *C. stricta*, Trin.; *C. Lapponica*, Trin.; and *C. confinis*, Nutt. The last-mentioned species grows tall, and is cut for hay. The seed, however, is subject to an ergot, which differs, says Mr. C. H. Peck, from *Cladiceps purpurea* in its smaller size and in its color.

A few specimens of the delicate *Stipa Mongolica*, Turcz., were collected. It appears to be very rare. *Catabrosa aquatica*, Beau., was collected in wet bogs near Gray's Peak.

No genus of grasses gives more trouble to the botanist than *Poa*. Much confusion and uncertainty has prevailed as to the species of this genus in the Rocky Mountains. The specimens in the collection are very numerous, and embrace at least twelve well-marked forms or species, most of which are pretty well known in collections, some, however, under provisional names, and some others which probably have not yet been properly defined.

The following are some of the species as commonly received: *Poa arctica*, R. Br.; *Poa alpina*, L.; *Poa pratensis*, L.; *Poa cesia*, Sm.; *Poa serotina*, Ehr.; *Poa sylvestris*, Gr.; *Poa flexuosa*, Muhl.; *Poa tenuifolia*, Nutt.; *Poa Andina*, Nutt. In addition to these is a species which approaches *P. brevifolia*, Muhl., but differs in some important particulars. The leaves are rather rigid, involute and cuspidate pointed. The cauline ones are very short, radical ones, 4-6 inches long. The culms are 1 to 1½ feet high, from running root-stocks. The branches of the panicle are mostly in pairs, slender, rather close and erect, flowering above the middle; the spikelets 3 to 4 flowered, flowers not webbed at the base.

A species described by Mr. Watson, in King's Report, under the doubtful name of *Poa alpina*, occurs in considerable quantity in the collection, and with considerable variety of form. It differs so materially from the Linnæan species that it should have a distinct name. It seems to have a wide range, at elevations of 6,000-10,000 feet, and might very appropriately be called *Poa montana*.

The genus *Festuca* is represented by the following species: *F. tenella*, Willd.; *F. ovina*, L.; in several varieties; *F. microstachys*, Nutt.; *F. brevifolia*, Br.; and *F. scabrella*, Hook., and by another, numbered 406 in the collection, whose specific position is yet undetermined. It may be characterized as follows:

*Festuca*, No. 406. Spikelets cylindrical, lanceolate, acute, 3-5 flowered, 5-6 lines long; glumes membranaceous, shorter than the flowers, nearly

equal, lower one convex, not compressed, inner one slightly keeled, purplish, obscurely nerved; lower palet lanceolate, acute or short cuspidate, minutely scabrous, obscurely 5 nerved, convex, inner palet nearly equaling the outer, narrow, slightly hispid on the keels; anthers 3, linear. Radical leaves numerous, involute, 6 to 12 inches long, rough margined. Culms erect,  $1\frac{1}{2}$  to 2 feet high; panicle, 3 to 4 inches long, loose; branches single or in pairs, naked below, erect.

*Grappheporum flexuosum*, Thurb., a handsome grass, occurs from Fort Garland, Colorado, as also a grass which approaches very near the same genus, but which seems to connect that with *Trisetum*. It might easily be mistaken for *Grappheporum melicoides*, but a close examination discovers the short awn on the back of the palet. A close examination of some specimens of *G. melicoides*, from near Mount Kineo, Maine, discloses also a short awn, though shorter than in these Rocky Mountain specimens. Other specimens of *G. melicoides*, from Canada, fail to show any awn. The question arises whether these short-awned specimens should be considered as belonging to *Grappheporum* or *Trisetum*. The Rocky Mountain specimens seem to be specifically distinct from those of Maine, and may, for the present, be characterized as follows:

*Trisetum Wolfii*, apparently cespitose, and from a running root-stock; culm erect, 1 to  $1\frac{1}{2}$  feet high, smooth, culm leaves flat, short, ( $1\frac{1}{2}$  to 4 inches;) lower leaves and sheaths somewhat scabrous, ligule lacerate; flowers in an upright close panicle, which is 2-4 inches long, 1-2 rays at each joint; spikelets lanceolate, 2-flowered, and with a rudiment or continuation of the rachis half as long as the upper flower; the rachis and rudiment villous hairy; glumes lanceolate, membranaceous, acuminate, equaling the flowers, which have a few hairs at the base; lower palet lanceolate, acuminate, slightly split or two-toothed at the point, obscurely 5-nerved, bearing near the point a straight appressed awn, equaling or a little exceeding the palet; upper palet rather shorter; grain oblong or linear, nearly as long as the palets. Collected at Twin Lakes, Colorado. A very similar, if not identical, species was collected in the Rocky Mountains in 1868, on the expedition of Major Powell, and distributed as 693 of Vasey's collection.

Some interesting forms of *Bromus* and *Triticum* occur, but are not yet sufficiently studied.

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## FACTS FROM OFFICIAL SOURCES.

BRITISH IMPORTS OF WHEAT AND FLOUR.—Official returns of imports into the United Kingdom show that the total import of wheat, in the two months ending February 28, 1874, was 7,208,729 cwts., of which the import from Russia was 1,250,594 cwts., a decrease of 1,177,313 cwts. from January and February of 1873; and from the United States, 4,454,942 cwts., valued at £3,050,974, an increase of 2,020,951 cwts. The increase in the United States imports of flour was from 160,227 cwts. to 713,989 cwts. Counting wheat and flour, the United States receipts in the two periods were, respectively, 5,325,773 and 10,949,852 bushels. The price of this wheat was equivalent, respectively, to \$1.79 and \$1.83 per bushel. For these periods, in which a small total increase is shown, the Russian receipts were reduced about one-half; those of the United States were doubled.

BLACK-LEG AMONG CATTLE.—The Department was recently addressed



by Hon. H. J. Jewett, of Ohio, in relation to the disease among cattle commonly known in this country by the name of black-leg or black-quarter, to which answer was given as follows :

DEPARTMENT OF AGRICULTURE,  
Washington, February 23, 1874.

DEAR SIR: I am in receipt of your letter of 19th instant, in which you say that in some parts of the West a disease called black-leg, or black-quarter, is prevailing among cattle, and request information as to the character of the disease, the remedies for it, &c.

The reports of this Department have, from time to time, related facts concerning the ravages of a disease similarly called, and I have no doubt the same as that to which you refer. However, I think that no special treatise on the subject has been published, and at the same time those directly interested in the matter have been indifferent about communicating facts as to treatment, &c.

In view of the importance of the subject, I deem it expedient to be somewhat explicit in replying to your letter.

I find this disease referred to in a report of the commissioners appointed to inquire into the origin, nature, &c., of Indian cattle-plagues, published in Calcutta, 1871. Anthrax fever, locally known as goli, (quarter-ill,) is described as a sudden swelling of one hind-quarter, which extends over the loins, back, and shoulders. When the swelling is pressed it makes a cracking noise like pressing salt. The animal is very lame in the leg attacked. The respiration becomes very much accelerated, and the animal shows great distress, and is evidently in great pain. The administering of medicines appears now to be of no use. Even firing and cutting of the swelling produce no beneficial effect. When the swelling is cut the blood is all black and thick. When this disease breaks out among the stock the cattle are moved from place to place with a view to giving them exercise and preventing the lameness coming on; and by moving them about they have not time to eat too much. When they have been driven over ground where the pasturage is scanty there is less chance of the disease continuing among them. This disease does not occur every year, but when the grass is unusually rich and plentiful. If twenty animals are attacked by this disease, for example, they all die, and treatment is of no avail. The only way, says this authority, of preventing the spread of the disease is to keep the yet healthy animals moving about, giving them limited pasture.

In a "Manual of the More Deadly Forms of Cattle Disease in India," Calcutta, 1872, the disease, under the name of *anthrax fever*, is said to be a blood disease, and in India is said to be contagious, though in cold climates it is not believed to be so. It is generally accompanied with a swelling under some part of the skin, generally on the loins or hind or fore quarters or throat, and sometimes tongue. The disease has been found communicable to other animals, and to man in the form of malignant pustule. *Causes* are described as follows: When cattle which have for some time been kept on very poor, bare, or reedy pasture are put on rich grazing grounds they become very often affected. The younger cattle are especially liable to become affected, as in them blood is more rapidly formed than in older animals. The blood not only becomes suddenly enriched, but also vitiated, and escapes from its vessels in those soft parts of the body loosely connected. The most thriving animals are the most susceptible, especially those which are rapidly improving after having been in somewhat low condition. Again, at seasons when cattle are not sheltered at night, and the days are very hot and the nights cold, they are more liable to be affected.

Again, in this manual, it is said that, in certain badly-drained lands in Great Britain, the disease was wont to occur frequently; but since the lands have been duly drained, the disease is seldom or never met with. In some parts of the continent of Europe the disease is always more or less present, at certain seasons, on lands where the drainage is defective.

Concerning symptoms, it is said that the attack is very sudden. An animal, seen perfectly well a short time before, may be found in an hour or two afterward to be dull and stiff, and to have a difficulty in moving, and in a few minutes a swelling will be observed under the skin on some part of the body, generally on the loins, hind-quarters, fore-quarters, or throat and tongue; sometimes the disease may be located in the chest or abdomen, or even brain. If the throat and lungs are principally involved, then the breathing will be distressed. If the brain is affected, there will be stupor, and when the spleen and other parts of the abdomen become gorged, signs of abdominal pain will be evident. The respiration becomes very much increased, the animal moans, and the pulse is weak and rapid; the animal's strength soon fails, the external swellings rapidly increase, and death takes place in a few hours.

Treatment is of no avail when the swellings are large, or when from the distressed breathing it is evident that the lungs are very much gorged with extravasated blood. Preventive measures may be taken. If an animal is suspected to be attacked, purge

well, keep under shelter, and give good pure water, in which common salt may be mixed. When one of the herd is attacked, others will probably have a tendency to become affected; it is therefore advisable to give to each animal a laxative drench, and in their water a small quantity of salt and niter. All should be kept on bare pasture, and be made to frequently move about. It is also a good plan to insert a seton in the dewlap of each animal. This has been found to be a most successful preventive measure, combined with the change to bare pasturage; the new pasturage being of an easily digestible kind. The prevention of the disease is a most easy matter compared with the treatment of an affected animal; and by carefully preventing stock from becoming exposed to the causes already noted, seldom will the disease be found to make its appearance.

Thus far as to the disease in India, where it has much prevailed.

Youatt and Martin on Cattle, edited by A. Stevens, New York, edition 1855, treat of this disease at some length. They strongly advise bleeding to the utmost limit allowable, in connection with purging. But on this head, as it relates to bleeding, they do not agree with our Calcutta authority, by whom it is said that the propriety of bleeding is very questionable, and certainly can only be carried out in the very first stage of the disease, as the blood so soon becomes vitiated, turbid, tarry, and black in color that it will not run from the opened vein. Youatt and Martin are of the opinion that the prevention of this malady is the only cure worth notice; and to this end recommend that a piece of short or inferior *keep* should be reserved as a *digesting place*, in which the cattle may be occasionally turned to empty and exercise themselves. Those observed to advance very fast may be bled monthly for several months; but occasional purges of alterative medicines would prevent those diseases which seem to take their rise in over-repletion and accumulation, and are far better than bleeding.

Mr. G. Lawson, an English authority much approved by Allen, in his work on American cattle, says of the methods *first* to be resorted to, that bleeding is the first and principal remedy, and must be used in proportion to the age and strength of the animal; from three to four quarts will generally be found sufficient. After this the following purgative drink is recommended:

Carbonate of potash, 2 drams.

Sulphate of soda, 6 ounces.

Barbadoes tar, 3 drams.

Warm water, 1 pint.

Mix for one dose.

Setons in the dewlap are recommended.

In conclusion, I would cite the language of Mr. John Lawrence, England, in his treatise on cattle medicine, as quoted by Allen:

"It should be considered that animals living in a state of nature, regulated by the reason and experience of man, would be almost wholly exempt from disease; that their appetites, unlike our own, may be held under a constant control; that their diseases result purely from the negligence or erroneous treatment of their owners. They are either too much exposed to the rigors and changes of the weather, or they are gorged with food, denied a sufficient quantity, or supplied with such as is unwholesome. Here we learn the chief causes of their maladies. *Learn to prevent them*, instead of undertaking the tedious, unsuitable, and hopeless task of learning to cure them. Of all things, let the proprietors of cattle renounce forever the insane folly of offering premiums for *incurable* diseases, and the hope of providing medicines which, by a sort of miraculous operation, will enable men to continue in the habit of exposing their animals to the constant risk of such disease. I have no infallible receipts to offer; on the contrary, I wish to impress my readers strongly with the idea that all *infallible receipts are infallible nonsense.*"

I am, very respectfully,

FREDERICK WATTS,  
*Commissioner of Agriculture.*

Hon. H. J. JEWETT, M. C.

AGRICULTURAL EXPOSITION AT BREMEN.—Through the Department of State information has been received from the minister of the German empire that an agricultural exposition is to be held in the city of Bremen in June next. The exposition will be continued from the 13th to the 21st of that month, under the special protection of the Crown Prince of the German empire. The consul of the United States at Bremen remarks that the exertions made by the leading agriculturists of Germany, and the interest manifested generally, combine in promise to make the proposed exposition one of great value to agriculture—general and special.

BANANAS IN FLORIDA.—A correspondent says take up late bananas

and bank them ; the product finally is the largest and finest of the fruit. He says, in regard to banking, " Dig a large hole for the roots on a dry, sandy hill ; lay them down at an angle of, say 10°, the hole sloping upward for the tops ; lay the roots in the hole 4 to 6 deep, and cover with fine straw and about 4 inches of dirt.

**DAIRY HUSBANDRY IN NORTHERN ILLINOIS.**—The following statistics of associated dairying in the contiguous counties of McHenry, Kane, Kendall, La Salle, and De Kalb, Illinois, are condensed from a paper furnished by Mr. N. E. Ballou, of the county last named. Mr. Ballou represents that this form of associated industry has proved more profitable in that section than any other branch of farming ; that it is rapidly extending, and that while other branches have exhausted the soil and diminished its value, this, in addition to its larger direct profits, is recuperating the soil and rendering it increasingly valuable.

In McHenry County there are thirty cheese and butter factories, at which, during the season of 1873, 17,000,000 pounds of milk were manufactured into not less than 1,500,000 pounds of cheese and 100,000 pounds of " gilt-edged " butter. Estimated value of factories and fixtures, \$125,000 ; of cows, about 5,500 in number, \$275,000 ; of products for the season, \$180,000, or \$32.73 per cow.

Kane, twenty-two factories, using the milk of 10,500 cows ; product, 2,500,000 pounds of cheese and more than 1,000,000 pounds of butter. Invested in factories, \$100,000 ; in cows, \$525,000 ; value of products, \$400,000, or \$38.10 per cow.

In Kendall this industry has but just made a beginning, but will be largely increased in 1874. Two factories turned out last season something over 200,000 pounds of cheese and about 25,000 pounds of butter. Invested in factories, \$10,000 ; in cows, \$30,000 ; value of products, \$37,500. La Salle also has as yet but one factory, but is preparing to engage in the business extensively, and it is reported that several large factories are now in the process of erection. De Kalb has now fourteen associated and three private factories for the manufacture of cheese, besides two for butter. The number of cows furnishing milk for these is about 4,000. Mr. Ballou predicts that in the season of 1874 there will be not less than twenty associated factories in the county, using the milk of 7,000 cows. Invested last season in factories, \$50,000 ; in cows, \$200,000 ; value of products, \$125,000, or \$31.25 per cow.

Our correspondent reports, as ascertained by correspondence with the officers of the Wisconsin Dairymen's Association, that, in 1873, one hundred and fifty factories in that State turned out 10,000,000 pounds of cheese, and that factory-cheese manufactured in the Northwest has already attained in the great markets, both in this country and Europe, a deserved reputation for its excellent quality ; also, that the factory-butter of that section is especially sought after, for the reason that it is adjudged superior, as a rule, to that made in private families. He adds the important statement that a State dairymen's association is about being organized in Illinois, which will make it possible hereafter to collect full statistics of this industry in that State.

**A HOPEFUL SIGN.**—The young men of the South are learning self-reliance and the wisdom of co-operation for the accomplishment of results unattainable by single-handed effort. It is reported that in Franklin, parish of Saint Mary, La., ten or a dozen young mechanics, out of employ and unable to find work at their several trades, have contracted with Hon. T. J. Foster to cultivate jointly on his land eighty acres of cane, of which fifty are stubble and thirty seed-cane. The

conditions are as follows: Mr. Foster is to furnish the seed, implements, teams, and feed for the teams, and is to receive one-half of the crop when made.

**TIMBER-GROWING IN LIVINGSTON COUNTY, ILLINOIS.**—A correspondent reports that experiments in cultivating groves of soft maple have been successful in this county previous to the last two years; since then a borer has appeared, which increases so fast as to threaten to destroy all the young soft maples. It does not attack those which are more than five inches in diameter. The cultivation of hedges has been stimulated by the scarcity and high price of timber until there is a fair prospect that prairie-farms will soon be better fenced than those having plenty of timber on them. For hedges the Osage orange is deemed the best.

**PRESERVATION OF GOVERNMENT TIMBER.**—Public attention seems at last to be waking up to the importance of preserving timber, especially on the public lands, from the prodigal waste and reckless destruction to which it has long been subjected. A bill has been introduced into the legislature of Colorado Territory which provides that whoever shall, through intention or inexcusable carelessness, set fire to any forest, prairie, or other grounds within the Territory, "shall be deemed guilty of a high misdemeanor," for which the penalty shall be imprisonment in the penitentiary for a term not exceeding two years, and a fine not exceeding \$1,000. The person furnishing information of the violation of the law is to receive one-half of the fine collected, and the other half is to go to the school-fund of the county in which the offense was committed. It is further provided that the penalty inflicted on the offender shall not debar the person or party injured by his offense from a civil remedy for damages.

**ABNORMAL WEATHER IN UTAH.**—A correspondent at Salt Lake City reports that while the winter has not been severely cold in that locality, it has been remarkable for the prevalence of fog. Frequently it has prevailed continuously, night and day, for nearly a week at a time, during which all things and all creatures have been covered with rime. Nothing like it has occurred before during the twelve years he has resided there. He desires the learned in meteorology to explain the cause of such continuous fog at that altitude with its arid surroundings.

**BLACKBERRIES IN NEW JERSEY.**—One farmer in Monmouth County, who has six acres in Wilson blackberries, sold, last season, fruit to the value of \$3,000.

**PROFIT FROM EGGS.**—Our correspondent in York County, Maine, estimates that there are in that county 13,000 families, one-half of which are supposed to winter on the average 10 hens each, from which are gathered an average of 100 eggs per hen, which sell for 24 cents per dozen, amounting to \$130,000. As the women and children manage this business, he considers it a very good show for them.

**PRODUCTIVENESS OF ALFALFA.**—A farmer in Fresno County, California, reports that, in 1873, from a field of five acres he cut 20 tons of alfalfa hay, which netted him \$10 per ton; also one crop of alfalfa-seed, weighing 2,200 pounds, which netted him 20 cents per pound. This is a clear profit of \$128 per acre, though it is not stated that any allowance is made for interest on the value of the land or the exhaustion produced by the cropping.

**BRADY AGRICULTURAL SOCIETY.**—This society has its field of operations in Huntingdon County, Pennsylvania. The secretary sends to

this Department a statement of the yield per acre secured in 1873 by several of the officers and members: The president, J. B. Wakefield, produced, of wheat, 30 bushels per acre. The secretary, C. Wakefield, wheat, 27; corn, 95; potatoes, 340. The treasurer, David Detweiler, wheat, 24; corn, 98; potatoes 100. Jacob Sharp, wheat, 27; corn, 100. S. Sharp, wheat, 21; corn, 85. N. Hartzlar, wheat, 28; corn, 60. J. E. Odenkirch, wheat, 21; corn, 93. C. S. Brown, corn, 90; potatoes, 200.

**A GOOD YIELD OF CORN.**—A farmer of Virginia gives an interesting account of the method he pursued to secure a good crop of corn in Smyth County. He began on a very poor farm in 1859, of which he devoted  $16\frac{1}{2}$  acres to corn. The yield was small. In 1866 he again planted in corn, with much better results. The tract was then turned over to grass, and mowed and pastured up to the winter of 1871-72. At this time manure from the barn was spread on the thinnest parts, and during the winter the field was plowed to the depth of 10 to 12 inches, after which slacked lime, to the amount of 80 bushels per acre, was applied, and the land harrowed five times, thoroughly mixing lime and soil. About May 1 the corn was planted in rows,  $2\frac{1}{2}$  feet apart. When it came up about one bushel of plaster per acre was spread, and the spaces between the rows were thoroughly plowed to the depth of 12 to 13 inches. It was now thinned, leaving two stalks to a hill; replanting was done, and cutting "trash" from the hills with the hoe; no other work with this implement was done. From the 20th to 27th of June plowed with broad shovel-plows, and afterward with the long coulter-plow; thoroughly erased all traces of the shovel, except at the hills. In September, from 10th to 15th, cut up and shocked; and in December cribbed. Yield from the  $16\frac{1}{2}$  acres, 1,500 bushels, or an average of  $90\frac{0}{11}$  bushels per acre. Some acres of the field yielded as high as 125 bushels. Corn planted, white gourd-seed; soil, a clay loam, very well adapted to blue-grass, when in an improved condition.

**A REMARKABLE YIELD OF CORN IN MARYLAND.**—Mr. H. Vanderford, one of the editors of the Democratic Advocate, Westminster, Md., furnishes the Department a statement of a remarkable yield of corn, published in a recent number of his journal. The crop, said to be the largest ever produced in that county, was grown by Mr. John W. Murray, of Hampstead district, Carroll County, from whose letter the following extract is made:

The land is low and is overflowed by the washings from the turpiket and from my barn-yard, and was in grass for fifteen years prior to the spring of 1872; then plowed and planted in corn, and yielded  $26\frac{1}{2}$  barrels per acre. This was the same piece of ground that I used last year. The stubble was left until I had planted the rest of my corn. On May 16, 1873, I plowed the ground very deep, harrowed it the same day, and rolled it on the 17th. I sowed 300 pounds fine bone and harrowed it again the same day. I marked it off, 32 inches one way, and sowed 200 pounds Rhodes's super-phosphate in the rows, and dropped the corn 10 inches apart, one and two grains in a hill. On the 4th of June it was badly missing; dragged the ground and replanted; 10th of June plowed again, still some missing; 17th of June plowed and hoed, and plastered the weak spots; 30th of June dragged, plowed, and thinned; 4th of July hilled with a potato-plow as deep as one horse could pull, and kept thinning as I thought required until shooting-time. The variety of corn was the Chester County mammoth yellow, of which I send you a sample.

In regard to the yield, the ground was surveyed by a practical, sworn surveyor, cut off by two sworn men, and measured by a sworn man, in the presence of many, and measured  $29\frac{7}{10}$  barrels,\* and the same measured at the cattle-scales in Baltimore made  $30\frac{1}{2}$  barrels, for which I hold a receipt.

I am not a one-acre farmer, but cultivate forty acres, with myself and three boys, or perhaps I could have given the one acre more attention and had a larger yield, which I believe could have been made.

\*A Maryland barrel is five bushels.

**JUTE AS A PROTECTION TO GROWING COTTON.**—A planter of Point Coupee Parish, Louisiana, has lately had his attention especially called to the cultivation of jute by the statement that in an adjoining parish cotton-worms did not attack a field of cotton surrounded by a row of jute. He says it has also been proven that the stems of the jute, after having been crushed by the rollers used in sugar-mills, are readily separated from the fiber.

**DICKSON COTTON.**—Of this variety a correspondent in Louisiana, who had planted seed received from the Department, is satisfied, by the experiments of two seasons, that with a favorable season and ordinary cultivation the yield would be 600 pounds of lint per acre. "The crop in this section did not average more than a bale to four acres, notwithstanding the great ravages of worms in July; but my Dickson cotton, having been planted early, in new ground, had so nearly matured that the worms injured it comparatively little—abandoning the tough leaves for those more tender in an adjoining field." The freedmen say that this cotton "picks better" than any other. However, our correspondent does not advise any planter to put his entire crop in this cotton, as it falls out very soon after opening, if not picked.

**FULTZ WHEAT.**—Mr. John A. Parker, of Tappahannock, Va., says he finds that sowing one-half bushel of this wheat to the acre is amply sufficient. It branches better than any other kind he has yet seen, and at the time of writing (January 18) shows much better than any fields of other kinds on which one and a half bushels per acre were sown. "The little parcel sent by the Department three years ago has caused a revolution in wheat-raising here."

## MARKET-PRICES OF FARM-PRODUCTS.

*The following quotations represent the state of the market, as nearly as practicable, at the beginning of each month.*

Articles.	February.	March.
NEW YORK.		
Flour, superfine State .....	per barrel.. \$5 65 to \$6 20	\$5 70 to \$6 10
extra State.....do.....	6 45 to 7 00	6 40 to 6 80
superfine western.....do.....	5 65 to 6 20	5 70 to 6 10
extra to choice western.....do.....	6 35 to 11 00	6 30 to 11 00
common to fair southern extra.do.....	6 70 to 7 75	6 60 to 7 55
good to choice choice southern .do.....	7 80 to 11 00	7 60 to 11 00
Wheat, No. 1 spring.....per bushel..	1 58 to 1 62	1 52 to 1 58
No. 2 spring.....do.....	1 54 to 1 59	1 48 to 1 52
winter, red, western.....do.....	1 60 to 1 65	1 56 to 1 62
winter, amber, western.....do.....	1 66 to 1 70	1 63 to 1 66
winter, white, western .do.....	1 60 to 1 93	1 69 to 1 85
Rye.....do.....	1 05 to 1 10	98 to 1 02
Barley.....do.....	1 80 to 2 10	..... to 2 00
Corn.....do.....	81 to 90	76 to 80½
Oats.....do.....	60 to 63	61 to 63½
Hay, first quality.....per ton..	26 00 to 23 00	23 00 to 27 00
second quality.....do.....	23 00 to 25 00	20 00 to 21 00
Beef, mess.....per barrel..	8 50 to 11 00	10 50 to 11 00
extra mess.....do.....	11 50 to 13 50	12 50 to 13 00

## Market-prices of farm-products—Continued.

Articles.	February.	March.
NEW YORK—Continued.		
Pork, mess.....per barrel..	\$16 00 to \$16 25	\$15 75 to \$15 80
extra prime.....do.....	13 75 to —	13 50 to —
prime mess.....do.....	— to 15 00	14 25 to 14 50
Lard.....per pound..	9 $\frac{3}{4}$ to 10	9 $\frac{1}{2}$ to 9 $\frac{3}{8}$
Butter, western.....do.....	25 to 35	25 to 40
State dairy.....do.....	32 to 47	36 to 55
Cheese, State factory.....do.....	12 $\frac{3}{4}$ to 15 $\frac{1}{2}$	14 $\frac{1}{2}$ to 17
western factory.....do.....	12 $\frac{3}{4}$ to 15 $\frac{1}{2}$	14 to 16 $\frac{1}{2}$
Cotton, ordinary to good ordinary.....do.....	13 to 14 $\frac{1}{4}$	12 $\frac{1}{2}$ to 14 $\frac{1}{4}$
low middling to good middl'g.....do.....	15 to 17 $\frac{1}{2}$	15 to 17 $\frac{3}{8}$
Sugar, fair to good refining.....do.....	7 $\frac{3}{8}$ to 7 $\frac{3}{8}$	7 $\frac{3}{8}$ to 7 $\frac{3}{8}$
prime refining.....do.....	8 to —	7 $\frac{3}{8}$ to 7 $\frac{3}{8}$
Tobacco, lugs.....do.....	6 $\frac{1}{2}$ to 8	6 $\frac{1}{2}$ to 7 $\frac{3}{4}$
common to medium leaf.....do.....	8 to 10	8 to 10
Wool, American XXX and picklock.....do.....	62 to 70	60 to 65
American X and XX.....do.....	45 to 60	45 to 57 $\frac{1}{2}$
American, combing.....do.....	52 to 60	52 to 60
pulled.....do.....	45 to 52	25 to 50
California, spring-clipped.....do.....	18 to 35	18 to 52
California, fall-clipped.....do.....	20 to 29	19 to 28
Texas.....do.....	15 to 35	18 to 36
BOSTON.		
Flour, superfine, western.....per barrel..	5 50 to 6 00	5 25 to 6 00
western extras.....do.....	6 75 to 8 00	6 25 to 9 00
western choice.....do.....	8 50 to 11 00	9 50 to 10 50
southern extras.....do.....	6 50 to 7 00	6 25 to 6 75
choice Baltimore.....do.....	9 00 to 11 00	9 00 to 10 50
Wheat.....per bushel..	1 50 to 1 85	1 50 to 1 85
Rye.....do.....	1 00 to 1 05	1 05 to 1 10
Barley.....do.....	1 35 to 2 00	1 75 to 2 15
Corn.....do.....	84 to 93	85 to 88
Oats.....do.....	50 to 64	61 to 69
Hay, eastern and northern.....per ton..	18 00 to 25 00	18 00 to 25 00
western choice.....do.....	24 00 to 25 00	24 00 to 25 00
Beef, western mess.....per barrel..	10 00 to 12 00	10 00 to 12 00
western extra mess.....do.....	13 00 to 14 00	13 00 to 14 00
Pork, prime.....do.....	14 50 to 14 75	14 50 to 15 00
mess.....do.....	16 50 to 17 00	16 50 to 17 00
Lard.....per pound..	9 $\frac{3}{8}$ to 10 $\frac{1}{4}$	9 $\frac{3}{8}$ to 10 $\frac{1}{4}$
Butter, New York and Vermont.....do.....	32 to 40	33 to 44
western.....do.....	28 to 39	30 to 39
Cheese, N. Y. and Vt. factory.....do.....	13 to 15 $\frac{1}{2}$	15 to 17
western factory.....do.....	12 to 15 $\frac{1}{2}$	14 to 16 $\frac{1}{2}$
Sugar, fair to good refining.....do.....	7 $\frac{3}{8}$ to 8	7 $\frac{1}{2}$ to 7 $\frac{7}{8}$
Tobacco, lugs.....do.....	7 $\frac{3}{8}$ to 9	6 $\frac{1}{2}$ to 8
common to medium leaf.....do.....	9 to 10 $\frac{1}{2}$	8 $\frac{1}{2}$ to 10
Cotton, ordinary to good ordinary.....do.....	13 to 15	12 $\frac{1}{2}$ to 14 $\frac{1}{4}$
low middling to good middling.....do.....	15 $\frac{1}{4}$ to 18	15 $\frac{1}{4}$ to 18
Wool, Ohio and Pennsylvania.....do.....	50 to 65	50 to 65
Michigan.....do.....	45 to 54	45 to 53
other western.....do.....	44 to 52	44 to 52
pulled.....do.....	25 to 60	25 to 60
combing-fleece.....do.....	55 to 60	55 to 60
California.....do.....	17 to 36	17 to 36
Texas.....do.....	20 to 37	20 to 37
PHILADELPHIA.		
Flour, superfine.....per barrel..	5 25 to 5 75	5 00 to 5 75

## Market-prices of farm products—Continued.

Articles.	February.	March.
PHILADELPHIA—Continued.		
Flour, Pennsylvania extra .....	per barrel.. \$6 00 to \$6 50	\$6 00 to \$7 00*
Pennsylvania family and fancy .....	do..... 8 12½ to 8 50	7 50 to 8 12½
western extra .....	do..... 6 00 to 8 25	6 00 to 7 75
western family .....	do..... 8 50 to 10 50	8 37½ to 10 25
Wheat, winter, red .....	per bushel.. 1 56 to 1 74	1 60 to 1 71
winter, amber .....	do..... 1 65 to 1 78	1 70 to 1 73
winter, white .....	do..... 1 60 to 1 85	1 78 to 1 85
spring .....	do..... 1 60 to 1 65	1 50 to 1 55
Rye .....	do..... 95 to 96	90 to 92
Barley .....	do..... 1 95 to 2 20	1 90 to 2 25
Corn .....	do..... 76 to 86	72 to 76
Oats .....	do..... 55 to 65	57 to 65
Hay, fresh, baled .....	per ton.. 23 00 to 24 00	23 00 to 24 00
common to fair shipping .....	do..... 20 00 to 22 00	20 00 to 22 00
Beef, western mess .....	per barrel.. 8 00 to 10 00	8 00 to 10 00
extra mess .....	do..... 9 00 to 12 00	9 00 to 12 00
Warthman's city family .....	do..... 16 00 to —	15 50 to —
Pork, mess .....	do..... 16 50 to 16 75	16 00 to 16 50
prime mess .....	do..... 15 00 to —	15 00 to —
prime .....	do..... 13 00 to —	13 00 to —
Lard .....	per pound.. 9½ to 12½	9½ to 12
Butter, choice middle State .....	do..... 40 to 45	42 to 48
choice western .....	do..... 33 to 38	40 to 42
Cheese, New York factory, choice .....	do..... 16 to 17	16 to 17
Ohio factory .....	do..... 13 to 16	14 to 16
Sugar, fair to good refining .....	do..... 7¾ to 8	7½ to 7¾
Cotton, ordinary to good ordinary .....	do..... 13 to 14¾	12¾ to 14¾
low middling to good middling .....	do..... 15½ to 17½	15½ to 17½
Wool, Ohio X and XX .....	do..... 52 to 56	51 to 56
Ohio combing .....	do..... 62½ to 65	60 to 62
pulled .....	do..... 48 to —	40 to 51
unwashed, cloth'g and comb'g .....	do..... 26 to 44	25½ to 42
BALTIMORE.		
Flour, superfine .....	per barrel.. 5 50 to 6 50	5 25 to 6 00
extra .....	do..... 6 50 to 8 00	6 00 to 6 75
family and fancy .....	do..... 7 50 to 11 00	7 25 to 11 00
Wheat, white, fair to choice .....	per bushel.. 1 75 to 1 90	1 70 to 1 85
amber .....	do..... 1 60 to 1 95	1 60 to 1 80
red .....	do..... 1 60 to 1 90	1 50 to 1 80
Rye, common to prime .....	do..... 96 to 98	90 to 91
Corn, white, southern .....	do..... 76 to 83	70 to 75
yellow, southern .....	do..... 73 to 78	70 to 74
Oats, southern .....	do..... 54 to 58	55 to 58
western .....	do..... 54 to 58	55 to 57
Hay, Pennsylvania .....	per ton.. 20 00 to 24 00	18 00 to 22 00
Maryland .....	do..... 23 00 to 26 00	23 00 to 25 00
western .....	do..... — to 23 00	20 00 to 22 00
Beef, Baltimore mess .....	per barrel.. 15 00 to 20 00	15 00 to 20 00
extra .....	do..... 23 00 to 25 00	23 00 to 25 00
Pork, mess .....	do..... 16 50 to —	16 00 to 16 25
Lard .....	per pound.. 9¾ to 10	8½ to 9
Butter, western .....	do..... 30 to 40	30 to 38
eastern .....	do..... 35 to —	34 to 35
Cheese, eastern cutting .....	do..... 15½ to 16	16½ to 17
western cutting .....	do..... 14½ to 15	15½ to 16
Sugar, fair to good refining .....	do..... 7¾ to 8	7½ to —
Tobacco, lugs .....	do..... 5 to 7	5 to 8
common to medium, leaf .....	do..... 7 to 9	7 to 9
Cotton, ordinary to good ordinary .....	do..... 14 to —	13 to 14½
low middling to middling .....	do..... 15 to 16	14¾ to 16



## Market-prices of farm products—Continued.

Articles.	February.	March.
BALTIMORE—Continued.		
Wool, fleece, com. to fine.....per pound..	\$0 45 to \$0 50	\$0 45 to \$0 50
tub.....do.....	55 to 60	55 to 60
unwashed.....do.....	35 to 38	35 to 38
pulled.....do.....	35 to 40	35 to 40
CINCINNATI.		
Flour, superfine.....per barrel..	5 25 to 5 75	5 00 to 5 50
extra.....do.....	6 65 to 7 00	6 40 to 6 75
family and fancy.....do.....	7 25 to 8 25	6 80 to 8 00
Wheat, red winter.....per bushel..	1 48 to 1 50	1 35 to 1 43
hill.....do.....	1 55 to 1 63	1 45 to 1 50
white winter.....do.....	1 65 to 1 70	1 48 to 1 55
Rye.....do.....	94 to 96	1 01 to 1 02
Barley.....do.....	1 60 to 1 85	1 70 to 1 85
Corn.....do.....	60 to 65	57 to 62
Oats.....do.....	46 to 54	45 to 52
Hay, baled, No. 1.....per ton.....	15 00 to 16 00	14 00 to 15 00
lower grades.....do.....	10 00 to 14 00	9 00 to 14 00
Beef, plate.....per barrel..	14 00 to	14 00 to
Pork, mess.....do.....	15 50 to	14 25 to 14 50
Lard.....per pound..	9 to 10 $\frac{1}{2}$	8 $\frac{1}{2}$ to 9
Butter, choice.....do.....	34 to 38	38 to 40
prime.....do.....	31 to 33	35 to 36
Cheese, factory.....do.....	16 to 17	16 $\frac{1}{2}$ to 17
pine-apple.....do.....	22 to 23	22 to 23
Sugar, New Orleans, fair to good.....do.....	8 $\frac{1}{2}$ to 9 $\frac{1}{2}$	8 $\frac{1}{2}$ to 9 $\frac{1}{2}$
prime to choice.....do.....	9 $\frac{3}{4}$ to 10 $\frac{1}{4}$	9 $\frac{3}{4}$ to 10
Tobacco, lugs.....do.....	6 $\frac{1}{2}$ to 12	9 to 12
leaf.....do.....	7 to 25	15 to 25
Cotton, ordinary to good ordinary.....do.....	11 $\frac{1}{2}$ to 13 $\frac{1}{2}$	11 $\frac{1}{4}$ to 13 $\frac{1}{4}$
low middl'g to good middl'g.....do.....	14 $\frac{1}{2}$ to 15 $\frac{1}{2}$	14 $\frac{1}{4}$ to 16 $\frac{1}{2}$
Wool, fleece-washed, com. to fine.....do.....	45 to 47	45 to 47
tub-washed.....do.....	48 to 49	48 to 49
unwashed, clothing.....do.....	30 to 32	30 to 32
unwashed, combing.....do.....	33 to 35	33 to 35
pulled.....do.....	35 to 38	35 to 38
CHICAGO.		
Flour, white winter, fair to good.....per barrel..	6 50 to 7 50	6 50 to 7 50
white winter, choice.....do.....	7 75 to 9 25	7 75 to 9 25
red winter.....do.....	6 00 to 7 75	5 75 to 7 50
medium to fancy, spring extra.....do.....	6 00 to 6 75	5 00 to 6 75
spring, superfine.....do.....	3 00 to 5 00	3 00 to 4 50
Wheat, No. 1 spring.....per bushel..	1 23 $\frac{3}{4}$ to 1 24	1 19 to 1 20
No. 2 spring.....do.....	1 23 $\frac{1}{2}$ to 1 23 $\frac{1}{4}$	1 16 $\frac{3}{4}$ to 1 17 $\frac{1}{4}$
No. 3 spring.....do.....	1 15 to 1 16	1 12 $\frac{1}{2}$ to
Corn, No. 2.....do.....	51 $\frac{1}{2}$ to 58 $\frac{1}{2}$	53 $\frac{1}{2}$ to 57 $\frac{1}{4}$
Oats, No. 2.....do.....	42 to 42 $\frac{1}{2}$	42 $\frac{1}{2}$ to 42 $\frac{3}{4}$
Rye, No. 2.....do.....	81 to 82	84 $\frac{1}{2}$ to 85 $\frac{1}{2}$
Barley, No. 2.....do.....	1 95 to 2 05	1 59 to
Hay, timothy.....per ton.....	10 00 to 14 00	10 00 to 14 50
prairie.....do.....	6 00 to 9 00	6 00 to 9 50
Beef, mess.....per barrel..	8 25 to 8 50	8 75 to 9 00
extra mess.....do.....	9 75 to 10 00	9 75 to 10 00
Pork, mess.....do.....	14 40 to 14 42 $\frac{1}{2}$	13 85 to 14 00
prime mess.....do.....	12 75 to 13 00	12 25 to 12 50
extra prime.....do.....	12 00 to 12 25	11 00 to 11 25
Lard.....per cental..	9 30 to 9 75	8 55 to 8 57 $\frac{1}{2}$
Butter, choice to fancy.....per pound..	33 to 37	38 to 43
medium to good.....do.....	25 to 31	30 to 35

## Market-prices of farm products—Continued.

Articles.	February.	March.
CHICAGO—Continued.		
Cheese, New York factory ..... per pound..	\$0 16 to \$0 17½	\$0 17 to \$0 18
Ohio and western factory ..... do.....	15½ to 16½	16 to 17
Sugar, New Orleans, prime to choice... do.....	9 to 9¾	9 to 9¾
common to fair... do.....	7¾ to 8¾	7½ to 8½
Wool, tub-washed, common to prime... do.....	48 to 55	48 to 55
fleece-washed..... do.....	36 to 48	37 to 48
unwashed..... do.....	25 to 34	25 to 32
pulled..... do.....	35 to 40	35 to 40
SAINT LOUIS.		
Flour, spring ..... per barrèl..	4 50 to —	4 85 to —
winter..... do.....	5 95 to 9 75	4 50 to 8 75
Wheat, red winter..... per bushel..	1 40 to 1 67	1 30 to 1 42
white winter..... do.....	1 50 to 1 70	1 50 to 1 62
spring..... do.....	1 24 to 1 37½	1 19 to 1 19½
Corn..... do.....	61 to 70	55 to 67
Rye..... do.....	85 to 85½	92½ to 95
Oats..... do.....	44½ to 49	46 to 52
Barley..... do.....	1 50 to 1 85	1 75 to 1 80
Hay, timothy..... per ton.....	16 00 to —	14 50 to 19 00
Beef, prime mess..... per barrel..	11 00 to —	— to —
mess..... do.....	12 00 to —	— to —
extra mess..... do.....	13 00 to —	13 00 to —
Pork, mess..... do.....	15 25 to 15 50	14 75 to 15 00
Lard..... per pound..	7½ to 9¾	8 to 9¾
Butter, choice..... do.....	28 to 38	36 to 38
inferior grades..... do.....	25 to 30	25 to 34
Cheese, Ohio and N. W. factory..... do.....	15½ to 16	16 to 16½
New York factory..... do.....	16 to 16½	16 to 16½
Sugar, New Orleans, common to fair... do.....	9 to —	9 to —
prime to choice... do.....	9½ to 10	— to 10½
Cotton, ordinary to good ordinary... do.....	11 to 13	— to —
low middling to good middling... do.....	14½ to 16½	— to —
Wool, tub-washed..... do.....	48 to 53	47 to 53
unwashed, combing..... do.....	30 to 34	31 to 35
fleece..... do.....	28 to 32	40 to 46½
NEW ORLEANS.		
Flour, superfine..... per barrel..	5 50 to 5 75	5 25 to —
extra..... do.....	5 90 to 7 25	5 62½ to 7 50
choice to fancy..... do.....	7 50 to 9 75	7 75 to 9 75
Corn, white..... per bushel..	72 to 75	75 to 77
yellow..... do.....	— to 75	— to 82
Oats..... do.....	57 to 58	63 to —
Hay, choice..... per ton.....	23 00 to 24 00	— to —
prime..... do.....	22 00 to —	21 00 to —
Beef, Texas..... per barrel..	12 00 to —	12 00 to —
Philadelphia..... do.....	16 00 to 16 25	16 00 to 16 25
Fulton Market..... half barrèl..	12 00 to —	12 00 to —
western..... do.....	9 00 to 9 25	— to —
Pork, mess..... per barrel..	15 62½ to 15 75	16 00 to —
Lard..... per pound..	9 to 9¾	9 to 10
Butter, choice Goshen..... do.....	40 to 42	38 to 48
western..... do.....	27 to 35	28 to 38
Cheese, choice western factory..... do.....	14½ to —	17 to —
New York cream..... do.....	17½ to —	17 to —
Sugar, fair to fully fair..... do.....	6½ to 8	7 to 7½
prime to strictly prime..... do.....	8½ to 8½	8½ to —
clarified, white and yellow..... do.....	9½ to 10½	8 to 9¾
Cotton, ordinary to good ordinary... do.....	11½ to 14½	11½ to 13½

## Market-prices of farm products—Continued.

Articles.	February.	March.
NEW ORLEANS—Continued.		
Cotton, low middling to good middling per pound	\$0 15 $\frac{3}{8}$ to \$0 17 $\frac{3}{8}$	\$0 14 $\frac{7}{8}$ to \$0 17 $\frac{1}{2}$
Tobacco, lugs .....	5 $\frac{1}{8}$ to 7 $\frac{1}{2}$	5 to 6 $\frac{1}{2}$
low leaf to medium leaf .....	7 $\frac{3}{4}$ to 9 $\frac{3}{4}$	6 $\frac{1}{2}$ to 8
Wool, lake .....	25 to —	— to —
SAN FRANCISCO.		
Flour, superfine .....	5 50 to 5 75	5 25 to 5 50
extra .....	6 00 to —	5 75 to 6 00
family and fancy .....	6 50 to 7 00	6 25 to 6 50
Wheat, California .....	2 15 to 2 25	1 85 to 1 95
Oregon .....	2 15 to 2 25	1 85 to 1 95
Barley .....	1 40 to 1 65	1 45 to 1 75
Oats .....	1 50 to 1 80	1 45 to 1 75
Corn, white .....	1 60 to 1 65	1 65 to 1 70
yellow .....	1 60 to 1 65	1 65 to 1 75
Hay, State .....	14 00 to 17 00	12 50 to 16 50
Beef, mess .....	9 50 to 10 00	9 00 to 9 50
family mess .....	9 00 to 10 00	9 00 to 10 00
Pork, mess .....	18 00 to 18 50	17 00 to 17 50
prime mess .....	17 50 to 18 00	17 50 to 18 00
Lard .....	10 to 11	10 to 11
Butter, overland .....	15 to 25	15 to 25
California .....	30 to 38	30 to 38
Oregon .....	15 to 20	15 to 20
Cheese .....	12 to 18	12 to 18
Wool, native .....	14 to 16	14 to —
California .....	18 to 22	18 to —
Oregon .....	18 to 22	18 to —

## LIVE-STOCK MARKETS.

NEW YORK.		
Cattle, extra heeves .....	\$12 50 to \$12 75	\$12 00 to \$13 00
good to prime .....	11 75 to 12 25	11 50 to 12 25
common to fair .....	10 00 to 11 50	9 75 to 11 25
poorest grade .....	8 50 to 9 00	8 00 to 9 00
average .....	10 50 to 11 50	10 50 to 11 00
Texans .....	8 00 to 10 50	8 50 to 10 25
milk-cows .....	40 00 to 80 00	40 00 to 80 00
calves, grain-fed .....	8 00 to 13 00	8 00 to 15 00
Sheep, ordinary to extra .....	6 50 to 8 12 $\frac{1}{2}$	6 00 to 8 00
Swine, common to fair .....	6 25 to 6 75	6 62 to 7 25
BOSTON.		
Cattle, choice .....	7 00 to 7 25	6 75 to 7 25
extra .....	6 00 to 6 50	6 00 to 6 50
first quality .....	5 00 to 5 50	5 25 to 5 75
second quality .....	4 00 to 4 75	4 00 to 5 00
third quality .....	3 75 to —	3 75 to —
working-oxen .....	100 00 to 250 00	100 00 to 250 00
milk-cows with calves .....	35 00 to 95 00	35 00 to 95 00
yearlings .....	10 00 to 18 00	10 00 to 18 00
Sheep, extra .....	5 00 to 6 00	5 00 to 7 25
inferior grades .....	3 00 to 4 50	3 50 to 4 75
Swine .....	6 50 to 6 75	6 50 to 6 75

## Live-stock markets—Continued.

Articles.	February.	March.
PHILADELPHIA.		
Cattle, common to choice.....per cental..	\$4 00 to \$7 75	\$4 00 to \$8 00
Sheep, common to choice.....do.....	5 00 to 7 25	5 50 to 7 50
Swine, corn-fed.....do.....	9 25 to 9 50	8 50 to 9 00
BALTIMORE.		
Cattle, best beeves.....per cental..	5 75 to 6 87	5 75 to 7 00
first quality.....do.....	4 50 to 5 75	4 62 to 5 75
medium.....do.....	4 00 to 4 50	4 00 to 4 62
ordinary.....do.....	3 00 to 4 00	3 50 to 4 00
general average.....do.....	4 75 to	4 75 to
most of the sales between.....do.....	4 25 to 5 62	4 25 to 5 25
Sheep.....do.....	4 00 to 7 00	2 50 to 7 75
Swine.....do.....	7 25 to 8 25	7 25 to 8 25
CINCINNATI.		
Cattle, good to prime butchers' steers, per cental..	4 75 to 5 50	5 25 to 5 50
common to good medium.....do.....	4 00 to 4 50	3 25 to 5 00
milch-cows.....do.....	30 00 to 50 00	25 00 to 65 00
Sheep, common.....do.....	2 25 to 4 25	4 50 to
good to prime butchers'.....do.....	4 50 to 5 50	to 6 00
Swine, shipping grades.....do.....	5 50 to 6 00	5 10 to 5 70
good to prime butchers'.....do.....	6 00 to 6 25	5 90 to 6 00
CHICAGO.		
Cattle, extra-graded steers, 1,400 to 1,500 pounds.....per cental..	5 75 to 6 25	5 85 to 6 25
choice beeves, 3 to 5 years old, 1,250 to 1,450 pounds.....per cental..	5 20 to 5 50	5 40 to 5 70
good beeves, 1,200 to 1,300 pounds, per cental..	4 75 to 5 10	5 10 to 5 30
medium grades, 1,150 to 1,300 pounds per cental..	4 50 to 4 70	4 75 to 5 00
lower grades, natives.....do.....	1 75 to 4 00	2 00 to 4 50
Texans, choice corn-fed.....do.....	4 00 to 4 60	4 25 to 4 75
Texans, north-wintered.....do.....	3 00 to 3 50	3 25 to 4 00
Texans, through droves.....do.....	1 75 to 2 75	2 00 to 3 00
milch cows.....per head..	20 00 to 50 00	20 00 to 45 00
veal calves.....do.....	3 00 to 5 00	3 50 to 5 75
Sheep, poor to medium.....do.....	3 75 to 4 50	4 00 to 5 25
good to choice.....do.....	4 75 to 5 50	5 50 to 6 25
Swine, good to extra.....do.....	5 40 to 5 75	5 30 to 6 30
inferior to medium.....do.....	4 80 to 5 30	4 25 to 5 00
SAINT LOUIS.		
Cattle, choice native steers, 1,300 to 1,600 pounds.....per cental..	5 75 to 6 25	5 50 to 6 00
prime second-class, 1,150 to 1,400 pounds.....per cental..	4 50 to 5 00	4 75 to 5 00
good third-grade, 1,050 to 1,300 pounds per cental..	3 50 to 4 00	3 75 to 4 00
fair butchers' steers, 1,000 to 1,200 pounds.....per cental..	3 25 to 3 50	3 50 to 3 75
inferior native grades.....do.....	2 50 to 3 75	2 50 to 3 75
Texans and Cherokees, corn-fattened per cental..	2 00 to 4 00	3 00 to 3 25
through droves.....do.....	1 50 to 2 50	1 75 to 3 75

## Live-stock markets—Continued.

Articles.	February.		March.	
SAINT LOUIS—Continued.				
Sheep.....per cental..	\$4 50	_____	_____	to \$5 00
Swine.....do.....	\$4 90 to	\$5 65	\$4 90 to	5 30
Horses, plugs.....per head..	30 00 to	60 00	30 00 to	60 00
street-car horses.....do.....	80 00 to	90 00	80 00 to	90 00
good work-horses.....do.....	85 00 to	100 00	85 00 to	100 00
driving horses.....do.....	100 00 to	140 00	100 00 to	140 00
heavy draught-horses.....do.....	125 00 to	165 00	125 00 to	165 00
Mules, 14 to 15 hands high.....do.....	50 00 to	100 00	50 00 to	100 00
15 to 16 hands high.....do.....	115 00 to	165 00	115 00 to	165 00
extra.....do.....	150 00 to	200 00	150 00 to	250 00
NEW ORLEANS.				
Cattle, Texas beeves, choice.....per head..	45 00 to	_____	45 00	_____
Texas beeves, first quality.....do.....	35 00 to	40 00	35 00 to	40 00
second quality.....do.....	20 00 to	28 00	20 00 to	28 00
Western beeves.....per cental..	10 00 to	12 50	8 00 to	10 00
Milch-cows.....per head..	35 00 to	100 00	35 00 to	100 00
Calves.....do.....	7 00 to	10 00	7 00 to	10 00
Sheep, first quality.....do.....	4 00 to	5 00	4 00 to	5 00
second quality.....do.....	3 00 to	4 00	3 00 to	4 00
Swine.....per cental..	6 00 to	7 50	5 00 to	7 00

## FOREIGN MARKETS.

WHEAT.—The weather in Europe has been remarkably mild since the opening of 1874, but a sharp frost during the second week of February checked the dangerous forwardness of vegetation and greatly benefited the soil for spring crops. From the continent comes a complaint of lack of snow to cover the winter crops. The mild weather in the United States greatly favored the continued shipment of grain. Both English and French deliveries of wheat were increasingly short, owing to the exhaustion of stocks in first hands. The deficiency of English home-supplies, however, was more than met by copious foreign imports. The Bengal famine is influencing the European markets by diverting supplies from Australia. The weekly deliveries of English grain are at least 10,000 quarters short of last year, while in France strong inducements are necessary in order to bring native produce to market. The effects of the American monetary crisis were visible in the increased sensitiveness to English advices in the New York markets. The deficiency in the English markets must be mainly supplied from America, from which at least half the late foreign arrivals have come.

The imports of wheat into the United Kingdom, during the second week in February, amounted to 594,340 cwts. The London market opened the following week with small supplies of English wheat and no great stock of foreign, half the latter being from America. The show of fresh samples from counties near London was limited and poor. The London averages were 65s. 8d. on 1,299 quarters. In Paris holders were successfully resisting further decline, the new offers being scanty; good

white wheat ranged from 64s. to 70s. per quarter; Spanish white, from Marseilles, was offered at 69s. per quarter; American spring at 64s. per quarter.

In Mark Lane, Essex, and Kent, new white was quoted at 54s. to 67s. per quarter; ditto red, 56s. to 64s.; Norfolk, Lincolnshire, and Yorkshire, new red, 55s. to 62s. Of foreign wheat, Dantzic mixed brought 61s. to 71s.; Königsberg 61s. to 70s.; Rostock, 63s. to 70s.; Silesian red, 53s. to 60s.; ditto white, 63s. to 65s.; Pomeranian, Mecklenberg, and Uckermark red, 61s. to 63s.; Russian hard, 54s. to 57s.; Saxonska, 61s. to 62s.; Danish and Holstein red, 61s. to 63s.; American, 58s. to 60s.; Chilian white, 64s.; Californian, 67s.; Australian, 69s. to 71s.

In Liverpool the import-trade was declining but the exports were increasing. American white, per cental, brought 13s. to 13s. 6d.; ditto red winter and southern, 12s. 4d. to 13s.; ditto No. 1 spring, 12s. to 12s. 2d.; ditto No. 2 spring, 11s. 6d. to 11s. 10d.; Canadian white, 13s. to 13s. 4d.; ditto red, 12s. 2d. to 12s. 4d.; Californian white, 12s. 10d. to 13s. 8d.; Chilian white, 12s. 4d.; Australian white, 14s. to 14s. 2d.; Spanish white, 12s. 10d. to 13s.; Danubian, 7s. to 9s.; Ghirka, 11s. 6d. to 12s.; Egyptian, 10s. 10d. to 12s. 9d.

**FLOUR.**—The supplies of both English and foreign flour were quite moderate in London in the third week of February. Trade was dull, but holders were not disposed to lower the rates. The Paris market suddenly declined 3 francs per 157 kilograms in the face of declining supplies of wheat, the range being from 49s. 4d. to 51s. 4d. per 280 pounds. In Mark Lane the best town household flour brought from 50s. to 57s. per 280 pounds; best country household 45s. to 47s.; Norfolk and Suffolk, 39s. to 44s. American flour, per barrel, 28s. to 30s.; extra, 30s. to 32s. In Liverpool English and Irish superfines, 44s. to 45s. 6d. per 280 pounds; ditto extra, 45s. 6d. to 50s.; French, 56s. to 60s.; Spanish, 49s. to 52s. 6d.; Trieste and Hungarian, 66s. to 78s.; Chilian and Californian, 46s. to 52s.; American Western State, per barrel, 30s. to 32s.; extra State, 31s. to 33s.; Baltimore and Philadelphia, 30s. to 32s.; Ohio, 31s. to 35s.; Canadian, 33s. to 37s.

**MAIZE.**—In Mark Lane, American white was quoted at 40s. to 43s. per quarter; ditto red, 36s. to 38s. In Liverpool, American white, 39s.; ditto yellow, 37s.; Danubian, 37s. 6d. to 38s.; Galatz, 40s.

**WOOL.**—The London wool trade has become firmer. Business not remarkably brisk in English wools, but steady. Colonial wools are steady at current rates.

**LIVE STOCK.**—The cattle trade was quiet but firmer on account of short supplies. Coarse and inferior beasts brought 4s. 6d. to 4s. 10d. per 8 pounds; second quality, 4s. 10d. to 5s.; prime large oxen, 5s. 6d. to 5s. 8d.; prime scots, 5s. 8d. to 5s. 10d.; coarse and inferior sheep, 5s. to 5s. 6d.; second quality, 5s. 6d. to 5s. 10d.; prime coarse woolled, 6s. 6d. to 6s. 8d.; prime southdowns, 6s. 8d. to 6s. 10d.; large coarse calves, 5s. to 5s. 6d.; prime small calves, 6s. to 6s. 4d.; large hogs, 3s. 6d. to 3s. 10d.; small porkers, 4s. 4d. to 4s. 6d.

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## TRADE OF ODESSA.

Odessa, at the head of the Black Sea, is the grand emporium of Southern Russia. It was made a free port in 1817, a privilege which, in connection with its admirable commercial position, has given it a practical monopoly of the trade of Southeastern Europe in the export of

grain and other agricultural products. Regular official bulletins are issued monthly, and sometimes more frequently, showing the extent and value of its commercial operations. From two bulletins issued January 12 and January 15, 1874, and signed by H. Willenz and Simon Bernstein, *courtiers-jurés*, are gathered the following statistics of the trade of 1873:

The course of trade during the year was marked by numerous fluctuations, sympathizing with changes in foreign markets. In the middle of the year prices were very high, and in almost every case higher, in proportion, than in the markets of consumption. The reason of this is found in the great rise of prices in other markets, coming upon the heels of the very poor crops of the regions adjacent to Odessa. It was necessary to depend upon arrivals from the north of Bessarabia, from the governments of Kieff and Podolia, where cereal crops were good in quantity and very satisfactory in quality—in fact, finer than for many years. The campaign was opened at prices unexampled at that period of the year and such as were customary only at its close.

During the entire year, in spite of declining movements in the great markets of consumption, prices at Odessa were, with slight variations, constantly sustained. This was the result of light stocks in depot. A daily accretion of 25,000 to 30,000 *tchetverts* by rail, and 40,000 to 50,000 by way of the Dnieper, scarce met the wants of the local and coast trade, a branch of commerce already large and constantly increasing.

The wool-business was almost neglected till the end of May. Important purchases on French account, at the fair of Charkoff, during June, produced a rise of 2 roubles the poud, in the price of fine wools in grease, raising the quotations to 10 roubles the poud. The rouble is the standard silver coin of Russia, but varies in value, according to date of coinage, from 73 cents to 80 cents. The poud is equal to 36.06764 pounds. Russian purchasers declined purchasing at these enhanced prices, and the former calm was re-instated as the prices abroad gradually declined. Washed fine wool was neglected the whole year, the prices ranging from 24 to 27 roubles the poud. White Donskoi was in but moderate demand at 10½ roubles the poud.

No commercial disasters were experienced during the year. The financial crises of Austria, Germany, and America necessarily produced some stagnation in business, lowering prices, and compelling some holders to realize at a loss. Russia, among commercial countries, was least affected by these crises, yet its enlarged speculations, provoked by the inflation of currency, felt the spasmodic contraction severely. The commerce of Odessa suffered but little from the reaction compared with other great marts of Europe. A decline in imports is noted as one of the results of the crisis, but the prospects of an enlarged business were quite satisfactory.

The stability of exchanges, which, in the report of 1872, was referred to the monetary unity of Odessa trade, was still more marked and satisfactory during the critical year of 1873. The range of fluctuation was quite limited. London exchanges varied from 7.30½ to 7.48½, against 7.22 to 7.41½ in 1872; Marseilles from 3.42½ to 3.50, against 3.46 to 3.56¼ in 1872.

The following tables will give a general idea of the commercial transactions of 1872 and 1873:

Cereals and seeds purchased and placed in warehouses.	1872.		1873.	
	Quantity.	Price in roubles.	Quantity.	Price in roubles.
Soft wheat.....tchetverts..	733,500	7.55 to 12.62½	390,300	9.55 to 14.62½
Sandomirca.....do.....	87,300	9.70 to 12.50	38,000	9.75 to 14.00
Ghirca.....do.....	1,363,100	8.25 to 13.05	712,000	9.50 to 15.00
Do.....pounds.....	749,300	.82 to 1.26	733,500	1.12 to 1.40
Hard wheat.....tchetverts..	6,900	8.50 to 10.75	1,400	13.00 to 14.00
Rye.....do.....	308,500	4.25 to 6.62½	194,700	5.30 to 8.20
Maize.....do.....	47,300	5.25 to 6.62½	419,200	5.45 to 8.50
Barley.....do.....	92,600	3.80 to 4.55	35,300	4.25 to 6.25
Oats.....do.....	.....	.....	2,800	3.40 to —
Flaxseed.....do.....	40,900	11.95 to 13.80	35,400	11.50 to 13.62½
Rape-seed.....do.....	22,700	4.00 to 6.12½	9,700	4.12½ to 6.80
Colza.....do.....	2,600	10.75 to 11.50	9,700	10.50 to 11.62½

Total grains and seeds 1872, 3,454,700 tchetverts; 1873, 2,582,000 tchetverts.

Decrease 872,700 tchetverts.

A tchetvert is equal to 5.95205 bushels.

The stocks of grains and seeds, in tchetverts, remaining in warehouse at the close of 1872 and 1873, respectively, were as follows: Soft wheat, 140,000 and 346,000; Sandomirca, 30,500 and 95,000; Ghirca, 698,000 and 350,000; hard wheat, 135,600 and 6,000; rye, 171,000 and 40,000; maize, 53,500 and 11,000; barley, 46,000 and 13,000; oats, 14,500 and 11,000; flaxseed, 13,000 and 11,000; rape-seed, 8,600 and 11,000; colza, 3,000 and 9,000; pease, 3,500 and 1,400; total grains and seeds, 1,194,500 and 904,400.

The exports of grains and seeds, in tchetverts, during 1873 were in round numbers as follows:

Countries.	Wheat.	Rye.	Maize.	Barley.	Oats.	Pease.	Flax-seed.	Colza and rape seed.	Total to each country.
United Kingdom .....	1,423,000	108,900	307,700	82,250	2,100	5,200	36,500	25,800	1,991,450
France .....	498,960	2,100	70,800	2,000	149,100	3,500	5,800	22,700	754,960
Turkey, Greece, and the Danube.....	11,100	5,700	.....	1,300	2,400	1,700	2,600	.....	24,800
Austria.....	235,100	3,100	41,800	6,100	17,600	800	.....	.....	304,500
Italy.....	70,900	14,100	7,700	.....	11,900	50	4,500	.....	115,150
Belgium.....	218,100	72,500	.....	27,500	.....	100	17,300	23,000	358,500
Germany.....	.....	46,400	.....	.....	.....	.....	.....	.....	46,400
Other countries.....	13,800	15,900	.....	.....	.....	.....	.....	.....	29,700
Total { in 1873 .....	2,476,900	268,700	428,000	119,150	183,100	11,350	66,700	71,500	3,625,400
{ in 1872 .....	3,838,000	363,600	57,800	315,250	46,000	13,050	151,800	115,500	4,901,000

The exports of flour and meal, in pouds, during 1873, were as follows: United Kingdom, 182,600; France, 500; Turkey, Greece, and the Danube, 347,100; Austria, 850; total, 531,050, against 752,100 in 1872.

Of tallow the stock on hand at the close of 1873 embraced 10,000 pouds of mutton and 6,000 pouds of beef. During the year the exports were 700 pouds to the United Kingdom; 800 pouds to France; 6,000 pouds to Turkey, Greece, and the Danube; 250 pouds to Austria; total, 7,750 pouds against 40,600 pouds in 1872.

The exports of wool, in pouds, during 1873, were as follows: United Kingdom, 132,500; France, 44,700; Turkey, Greece, and the Danube, 12,800; Austria, 18,500; Belgium, 2,000; total, 210,500, against 334,100 in 1872.

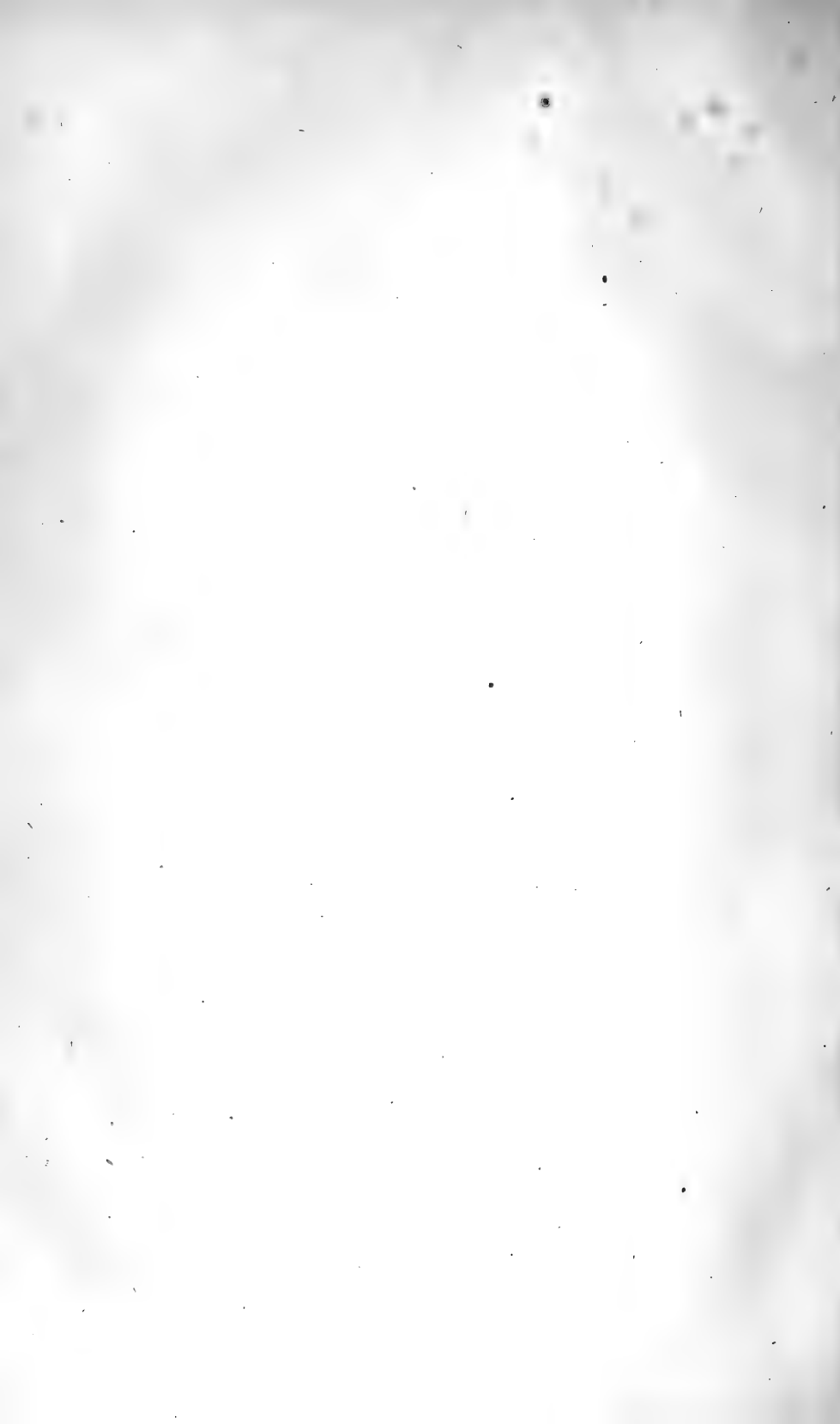
During 1873, 922 vessels left Odessa with cargoes direct to foreign ports; of these 349 were sailing-vessels and 573 steamers.



The nationalities of the sailing-vessels were as follows: Italian, 128; Austrian, 116; Greek, 37; English, 18; German, 17; Norwegian, 14; Russian, 11; Turkish, 8; total, 349, against 541 in 1872 and 797 in 1871.

The nationalities of the steamers were as follows: English, 259; Russian, 178; Austrian, 88; Italian, 18; Belgian, 16; Dutch, 10; Danish, 2; German, 2; total, 573, against 504 in 1873 and 425 in 1871. The trade is rapidly passing from sailing-vessels to steamers.

There were in port January 1, 1873, 35 vessels; arrivals during the year, 1,373; departures, 1,391; in port January 1, 1874, 17 vessels.



MONTHLY REPORT

OF THE

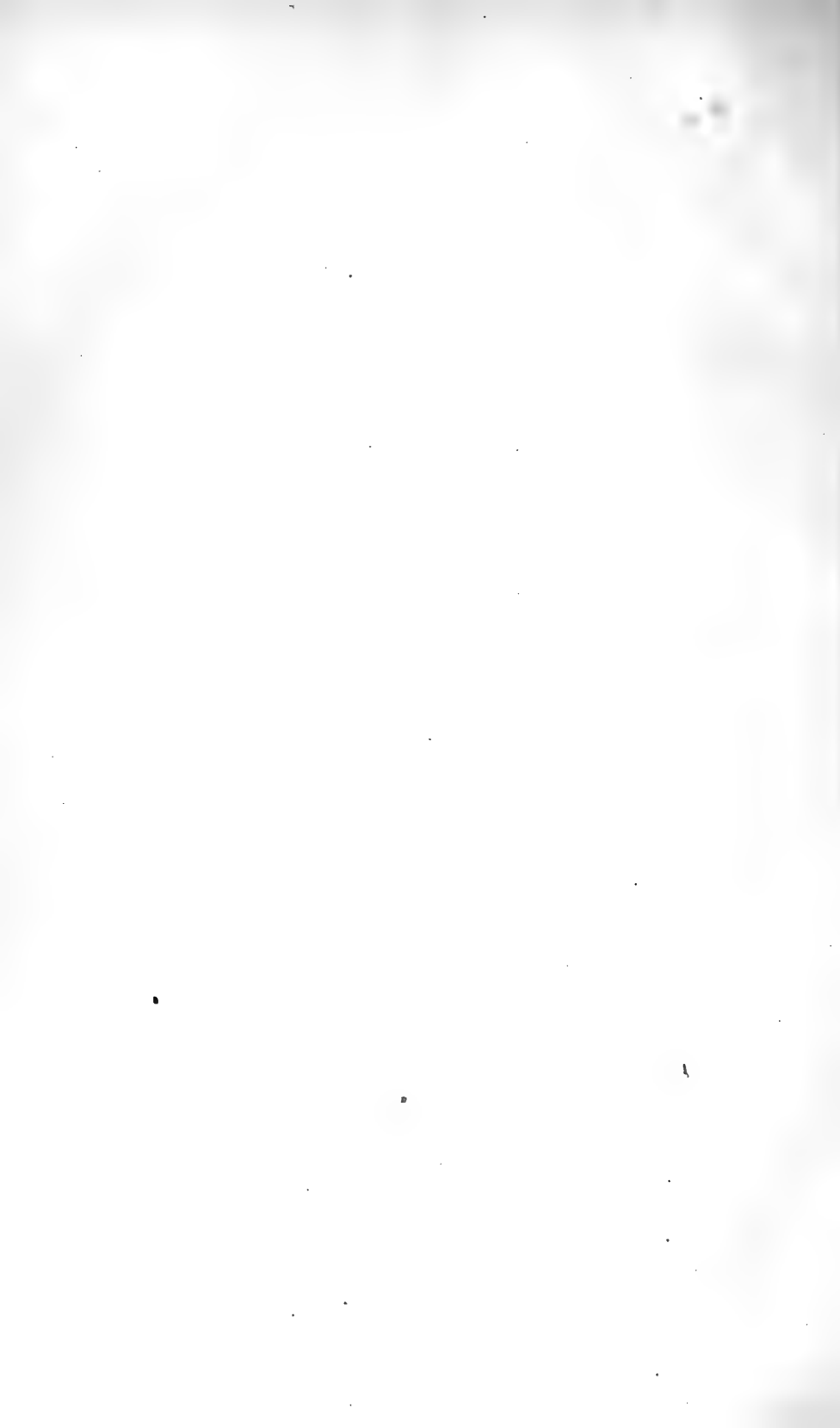
DEPARTMENT OF AGRICULTURE

FOR

APRIL AND MAY, 1874.

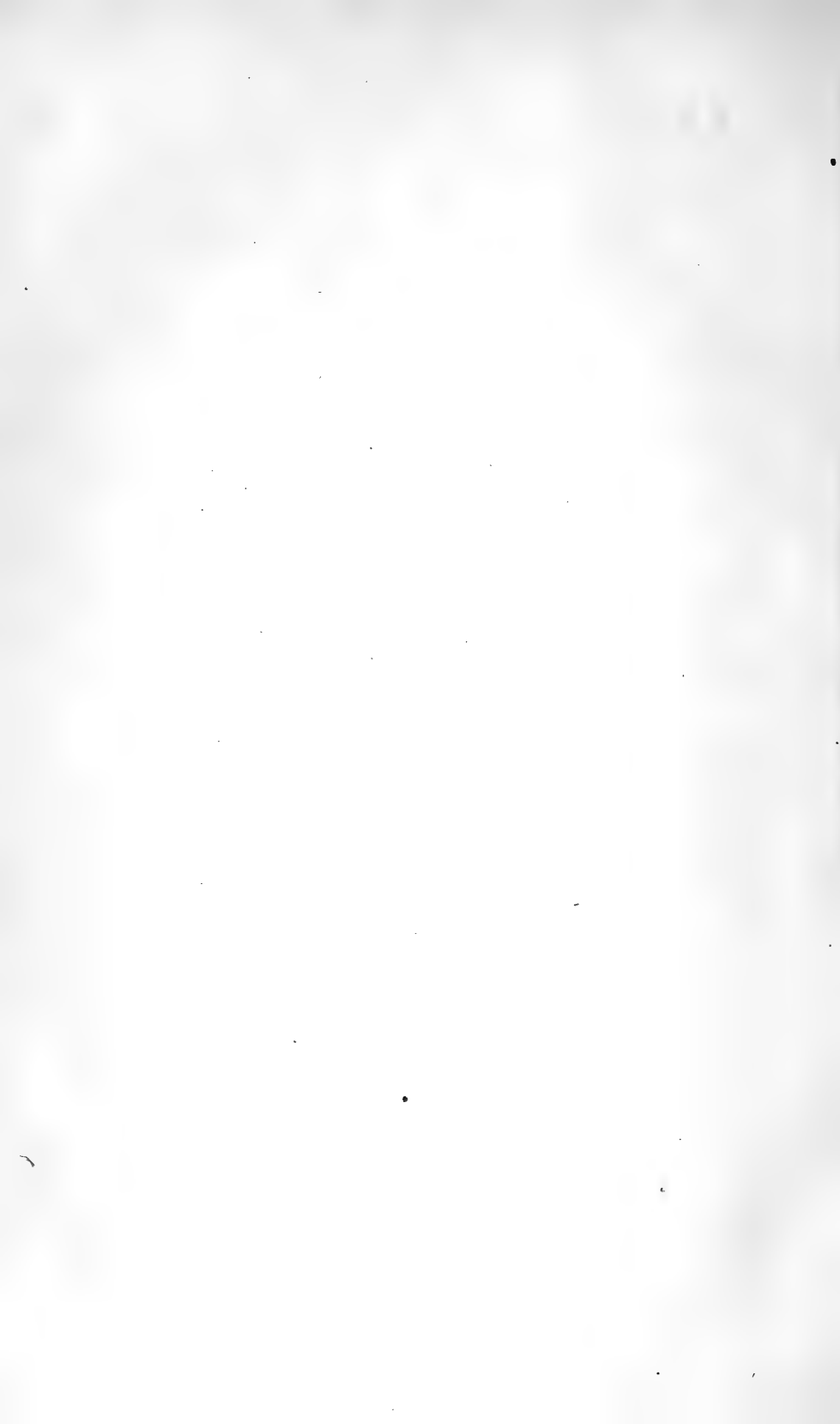


WASHINGTON:  
GOVERNMENT PRINTING OFFICE.  
1874.



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# MONTHLY REPORT.

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DEPARTMENT OF AGRICULTURE,  
*Statistical Division, April 18, 1874.*

SIR: I present herewith, for publication, a report of the condition of winter-grain throughout the United States in the first week in April; a statement of the condition of farm-animals during the past winter, and of the prevalence and fatality of diseases among them during the past year; also an enumeration of the official schools of France, in the interest of rural industry, with a brief view of their constitution and status; the usual records of investigations in other divisions of the Department, and a variety of minor statistics.

J. R. DODGE,  
*Statistician.*

Hon. FREDERICK WATTS,  
*Commissioner.*

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## CONDITION OF WINTER-WHEAT.

Four-tenths of the wheat harvested in the United States is fall-sown. The spring-wheat territory includes practically the six Eastern States, four Northwestern, and those of the Pacific coast. The former are of little importance in production, and the latter are not properly included in either list, sowing being continued from fall to spring in California and in winter and spring in Oregon. The four States, Wisconsin, Minnesota, Iowa, and Nebraska, now produce 90,000,000 bushels, or about one-fourth of the crop.

The present returns include the larger portion of the winter-wheat area. They represent the crop as more generally promising than at this period for several years past. The influence of sudden alternations of temperature, and of cold and drying winds, during the month past, has been almost the only drawback to the uniformity of vitality and higher condition of the wheat-plant in every section of the country. The winter has been so remarkably mild in the South, with almost entire absence of injurious changes of temperature, that the returns from Virginia to Texas are nearly unanimous in ascribing either average vigor or luxuriant growth to the wheat-area. In about one-fourth of the counties in the Ohio Valley an unpromising appearance is reported, while a majority represent in various terms a condition above an average. From Missouri and Kansas still fewer unfavorable returns have been received.

Though the wheat-product of the New England States is little more than a peck to each inhabitant, of which but one-twelfth is fall-sown, winter-wheat is sometimes grown in Aroostook, the most northern point in Maine, and it is common to obtain on new lands there a yield 50 per cent. higher than the usual average for the whole country. About half the winter-wheat of New England is grown in Connecticut, where the proportion of spring-wheat is only one to twenty. The small area sown has been less effectually covered with snow than usual, having been bare much of the winter, even in Maine and New Hampshire, with occasional thaws, and has suffered injury in consequence.

Six-sevenths of the crop of New York is seeded in the fall. Favorable reports are more numerous than unfavorable. The promise is good in Ontario; a fair expectation is entertained in Niagara; a better prospect than last year in Livingston; average in Genesee, though injured on low grounds by alternate freezing and thawing. These four counties produce one-third of the winter-wheat of New York. In Seneca the fields were full of promise until late in March, when the effect of cold winds and changeful temperature was apparent. Among other counties reporting favorably are Yates, Greene, Steuben, Chautauqua, Wyoming, Kings, Seneca, Rensselaer, Schuyler, and Suffolk. Wheat-fields have suffered considerably from the cold winds and alternations of freezing and thawing, in the latter half of March, in Albany, Montgomery, Warren, Saratoga, Schenectady, Fulton, Oneida, Sullivan, Otsego, Wayne, and Washington. In several northern counties, in which the back of winter was not broken, it was deemed too early for a reliable opinion.

Not one county in New Jersey reports an unpromising appearance of growing wheat. In Gloucester, the recent atmospheric changes have despoiled its dark green color to some extent. In Burlington it has improved in appearance throughout the winter, and looks now as if it would do the county credit.

In analysis of Pennsylvania returns but four counties present inferior condition, Erie, Forest, Jefferson, and McKean, while forty are characterized as "average," "unusually good," "very promising," "extra," "never looked better," notwithstanding the winter has been open and the ground bare for much of the time in many counties. This exemption is remarked as exceptional, and due to the absence of sudden and extreme changes. In many counties there are occasional fields, in undrained and unsuitable soils, badly frozen. Among these are Clearfield, Mifflin, Lancaster, Lycoming, Union, Washington, Luzerne, and Dauphin. In Wyoming the remarkable vigor of drilled wheat is noticed. The early-sown is in several cases reported superior to the late. The Berks correspondent thinks it "astonishing how nice it is, considering the open winter," and "has not seen one very poor field."

Little Delaware produces about one million bushels of wheat, and the promise this year is very good, counties ranging from average up to 50 per cent. better than last year. The Kent correspondent remarks its fine appearance wherever attention was paid to the preparation of the ground.

Fourteen counties in Maryland have indicated prospects ranging from fair to extra, and not one makes an unfavorable return. The cold winds of March have temporarily affected the appearance of many fields. The Queen Anne correspondent says: "I have never seen so good a stand of wheat, even in low and unfavorable ground, although continued rains in October prevented seeding until late in the autumn."

Returns from sixty-four counties in Virginia represent the prospect good at present for an excellent crop. No county fails to show average



condition. Wheat-growers generally are delighted with the prospect. Comparisons are frequently made with former crops, and some declare the crop finer at this season than in any April since 1860.

The cotton-States cultivate wheat sparingly, and only in counties which produce little or no cotton. Throughout the entire area the promising appearance of growing wheat is remarkable. We have never been able to report such uniformity of high condition, and only once, in 1871, anything approaching it. Scarcely a really marked exception is reported. Although many counties in North Carolina grow no wheat worth noticing, fifty-two reports represent a condition from fair to superior. Many give precedence to present prospects over those of springs from seven to ten years past. Some counties in the Carolinas and Georgia report an increased area. Alabama and Mississippi grow wheat in very small areas; in most of the counties none. It presents a fine appearance where it can be seen at all. In Bibb, Alabama, our correspondent was shown a stalk in bloom 3 feet in height, representing a field of three acres. In Lee, Mississippi, a field of eight acres is deemed worthy of special mention. Our correspondent there, in an experiment with a quart of wheat, which he sowed in a drill made with a bull-tongue plow, obtained wheat enough to seed six acres, and says he intends to put in thirty acres in the fall, as wheat will usually command \$2 per bushel. Fifty-five counties in Texas report favorably, with the slight exception of the appearance of rust in Gillespie, McLennan, Victor, and a few other counties. A "rust-proof" wheat is cultivated in Tyler and other counties. A variety known as California wheat has done well in some localities for several years. In the northern part of the State, on the 1st of April, wheat was 6 to 12 inches high; in more southern localities 2 feet in height, and heading out. In many cases it made an excellent winter pasture, and is claimed to give better promise of a crop in consequence. Recent rains have wrought injury in some sections. The mildest weather and earliest spring in fifteen years is reported in Arkansas, and a vigorous growth of wheat in small patches, than which the memory of the oldest inhabitant is invoked to produce a more luxuriant. In Tennessee almost equal unanimity proclaims the finest prospect, reports ranging from "average" to "finest for years;" "best since 1857," and equivalent expressions.

In West Virginia a county upon the mountains, Pendleton, reports "a dry fall and poor start," but all other sections represent good condition, in some cases the best for fifteen years. Kentucky reports a very mild winter, unusual exemption from injurious alternations of temperature, and a uniformly good appearance of the growing crop. In some localities the unfavorable influence of March weather is slightly apparent.

Two-thirds of the Ohio counties make favorable returns. In Morrow fields look unpromising, but those well cultivated and seeded with the drill look best. It is noted in Henry that winter-wheat fails with the cutting off of the surrounding timber. "Better than for twenty years" is the record in Vinton; "best in ten years" in Gallia; "very fine" in Jefferson. Among the counties which have reported injury from alternations of freezing and thawing are Licking, Hancock, Shelby, Mercer, Richland, Starke, Van Wert, Lucas, Defiance, Hardin, Logan, Crawford, Wyandot, and Huron. The southern and eastern counties, with a generally rolling surface, have escaped much injury. The flat, wet lands of the north and northwest comprise most of the deteriorated area. The Franklin correspondent says:

Wheat, on proper soils for its growth, was never better. On lands poorly drained and badly tilled it is considerably winter-killed. In fact, on badly-managed lands this crop has

long since ceased to pay expenses. This, however, is the fault of the cultivation, and not of the climate or soil. I have known two neighbors, with fields of like soil lying together, with only a fence between—one would have thirty bushels to the acre while the other had less than five bushels per acre; one keeping his land up and making money, the other letting his land become thin, and he going in rags and becoming poorer each year.

Very few counties in Michigan have any cause to lament the condition of winter-wheat. With the exception of returns from Newaygo and Cass, and those of Branch, Berrian, and Lenawee, as to clay-lands, all are promising, most of them to an unusual degree. The opinion in Saint Joseph is, "The best in ten years;" "the best in twenty years" in Calhoun; and "never better" in Barry and Jackson. In the latter "the foot-stalks are very large, the leaf broad; the stools stand square and firm." In Van Buren timber-lands make the best show.

Fully 70 per cent. of the Indiana counties make favorable returns. Some of the exceptions are Decatur, Noble, Randolph, Hamilton, Marshall, Whitley, Steuben, Grant, Martin, Tipton, Wells, and Wayne. The clay soils are affected by freezing and thawing, the sandy soils and bottom-lands exempt. The prospect is claimed to be the best in forty years in Knox. The early sown is best in Brown.

Very few returns from Illinois are unfavorable. The early sown is almost uniformly in superior condition; in some cases late sown is a failure. The favorable influence of good tillage upon condition is repeatedly shown. The rough and changeable weather of March has been injurious in Grundy, De Kalb, Washington, Tazewell, Effingham, and Mason. In Franklin its healthy color and thickly-matted growth is noticeable. Six counties produce nearly a quarter of the winter-wheat of the State, averaging in a good year three-fourths of a million bushels each—Randolph, Macoupin, Washington, Monroe, Clinton, and Jersey—and of those all except Washington report condition from average to fine; Randolph (producing a million bushels usually,) marked "very fine."

Wisconsin, Minnesota, and Iowa, though producing in 1873 about ninety millions of bushels of wheat, do not together aggregate more than twice the amount of fall-sown wheat grown in Randolph County, Illinois, yet many people gravely speculate upon the prospects of the crop of winter-wheat in those States. Still there are favorable reports this year from Kewaunee, Washington, Sheboygan, Buffalo, Calumet, and other counties in Wisconsin; and Benton, Jefferson, Lee, Louisa, Appanoose, Muscatine, Decatur, and Clayton in Iowa.

Nearly all the wheat of Missouri is fall sown. For several years past its wheat returns have been unpromising, but there is very little cause for complaint the present spring. Some correspondents state that the prospect has not been better for thirty years. It is generally of good color, well rooted and vigorous. In Perry "croakers say it is entirely too fine for the season." The Polk County correspondent says:

"Never looked better, but the chinch-bug is bound to take it. Millions of them have just put in an appearance. Every shelter for them during the winter was literally filled."

In Kansas almost equally flattering prospects are presented. But three counties, Nemaha, Miami, and Shawnee, report low condition. "Very good," "never better," and "best for eight years," and similar expressions characterize the returns. The Labette correspondent says, "It is as thick on the ground as can be, from four to eight inches high, affording excellent pasture for some of the half-starved cattle, without doing any harm either." The early sown is the best. Nebraska is not a winter-wheat State.

The California returns are of various import, some very favorable,

others discouraging. Strange to say, several correspondents report too much rain. "Good, except on low land;" "drowned by excessive rains;" "too much rain;" "winter has been so rainy there has not been enough sown to bread the county." Such are some of the returns relative to this land of assumed drought. Later returns will be more complete. The Mendocino correspondent says:

Seeding is not yet entirely done, the continual rains having prevented work on the low lands. There is but little difference here between winter and spring wheat. Winter-wheat brought from colder climates does not succeed well the first year. It grows and spreads on the ground until the dry season sets in, when it is ripened too rapidly. It, however, soon becomes acclimated, and after any given variety has been raised here one or two years, this characteristic disappears.

### DRILLING vs. BROADCASTING.

The use of the drill for winter-wheat has become so prevalent that many intelligent people think the practice of sowing broadcast by hand has become quite obsolete. It is by no means the case. Information acquired through our correspondence shows that of the entire winter-wheat area, 52 per cent. only is put in with the drill.

"Does drilling tend to prevent winter-killing of wheat?" Repeated testimony in the affirmative has been received from our correspondents, which has commanded nearly universal acquiescence. Occasionally the negative has been assumed by writers for agricultural papers. In reviewing the deliberate utterances of our own correspondents, testimony has so accumulated as to settle the question beyond peradventure. Opinions are found to differ relative to the amount of benefit derived from drilling, in different soils and seasons, but the general fact of advantage is affirmed by nearly all. The amount of advantage, expressed as a percentage, is estimated variously from 10 to 100 per cent. Calculated with reference to the quantity grown in each county, the average of all these estimates of increase is 10 per cent., which is equivalent to the total quantity of seed used.

In the principal wheat-growing counties of New York the benefit is acknowledged freely. In Genesee 15 per cent. is deemed a low estimate of its advantage. In Onondaga drilling is regarded as "the only proper way to put in seed; a great protection against winter-frosts, and saves one-fifth of the seed." In Steuben and Wayne the crop is 50 per cent. better than that broadcasted; in Livingston and Ontario 10 per cent. "A better growth in the fall" is reported from Monroe. "In fourteen years' trial drilling proved a benefit in every year but one," says our Wyoming correspondent; similar statements coming from Erie and other prominent counties, and from many which have a smaller area in wheat. The majority in Niagara, a county which sometimes produces a million bushels, think drilling prevents winter-killing, though some prominent farmers do not admit it.

Testimony is in the same direction in New Jersey, with the sole exception of the return from Monmouth. In Burlington an exception is naturally enough made relative to marshy land, where winter-wheat could scarcely be expected to survive the effects of submerging and freezing. Of county reports from Pennsylvania, only three deny positively the winter-protection of drilling, Lehigh, Clinton and Union. In Lehigh it is said that wheat was worse killed where it was drilled. It is deemed an undecided question in Bucks, Chester and Westmoreland. Drilling in Washington "prevents winter injuries to such an extent that portions of fields drilled last fall for testing this question produced fair crops, while portions broadcasted failed entirely." "A larger straw, better

berry and larger yield," are results of drilling in Luzerne. It is acknowledged in Delaware that it saves seed, yet some farmers still doubt the economy of drill-culture. In Snyder "nearly all the broadcast sowing was frozen out, while that drilled had deeper root and did much better." Our Wyoming correspondent "in fifteen years' experience, on a farm of 250 acres, never lost an acre of drilled wheat." Maryland reports indicate the superiority of drilled crops without a positive exception. Those from Virginia maintain a similar unanimity. The King George correspondent declares drilled wheat the best "from the coming up to the reaping." In Nelson, "drilled wheat is held to be proof against winter-killing if put in early," and even if late, is better than broadcast. A greater advantage on clay than on sandy soils is indicated in several localities.

In the cotton States drills are almost unknown. A few have been introduced into Texas, and in parts of Tennessee they are more numerous and deemed a decided advantage. In West Virginia and Kentucky, wherever used, they are credited with enhancing the supply of wheat.

Without exception the reports from Ohio acknowledge the benefit of the drill; in Williams only the qualification is added, "some doubt it." In Hardin a nearly double product is claimed; in Morrow "recent results of drilling have been more efficacious than ever before known;" in Highland it is found more beneficial in connection with deep plowing; in Hancock the recent product of drilled wheat ranges from 20 to 47 bushels per acre. The Logan correspondent says: "There are exceptional seasons, in which broadcast wheat does not winter-kill to any appreciable extent, but I should estimate that, on an average, drilled wheat will have the advantage of broadcast in withstanding the winter siege to the amount of 20 per cent. of the crop. Reasons: It is more uniformly placed at a depth that enables it to anchor its roots deep in the soil; and the ridges that the drilling leaves on each side of the wheat-bed are, by degrees, precipitated on the young plants, by the same alternate freezing and thawing that lifts the wheat, thus making use of the same means, at the same time, to counteract its injurious influence." A single correspondent in Michigan, representing Livingston, says: It does not prevent winter-killing, but rather increases it, the land being very flat, the furrows holding the melted snow. All other counties report a belief in drill-culture as a preventive of winter-killing. Its superiority is repeatedly claimed in seasons of autumn drought. Throughout Indiana the testimony is the same. Laporte alone says "No," but adds that the soil is sandy, and that wheat, either drilled or broadcast, escapes winter injuries. In one county, Perry, not a wheat-drill is found, but they are used very generally throughout the State. It is said in Franklin: "None but old fogies sow broadcast here, and they are scarce. No fact in agriculture is better established, than that drilling grain is a great improvement on broadcasting." The drill is credited in Ripley with an increase of 4 or 5 bushels per acre; in Jasper, with 5 bushels on low land, and 2 on high ground. Of thirty-two counties reporting relative to winter-wheat in Illinois, there is not a positive dissent to the theory that drilling is a winter protection. The benefit in dry seasons is emphatically asserted, and attributed to the deeper planting and the pulverization of the seed-bed by the drill. In Macoupin drilled wheat is assumed to be a sure crop, while that sown broadcast will winter-kill to some extent every winter, and probably entirely one winter in every three. In Clay County the advantage is stated at 15 per cent., though it is admitted that no benefit is received on certain clay soils, that become early saturated and "run

level." It is admitted in Lawrence that drilled wheat, often a good crop, when broadcasted is a failure. In Washington "broadcasting never yields half a crop," and is abandoned. In Richland "many decline to plant wheat unless it is drilled," and it is stated that the crop has been doubled since the drill has been introduced. The Schuyler correspondent reports an experiment, in which three acres drilled yielded 18 bushels per acre, while seven acres broadcasted were not worth harvesting. In Bureau, drilled wheat is sometimes winter-killed in prairie when it does well in timber.

In Wisconsin, Minnesota, and Iowa, there is no winter-wheat grown worth considering. The general belief is strong in the liability to winter injury, whatever the mode of planting. In some counties of these States there is a small portion of winter-wheat sown, and in several of these the advantage of drilling is conceded. In Lee, Iowa, which produced 95,326 bushels of winter-wheat in the census year, it is said that "last winter the drilled wheat stood the winter well and produced a good crop, while that sown broadcast was so much winter-killed as hardly to pay the expenses of harvesting."

In Missouri, returns cover forty-seven counties, of which only one (Platte) reports drilled wheat as unreliable as broadcast. In Benton "the only way to secure a crop" is by use of the drill. In Chariton it insures almost certainly a full yield, while broadcast wheat is often but half a crop; and in certain soils in Franklin it doubles the yield. "Drilled wheat is scarcely injured; broadcast wheat is half winter-killed," says the correspondent in Greene. In Marion, "last winter a marked difference appeared. Nearly every crop of broadcast proved a failure, while many crops of drilled yielded 20 to 25 bushels per acre; generally a difference of 30 per cent. in favor of drilling." In La Fayette, "during the last season, all drilled wheat made fair returns, while at least 50 per cent. of broadcast did not make a fourth of a crop." In Stone the advantage is placed at 33 per cent. if the drills run north and south. The explanation is, "when the drills run north and south, the sun at noon strikes the furrows on each side, thawing the frozen sides, and the dirt falls in and keeps the roots covered."

The verdict of Kansas is decidedly in favor of the drill. Very few counties give opposing testimony. Marion objects. Dickinson says, "All wheat winter-killed last winter;" and Lincoln reports "drilled wheat winter-killed worse than broadcast." Droughts in autumn, which are not unfrequent, are less injurious to wheat where the drill is used. From Nemaha the report is, "Five per cent. of drilled wheat is killed; 30 per cent. of the broadcast." In Cherokee "great destruction of broadcast; 15 per cent. of the drilled." In Coffey, 50 per cent. of the acreage is drilled and 95 per cent. of the product. In Montgomery "nearly all the broadcast is killed." In Shawnee the preference is expressed for drills running east and west, because the prevailing winds are north and south, and the injury from displacement of earth is less. A farmer in Jefferson says he once put in 80 acres of winter-wheat, and "got 27.73 bushels to the acre." His neighbors sowed broadcast, and "not one had good wheat." He says he has "raised four crops in succession without winter-killing," while his neighbors have had their crops "frozen out."

Drills are not much used in Nebraska, and scarcely at all among the mountains or on the Pacific coast.

The following table gives the number of counties reporting; the proportionate area represented compared with the entire winter-wheat area of each State; the proportion of this area sown and drilled, respectively; the estimated increase of product by drilling over that obtained by

sowing; and the estimated quantity of seed used per acre, respectively, in these modes of seeding:

States.	Area represented.		Proportion sown.	Proportion drilled.	Increase of product by drilling.	Seed per acre.	
	No. of counties.	Percentage.				Bushels in broadcast.	Bushels in drilling.
New York.....	21	63	50	50	13	1.80	1.60
New Jersey.....	10	22	45	55	6	1.95	1.60
Pennsylvania.....	33	62	30	70	12	1.74	1.49
Delaware.....	2	43	26	74	10	1.75	1.50
Maryland.....	8	66	24	76	7	1.70	1.43
Virginia.....	29	35	62	38	12	1.44	1.21
North Carolina.....	18	26	97	03	.....	1.07	.....
South Carolina.....	4	.....	99	01	.....	1.00	.70
Georgia.....	16	14	99	01	.....	1.00	.90
Alabama.....	8	.....	99	01	.....	1.00	.....
Mississippi.....	5	.....	99	01	.....	1.25	.....
Texas.....	9	21	98	02	.....	1.18	90
Arkansas.....	2	.....	100	.....	.....	1.10	.....
Tennessee.....	27	37	96	04	10	1.20	1.10
West Virginia.....	17	57	58	42	12	1.53	1.33
Kentucky.....	23	22	92	8	10	1.36	1.11
Ohio.....	38	51	39	61	16	1.57	1.33
Michigan.....	22	52	49	51	9	1.62	1.40
Illinois.....	32	39	24	76	19	1.52	1.24
Indiana.....	41	44	49	51	15	1.48	1.21
Missouri.....	47	45	62	38	21	1.52	1.21
Kansas.....	23	36	55	45	16	1.49	1.23
Nebraska.....	2	4	51	49	17	1.56	1.25
California.....	9	.....	98	02	.....	1.33	.....
Oregon.....	7	21	81	19	5	1.50	1.21

**SPRING WHEAT.**—The proportion of spring wheat sown is about 40 per cent. of the whole crop. It is grown mainly in Wisconsin, Minnesota, and Iowa, almost to the exclusion of fall-sown wheat in those States. Michigan, though as far north as either, produces almost exclusively winter-wheat, owing to the modifying influences of the surrounding waters, and perhaps in some degree to the soil, much of which has good natural drainage. One-third of the crop of Illinois, (in the northern counties,) is spring-wheat. A small portion of that of Kansas is sown in the spring, and nearly all of that of Nebraska. California is anomalous in wheat as in everything else. Wheat can be sown all through the summer to sprout when rains fall, or it may be put in all through the rainy season till spring. In point of fact, the planting season has actually a range of several months. The little grown in the New England States is nearly all spring-wheat. In the Middle and Southern States, and in the Western States not named above, fall sowing is almost the exclusive practice. A little is sown in the spring in New York and Pennsylvania.

A considerable portion of the farmers of New England, including some of our correspondents, have never even seen a drill. One report from Vermont (Grand Isle) makes the yield of drilled double one year, while the next showed little difference. In Aroostook, Maine, new land often yields 20 bushels per acre with broadcast sowing.

The use of the drill is nowhere the predominant practice in the spring-wheat region. Our returns cover nearly one-half of the area of spring-wheat, and the proportion reported drilled is found to be 39 per cent. in Minnesota, 38 in Wisconsin, 21 in Iowa, 11 in Illinois, 49 in Kansas,

and 7 in Nebraska. The average proportion of spring-wheat drilled throughout the country is 30 per cent. A still larger proportion is seeded by the use of some style of broadcast seeding-machine, leaving the remainder to be sown by hand, mostly in lands having stumpy or uneven surfaces, where fields are small, or where new farms have been opened, and cultivation attempted before the pioneer could find means to procure drills or seeders. A very small proportion is actually seeded by hand, far less than in the cultivation of winter-wheat. In the Eastern States, to a considerable extent in the Middle States, almost exclusively in the Southern States, and in the region south of the Ohio, hand-sowing is practiced; and when a machine is used in putting in winter-wheat, it is generally a drill, very rarely a broadcast seeder.

Various forms of broadcast seeders, which are a great improvement on broadcast sowing by hand, are used in the West. They have come in since drills, and for spring sowing have displaced them in many localities. A principal reason assigned for this preference, especially in corn-growing Illinois, is their better adaptation to sowing after corn, without plowing, which is a prevalent practice. It is slovenly but cheap, and a scarcity of farm-labor compels its adoption by the average farmer. Our Kankakee correspondent says that "farmers who drill winter-wheat, broadcast their spring crop, and declare that corn-land harrowed in grows less to straw and is less liable to fall down."

There is another ground of opposition to the drill, which is a direct confession of slovenly farming. It is very common in the whole northwest, and appears to constitute very prominent objection. It is that the drill leaves between the rows wide spaces "in the best possible condition for the growth of every kind of weed." In the case of the corn-land, the mellow row-spaces are already full of weeds at the time of planting, and their presence and future growth are the result of the absence of all preparatory culture, with which the drill has no connection whatever. As the drill alone, running among grass and weeds, over corn-hills, was found to be impracticable, a compromise was made between negligence and labor, and a cultivator and broadcast seeder were combined to accomplish the least amount of work admissible at the lowest cost; and as this sort of culture is the rule in the spring-wheat region, the seeder largely predominates, the drill being used only in sections where more thorough culture prevails. It is admitted generally, throughout this region, that in dry soils the drilled wheat, which is put in at a uniform and greater depth, gives more satisfactory results. In Dane County, Wisconsin, it is declared that "drilling does as well always, and in dry seasons better." If a dry, sandy field is late sown, it should be drilled, says the Pierce County correspondent. In Saint Croix it is affirmed that "in dry ground, or when dry weather follows, drilled wheat produces four or five bushels more per acre. In Fillmore, Minnesota, a great wheat-growing county, our correspondent asserts, from an experience of fourteen years, that "drilling produces three to five bushels more per acre, with one-eighth to one-fourth less seed." In Olmsted it is thought "drilling is not superior to broadcasting, except in dry seasons." Our Houston correspondent prefers a mixed practice, deeming it "a good plan to drill both ways, one way east and west, that the weeds may be more shaded, and then cross-drag to scatter some of the grain." In Nicollet the drill "is best if fields are kept clean." In Freeborn the seeder "is most used, worked among grubs, stones, and in wet land, but the drill is best in dry soil." Similar views are reported throughout Iowa. Four-fifths of the area is sown broadcast. It is universally believed that the seeder is better

than hand-sowing. Some prefer plowing in. For dry soils preference is expressed here, as elsewhere, for the drill. Our correspondent in Jasper, from a long experience, gives ten per cent. preference to the drill. In Tama the seeder is used, but fall plowing of corn-land gives better results than spring plowing. In Marion, "drilled wheat has stouter growth of stem, it tillers better, the roots reaching moisture." Our Hancock observer thinks he could grow winter-wheat with drill-culture. In Leavenworth, Kansas, the reporter thinks the practice of drilling promotes better culture, as the ground must be in good order to use the drill advantageously. The importance of drilling, as a preventive of the effects of drought, are enforced repeatedly by Kansas correspondents. The light soils of Nebraska are deemed well suited to drill-culture. The following extracts illustrate some of the main points in seeding :

*Mercer, Ill.*—Owing to the fact that nearly all our spring-wheat is sown broadcast upon ground previously occupied by corn, and upon which a drill could not work, many drills were introduced and thoroughly tried several years since. All are now thrown aside to rot in fence-corners. I have known but one piece to be drilled in fifteen years, and the party doing it has not repeated the experiment. It is so seldom that they can be used, either for profit or convenience, that it does not pay to keep the machine. The time may be approaching when we shall adopt summer-fallowing and winter-wheat, and with it the drill; but while we have the cattle of the West to stall-feed, we shall raise wheat only to prepare our ground for grass.

*Steel, Minn.*—Formerly all spring-wheat was sown broadcast. The best farmers now have changed to a great degree their practice. If the ground is in good working condition and clean, there is a general concurrence that drilling is best. Some use a broadcast machine, because they can hurry in the early spring, and put the grain in before the ground is dry, even before the frost is out but a few inches. The only other objection to drilling that is much urged, is that it gives the seeds a much better chance to start and grow between the drills of six inches than if the seed be evenly scattered. This, it is acknowledged, is only occasionally the case, as in the season of 1871, when there was a hot, dry time in May and June, and even then weeds were perhaps as vigorous and numerous in the broadcast sowing. These are the objections I hear urged, but the opinion is prevalent that these statements are at least but partially true, and that the deeper covering of the seed, and the less seed necessary, are both positive advantages; and, further, the great test that drilled seed, on the whole, produces the best crop. Some farmers think that the drills only four instead of six inches apart would give better results.

*Hardin, Iowa.*—I have followed both drills and broadcast seeders over hundreds of acres for the sole purpose of observing which did the best work. I find that when the soil is just right as to moisture, the drill covers best, hardly a dozen grains remaining uncovered to a square rod; but if the soil is rather wet it *will not fall back* properly so as to entirely cover the seed deposited in the bottom of the furrow, and, if the ground is foul with roots, weeds, or stubble, poorly turned under, and rather too wet, the points of the drill-teeth clog badly. Most good farmers will say you must not sow your seed then when the soil is too wet, which is very true in most soils, especially clay or clayey; but every one hereabouts who has tried it, has found that when the time comes for sowing, the condition of the soil as to moisture, at least as to being too wet, is of little consequence, so that *time* seems to be the "essence of the contract" more, than condition of soil.

I first observed this in the spring of 1867. I went twice across a field (eighty rods) with a broadcast seeding-machine, making a strip one rod wide, or just half an acre. The ground was so wet that the horses sunk to their fetlocks at every step, and seemingly one-fourth of the grain remained uncovered, as the soil worked up by the seeder-teeth appeared more in the condition of mortar than like a proper seed-bed. So I quit for two days, until the sun and wind had dried out the land properly, when I resumed work with the same machine, same seed, and same rate of seed per acre, and finished the field of forty acres in the same way. None of the land was harrowed after the sowing. The strip first sown came up first, looked better, and kept ahead all through the season, showing a plain difference at a distance of one hundred rods, so much so as to attract the attention of almost every one who passed. Thinking that I had discovered something, I harvested the first-sown strip separate, and another strip of the same size also separate. The result was, the first-sown strip, half an acre, yielded eleven bushels, and the other strip nine bushels. Another farmer, living about three miles from me, made the same discovery the same season; and every one who has tried the plan, to "put in their wheat in time," as they call it, without reference to the condition of the soil, even when hardly thawed enough to cover the seed, has confirmed the wisdom of the practice.

*Labette, Kansas:* We have harvested but six crops from our broad, unfenced fields of



this county. The first four were sown all broadcast. The ground was then very rough and the country new, and no machinery of any kind was used in sowing or harvesting. From the roughness of the ground, which was somewhat of a shelter to the crop, the stand was generally good. In our fifth crop—the sod was by this time all rotten and the ground very smooth and level—we found that by sowing it broadcast, our process of “dragging” it in did not bury the seed deep enough, and that our violent northern winds blew what little dirt there was from around the roots of the wheat, and in many instances blew the plants entirely out of the ground or left them merely hanging by one or two roots, from which but a poor stalk or head could ever be harvested; hence our crop of 1871 was a failure in many places. In sowing our sixth crop many conceived the idea of deep drilling, and from actual observation and experience the following facts are evident. Wheat that is drilled in deep, east and west, and not rolled after, is equivalent to the planting of it in small trenches and deep enough in the ground to draw plenty of moisture; and as our strong winds are either from the north or south they will in this case pass directly over the drills of wheat in the trenches without doing any injury whatever, as the roots are so deep in the ground as to be below the force of the winds, and the dirt on the sides is blown into the trenches, thus planting the roots deeper into the ground and saving it from the frosts that winter-kill our wheat. The trenches that the drills make also answer admirably for surface-drainage, in connection with some main furrows that should be opened, north and south, with the plow, and cleaned up with the shovel. This county intends in the coming wheat-crop to test fully the efficiency of drilling over broadcast-sowing. Of the last crop, nine-tenths was drilled. *Nemaha*: The advantages of drilling spring-wheat over broadcast-sowing are so evident here that no farmer who can get the use of a drill will have his wheat put in otherwise. The same is true of other grains. About the time of spring-seeding here there is much windy weather, and the most expert hand fails to distribute the seed evenly over the ground, the grain coming up in thick and thin streaks. The thick will ripen first and produce an inferior quality of grain, while the weeds will grow in the thin places. The uneven depths of covering of broadcast-sown grain is a great disadvantage to the crop, causing it to grow and mature unevenly, while some drills leave the surface of the ground smoother and in a better condition for the harrow. In 1858, when this county first began to settle up, many of the best farmers tried spring-wheat broadcast, for several years, with but partial success. Some were nearly discouraged, but, having procured drills, the same men have become the most successful wheat-growers in the country, and annually market hundreds of bushels of the finest wheat. A gentleman in this town (a good farmer) for several years tried to raise spring-wheat and other grain by broadcast-sowing, only partially succeeding; he finally concluded it was not a good country for wheat, and sold his farm. The purchaser uses the drill, and succeeds every year on the same ground where the other failed. The use of the drill is an advance step in the progress of agriculture. No country is better adapted to its use than the prairies, and the time is near when it will be as indispensable to the well-ordered farm as the wagon.

**SUMMARY.**—The following conclusions are presented:

1. Fifty-two per cent. of the winter-wheat and thirty per cent. of the spring-wheat, or about forty per cent. of the aggregate of both kinds, represent the proportion seeded with a drill.
2. Nine-tenths of the testimony given asserts the superiority of the drill for winter-wheat.
3. An average increase of one-tenth in the yield is assured by the use of the drill.
4. A large majority of observers declare that, in most soils in which injury resulting from frost is liable to occur, drilling prevents or reduces the loss.
5. The majority assert that in certain clay soils with rolling surfaces, some advantage accrues in surface-drainage by the use of the drill; while in some heavy soils with flat surfaces the water freezing in the drill-furrow does positive injury.
6. The broadcast-seeder predominates in spring-wheat regions, because better adapted than the drill to seeding in unplowed corn-fields, on rough surfaces, and in weedy fields.
7. About one-sixth of the seed-wheat (or 5,000,000 bushels for the crop) might be saved by the exclusive use of the drill. The average quantity of seed used per acre in seeding winter-wheat is 1.38 bushels.
8. The drill is used for seeding in connection with thorough culture, especially in winter-wheat growing; the broadcast-seeder for imperfect culture and rough surfaces; and sowing by hand is the method adopted for small patches and first efforts of impecunious pioneers.

## CONDITION OF FARM-ANIMALS.

The winter of 1872-73 was extraordinary for the steady coldness and dryness of its temperature, except on the Pacific slope, where it was unusually mild, and in Texas, where cold storms prevailed to an unprecedented extent. These conditions were reversed the past winter; on the Pacific slope it was one of the severest and most protracted ever known, occasioning great suffering and loss of unsheltered and unfed stock, while in Texas farm-animals, without either shelter or feed, have not only escaped any considerable suffering from exposure and hunger, but have improved in condition. In the remainder of the country the winter was unusually mild, and in the Mississippi and Ohio Valleys, especially, wet and changeable. This statement, however, must be qualified by the fact that throughout Northern and Northwestern States the month of November was the coldest and most snowy for many years. This necessitated the bringing of stock into winter-quarters early and a very long season for feeding. On the whole, the winter has been exceedingly favorable for farm-animals wherever there were adequate provisions for sheltering and feeding them in such exigencies as required it. Except in a few limited localities affected by drought the crops of grain, hay, and rough feed were sufficiently abundant to take away all excuse for scant feeding, and, excepting the same localities, fall-feed was unusually good, so that cattle and sheep went into winter-quarters in more than ordinary flesh and vigor. Owing to the mildness of the winter it has required less than average feed to keep up and improve their condition. And even in localities visited with scarcity, by saving rough feed and supplementing any deficiencies by timely exchange of surplus animals for provender, it has been practicable and profitable to bring stock through the winter without depreciation. From Laeade, Mo., the condition of cattle and sheep is reported as better than for many years, and the losses 50 per cent. less than the average.

The reason is that the farmers took better care of their stock than ever before. Last fall feed was so scarce that our farmers feared they would be unable to get their animals through the winter. The result has been that they saved their feed, took special care of their stock, and have brought it through in better condition than ever before.

But while the past winter has been exceedingly favorable for stock properly sheltered and fed, it has been characterized by greater humidity, and has been in that respect more trying to the unsheltered than the preceding. In Kansas, Woodson reports sheep well cared for in good condition, but others poor and dying of starvation, and cattle miserably poor and rough-looking. The correspondent adds:

No one pretends to house cattle here, and the cold, pelting rains and snow-storms have laid their long fingers on the poor brutes the past winter. Estimating the total number of cattle one year old and over at 14,500, and the loss in condition, both as to flesh and health, at \$4 per head, we must sustain a dead loss of \$58,000. The recuperating process has not yet commenced, and midsummer will be reached before the loss in flesh and vigor will be made up, so that the season for growth and profit will necessarily be very short.

The Miami report, representing cattle as "dried beef on foot, owing to lack of proper shelter," and sheep as "thin and feeble for want of shelter for them and for their feed," and the loss 10 per cent. greater than the previous winter, states that the open, wet, changeable winter damaged corn and hay (which is again damaged by being trampled in the mud and dung, in the process of feeding) as well as cattle directly; and the conclusion is that "farm-stock endure the rigors of a cold, dry winter much better than an open, wet one," which is, perhaps, equivalent to saying that, as a rule, to winter stock without shelter, in North-

ern Vermont and New Hampshire, would involve less suffering and disaster than in Southern Missouri and Kansas. That from Ottawa states that the well sheltered and fed are in excellent condition, the loss not exceeding 1 per cent. "Of those with plenty of feed, but without shelter, the loss is probably 10 per cent.; of those without shelter and with little or no feed, 30 per cent." And yet, owing to the fact that "more care was taken to provide feed and shelter, the loss was only half as great as the previous winter." That from Neosho represents that "cattle are very thin for want of food, and unless grass comes soon many will die," for the reason that "farmers did not put up a sufficiency of hay, though there was an abundance to be had for the cutting."

But the most disastrous results from failure to provide for sheltering and feeding stock have been west of the Rocky Mountains. In each of the fifteen counties reporting from California, and in ten out of eleven reporting from Oregon, cattle and sheep are below average in condition. The reasons for leaving stock to the provisions of nature, unassisted by man, for protection and food in winter, are stated in the return from Mendocino, California :

We have four or five consecutive winters in which sheep and cattle will do well without any feed or housing; but occasionally this is changed, and we have almost incessant rains in the valleys and snows on the mountains for four months. Such has been the past winter. Our stock-raisers become so accustomed to neglect to provide feed and shelter, that, when these seasons come, they are entirely unprepared, and stock dies by hundreds.

To say nothing of losses in products, offspring, flesh, and vigor, and of transmissible weaknesses of constitution, the direct losses by death in this county are placed at 20 per cent. of the cattle and about 30 per cent. of the sheep. The report from Santa Clara states that constantly-increment weather has "caused stock of all kinds to suffer, unless provided with shelter, and only a small portion have any except what nature provides."

Among the counties losing most heavily in wintering, the returns from the following are sufficiently specific for a calculation of numbers lost on the basis of the assessor's returns for 1873, which are understood to be very incomplete with reference to all kinds of stock :

	No. cattle.	Per cent. lost.	No. lost.
Mendocino .....	25, 195	20	5, 029
Stanislaus .....	7, 620	10	762
El Dorado .....	8, 905	17½	1, 558
Humboldt .....	28, 589	33	9, 434
Total .....	70, 309	.....	16, 790

This makes an average loss of twenty-three per cent. in these counties. If the loss throughout the State should prove as much as ten per cent., it would prove a serious injury to the agriculture of the State, and a reproach to the providence and humanity of her citizens.

The report from Douglas states that the losses of cattle and sheep are 150 per cent. greater than last year, and that the surviving ewes are generally too poor to raise lambs, and adds :

Nine out of every ten of the cattle and sheep lost in this county the past winter should be put down to starvation. There is nothing provided for them in the summer. All look for early rains to start the grass and for a mild winter to keep it growing; and when the reverse of this occurs, as in the past winter, loss by starvation is inevitable. I have wintered quite a large stock without any loss to speak of. One cow, by accident, and one from a swelling

at the root of her ear, is all the loss out of a stock of 116 head. I commenced with a flock of 1,100 sheep, and have fully as many lambs as usual. My losses are confined to a few old ones and those killed by dogs.

From Whitman, Washington Territory, the report states that cattle as a general rule make their own living on the bunch-grass, and that the winter has been the hardest one on stock since that of 1861-'62, when 50 per cent. of the cattle in that part of the country east of the Cascade Mountains perished. It furnishes the following illustrations of the folly of neglect :

One man brought from Oregon 1,100 sheep, and, without feed or shelter for them, he has now less than 300. A neighbor, who had nearly 300, prepared good, warm sheds and plenty of feed, such as hay, oats, beets, parsnips, &c.. During stormy weather he fed well. His flock came through with a loss of only two, and they died from injuries.

The return from Ada, Idaho, represents that though the winter in that Territory has not been excessively cold, it has been unusually long, and as "but little food and no shelter is provided, it has been more severe on cattle and sheep than any winter since the Territory was settled."

### CONDITION OF CATTLE.

Among the thirty-six counties reporting definitely, from New England, Kent, Rhode Island, returns average; all the others range above. The prevalent thrifty condition in Maine is largely accounted for by the return from Piscataquis: "Farmers are taking better care of their stock; they are more regular in feeding, and take more care to keep them gaining through the winter; they have discovered that it does not pay to let cattle get poor, it takes so long, and so much feed, to get them up and gaining again." In Carroll, New Hampshire, "farmers begin to find that it pays to winter only what they can keep in a thriving condition." Also in Berkshire, Massachusetts, that "by prevention of exposure to storms, and by keeping up a moderate, even temperature, the cost for food is diminished, and the health of animals materially benefited. In Kent, Rhode Island, a gradual improvement in condition through the winter is secured by feeding more roots and corn-meal than formerly.

In the Middle States the general condition indicated is also one of remarkable thrift. The exceptions noted are very few. A scarcity of feed in Washington, Suffolk, Livingston, and Genesee, New York, has caused loss of condition; a similar deficiency, resulting from drought, in Talbot, New Jersey, caused like deterioration; and comparative leanness has come upon the kine of the counties of Wyoming, Westmoreland, and Warren, Pennsylvania, in the latter owing to the light hay-crops and high price of corn; an average condition exists in Dutchess, New York; in Bergen, New Jersey; in Columbia, Dauphin, Juniata and McKean, Pennsylvania; and in Cecil, Maryland. All of the ninety other counties in these States making specific returns on this point report condition higher than average. It is mentioned that more grain than usual has been fed to cows in Montgomery, New York, and that the flow of milk has been correspondingly liberal; and in Otsego, that selling prevented starving, leaving the remainder in fine order. Roots prevented ruin in Union, New Jersey. Well-stabled cattle of Berks, Pennsylvania, lived high on meal and bran. Maryland shows only in Talbot poor stock; in Carroll medium; in twelve other counties high condition, particularly in Frederick and Prince George.

Rarely has a more favorable winter for unsheltered farm-animals been known in the Atlantic States, south of the Potomac and the Gulf States. Of sixty-three counties in Virginia, fifty-three place condition of stock above average, and only one claims poor cattle. This improvement is attributed to increase of forage and attention in Suffolk, an actual gain of flesh during the winter is claimed in New Kent, and in Middlesex, cattle look as well as when in the flush pastures of June, while some are "fat enough for the butcher," in James City. The feeding value of turnips is strikingly manifest in Southampton. North Carolina is represented by fifty-four of her counties, of which only Caldwell and Stanly have thin cattle, and Wilkes divides fat and lean by partition of "shelter." Only two in South Carolina, Marlborough and Greenville, report thin cattle, because unsheltered and unfed. Eight reports of cattle poorer than usual appear in a list of fifty-two from Georgia. Superior condition in Sumter comes from increase of attention. In Troup, Columbia, Catoosa and Carroll condition is modified by too close proximity to starvation. In Jackson, Florida, condition is characterized as "moderate;" it is more moderate still in Columbia; in other counties from good to fine. No unfavorable report comes from Alabama; in several instances cattle are reported fat. Lee and Jefferson in Mississippi make the only reports of low condition in that State; nearly all indicate some degree of superiority. Among counties standing highest are Attala, Amite, Jasper, Jones, Lafayette, Marion, and Yalabusha. Stock is reported thin in Franklin and Rapides Parishes, Louisiana; average in Assumption and Caddo; in all others superior. We have fifty-seven county reports from Texas, in all of which condition is better than usual, in many instances very fine. The tendency to improvement of stock, by breeding and better care, is manifest throughout Western Texas. In some cases, as in Bell, Cooke, Fannin, Hardin, Kauffman, Refugio, and Williamson, very good beef may be taken direct from the prairies. Remarkable condition is claimed in Bosque, Bell, Bexar, Collin, Grimes, Galveston, Medina, Navarro, Parker, and Smith.

One report among twenty-six from Arkansas, that from Union, alone indicates leanness. The buffalo-gnat, as usual, is very troublesome, and in some cases fatal. In Tennessee only six reports are comparatively unfavorable; from Campbell, Grundy, Hardie, Murray, Smith, and Union. In these, sheltered cattle are in good order. Reports from thirty-eight other counties indicate health and thriftiness, in a measure unusually large in Dickson, Johnson, Lawrence, Obion, and Wayne.

Coming to the Ohio Valley, an equally satisfactory state of things exists in West Virginia. Monroe and Pleasants have felt the effects of scarcity of feed. Mercer has only a medium report, in consequence of exposure to too much humidity. All other counties, numbering twenty-eight upon the record, represent condition as superior.

Kentucky fails to make so fair a record, yet a majority of the returns are favorable. Among those least so are Lewis, Russell, Owsley, where feed is scarce and grain high; and in some cases a degree of mortality is reported.

Wet and changeable weather has been unfavorable to high condition in Ohio, and stock too much exposed show its effects; yet nearly six-sevenths of all reports represent either medium or superior condition. A want of better barns and shelter for fodder still exists in many sections.

In Michigan, Calhoun, Cass, Macomb, and Oakland, report comparative leanness; Branch, Ingham, Manistee, and Ottawa, full medium condition; and nineteen counties, a still higher degree of thrift.

In Indiana and Illinois the general condition resembles that in Ohio, and for like reasons. In the former State out of forty counties twenty six return a condition above average; Decatur, "rather poor on account of the great amount of rain and mud through the winter;" Hamilton, poor, "the warm, wet winter being unfavorable for out-door feeding;" Gibson, Warren, Wells, and Pike, thin but healthy.

In Illinois seven counties return average condition, ten below and thirty-five above. In Effingham, there being an unusual amount of rain-fall, "stock of all kinds not sheltered have not done as well as usual;" In Ogle the weather in March was hard on cattle not provided with shelter; in Richland bad crops and changeable weather have conspired to make cattle poor; and in Mercer they are poor from scarcity of grain and forage, the stalk-fields having been rendered nearly worthless by drought last season; in McHenry, "lean, owing to the condition in which they went into winter-quarters, occasioned by scarcity of pasture last autumn;" rather poor in Rock Island, for a like reason. In De Witt they were never seen looking so well as this spring; Randolph, ten per cent. better than for several years.

From Wisconsin, Minnesota, and Iowa the returns of condition are almost uniformly favorable. Whether from more general provisions for housing stock and feed, or from more favorable meteorological conditions west of the Mississippi, there is no complaint of damage from wet weather. Of twenty-nine counties in Wisconsin all except Adams and Washington report higher condition.

Among thirty returns from Minnesota, Faribault alone is below average, and that slightly; the winter mild but very long, and coarse grain scarce and high. Isanti, in which hay had been fed up to April 1, "just six months," reports average, but "many are very poor, chiefly from neglect." Chippewa reports that all are stabled and the condition first-rate. The same in Martin, Douglas, Fillmore, Murray, and Waseca.

From Iowa fifty returns have been received; six of which range below average; nine from fair to full average, and thirty-five from good to superior. In this last grade are Jasper, Taylor, Louisa, and Allamakee. In Pottawattomie cattle are not in as good flesh as usual, but "those fed principally on corn-fodder and straw are in better condition than those fed on prairie-hay." Muscatine reports that cattle are thinner than for some years, for the reason that "in consequence of the drought last season fall-feed was very poor, and also the shortness of the corn-crop and the advanced price of grain rendered heavy feeding impracticable." Morrow, rather thin, owing to the destruction of the corn-crop by grasshoppers; Grundy, poor; "most of the farmers attempted to get their stock through on rough feed."

In sixty-one returns from Missouri, eighteen are below average and thirty-four above. Scarcity of feed is reported in Platte, Clay, Stone, Jasper, Dallas, Christian, Clinton, Montgomery, Ralls, Livingston, Vernon, Holt, De Kalb, and Jefferson.

In Kansas and Nebraska stock have suffered to some extent from scarcity of feed, partly occasioned by drought and chinch-bugs, and partly by neglect to store up, in the season of it, grass "that was abundant and might be had for the cutting." Out of thirty-three returns from Kansas, ten are below average, and sixteen above. Some of them have been noticed under "Condition of farm-animals." In Labette, cattle are poor "from shortness of pasture in the fall, scarcity of feed and the extreme length of the winter. Many skeletons scattered on our prairies." In Ottawa, the loss is greater among Texas cattle than among natives. "The past winter has clearly demonstrated that cattle cannot be success-

fully wintered, at least in this part of Kansas, without feed and shelter." In Greenwood, the report states that a considerable number have died and more must unless grass starts soon, and that the surviving are in the worst condition for several years. It adds: "The winter has been mild, but there have been frequent rain and snow storms, making the ground muddy, and as most farmers feed on the ground, much of the hay fed has been tramped in the mud and wasted." In Washington, while the condition of cattle along the streams is good, on the prairies, though grass was abundant, many have died for want of water. Our reporter remarks: "Water is a necessity which no amount of feed can supersede. I have cattle in good condition that have gone through the winter on straw and pure running water, to which they have free access." Howard, Barton, Osage, Butler, Cowley, Marion, Montgomery, Rice, and Riley are among the counties returning good condition.

Out of twenty-one returns from Nebraska, fourteen are above average. In Richardson the condition is poor, from scant fodder and poor shelter. In Cass, very poor from scarcity of corn; Nemaha, rather poor from less and poorer feed prepared last fall, and feeding sparingly of corn because of a prospect of a rise in the price; Merrick, first rate "and that without any feeding whatever;" Antelope, Hall, Stanton, Otoe, and Furnas, quite superior.

In California, the condition ranges from bad to very bad, without any reported exception, as is stated in the introduction to this report. The report from Plumas, except as to the depth of snow, will serve to illustrate the prevailing condition, though the per cent. of actual loss by death is much less than in some other counties:

Not yet out of winter-quarters, for we have still two feet of snow on the ground—a thing unparalleled at this date since the settlement of the county. The severity of the winter, and the short crops of hay last season, compelled many farmers to shorten feed before mid-winter, and hay cannot now be had at even fabulous prices. Old straw-stacks half rotten and two or three years old have, in many cases, been resorted to, also feeding grain of any description, to prevent the actual starvation of stock. So far there has been but little actual loss, and if we have mild, open weather soon, most of the stock can be saved, though considerably emaciated.

In Utah, the winter has been unusually long and severe, and consequently the prevailing condition of stock is unfavorable. In five out of ten counties reported, it is below average. In Beaver, worse than ever known; very bad in Kane, San Pete, and Iron; in the latter, a great many have died from cold and starvation. In Davis, it is poor where farmers by reason of the prolonged winter have got out of feed; but in other cases, good. New Mexico reports average condition in Mora, good in Taos and Santa Fé. In Arizona, Maricopa, cattle are fat, but in Yavapai low in condition, because herded out and exposed to all the storms of a hard, wet winter. In Colorado and the Territories east of the mountains, the winter was milder and the general condition as in the States is above average. From Montana, Missoula reports that it is excellent, and Lewis and Clarke that it was never excelled. From Dakota, Bon Homme reports the winter so mild that cattle have run on the open prairie, and done well on the old grass, and are now in extra good condition. In Davis, cattle have improved during the winter on the wild prairie-hay, "the only feed they have," and come out in first-rate condition, as they do also in Hanson.

#### CONDITION OF SHEEP.

As exigencies of weather and abundance or scarcity of feed affect cattle and sheep very nearly in the same degree, in the absence of any prevailing disease among either class, it may be inferred that the gen-

eral condition of sheep will correspond with that of cattle in corresponding localities. Our returns show that this is the fact. The comparatively high price of wool has had its effect in securing to sheep better protection and feed than they otherwise would have received, east of the Rocky Mountains. The general mildness of the winter, sufficiency of feed, and consequent superior condition of ewes, have conspired to raise the percentage of lambs, in number and vigor, considerably above an average. In the Southern States, the old and often reiterated complaints against the dogs, and the reasons for complaining are not in any degree abated.

In New England, among thirty-four returns, only Oxford, Maine, reports average; all others a better condition. Kent, Rhode Island, reports more lambs raised than usual.

From the Middle States, Washington, Pa., reports that those which "have been grained, as sheep should be in such winters, have done well," but the condition is not generally good for the reason that "the warm, wet winter has dulled their appetites, and, running mostly to grass, they have preferred living scantily on that rather than on hay." This is the only county, out of ninety-eight, which returns a general condition below fair or average, while eighty-two report a condition above that. In Albany, New York, farmers find it pays to feed better than formerly. Among others reporting a very high condition are Warren, Niagara, Schenectady, Rensselaer, Lewis, and Washington, New York; Warren and Gloucester, New Jersey; Snyder, York, Tioga, Bucks, Lebanon, Wyoming, and Mercer, Pennsylvania; Prince George, Carroll, Baltimore, and Wycomico, Maryland. Queen Anne, Maryland, returns good condition and no loss of lambs.

In the South Atlantic States, out of one hundred and sixty-eight returns, only three are below average—Marlborough and Georgetown, South Carolina, and Catoosa, Georgia; while one hundred and fifty are above. In Dinwiddie, Virginia, "spring-lambs very forward, and some few already marketed at \$6 per head."

In Forsyth, McDuffie, Granville, and Davie, North Carolina, the condition of sheep is very superior.

In fifty-one returns from Texas, all report above, and most of them much above. Bexar, Harrison, and Medina, a condition never excelled; Navarre, Collin, McLennan, Bosque, Ellis, Hunt, and Galveston, better than for a number of years. In Austin, Bosque, and Bandera, there has been no day all winter in which green grass was not plenty; in Victoria they are fine and fat; in Williamson, have been fat all winter. In Bell and Refugio, the prevalence of scab to some extent is noted; in Austin a few deaths of lambs.

Arkansas returns two counties, Montgomery and Hempstead, as average, nineteen above and none below. From Tennessee, forty-three returns have been received; in Sumner, Meigs, Loudon, and (except those sheltered) Campbell, they are not in average condition, because not sheltered, but exposed to the prevalent damp and rainy weather. In Union, feed having given out, and in Madison and Grundy, poor condition is reported; in all others good; in Obion, they are amply rewarding for care by multiplying rapidly. "Good shelter, and good care and feeding will pay 25 per cent. in lambs, and 25 per cent. in wool."

In Coffee, our reporter says: "Sheep have done well on grass without any other feed all winter. My wethers are all in condition for the butcher, entirely on grass."

In West Virginia, among thirty-two returns, the only one not reporting a condition above average, is from Pleasants, owing to frequent rains



and scarcity of rough feed. The report from Boone states that sheep run at large in the mountains the year round, keeping perfectly healthy, and (if rightly managed) will come home for salt every eight or ten days.

In Kentucky, Edmonson reports a low condition; Boyd, poor, owing to the amount of wet weather; and La Rue, the worst ever seen, owing to the disease elsewhere noticed; seven counties return fair or average, and nineteen a higher condition; Fayette, where the grass has been green all winter, very fine; Jackson, also, in which the number of lambs living is 50 per cent. greater than average.

Eight counties in Ohio return poor condition, ascribed principally to want of shelter, wet weather, and mud, injuring both them and their feed; in Perry, good, except as affected by the disease referred to under the head of "diseases." Five counties report average, and twenty-nine above.

Michigan: three counties average, five below, and eighteen above. Macomb, 20 per cent. below; Cass, light, owing to scarcity of feed; Carroll, poor, owing to open, wet weather; Van Buren and Antrim, in first-rate condition.

In Indiana, Knox returns poor condition, resulting from a severe drought last fall; Scott, those not sheltered, poor, but good where well cared for; and Brown, the strange paradox of 10 per cent. below average, but 20 per cent. more lambs saved than usual. Nine counties report a condition about average, and twenty-five range above.

Among the returns from Illinois nine counties range somewhat below average; fourteen are designated as fair or average; and twenty-six range higher. Less favorable than last year in Boone, Winnebago, McLane, Richland, Wayne, and Mercer, owing to scarcity of grain and forage, or wet weather. The few flocks in McHenry are better than average, because "in the hands of farmers who give them the requisite attention."

Twenty-eight counties report from Wisconsin: Adams, not quite average; Washington and Dodge, not as good as last year; Clement, fair; all others better than average. Among those in which the grade of condition is the highest, are Green, Sheboygan, Crawford, Dunn, Fond du Lac, Columbia, Walworth, and Outagamie. In the latter, more than ordinary efforts to improve flocks are noted.

The general condition in Minnesota is remarkably high, only four counties, Goodhue, Isanti, Kandiyohi, and Steele being reported as low as average. In Murray, Martin, Redwood, Fillmore, Waseca, and Douglas it is first rate.

From Iowa, Monroe reports rather thin, owing to short corn-crop; Lyons, very poor; eight counties fair, or average; thirty-one range from good to never better. In the latter class are Taylor and Jasper. Marion, 12 per cent. above average. Benton, better than for several years.

Missouri reports nine counties in average condition; six below; and forty-five above. In Saint Francois the condition is bad, because cattle are not generally sheltered, and there has been a great amount of rain and sleet. In Saint Clair, where they are thin, the loss of lambs is great. Very thin in Clay, owing to scarcity of feed. In Stone, sheep are "mutton-fat, having wintered almost entirely on the growing wheat." In Vernon the wool-clip will be one-third heavier than last spring. In Holt "the mutton for sale is superior to what it usually is." In Jefferson, while the common breed is in fair condition, the merinos and cots-wolds are not, they not standing exposure as well as the others.

In Kansas, sheep appear to have suffered extensively for the want of

shelter and due care. In Woodson, while flocks well cared for are in good condition, others are poor and dying of starvation. In Miami they are thin and "dilapidated" for want of shelter to them and their feed. In Bourbon, small flocks, properly cared for, are in good condition, but a flock of 400 has lost 35 per cent. from neglect and exposure. In Dickinson, all sheep that went into winter-quarters are in good condition have done well, but "most of the sheep were driven from Iowa and Missouri late in the fall, and were poor to start on; and consequently are not in good condition."

In Nebraska the general condition of sheep is considerably above average. The only county in which they are reported below is Pawnee, in which they are thin.

The condition in California and Oregon bears too close a resemblance to that of cattle already described; but, in the former State, Del Norte and San Diego report it as fine, and Plumas as somewhat better than that of cattle; and in the latter, Lane and Clatsop return good condition, and Benton average; in Douglas, except the flocks well cared for, too poor to raise lambs; in Wasco the worst for ten years; in El Dorado, California, while cattle are in very bad condition for want of proper feed, sheep are still worse, being too weak and poor to raise lambs, and consequently nearly half of the lambs have died.

Reports from Nevada state that sheep are in very fair condition, being more generally fed than cattle.

The extensive suffering and loss, from exposure and hunger, in Washington Territory, have been previously noted. King County alone reports good condition. Among the twelve counties reporting from Utah, Weber, Wasatch, and Sevier return good condition; Morgan and Iron, very good; San Pete, never better; Davis, fair, "except a few from short feed and neglect of treatment for scab;" Kane, rather poor, but better than cattle. Utah, a loss of 9 per cent. by snow-storms. From Idaho: Ada reports poor condition; Nez Perces, good. From New Mexico: Santa Fé, good; Taos, excellent; Aura, far better than last year. From Arizona: Maricopa and Mohave, good; Yavapai, great loss of sheep and all early lambs—flocks brought from California last fall and not acclimated—dying of cold; some losing as high as 70 per cent.

Returns have been received from Weld, El Paso, and Douglas, Colorado; and from Clay, Davison, Hanson, and Lincoln, Dakota, all favorable.

#### LOSSES OF CATTLE AND SHEEP.

Losses in cattle and sheep by death and depreciation in condition and production, the past winter, are very much less than in the previous winter, east of the Rocky Mountains, and much greater west. They do not exceed those of the winters of 1872-'73, in any county reported in New England, and in more than five-sixths they are returned either less than last year, or less than average. In Maine, Sagadahoc, never less; in New Hampshire, Carroll, less than for years; in Vermont, Addison, of cattle, 75 per cent. less; of sheep, 90 per cent. less.

In the Middle States, out of one hundred returns, seventy-four report the losses less than last year, or less than average, and not one greater. New York, Warren, 75 per cent. less; Seneca, no losses. New Jersey, Gloucester, 50 per cent. less; Hudson and Burlington, no losses, being well sheltered and fed. Pennsylvania, Bucks, Lehigh, Lycoming, Northumberland, and Greene, no losses; Mercer, 67 per cent.

less. Maryland, Queen Anne, Charles, Howard, and Washington, no losses.

In the South Atlantic States losses compared with the previous or former years are diminished in equal or greater proportion. Among one hundred and seventy-six returns, none report losses exceeding, and only fifteen equaling, those of last year, or average. Out of sixty-three returns from Virginia, in three only do the losses equal those of last year. Warwick, Sussex, New Kent, Craig, Princess Anne, Rockingham, Buckingham, Westmoreland, King George, Matthews, and Montgomery report no losses; Albermarle, less than ever before; James City, 98 per cent. less; Patrick, 90 per cent. less.

In fifty-two returns from North Carolina, five report the loss the same as last year, and forty-seven less.

Every return from South Carolina reports less except that in Georgetown more deaths among early lambs are specified.

In fifty returns from Georgia, forty-four are less, none greater. Pickens, Schley, Sumter, Murray, and Whitfield, no losses; Twiggs, 95 per cent. less.

Returns from the Gulf States are not less favorable. Columbia and Putnam, Florida, report losses the same as last year; also Lee and Jefferson, Mississippi; and Wilkinson "a greater loss in calves only." Rapides, Caddo, and Assumption, Louisiana, return average losses. All others report less than average, and so much less as to indicate that the loss in these States by death, excluding those by accidents, stealage, and dogs, can scarcely exceed 1 per cent. Franklin, Perry, Limestone, Morgau, and Tuscaloosa, Alabama; Pike, Jones, and Lowndes, Mississippi; and East Baton Rouge, Saint Landry, Saint Mary, Terrebonne, Avoyelles, and Tensas, Louisiana, report, no losses.

From Texas fifty-three returns have been received. The contrast is great between the disastrous losses of last year and the almost entire exemption from suffering and loss this. Seventeen counties report, no loss. Collin, "no loss, except by bad management in shipping fine blooded stock from Kentucky, Missouri, and Illinois;" Medina, none, (except from old age and occasional disease,) against a loss of 30 per cent. of the cattle and 15 per cent. of the sheep last year. Matagorda reports average losses—the only county that does not report less.

In Arkansas, Tennessee, and West Virginia losses have been scarcely greater. Cross is the only county in Arkansas returning losses equal to average. Craighead, Crittenden, Prairie, Pulaski, Sarcy, and Drew, no losses. Tennessee reports, from Union, losses 5 per cent. greater than last year; six counties the same, or average; thirty-eight counties less. In West Virginia, Pleasants, Grant, and Mercer report losses equal to last year; all others, less. Braxton, Brooke, and Kanawha, 75 per cent. less. Raleigh, Morgan, and Boone, 50 per cent. less. Monongalia, no losses. Marion, none, "except in some localities by black-leg."

In the valley of the Ohio, unusually wet and changeable weather, though not bringing the per cent. of loss up very near the annual average, had the effect to slightly increase it over that in the States previously noticed.

In Kentucky, La Rue reports that while the loss of cattle was no greater, that of sheep was 5 per cent. greater than last year. Russell losses 10 per cent. greater; five counties the same, or average; twenty counties less.

In forty-four reports from Ohio, nine place the losses at average, or the same as last year; in ten the losses in cattle or sheep, or both, are greater than average; in twenty-five less. Athens, losses of sheep

greater than for several years; Licking, of cattle, much less than last year; of sheep, three times as great. Shelby, of cattle, the same; of sheep, 10 per cent. greater. Morrow, of cattle 10 per cent., and of sheep 15 per cent. greater. Losses of both kinds greater in Henry, Crawford, Sandusky, and Van Wert. Hancock, no losses.

From Michigan, Carroll reports loss of cattle the same as last year; of sheep, 50 per cent. greater. Seven counties report average, or the same as last year, and nineteen less.

From Indiana: Less losses than last year are reported in thirty counties; Huntington, Hamilton, La Porte, and Orange, no losses; in eight counties the same as last year, or average; Scott, the same in cattle, 5 per cent. greater in sheep; Starke, 2 per cent. greater.

In Illinois thirty-two out of fifty counties report losses less than last year, and nine the same, or average; Boone, no greater in cattle, but 25 per cent. greater in sheep; Richland, 20 per cent. greater than for five years; McLean, 4 per cent. greater; Tazewell, 10 per cent.; Macon, Mercer, and Vermilion, somewhat greater.

In Wisconsin losses are less than last year in twenty-five out of twenty-nine counties reported. Washington, Green, Waukesha, Douglas, and Outagamie, no losses; Dodge and Dunn, very few; Iowa less than for ten years. The only counties reporting greater are Ozaukee, 30 per cent., and Adams, 3 per cent. greater in sheep.

From Minnesota the reports are almost uniformly favorable; the only exceptions being Redwood, greater loss than last year from disease, and less from freezing to death; and Kandiyohi, no loss in cattle; in sheep, 5 per cent. greater.

Reports are equally favorable from Iowa; forty out of forty-seven, indicating, on the average, a largely diminished loss from last year. Woodbury, Louisa, Allamakee, Appanoose, Webster, Dallas, Montgomery, Plymouth, Scott, Sioux, and Harrison, no losses; Clayton, scarcely any; Shelby, the same as last year in cattle, 10 per cent. greater in sheep, being the only county in which a greater loss of either is returned.

In Missouri the losses, though small compared with previous years, have been considerably larger than in either of the other States bordering the Mississippi on the west. In forty-four of the sixty-one counties reported, they are either less than the previous year, or less than average. Moniteau, less than ever before; McDonald and Platte, no losses; Ralls, same as last year in sheep, in cattle 37 per cent. greater; Montgomery and Dade, 10 per cent. greater; Maries, in sheep, 200 per cent. greater; De Kalb, in sheep, average; in cattle, 500 per cent. greater.

In Kansas the proportion of losses compared with the last year, especially in cattle, is greater than in any other State east of the Pacific slope. The principal causes assigned are a long, wet, changeable winter and want of adequate shelter and feed. In Osage, losses in cattle greater than for several years; Jefferson, greater than average, 20 per cent.; Nemaha, nearly double; Greenwood, 67 per cent. greater. In cattle and sheep, Miami, 10 per cent. greater; Labette, 20 per cent.; Bourbon, 50 per cent.; Washington, in cattle, one-half; in sheep, one-eighth; Sedgwick, 75 per cent. less; Cowley, 98 per cent.; Douglas, no losses; Montgomery; very few; Dickinson, no loss in cattle.

From Nebraska the returns are more favorable, being up to the general average of very slight losses east of the Rocky Mountain Range. In eighteen returns two report the losses the same as last year; all others less.

The losses on the Pacific slope have already been sufficiently noted

under the head of "farm animals," except in the Territory of Utah, where they have been about average with previous years in sheep, but greater in cattle. Davis reports losses of cattle greater than last year; of sheep less. Beaver, of cattle, 300 per cent. greater; of sheep, never less. Weber, of cattle, greater; of sheep, no losses. San Pete, of cattle, 33 per cent. greater; "farmers are considering the best plan to increase feed and avoid future losses."

Returns from the several Territories east of the mountains, generally indicate that both cattle and sheep have come through the winter with very slight losses.

In nine hundred and fifty-nine returns from the Atlantic slope, one hundred and twenty-seven report the losses in cattle and sheep either equal to those of last year or average; seven hundred and eighty-six as less; and only forty-six as greater. In forty-seven from the Pacific slope, thirty-seven report greater losses, and eight less.

### DISEASES OF FARM ANIMALS.

The sanitary condition of farm animals during the past year has been quite as favorable as in any period since the inauguration of these reports. The difference is mainly due to the mildness of the past winter, together with the absence of long-continued seasons of drought and excessive heat in summer. Gradually the profitableness of better treatment of domestic animals is dawning upon the minds of the more improvident owners, though such education is slow and dearly bought. There are yet, however, some exceptions to this general improvement. These are found only in a few unprogressive localities in the South and West, where old wasteful methods still prevail. An Oregon correspondent sharply criticises the practice of farmers of his country in turning animals out to shift for themselves, trusting to a mild winter and early spring rains to start the grass, expectations which are very frequently disappointed. Several similar cases are reported in other parts of the country. It is remarkable that specific diseases are most prevalent in such localities. Below will be found a brief generalization of the diseases affecting different classes of farm animals.

#### DISEASES OF HORSES.

Leaving out of view the relapses and effects of the great visitation of epizootic-influenza, the record of horse-diseases in 1873 would be quite unimportant. Diseases reported are of a milder type than usual. The fatalities noted are mainly the results of neglect and improper treatment, either in health or after symptoms of disease have been developed. Yet in this respect there is a growing improvement. Men are discovering that the dictates of mercy coincide with those of an enlightened self-interest. Public sentiment is also awakening to a closer scrutiny of the treatment of the useful animals, thus largely counteracting the temptations to thoughtless cruelty, which have too often disgraced our civilization. There can be little doubt that a proper treatment of horses would diminish their liability to disease, and consequently depress the rate of mortality, thus effecting a great saving to the industrial interests of the country. New Hampshire, Massachusetts, Rhode Island, and Louisiana report no prevailing maladies. The leading types of disease reported in the other States will be found in the following *résumé*.

EPIZOOTIC INFLUENZA.—This epizootic broke out about the last of the summer of 1872, and traveled across the country in a general south-

westerly direction. Certain portions of the country did not receive this contagion until during the first months of 1873. Some of our reports embrace the first experiences of the malady, while others chronicle its secondary visitations or its chronic results. It is not always easy to distinguish which of these is intended. In the New England States a few counties experienced for some months the injurious effects of the disease, but generally the horses of these States were in a healthy condition. In York, Maine, stabled horses that had suffered from the first attack, had swellings in their legs during 1873, but farm-horses generally escaped. In Piscataquis, the disease was confined to horses employed in lumbering. Mild visitations are reported in Oxford, Maine; Caledonia and Rutland, Vermont; Tolland and New London, Connecticut. Few deaths are noted. The Middle and Atlantic coast States present nearly the same general indications. In New York, Albany, Livingston, Warren, Niagara, Saratoga, and Seneca Counties report a limited extent and mild type of disease, as also do Sussex, Hudson, and Cape May, New Jersey. In Camden, New Jersey, there was a disease, probably a modification of this influenza, which considerably resembled colt strangles, but it affected old horses also. The presence of the disease, or of some of its chronic effects, was noted in Washington, Center, Clearfield, Clinton, Chester, Berks, Armstrong, Wyoming, Somerset, and Dauphin, Pennsylvania; in Sussex, Delaware; in Wicomico and Queen Anne, Maryland; and in Rappahannock, Sussex, King William, Russell, Page, Highland, Patrick, Scott, Albemarle, and Powhatan, Virginia. In some cases only over-worked and ill-treated horses were diseased. In other cases horses in good condition, that had escaped the first visitation of the disease, were affected by its reactionary influences. In North Carolina, Lincoln, Pasquotank, Wake, Dare, Caswell, Henderson, Stokes, Ashe, Jones, Iredell, and Buncombe report a partial prevalence, with inconsiderable losses, as also Georgetown and Richland, South Carolina; and Laurens, Pickens, Gilmer, Dawson, Johnson, Liberty, Early, Coweta, Walker, and Jefferson, Georgia.

In Florida, Jackson, Columbia, Gadsden, Wakulla, and Orange report mild visitations; as also do Smith and Tuscaloosa, Alabama; Lee and Coffee, Mississippi; Palo Pinto, Colorado; Red River, Victoria, Burnet, Washington, Galveston, Polk, and Uvalde, Texas; Searcy, Columbia, and Woodruff, Arkansas; Lincoln, Humphreys, Hancock, Wilson, Johnson, Williamson, and De Kalb, Tennessee; Barbour and Preston, West Virginia; Clarke, La Rue, Trimble, Hart, Jackson, and Mead, Kentucky. In some counties the secondary attack degenerated into glanders, in all cases fatal.

The infliction was light in the few counties north of the Ohio River in which it was reported, viz, Adams, Mercer, Vinton, Ross, and Perry, Ohio; Van Buren, Michigan; Dubois, La Porte, Martin, Union, and Scott, Indiana; Boone, Bureau, Carroll, Madison, Franklin, Clinton, Piatt, McHenry, DeWitt and Knox, Illinois; Saint Croix, Washington, Dane, La Crosse, Ontonagon, Eau Clair, Dunn, Crawford, Buffalo, and Columbia, Wisconsin. In some cases the disease showed a decided tendency to dropsy. West of the Mississippi it was marked by the same limited range and mildness of type, being frequently styled the dregs of the former visitation. The severe demands upon horses in the labors of agriculture in some localities have somewhat aggravated the symptoms. The presence of the disease is noted in Dodge, Blue Earth, Benton, Martin, McLeod, Stearns, Faribault, Steele, and Waseca, Minnesota; Woodbury, Black Hawk, Humboldt, Pocatontas, Lee, Jefferson, Mower, Muscatine, Decatur, Marion, Marshall,

and Hancock, Iowa; Chariton, Maries, Jefferson, Washington, Montgomery, Benton, Christian, Pettis, Cass, and Franklin, Missouri; Marshall, Howard, Miami, Johnson, and Cherokee, Kansas; Richardson, Nebraska. On the Pacific coast some of the reports indicate the results of the first visitation of the disease, which was not developed until 1873. Sonoma County, California, reports a loss of 5 per cent.; stabled horses, especially livery-horses, were the most severely affected. The disease is also noted in Del Norte, Lake, Stanislaus, El Dorado, Mendocino, and Contra Costa, California; in Polk, Lane, Yamhill, and Grant, Oregon; in Esmeralda, Nevada. In the Territories the presence of the disease is noted only in Walla-Walla and King Counties, Washington; Weber and San Pete, Utah; and Maricopa, Arizona.

**DISTEMPER.**—The range and intensity of this malady were quite limited. It is mentioned in three counties in New England, viz, Somerset, Maine; and in Franklin and Grand Isle, Vermont. It was noted in Franklin, Northampton, and Adams, Pennsylvania; in Baltimore and Frederick, Maryland; in Madison, King George, Smyth, Russell, and Scott, Virginia; in Yancey, McDowell, Alamance, Watauga, Greenville, Davidson, and Warren, North Carolina; in Fannin and Towns, Georgia; in Williamson, Texas; in Woodruff, Arkansas; in Grundy, Johnson, Maury, Meigs, and Robertson, Tennessee; in Jefferson, Tucker, Grant, and Harrison, West Virginia; in Trimble, Lewis, Laurel, Russell, Livingston, and Metcalf, Kentucky; in Huron, Perry, and Jackson, Ohio; in Orange, Indiana; in Richland, Wisconsin; in Chariton, Osage, and Lincoln, Missouri; in Brown and Cloud, Kansas. The only visitations at all severe were in Jefferson, West Virginia, where the cases were of a malignant type; in Russell, Kentucky, where the deaths amounted to nearly two per cent., and in Metcalf, Kentucky, where half of those not stabled and treated died. In some cases it is called colt distemper, from the fact that only colts were affected with it.

**BLIND STAGGERS.**—Several of our correspondents attribute this disease entirely to feeding damaged grain. The disease was found only in the corn-growing regions of the South and Southwest, a few only being found in Southern Kansas. Our correspondent in Kerr, Texas, says that the corn in that region was infested, during its milky stage, by a sort of caterpillar, leaving a very noxious dust or powder in the husk. Grain being fed generally without winnowing, much of this poison was absorbed by the horses feeding upon the damaged corn. In the disease as here developed a sack of pus was formed within the head, just below the line of the eyes. In many cases instant relief was given by passing a sharp instrument or stick up the nostril and tapping the sac, which instantly discharged its noxious contents. Another effective remedy was to bathe the space between the ears with spirits of turpentine, and rub freely with a hot smoothing-iron. This disease was quite destructive in Williamsburgh, South Carolina. It was noted in Taylor, Florida, and in Lauderdale and Smith, Alabama; in the last-named the deaths amounted to three per cent. of the cases. It occurred in Newton and Lauderdale, Mississippi; in Palo Pinto, Blanco, Gillespie, Bandera, San Saba, and Upshur, Texas; in the last-named the loss amounted to one per cent. It was also troublesome in Independence, Sharp, and Hempfield, Arkansas; in Fayette and Johnson, Tennessee; in Greenwood, Rice, and Barton, Kansas.

**COLIC.**—This disease is attributed to poor feed and exposure in Lawrence and Dauphin, Pennsylvania. In Williamsburg, South Carolina, it destroyed half the mules brought from the West in 1872 and 1873. It was noted in Lauderdale, Alabama, and was severe in Cross,

Arkansas. In Bradley, Tennessee, and in Taney and Stone, Missouri, it prevailed to some extent, associated with bots.

**LUNG-FEVER.**—A few cases were reported, all north of Mason and Dixon's line—from Aroostook, Maine; Chautauqua, New York; Westmoreland, Northampton, and Franklin, Pennsylvania; Richland, Ohio; and Benton, Iowa.

**CEREBRO-SPINAL-MENINGITIS.**—A few cases were noted in Hartford, Connecticut, and in Scott, Iowa. The street-railway horses in Brooklyn were also affected with spinal disease to a serious extent.

**PLEURO-PNEUMONIA.**—Some fatal cases occurred among well-sheltered and well-fed horses in Montgomery, Pennsylvania. It was accompanied by sore mouth and throat in Saint Mary, Maryland. A few cases, but no deaths, occurred in Otoe, Nebraska.

**INFLAMMATION OF THE KIDNEYS.**—In Northampton, Pennsylvania, horses, in apparent good health, would suddenly fall helpless. Ulcers would break out upon the hips and run for months, leaving the animal very lame. It was a question whether such horses should not be immediately put out of their misery by shooting.

**MISCELLANEOUS.**—In Smyth, Virginia, what is called foot-ail is noted. In Madison, Nebraska, cracked-hoof and bound-hoof resulted from lack of care. Brain-fever, with some fatality, is reported in McDuffie, Georgia; catarrhal fever in Marion, Indiana. Farcy was noted in Antelope, Nebraska. In Vernon, Missouri, 100 horses died of yellow-water. Several deaths resulted from dysentery in Bureau, Illinois. The sweeny and big-shoulder are mentioned in Marion, Mississippi. Horses from the East do not thrive in the elevated atmosphere of Boone, Nebraska. In Levy, Florida, horses and other stock swallow very considerable quantities of sand. When the grass starts in the spring sufficiently to constitute an aperient, horses and mules pass nothing but white sand for two or three days at a time. What is called heart-dropsy killed several good horses in Hancock, Iowa. The symptoms showed great variety, except in the one point of a great and abnormal agitation of the heart. In Lawrence, Missouri, horses were affected with swellings in the legs, which caused great emaciation. In Woodson, Kansas, a malady, supposed to result from epizootic influenza, causes animals to gradually decline in flesh and strength till they die, with little pain. In Labette, Kansas, a similar disease affected only animals from the East and North.

#### DISEASE OF CATTLE.

Only one county in New England reported any cattle-disease, and that but a limited and local one affecting calves. The Middle States present only a few casualties from abortion, and a few cases of pleuro-pneumonia and distemper. In the South a class of diseases indicated by the unmeaning term murrain are heard of in a few counties, with numerous cases of black-tongue, distemper, &c. Of Western States, Kentucky, Ohio, Wisconsin, and Oregon, present an entire exemption from prevailing diseases. In the other States the greatest loss was experienced from the Spanish or Texas fever, resulting from the importation of Texas and Cherokee cattle. The following is a brief generalization of cattle-diseases affecting different parts of the country in 1873:

**TEXAS FEVER.**—This fever was more or less destructive in the range of States from Indiana to Kansas. In Fountain, Indiana, twenty deaths followed the contact of natives with Texans. The southern part of Sangamon, Illinois, was visited during the summer, and hundreds died, occa-



sioning great alarm in the community. A large percentage of cases was among "Missouri cattle" which had passed through the Saint Louis stock-yards. In some cases they escaped themselves though they imparted the disease to native cattle. Cattle known to be Texas cattle were not affected themselves. Several hundred deaths are reported in Macoupin.

In Missouri several counties report considerable fatality from the presence of Texas cattle. Nodaway lost two hundred; Caldwell, over one hundred in a few herds in the town of Kidder. Jasper, Pettis, Stone, Saint Clair, and Vernon report numerous cases, as also Howard County, Kansas.

**MURRAIN.**—This name, with its variations, bloody murrain and dry murrain, is used to describe a variety of diseases. In no county was the loss at all remarkable except in Bibb, Alabama, where between fifty and one hundred deaths are reported. In Floyd, Virginia, a few cases were noted; the attack was sudden and fatal in from three to five hours; no effective remedy is mentioned. A few cases of murrain, in some form, occurred in Sullivan County, New York; in Grayson, Patrick, Scott, Powhatan, Gloucester, and Monroe, Virginia; in Caswell, North Carolina; in Lauderdale, Alabama; in Tensas, Louisiana; and in Independence and Washington, Arkansas. In Grant, West Virginia, the disease was less prevalent than formerly.

**BLACK-LEG.**—This disease, reported mostly in the northwest, made quite a havoc in Marion, West Virginia, on some farms destroying all the calves, and causing farmers to quit raising them. In Grant and Pendleton some isolated cases are noted. A few cases, mostly fatal, cured in Stark, Indiana. The disease appeared also in Grundy, Illinois; Jackson, Minnesota; Benton, Hardin, and Shelby, Iowa; Vernon, Missouri; Osage, Howard, Nemaha, and Woodson, Kansas. In the last-named county one neighborhood lost 60 per cent. of the calves. This is attributed to custom of allowing animals to stand or lie in mud and water.

**PLEURO-PNEUMONIA.**—In Hudson, New Jersey, a few cases were developed among cattle sold by cattle-peddlers at suspiciously cheap rates. These animals were found to be swill-fed stock from the stables of New York and Brooklyn. By persevering efforts the disease was eradicated. A few cases are reported in Chester, Pennsylvania. In Baltimore, Maryland, the disease after having been with difficulty suppressed broke out again, but with diminished virulence.

**DISTEMPER.**—This disease was manifested in a few cases in Kings, New York; Lunenburg, Virginia; Henderson, Stanly, Wilkes, and Caldwell, North Carolina; it was quite fatal in some parts of Pickens, Georgia.

**ABORTION.**—This disease was noted in Montgomery, New York, where 4 per cent. of the calves were lost. A few cases occurred also in Sussex, New Jersey, and Nemaha, Kansas, mostly among young cows. This disease is known to be quite prevalent in dairy districts, but its existence is kept as private as possible.

**MILK-FEVER.**—In Troup, Georgia, milk-fever prevailed to a considerable extent, coming on from one to three weeks after calving; symptoms: loss of appetite, dullness, rolling of the eyes, looking at the flanks, paralysis of hind-quarters, trembling as if from chill, &c. Several cases were cured by doses of half a pound of Epsom salt dissolved in a quart of boiling water and mixed with a pint of molasses, administered as warm as possible. In every case this remedy gave immediate relief. Some cases were noted in Saint Joseph, Michigan.

**HOLLOW HORN.**—Several of our correspondents consider this term as the synonym of hollow stomach. In all cases it resulted from poor feeding and neglect. Stafford and Surry, Virginia; Madison, North Carolina; and Dallas, Arkansas, report a few cases.

**MAD ITCH.**—This disease was mentioned in the reports from Mercer, Illinois, and Nemaha, Nebraska.

**SORE TONGUE.**—A few died of this malady in Georgetown, South Carolina, and in Richland, Illinois; probably death was caused by starvation from inability to eat. In Sullivan, Tennessee, all affected recovered in six or eight days. The *black tongue* is reported in North Georgia.

**DIARRHEA.**—In Russell, Kentucky, some cattle were affected with copious discharges, watery, tar-black, and exceedingly offensive; they fed greedily but fell off rapidly, becoming so weak as to be unable to stand; they died of exhaustion and apparently without pain. A few cases of diarrhea are reported in Wilkinson, Mississippi.

**MISCELLANEOUS.**—In Wilkinson, Mississippi, a few calves died of a swelling of the sub-maxillary and parotid glands. In Assumption, Louisiana, cattle became weak and emaciated, lumps about the size of an egg forming along the back. These, on being opened, were found to be filled with worms precisely of the form and size of bot-worms in horses. In Putnam, Illinois, stock were affected with eye-diseases; no fatalities. In Washington, Kansas, cattle died so suddenly as to give suspicion of poisoning. A post-mortem examination showed inflammation and gangrene in the stomach and worms filling the intestinal canal. Some attributed this result to drinking stagnant water in the holes of the dry prairie. A case of gross abuse and cruelty is reported in Ralls, Missouri. A large herd, principally the refuse of the Saint Louis market, were grazed on the prairie and herded at night in small inclosures. At midsummer, when water was scarce and the animals had no supply except from filthy pools, a disease broke out and one hundred died. In Miami, Kansas, small feeders met with considerable losses through neglect, exposure, and poor feeding. In Del Norte, California, some calves died, it is supposed, of leeches in the liver.

Several new diseases, as yet unnamed, were reported in different parts of the country. In Caledonia, Vermont, calves about four months old became stupid, refusing to eat and died in convulsions in from twelve to sixteen hours. Many farmers lost half their calves. In Washington, Kansas, an affection of the lungs, accompanied by weak eyes discharging matter, was somewhat troublesome. In Redwood, Minnesota, many young cattle died of an unknown disease; they were usually taken with stiffness, loss of appetite; would lie down, never to rise again; the hind parts became paralyzed; death supervened in from twenty-four to forty-eight hours, sometimes accompanied with severe pains and sometimes not; the blood then congested in dark blotches; the animals affected were mostly in good condition. Older cattle, in Osage, Kansas, exhibited a strange malady. They would stand stupidly, refusing to eat and then lie down and die. It was mostly the best cattle that were thus affected. In Nemaha, Kansas, in herds kept during the summer in close range and fed on prairie-hay, many cattle apparently in good condition previously were found dead without any apparent disease. In Butler, Kansas, many Texas cows, heavy with calf, died suddenly of an unknown disease. In Riley County, Kansas, close herding, cruelty, and starvation have brought in new types of disease for which, as yet, no popular name has been found. In Wasco, Oregon, during twenty years, there was a foot-disease resulting in the entire

loss of the hoof. It was not very prevalent, however, and disappeared with the return of spring.

In Burke, North Carolina, about 5 per cent. died of a fever that has infested the county for ten years. In Wilkes, Georgia, a few cases of fever were successfully treated with sulphur and sulphate of iron. In Clinton, Illinois, one hundred and twenty-five cattle died with high fever and acute pain. The maw, on dissection, appeared to be hard, dry, and about two-thirds full of mud. The animals had fed upon the dry prairie and had drunk of the muddy waters of its stagnant pools.

The Territories present a remarkable exemption from disease; not a county reports anything like a prevalent type.

#### DISEASES OF SHEEP.

In New England, New Jersey, Delaware, Maryland, North Carolina, South Carolina, Florida, Alabama, Mississippi, West Virginia, Michigan, Wisconsin, Minnesota, and Nebraska sheep-diseases have been too inconsiderable to deserve mention. In the other States the staple complaint is of liver-rot, foot-rot and scab, with an occasional case of grub in the head. In various portions of the Middle, Southern, and Western States, the chronic grievance of "worthless curs" is aggravated by increased ravages. In some counties sheep-husbandry is entirely prostrated. Our correspondent in Seneca, New York, puts the case strongly and pathetically in describing the loss of choice merinos by one of his assistants. He says, "None but those who have spent long years and money without stint in bringing to perfection a thorough-bred flock can appreciate the loss and discouragement."

The following is a brief abstract of reports, showing a gratifying exemption from disease as compared with former years:

**FOOT-ROT.**—In Yates, New York, foot-rot affects about one-fourth of the flocks, receiving sufficient attention to prevent its spreading, but not to secure its final extirpation. It was also noted in Steuben, but was under better control than formerly. It was mentioned in but three counties of Pennsylvania, Washington, Mercer, and Warren. In the last-named, coarse-wooled sheep, less liable to this disease, are raised in increasing numbers. The most approved remedy here is pure hydrochloric acid. It was noted also in Prince George, Virginia; Fannin and Gordon, Georgia; Jackson, Kentucky; Logan, Huron, Hancock, Wyandot, Crawford, and Delaware, Ohio; White, Indiana; Lee and McHenry, Illinois; Jackson and Buchanan, Iowa; Sumner, Kansas. In nearly all these localities the infliction was light and the loss inconsiderable.

**ROT.**—This disease prevailed to a considerable extent in Stafford and Scott, Virginia; in the last-named county the loss was 10 per cent. Murray, Georgia, also lost 10 per cent., and Dooly acknowledged the presence of the malady. In Cameron, Louisiana, it swept half of some flocks. Five per cent. of the sheep of Humphreys, Tennessee, were affected. In Blount 4 per cent., and in Putnam, 6 per cent. died. In Meigs, a third of the old sheep were lost. In Butler, Kentucky, the loss was 4 per cent.; in Pulaski, 10 to 15 per cent.; in Russell, 10 per cent.

**SCAB.**—A few cases are reported in Washington, New York, and in Bucks and Lawrence, Pennsylvania; mostly in poorly-attended flocks. An effective remedy was found in a solution of carbolic acid in 300 parts of water. Some scab was brought into Prince William, Virginia, by flocks from the Southwest. In Caddo, Louisiana, 25 per cent. of the sheep were affected. This malady was more general in Texas, causing

a movement of many flocks from several counties to the Rio Grande, where the sanitary conditions are said to be much better. Scab exists in Bell, Navarro, Bee, Collin, San Saba, Williamson, Austin, DeWitt, Uvalde, and Medina. In most of these counties the malady was of a very mild type. Bathing infected animals in a strong decoction of tobacco is highly recommended as a remedy. Fountain, Indiana, and Boone, Madison, Vermillion, Clinton, and Schuyler, Illinois, report a slight degree of scab, but not in well-tended flocks. The tobacco decoction was, in several localities, used with success. One flock of 300 in Schuyler was entirely freed by this remedy. In Iowa, Decatur reports one-fourth of the sheep scabbed; Marion, 10 per cent. In Clinton, Missouri, 50 per cent. were affected; in Montgomery, 5 per cent. The disease was also noted in Pike, Washington, Putnam, Vernon, Clay, and Lincoln. Brown, Kansas, never had a case, although just across the Missouri River the disease is rife. In Lincoln, an overdriven and abused flock from Missouri lost one-half. Woodson lost 8 per cent. of her fine-wooled sheep; coarse-wooled not being affected. It was quite severe also in Sumner. In Plumas, California, it caused a large loss of wool, and a loss of 5 per cent. of the sheep. It is noted in Del Norte, San Diego, Stanislaus, Amador, Contra Costa, and Sonoma. In many instances it was the direct result of insufficient feeding and neglect. It also appeared in Wasco and Lane, Oregon. Several counties in the Territories report the presence of scab, viz: Mora, New Mexico; El Paso, Colorado; Morgan, and Rich, Dakota; Salt Lake and Davis, Utah; King and Walla Walla, Washington. In some of these counties the disease is very limited, in others it embraces half the flocks. A mixture of quicksilver, lard, and tar is recommended, as well as a preparation of tobacco, arsenic, and tar. Both these remedies were found effective in Davis, Utah.

**MISCELLANEOUS.**—A few sheep, apparently in fine condition, in Northumberland, Virginia, unaccountably refused to eat, and died of apparent starvation. The blind-staggers is reported in King William and Nelson, Virginia, in the former the loss amounted to 1 per cent., in the latter, the disease was attributed to eating ivy. With proper attention, and copious doses of thin gruel, they recovered entirely in ten or twelve days. It is also noted in Sumner, Tennessee. Orange, Indiana, lost 1 per cent. from pneumonia. Wayne, Illinois, chronicles a mortality of 10 per cent. from a dry, hacking cough. In Bee, and DeWitt, Texas, many lambs died of worms. The scours in La Rue, Kentucky, was caused by salting sheep with salt that had been used on meat. Grub in the head was quite destructive in Washington, New York; one flock of two hundred and fifty, losing sixty. Medina, Ohio, lost 8 per cent. from the same disease, which was also reported in Huron, and in Coffee, Tennessee. Carroll, Ohio, lost lightly from paper-skin. Jefferson, Missouri, lost 12 per cent. of her fine sheep from a disease called "running-at-the-nose." Multnomah, Oregon, lost 3 per cent. from flukes in the liver. In Clatsop, this disease was developed on new lowlands, while sandy coast soils were entirely exempt. The loss in the whole county was between 5 and 6 per cent. In some cases the open winter had caused a considerable falling of wool from the sheep.

#### DISEASES OF SWINE.

Swine were remarkably healthy during 1873. New England, New York, New Jersey, Delaware, Michigan, Wisconsin, and Minnesota were entirely exempt from prevailing diseases. With the exception of considerable loss from black-tooth in Bonhomme, Dakota, all the Terri-

ories may be placed in the same category. Several States report a little disease of some kind in one or two counties. In the other States the number of counties mentioning hog-diseases bears a small proportion to the whole, and the maladies are generally of a mild type and limited range. Some localities, especially in the South, were subjected to severe losses, but no general epizootic malady is indicated in any of the States. The popular nomenclature is still very loose, frequently designating by a single name, cholera for instance, maladies of specifically different type. Hence the following abstract of our reports can make no pretensions to scientific accuracy.

**CHOLERA.**—A few cases of what is called cholera are noted in Dauphin and Westmoreland Counties, Pennsylvania, and in Washington, Baltimore, Wicomico, Saint Mary's, and Montgomery, Maryland. In the last-named county the symptoms were those of a malignant fever, producing constipation, general debility, and stiffness of the legs. In one locality one-fourth of the hogs died, and the residue were left in a feeble condition. In Virginia the disease assumed a more malignant character. Scott County reports a loss of 50 per cent. from cholera and quinsy; Rappahannock, from one-third to one-half, some farmers losing their whole stock; Page, 50 per cent., no effective remedy being found; Floyd, 40 per cent. in some localities, in others none at all; Russell, one-eighth; Montgomery, 8 per cent.; Patrick, 10 per cent.; Clarke, 12 per cent., in the northeastern part; Fairfax, 5 per cent.; Washington, 300 head; Madison, Pulaski, Frederick, Gloucester, Lunenburgh, Sarry, Smyth, and Warren, some losses. In the last-named county a pint of apple-brandy, administered in two doses, was found effective. Our correspondent in Highland suggests that cholera generally follows a heavy mast year; hogs, in the following year, being scantily fed, are more liable to destructive diseases.

In North Carolina heavy losses were fewer. Polk lost one-third; Guilford and Stanly one-fourth; Wake, one-fifth. Here the disease was, by some, called typhus fever; it yielded to no remedies. Gaston lost 12 per cent. from cholera and quinsy; Rockingham, 10 per cent.; Buncombe, 5 per cent.; Greene, 150 head; Yancey and Granville, 3 per cent. in some localities; smaller losses in Lincoln, Mecklenburgh, McDowell, Madison, Franklin, Caswell, Henderson, Stokes, Davidson, Randolph, Caldwell, Ashe, Martin, Harnett, and Warren. In Alamance some hogs died from eating mushrooms, and their death was attributed to cholera. A mixture of lard, castor-oil, and kerosene were found effective in some cases. In Stanly, where the loss was estimated at 25 per cent. of the whole stock, the disease was characterized by a bloody diarrhea; the causes assigned were exposure and lack of food. Small losses were experienced in Clarendon and Williamsburgh, South Carolina. In Georgia losses were not generally severe. Early lost one-third; Gilmer, 5 per cent.; in Worth, in some districts, nearly all died; Upson,  $2\frac{1}{2}$  per cent.; McDuffie, Marion, Coweta, Lee, and Hancock, a smaller percentage. In Lee the disease attacked first pigs and then older hogs, usually sweeping all on the plantation. In advanced stages the animal broke out into eruptions all over the body. In Florida it is mentioned only in Madison. In Alabama, Coffee lost 50 per cent.; Perry, 25 per cent.; Greene, 15 per cent.; Lauderdale, 5 per cent.; Russell, 4 per cent.; smaller losses in Saint Clair, Crenshaw, Wilkinson, and Tuscaloosa. In Mississippi, Yalabusha lost one-third; in some parts of La Fayette three-fourths died of cholera and red mange; Lauderdale lost 5 per cent.; in some parts of Grenada whole herds were swept. Bossier is the only parish of Louisiana reporting cholera

or any other disease. In Texas, Fannin reports a loss of 75 per cent.; some herds being entirely exterminated. In Lamar the visitation was alarming, in some localities destroying the last hog. The disease appeared to come from the South through the center, the east and west portions of the county being mostly exempt. Only a few of the other counties, Red River, Cherokee, San Saba, Victoria, Atascosa, report the disease, and generally in a mild form. In Arkansas, Randolph lost 25 per cent. from cholera and quinsy; Montgomery, 5 per cent.; Campbell, 3 per cent.; Cross, Smith, and Woodruff, smaller percentages. In Craighead some deaths from eating acorns were attributed to cholera, in order to cover the neglect of providing them better food. In Cross, the disease is also called red-bone. Heavy losses are reported in several counties of Tennessee. Morgan and Madison, 33 per cent.; Obion, 25 per cent., being always heavier after a copious beech and oak mast; those who fed and took care of their hogs saved them; Williamson, 22 per cent., some herds losing half; Linden, Jefferson, and Robertson, 20 per cent.; Decatur and Roane, 10 per cent.; smaller losses in Washington, Hardin, Humphreys, Loudon, Fayette, Maury, Sumner, Carter, Greene, Hancock, Putnam, Johnson, Weakley, and De Kulb. In Sumner, the disease is also styled pneumonia. In Knox, a loss estimated at 20 or 30 per cent., resulting from gathering large numbers at fattening time; the symptoms subsequently disappeared. A post-mortem examination in Hancock showed a high inflammation of the kidneys, the adjacent parts presenting the appearance of bruised flesh. The best remedy here was the administration of a gallon of spirits of turpentine to each 100 hogs once in two weeks. In Jefferson, West Virginia, from 2,500 to 3,000 hogs died, valued at \$10,000; Lincoln lost 30 per cent.; Morgan, 15 per cent., the disease here being called blue sickness; Berkeley and Cabell, minor losses. In Kentucky, Shelby lost 2,000 head; Breckenridge, 50 per cent. in the eastern sections, and 12½ per cent. of the whole; Mercer, 40 per cent.; Christian, 33 per cent.; Hopkins, from one-third to one-half; Graves, 25 per cent.; Pulaski and Nelson, 20 per cent.; Warren, 10 per cent.; Boyle, 12½ per cent. of young hogs; smaller losses in Trimble, Laurel, Russell, Jefferson, Spencer, La Rue, Hart, Livingston, Jackson, and Boone. In Ohio, the heaviest loss, 10 per cent., was in Ross and Warren. In Huron the mortality was mostly among distillery hogs; one establishment lost 700 in three weeks. In Hamilton, on the bottoms and river courses, the deaths amounted to 10 per cent. The disease existed in Van Wert, Fairfield, Mercer, Vinton and Shelby. In Indiana, Johnson lost nearly half; Marion and Pike, 25 per cent., mostly among young hogs; Martin, 20 per cent. in some neighborhoods. The disease was here called pleuro-pneumonia; Tipton, 15 per cent.; Hamilton, 10 to 15 per cent.; Morgan and Decatur, 10 per cent.; smaller losses in Ohio, Brown, Knox, Clay, Warren, Fountain, Spencer, and Jennings. In Illinois, Wayne and White lost 30 per cent.; Bureau, between 1,000 and 2,000 head from cholera and quinsy; Edwards, 20 per cent.; Stark, McLean, and Franklin, 10 per cent.; Washington, Cass, and Mason, 5 per cent. The disease was noted in Sangamon, De Witt, Macon, Macoupin, Henderson, Carroll, Tazewell, Rock Island, Madison, Marion, Warren, Vermilion, Putnam, Clinton, Williamson, Richland, Mercer, and Lee. In Macon, a tablespoonful of turpentine and a gill of dish-water was found a very effective remedy. In De Witt animals that recovered from the disease did not subsequently thrive; the pigs they brought forth were either born dead or soon died. In Ringgold, Iowa, 20 per cent. died; Benton, 10 per cent.; Wayne, 10 per cent. in some localities; Dallas, 8 per cent.; Appanoose, 6 per cent.; smaller losses in

Louisa, Jones, Johnson, Hardin, Jones, Greene, Decatur, Marion, Jackson, and Harrison. Missouri reports a loss of nearly 50 per cent. in Pike, and 30 per cent. in Caldwell, from cholera and associated diseases; Bollinger, 15 per cent.; Maries and Carroll, 10 per cent.; Worth, Bates, Nodaway, Ralls, Stoddard, 5 per cent.; minor losses in Texas, Polk, Holt, Benton, and Lincoln. Jefferson lost 40 per cent. in one district from eating a copious black-oak mast; death supervened in forty-eight hours; drenching with coal-oil was found beneficial. In Richardson, Nebraska, the disease was destructive on the Missouri bottoms, some farmers losing all; Nemaha lost 12 per cent.

**THUMPS.**—This disease is frequently mentioned in connection with cholera, and very probably has often been confounded with it. It is reported in Laurens, Georgia, and in Madison, Suwannee, Columbia, and Pilatka, Florida. In the last-named county, in connection with the staggers, it carried off 25 per cent. It is also noticed in Wells, Indiana; Ralls, Missouri; and in Polk, Oregon.

**QUINSY.**—This disease was noted in Coahoma, Mississippi; Randolph, Arkansas; Putnam, Tennessee; Clinton and Pratt, Illinois; Marion, Hardin, and Montgomery, Iowa; Christian, Missouri.

**MANGE.**—Mange is reported in James City, Virginia; Smith and Lafayette, Mississippi; Wood, Texas; Stone and Fulton, Arkansas; Defiance, Ohio; Cloud, Kansas.

**MISCELLANEOUS.**—In Montgomery and Berks, Pennsylvania, hogs from the West exhibited a considerable mortality, while native hogs did very well. An unknown disease was observed in Cameron. Another was developed among pigs in Washington; the prominent symptoms were cough, heaving flanks, high fever; death supervened in forty-eight hours. In Southampton, Virginia, an undesignated malady inflicted great loss; symptoms variable; sometimes the whole body was covered with sores; cough, loss of bristles, &c. In Burke, North Carolina, "measles" carried off 25 per cent. An unknown disease was destructive in Perquimans. In Catoosa, Georgia, some fattening hogs died very strangely in a few hours, turning green after death. The disease was too wide-spread to have been caused by poisoning. Half the stock-hogs of Jefferson, Alabama, were destroyed by some unknown malady; they were very poorly fed. In Bell, Texas, many fine hogs, in good condition, refused to eat for several days, and then died frothing at the mouth, in apparently great distress. Many hogs were poisoned by cuckold burrs in Red River, Kauffman, and Collin. These were not injurious if the hogs had other feed. In Harrison some died of eating cotton-seed, and in Upshur from eating bitter mast. Kidney-worms are noted in Upshur and Cherokee. In the last named a new disease called staggers is noted; symptoms, blindness, giddiness, jerking of the whole system; death in a few hours. In Medina a loin disease, incurable, destroyed 7 per cent. In Lucas, Ohio, kidney-worms were successfully treated with soapsuds, arsenic, sulphur, &c. In Sangamon, Illinois, a new disease appeared; symptoms, blindness in the right eye, deafness of the right ear, right leg and shoulder weak, head carried right-side down; death in three to ten days. In Clinton, trichinæ and catarrh were associated with cholera and quinsy. In Clinton, Iowa, a serious lung-disease is attributed to the practice of permitting hogs to sleep in piles under straw stacks; coming suddenly into the cold air, they contract disease. A strange fatality has been developed among hogs in Placer, California. Animals apparently in perfect health at night are found dead in the morning; loss estimated at 7 per cent. up to date of report. The losses from starvation and neglect are in many localities almost frightful.

## FRENCH SCHOOLS OF AGRICULTURE.

The statistician last summer obtained at the office of the ministry of agriculture and commerce in Paris a variety of official data relative to the French system of agricultural education, with current reports of progress, from which a few facts may prove interesting. The system originally embraced three classes of schools. A central university or agronomic institute, at Versailles, presenting the highest range of instruction, was abolished in 1853, a piece of questionable economy, deeply deplored by French agronomists. Next in rank were three intermediate or high schools, called regional schools, on account of their special adaptation to the needs of the northern, western, and southern regions of France. The school of Grignon, in the department of Seine-et-Oise, not far from Paris, devotes special attention to *grande culture*, to grasses, cereals, and industrial crops, to stock-breeding and to the agricultural and viticultural interests of northern France generally. An agricultural station is attached to the institution. The school of Grand Jouan, in the department of Loire-Inférieure, studies especially the best methods of bringing virgin lands under cultivation, mixed pastoral husbandry, tenant farming, natural meadows, live-stock breeding, industrial and fruit crops, and the agricultural industries of the western departments in general. The school of Montpellier, in the department Hérault, represents the agricultural peculiarities of the Mediterranean region, embracing live-stock breeding, the replanting of forests, irrigation, silk culture and manufacture, and the agricultural, pomological, and viticultural interests of the region of the olive, the mulberry and the orange. It has a sericultural and a viticultural station attached.

These and all other agricultural schools are under the direction of the minister of agriculture and commerce, to whom applications for admission are addressed. By special indulgence foreign students may be admitted. Each applicant must present a record of his birth, a certificate of moral character from his mayor, a medical certificate, showing that he has been vaccinated or has had the varioloid, and a satisfactorily-indorsed obligation to pay the tuition charges at the beginning of each term. Pupils are divided into internal and external pupils, and free hearers. The latter are admitted by the director of the school, who notifies the minister of the fact. Applicants are examined in arithmetic, algebra, plain geometry, (four books,) surveying, draughting, leveling, physics, hydrostatics, hydraulics, chemistry, geography, &c. A bachelor of science is exempt from this examination.

The courses of theoretic study embrace agriculture, horticulture, viticulture, sylviculture, sericulture, natural history in all its branches, zoology and zootechny, physics, mechanics, chemistry, meteorology, mineralogy, geology, topographical engineering, agricultural construction, rural economy and legislation, rights of administration, agricultural book-keeping, &c. Practical instruction embraces laboratory practice, analysis of soils, fertilizers, agricultural products, &c., water gauging, canal construction, irrigation, agricultural machinery, manipulation of fruits and vines, live-stock management, cereal, grass, and industrial crops, fabrication of alcohol, wine, and oil, farm management, &c. Pupils passing a satisfactory examination on the completion of these courses receive a certificate or diploma. These graduates may upon the completion of an additional course receive the degree of agricultural engineer. Of these latter graduates a few may obtain two years "stages" in private or public agricultural establishments. These "*stagiaires*" may



be sent to study the agricultural resources of foreign countries, and to investigate special subjects, presenting a memoir of their investigations to the administration. Internal or boarding pupils pay a charge for tuition and board of 750 francs per annum; external pupils and free hearers are charged 200 francs per annum for tuition. The school at Montpellier does not receive boarding pupils.

The third grade embraces the primary or farm schools, of which there are forty-three in operation in various localities. These are established by decree of the minister of agriculture designating the name, location, number, and age of pupils or "apprentices," the length and character of the course of study, the *personnel* and salaries of the board of instruction, &c. In the pastoral regions schools are allowed to receive one apprentice for every four or five hectares (10 to 13 acres) in the cultivable domain attached; in the regions where grain-culture is pursued thirty pupils are allowed for each 100 hectares, (247 acres.) Each school must accommodate at least twenty-five. Great care is exercised to make the number of pupils proportionate to the work to be performed. The age of admission varies from fifteen to thirty years. The government pays the director 270 francs per annum for the board of each apprentice. Apprentices perform the labor of cultivation, and receive regular wages. They also pursue a prescribed course of study, and are at regular intervals examined thereon. The director, who is either owner or tenant holder of the domain, receives for his remuneration a salary of 2,400 francs per annum besides the profits of cultivation.

The course of study, which generally lasts but two years, is of the most practical character, though some schools enlarge their theoretical and literary instruction. The board of instruction consists of the director, who is also professor of agriculture, horticulture, zootechny, &c., a superintendent of accounts, whose office is to supply the lack of primary instruction and to teach proper methods of keeping farm accounts, &c.; a gardener and nursery-keeper, whose duty is to teach practical horticulture; an overseer of laborers, and a veterinary surgeon. Sometimes a chaplain is attached to the staff; but he takes upon him, in addition to his spiritual functions, some branches of secular instruction. The directors are mostly graduates of farm-schools, though one or two have received university degrees. Occasionally a prince, count, baron, or retired army officer occupies the chair. The subordinate members of the board of education receive salaries ranging from 500 to 1,500 francs per annum. Each school has a farm varying from 100 to 1,100 acres, generally well stocked with farm-animals, and furnished with the most approved farm-implements. Every facility is offered for thorough practical instruction in agriculture, horticulture, viticulture, stock raising and management, business management, &c. Each school aims to suit its instruction and cultivation to the regions in which it is located. A complete record of the operations of these schools would afford facilities for a most satisfactory general study of French agriculture.

These schools are under the supervision of six inspectors-general of agriculture, who parcel out the territory of the republic among them. The French ministry of agriculture has commenced a series of annual publications containing extracts and compilations from the reports of the inspectors-general. The first of this series, that of 1872, represents these schools generally in a favorable condition, though all were more or less injured by the late war. In several instances the excessive requirement of manual labor is sharply criticised as not only trenching upon the hours that should be devoted to study, but as also repressing

the spirit of intellectual exertion and disqualifying the pupil for effective study.

The following is an abstract of the leading points reported by Inspector-General Boitel whose jurisdiction, covering fifteen central departments, includes four farm-schools :

Schools.	Departments.	Date of organization.	Pupils.		Graduates.	Years in course.	Hours of labor.		Hours of Study.		Acre in school-farm.	Age of admissibility.
			Normal.	Supernumerary.			Winter.	Summer.	Winter.	Summer.		
Chambaudoin.....	Loiret ..	1848	30	....	242	2	9	10	2	1	444	18 to 22
Hubaudières.....	Indre-et-Loire.....	1852	33	....	166	2	8	10	5	1½	400	16 to 24
Laumoy.....	Cher.....	1849	33	8	222	2	8	11	4½	2	343	17 to 26
Saint-Michel.....	Nièvre.....	1843	33	4	297	2	9½	10½	3	4	417	17 to 21

The processes of culture, the financial management, and the practical instruction in these schools appear to have been quite satisfactory to the boards of examination as well as to the inspector-general. The systems pursued, while generally adapted to the wants of the region they represent, present special features adapted to local circumstances. The school of Chambaudoin is a school of *grande culture*, and directs special attention to the training of farm-superintendents. Its methods of culture and breeding are of the most scientific character. Great caution is exercised in recruiting the flocks and herds depleted by the late war. Its domain is very fertile. On the contrary, the school of Hubaudières is located in one of the most sterile cantons of Lorraine, upon a farm held by a long lease, with stipulations for reimbursement for soil-improvements. Its small area of good land is subjected to an intensive culture, producing large crops. Its farm-implements are excellent, and its system of records satisfactory. Charmoise sheep and Craonnaise hogs are bred on the farm. The departmental council-general awards 500 francs annually in prizes.

The school of Laumoy is especially commended for its soil-improvement. It has a working capital amounting to \$40 per acre, and keeps 2,000 pounds of live stock per acre. The special aim of instruction here is to impress the value of judicious culture, and to illustrate the power of capital intelligently applied to production. Its theoretical instruction is not equal to its practical. The Agricultural Society of Bourges annually awards a series of silver medals.

The school of Saint-Michel, among the foot-hills of Morvan Mountains, has taught the rude mountaineers how to grapple with natural difficulties. It has enhanced the rate of production, and introduced a better kind of crops; yet from the granitic soil it has not been able to extract a sustenance sufficient for the Charolaise cattle, while its sheep are only the common breeds suited to meager pastures. Its excellence of theoretic instruction has attracted a large number of pupils, in spite of its inferior physical resources.

Seven schools are reported by Inspector-General Tisserand in his jurisdiction of eleven northeastern departments, as follows :

Schools.	Departments.	Date of organization.	Pupils.		Graduates.	Years in course.	Hours of labor.		Hours study.		Acres in school-farm.	Age of admissibility.
			Normal.	Supernumerary.			Winter.	Summer.	Winter.	Summer.		
Étoges .....	Marne .....	1870	30	.....	.....	2	8½	10	2½	1	322	18 to 19
La-Malgrange .....	Meurthe et Moselle.	1868	24	1	10	2	8	10	3½	2	262	17 to 24
Saint-Eloi .....	Haute-Marne .....	1868	24	2	11	2	8	11½	4	1	483	16 to 22
La-Roche .....	Doubs .....	1869	33	3	10	2	9	11	3	1	312	16 to 23
Saint-Remy .....	Haute-Saône .....	1851	32	33	682	2	6	8	6½	4	335	17 to 22
La-hayeaux .....	Vosges .....	1849	30	2	256	2	9½	10	2½	2	240	16 to 21
L'Orme-du-Pont ..	Yonne .....	1848	33	.....	192	3	8	9½	3	2	403	16 to 22

The condition and operations of these schools are generally satisfactory ; but in two instances the inspector-general criticises the lack of a weighing-apparatus, without which it is impossible to test and record accurately the results of cultivation. The school of Étoges maintains a large vegetable-garden, with ample resources for illustrating the processes of vine and fruit culture. Fertilization is systematically and energetically prosecuted. A neighboring swamp yields about 140,000 pounds of muck per annum, while about 10,000 pounds of domestic manures are applied to each acre, besides guano, purchased for wheat-growth, and salts of potash, furnished by the salines of Beer, at fifty cents per hundred pounds, which have made good crops of lucern in calcareous soils. The cows are of the Normandy breed.

The school of Malgrange, near Nancy, upon its diluvial and easily worked soils, alternates grain and root crops. Its stronger lands, after thorough drainage and liming, are subjected to a four years' rotation : 1, roots or half-fallow for colza ; 2, winter-grain ; 3, clover and annual forage-plants ; 4, oats. The farm-animals furnish nearly a million pounds of manure, and about the same quantity of mud is brought from the streets of the neighboring city. The eastern agronomical station performs its experiments on the farm, adding a valuable element to the course of instruction. The school of Saint-Eloi strongly recommends salts of potash for silico-calcareous soils. It uses freely of oil-cake for stock-food. Its sheep-fold contains 450 metis-merinos, served by rams of the silky-fleeced Manchamp breed ; the Dishley rams will be introduced hereafter as suited to a more intensive sheep-husbandry. The piggery is recruited from the Berkshire breed. The low grade of study here is justly attributed to excessive labors, but the price of hired labor is alleged in palliation. The school of La-Roche is greatly benefited by the annual reunions of the Agricultural Society of Doubs on its farm. Besides a regular farm-equipment, it has a flour-mill and circular saw, driven by a portable steam-engine, which also drives a thrashing-machine, a laundry, and a root-cutter. A distillery, a Gruyère cheese-dairy, producing 15,000 pounds of cheese per annum, and a forge, give considerable extra employment to pupils. A four-year rotation is followed : 1, weeded plants ; 2, wheat ; 3, half clover and half annual forage-plants ; 4, two-thirds oats and one-third rye. This rotation is maintained by heavy manuring. A large number of farm-animals are kept, and oil-cake and sugar-beet pulp are purchased to supplement

the heavy gras -crops, for their support. Forty cows are kept, besides a fine flock of white Appenzel goats, a celebrated milk-bearing breed. The board criticised the neglect of making the management of cows a part of the course of instruction, a fault which will be remedied hereafter. The programme of studies embraces six lessons per week in summer and ten in winter.

The school of Saint-Remy is eulogized as the most effective of the farm-schools, and as having sent forth the largest number of graduates—682. Its board of instruction is also the largest. Its arrangement of lands and buildings is artistic as well as scientific, presenting a fine monumental aspect. The cattle are of the Femeline and red Oignon breeds; the sheep mostly Dishley merinos, with a few crosses of Dishley's and Southdowns. The system of instruction is complimented as a happy mingling of study and labor, the proportion of time allotted to each being about equal in winter. Shops for special manufactures in wood, iron, &c., give a wider scope for intelligent industry. The school of Lahayeaux, in process of re-organization, promises higher results than formerly, although it has enjoyed a superior reputation. The school of Orme-du-Pont is located in a county of *grande culture* and of large landed proprietorships. In a six-year rotation, in which cereals regularly alternate with weeded or forage crops, it seeks to produce an immense mass of forage for animals, and, consequently, a large supply of fertilizing material. Too much time is here given to manual labor.

Inspector-General Malo reports as follows, concerning seven schools in his fourteen central, eastern, and southeastern departments :

Schools.	Departments.	Date of organization.	Pupils.				Hours of labor.		Hours of study.		Acres in school-farm.*	Age of admissibility.
			Normal.	Supernumerary.	Graduates.	Years in course.	Winter.	Summer.	Winter.	Summer.		
Pont le Veyle ....	Ain.....	1849	24	5	328	2	10	12	3	1	177	12 to 22
La Chassagne ....	Cantal.....	1869	24	...	...	2	8½	10	5	1	497	16 to 22
Des Plaines .....	Corrèze .....	1849	27	6	387	2	10	11½	.....	1	462	16 to 22
La Villeneuve .....	Creuse.....	1849	33	3	.....	2	10	11	.....	1	960	18 to 26
Merlieux.....	Loire.....	1869	30	4	.....	2	10	12	4	2	474	16 to 21
Montat.....	Lot.....	1849	32	2	293	2	10½	10	5	3	290	18 to 21
Montceau.....	Saône-et-Loire.....	1849	33	.....	262	2	9	11½	4	1	476	17 to 21

These schools are in a good condition and present results which the inspector-general regards as satisfactory. The school of Pont-le-Veyle makes a specialty of fruit-culture, but by energetic fertilization it makes its poor soil bring good crops of grain and grass when the inundations of the Veyle do not interfere. Its yield of rye reaches 23 bushels per acre; wheat or barley, 27½; beans, 32. The rotation is quadrennial, embracing a large proportion of forage-crops. The school of La Chassagne cultivates fields 3,000 feet above sea-level, the soil being mostly volcanic detritus, partially drained and irrigated. The leading industry is necessarily pastoral, embracing cheese-manufacture. The cattle are a local sub-race derived from the Aubrac breed, which, by improved methods of breeding, has been brought to a higher yield of milk. The sheep are the local varieties crossed with the Charmoise. The school Des Plaines is also located on poor soil at a high elevation, 2,000 feet. Its most profitable branch is cattle-breeding, especially its

Salers cows. The sheep are Charmoise. A biennial rotation is used; rye yields 23 bushels per acre and oats 40. The school of Villeneuve presents cultural and economic conditions analogous to the two last named; very unpromising resources have received a considerable development. The school of Merlieux illustrates the process of redeeming lands wasted by previous improvident culture. It follows a five-year rotation: 1, weeded plants; 2, winter or spring grain; 3, meadows for mowing or pasturing, maintained for three years. Lime is applied with excellent results. The school of Montat practices a four-year course upon calcareous and permeable soils, and a biennial course, with liming, upon stronger lands. Stolen crops of turnips, carrots, cabbage, and corn-fodder are raised for stock-feed. Winter-grain and grapes are the money-crops. The cattle number less than one head for every four acres. Wheat yields from 23 to 29 bushels per acre; oats, 57; prairie-hay, 4 tons; sugar-beets, from 10 to 11 tons. The school of Montceaux has replaced its former two-year rotation with an intensive culture extending through five years; the wheat-yield has been raised to 32 bushels per acre; rye to 29; oats to 57.

The following points have been tabulated from the report of Inspector-General Lembezat concerning nine schools in sixteen southwestern departments:

Schools.	Department.	Date of organization.	Pupils.		Graduates.	Years in course.	Hours of labor.		Hours of study.		Acres in school-farm.	Age of admissibility.
			Normal.	Supernumerary.			Winter.	Summer.	Winter.	Summer.		
Chavaignac.....	Haute-Vienne.....	1847	33	.....	299	2	8	9	5	2	573	17 to 23
Monts.....	Vienne.....	1849	24	.....	179	2	9	11	3	2	361	18 to 19
Machorre.....	Gironde.....	1868	24	.....	.....	2	7	9	5	2	90	16 to 20
Lavallade.....	Dordogne.....	1847	33	.....	318	2	9	10	5	2	333	16 to 23
Beyrie.....	Landes.....	1849	27	.....	282	2	9	10	3	1	289	17 to 23
Tolu.....	Basses-Pyrénées.....	1849	24	.....	230	2	9	11	3	2	233	17 to 23
Bazin.....	Gers.....	1847	30	.....	224	2	8	11	4	1	230	17 to 24
Royat.....	Arriège.....	1849	33	1	307	2	8	9	5	3	202	16 to 22
Puillboreau.....	Charenté-Inférieure.....	1849	33	.....	214	2	8	11	4	2½	240	16 to 22

The school of Chavaignac, with a sterile, granitic soil, cultivates mostly grass and root crops, producing excellent clover with copious liming. The Jerusalem artichoke has been successfully cultivated. The school of Monts pursues a very regular eight-year rotation, as follows: 1, weeded plants; 2, spring barley; 3, clover; 4, wheat; 5, colza; 6, wheat; 7, green forage-crops; 8, oats. Salers cattle are used. The school of Machorre has nearly 100 acres in vineyard, cultivated according to the most approved methods. The school of Lavallade cultivates part of its domain by the labor of its pupils, and part by tenant-farmers. Tobacco-culture is greatly impeded by a weed exceedingly tenacious of life. Natural resources are here quite unfavorable, but the course of instruction is superior. The school of Beyrie also lets out a part of its farm to tenants. It follows a six-year course: 1, sugar-beets; 2, winter vetches, followed by half-summer fallow; 3, winter-wheat, with clover; 4, red clover and forage-plants; 5, corn; 6, winter-grain, followed by a stolen crop of turnips. Viticulture, in its most improved methods, is a specialty. The status of theoretical instruction is criticised, but its defects are excused by the devastations of the war. The school of Tolu ex-

cites a similar strain of remark. The school of Bazin practices a nine-year rotation: 1, weeded plants; 2, vetches or annual forage-plants; 3, wheat and oats, with sainfoin; 4 and 5, sainfoin; 6, wheat; 7, sainfoin or clover; 8, colza and leguminous crops; 9, wheat. The school of Royat has radically changed its system, greatly reducing its annual crops and enlarging its scope of viticulture. At least 100 acres of vineyard have been planted with the common Burgundy stocks, the vines being sufficiently distant from each other to admit of thorough plow-culture. Large gardens are maintained in high efficiency by irrigation at all seasons. The school of Puilboreau also devotes special attention to the vine.

The following facts have been compiled from the report of Inspector-General Zielinski, whose jurisdiction embraces seven schools in the northwestern departments:

Schools.	Department.	Date of organization.	Pupils.			Years in course.	Hours of labor.		Hours of study.		Acres in school-farm.	Age of admissibility.
			Normal.	Supernumerary.	Graduates.		Winter.	Summer.	Winter.	Summer.		
Kerwazek-Trevarez.	Finistère .....	1847	33	1	248	2	7½	8	4	3½	187	17-03
Grand-Resto.	Morbihan .....	1870	28	—	9	2	9	10	4	2	173	17-28
Trois-Croix.	Ille-et-Vilaine .....	1832	30	2	346	2	7	8	5	5	230	17-23
Rieffelland.	Loire-Inférieure .....	1830	30	5	410	3	9	9	4	3	297	16-22
Saint-Gildas-de-Bois.	do .....	1840	24	—	282	2	—	—	—	—	126	16-19
Saut-Gautier.	Orne .....	1851	33	—	191	2	9	9½	3	1	361	15-23
La Pilette.	Sarthe .....	1848	24	—	—	2	8	10	2	2	170	18-30

The school of Kerwazek-Trevarez has a working-capital of \$68 per acre, upon which a return of nine per cent. has been realized. The leading industry is stock-raising, for the support of which a seven-years' rotation is pursued, as follows: 1. Weeded plants or buckwheat. 2 and 3. Clover. 4. Cereals. 5. Annual forage-plants. 6. Cereals. 7. Stolen crops. A large area of natural and artificial meadow is maintained. The school of Grand-Resto was located three years ago in the midst of a rude population that does not speak the French language, and to whom a systematic and scientific culture is entirely unknown. From this class of people, destitute of schools, it is difficult to obtain a sufficient number of pupils prepared by previous instruction to undertake the course of study. Sixty pupils of the neighboring lyceum of Pontivy pursue the labors of cultivation. A capital of \$64 per acre is invested, and will be augmented according to the necessities of recuperative and intensive culture. The new methods are annually increasing the crops, while they diminish the cost of production. The school of Trois-Croix follows a six-years' rotation, viz: 1. Weeded crops. 2. Spring grain. 3. Clover and beans. 4. Oats following clover, and wheat following beans. 5. Colza, with half manuring, followed by buckwheat. 6. Wheat. This exhaustive culture is supported by the manure of a large number of farm animals, and yields large returns. The working capital amounts to \$88 per acre, yielding nine per cent. A neighboring normal school sends its pupil-teachers weekly to visit the farm-school and to inspect its methods and results. The school of Rieffelland; formerly an appendage to the regional high school of Grand Jouan, follows two independent systems of rotation suited to its different classes of lands.

The school of Saint-Gildas-de-Bois, located near a reclaimed marsh, and owning a great variety of soils, has introduced several processes of culture hitherto unknown in that part of the country. It has a large capital, but its investment includes the manufacture of agricultural implements. Special attention is given to the crossing of native sheep with imported stock. The school of Saut Gautier is struggling with financial difficulties springing out of previous disasters, especially during the late war. It has been reconstituted, and is now aided by departmental subsidies. The school of La Pilette replaces that of Chauvinière, suppressed by ministerial decree October 10, 1872. Special rotations and systems of culture are adapted to different kinds of soil. In 1871 the school obtained the grand gold medal for the introduction of superior agricultural machinery and irrigation. The council-general of Sarthe pays \$25 per annum for each pupil.

Sixteen departments in the extreme southeast contain nine schools, which are thus reported by Inspector-General Du Fretay.

Schools.	Department.	Date of organization.	Pupils.		Graduates.	Years in course.	Hours of labor.		Hours of study.		Acres in school-farm.	Age of admissibility.
			Normal.	Supernumerary.			Winter.	Summer.	Winter.	Summer.		
La Montaurone...	Bouches du Rhone.	1839	33	4	359	3	7	11	3	2½	544	17-21
Saint Donat-la-Paoute,	Alpes Maritimes.	1863	33	3	168	3	10	10	3	2	349	16-22
Germainville .....	Pyrénées Orientales.	1849	33	....	244	3	9	9½	4	3½	297	16-19
Besplas .....	Aude .....	1849	30	....	211	3	8	9	3	3	250	18-19
Nolhae .....	Haute Loire .....	1849	30	1	200	2	10	10½	3	2	187	17-20
Recoulettes .....	Lozère .....	1851	21	....	201	2	7	10½	5	1½	129	16-19
Berthaud .....	Hautes Alpes .....	1849	24	....	149	3	8	10½	4	1	174	17-20
La Batie .....	Isère .....	1857	33	5	195	2	....	....	....	....	225	16-22
.....	Basses Alpes .....	1849	33	7	328	3	....	....	....	....	1, 100	17-20

The school of Montaurone, formerly a model farm, has 90 acres of vineyard, which suffered severely from the phylloxera. A fine plantation of 12 acres of olives was severely injured by frost in the winter of 1871-72. The school devotes its level land to grass, forage, fruit, vegetable, and flower crops, and to vineyard; its undulating lands are planted in olives, almonds, and evergreen trees. The mud and offal of the neighboring city of Grasse is utilized by the school of Saint-Donat-la-Paoute. A manufactory of perfumes has been established. The school of Germainville has reclaimed its farm from a swamp. Viticulture is the leading pursuit. The school of Besplas devotes two-thirds of its acreage to forage-plants. The school of Nolhae has been famous for good culture, and has sent out many distinguished graduates. Of late years the ill-health of the director has somewhat crippled its operations. The school of Recoulettes is criticised for having pushed the culture of sainfoin to too great an extent. The school of Berthaud contends with great difficulties, growing out of insufficient capital. It cultivates almonds, olives, and vines. The school of La Batie is highly complimented for extensive improvements, excellent methods, and satisfactory crops. A gold medal was awarded the director. The school of Paillerols presents the greatest variety of culture in the southern region. Its level plain is irrigated and subjected to

a judicious rotation of cereal, root, and forage crops. Flowers, shrubs, and industrial plants are extensively cultivated. Viticulture is pursued according to the most approved methods; choice almond and olive trees are also planted in large numbers.

**VETERINARY SCHOOLS.**—Besides the foregoing schools, several institutions for instruction in special branches have been established. Among these are the three veterinary schools at Alfort, Lyons, and Toulouse. These are under the supervision of the departmental prefects. The course of study embraces four years, and comprehends physics, meteorology, chemistry, botany, geology, zoology, anatomy, physiology, hygiene, zootechny, special and general pathology, medical and surgical therapeutics, pharmacy, sanitary police, medical jurisprudence, &c. The board of instruction consists of a director and five professors, with a number of tutors necessary to give proper instruction to all the pupils. A variety of subaltern agents are employed in the administration of the school. All the functionaries are appointed by the minister of agriculture. An inspector-general is appointed by the minister to supervise these schools. The management is committed to a council composed of the director and professors. The director receives a salary of 8,000 francs per annum; professors, 4,500 to 6,000; chiefs of service, 2,400 to 3,000; stewards, 3,500 to 5,000, &c. The price of tuition is 600 francs per annum for boarding pupils, 200 francs for external pupils, and 150 francs for free hearers. Applicants must present the same preliminary requisites as in the regional schools, and must pass examination upon the French language, arithmetic, geography, and French history. A regular uniform is prescribed. The school of Alfort admits forty pupils from the army, who are supported by the war department.

**SCHOOL OF SHEPHERDS.**—This institution, located at the Bergerie of Rambouillet, the national sheep farm of France, is intended to train young men in the management of flocks. It is open to pupils from all parts of France. Every applicant for admission as an apprentice must pass examination in his own commune, and must show that he was sixteen years old on the previous 1st day of January. The same moral and sanitary requirements are demanded as in the other schools. The pupil must be able to read and write and must understand the ground rules of arithmetic. His application and accompanying record of examination must be presented prior to the 10th of September. The school year begins October 1; every apprentice not present forfeits his standing in school. All the pupils are boarded gratuitously, receiving the same fare as the rural population of the country. They sleep near the sheep-folds in regular turn. Their course of instruction lasts two years, and no charge of tuition is made. The chief shepherd exercises them in the management of all operations of sheep husbandry, lambing, weaning, castration, pairing, gestation, parturition, shearing, folding, feeding, slaughtering, preparation for market, &c. They are taught the best treatment of sick animals. They also cultivate the land. If their primary instruction is defective it is supplied by special teaching. Their instruction is tested and completed by the sub-director. After two years of pupilage, if they pass a satisfactory examination, they receive a certificate with a premium of 300 francs. If they do not pass this examination they receive only 200 francs. Each pupil is required to bring with him a stated amount of clothing, which his friends must keep him supplied with. The washing is done at the expense of the school.



## ENTOMOLOGICAL RECORD.

BY TOWNEND GLOVER, ENTOMOLOGIST.

LUMINOUS BEETLES.—As it does not appear to be generally known that a luminous beetle closely resembling the “*cucuyo*” or fire-fly of the West Indies is found abundantly within the limits of the United States, and although the fact may not be of any value to the agriculturist, it must yet be interesting to entomologists in general. We, therefore, make extracts from a letter from a valued correspondent, Mr. N. B. Moore, Manatee, Florida, who at the same time forwarded with his letter specimens of an insect, which proves to be the *Pyrophorus physoderus*, (Fig. 1,) a species of snapping-beetle, and closely resembling the *Pyrophorus noctilucus*, (Fig. 2,) or far-famed fire-fly of the West Indies, with exception of size, as will be seen by the wood-cuts.



Fig. 1.

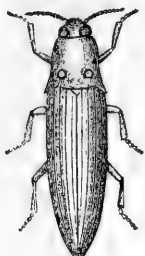


Fig. 2.

Mr. Moore writes that “these insects are very plentiful on the ‘pine barrens’ and among saw-palmettoes, having captured as many as nineteen on the 28th of August. The common ‘lightning-bug,’ or fire-fly, (*Photinus pyralis*,) is also abundant, but appears an hour earlier in the evening, and, no doubt, has often been mistaken for this insect. In its manner of flight the *Pyrophorus* seldom rises more than three feet above the earth, so as to pass close over the tops of the vegetation. Their flight is also much slower and more meandering. The light is emitted from the reservoirs of the thorax at the base of the spines and through them. When on the wing it is generally, if not always, continuous, and equal in amount, as seen from above or below. I do not think it is remittent, and there is no flash, and in amount there is less than the *Photinus pyralis* emits at the time of its flash; there is no perceptible difference in the color of the light of the two species except that which rises from degree of intensity. Its utmost luminosity is attained when running on the ground. When placed upon a quilt or pillow an almost dazzling effulgence emanates from the thoracic reservoirs, seemingly from the disks or perhaps globes, one at the base of each spine. If caught and held between the thumb and finger gently, the same effulgence is emitted. If the insect stops running or takes wing the light emitted is much less, though a fixed increment.

“Experiments in a dark room, with eighteen of the *Pyrophorus* and one of the common *Photinus* on a table, enabled me to compare the light of one of the former with that of the latter at their maximum brilliancy, and I find them about equal; though, as one is a flash and the other a continuous light, I think the latter is really superior. I have not found the one, when in its native habitat, intruding upon the possessions of the other, but they keep apart. When examining them with a glass, I discovered, while observing one that lay upon its back, other sources of illumination; luminous dots, in pairs, were first detected along the lateral margins of the abdomen, and transversely opposite; the anterior pair rather faint, indeed not discovered till after the next succeeding pair were seen; the next bright; the third pair I would rate between them in luster; a fourth pair a little fainter; these, united by a line of light extending across the abdomen, at the junction of the segments. I could discover no trace of concurrent or sympathetic action between the light emanating from the thorax and that from other parts

of the body, nor could any mode of teasing the insect induce an augmentation or diminution of light from the last.

"The *Pyrophorus* has a habit, before it becomes jaded, of throwing itself up from the ground or other surface when placed upon its back, by a spring or jerk of the head downward, and can throw itself to a height of six or eight inches. I found the combined light of eighteen, in a two-ounce vial, sufficient to enable me to read a newspaper, as one could desire to do in a public assembly."

In answer to a request for living specimens, Mr. Moore replies that those he confined died in less than thirty-six hours.

**POKE-ROOT FOR DESTROYING INSECTS.**—Dr. F. C. Renner, of Frederick County, Maryland, writes to the Department that several years ago he collected some poke-root (*Phytolacca decandra*) for medicinal purposes, and placed it at various places about the house, to dry. After several days he observed that there were many cockroaches lying dead, and upon examination found they had been partaking freely of the poke-root. Some of the root was placed near their haunts, and the result was that it rid the premises of those insects. Since then he has communicated the remedy to others, who have tested it with satisfactory results.

We have not yet had an opportunity of trying the efficacy of the root as an insecticide, but shall test it in the spring. Should any of our correspondents have experimented with it, they will oblige us by giving the result of their experience before we venture to recommend it for general use.

## CHEMICAL MEMORANDA.

BY WM. McMURTRIE, CHEMIST.

This Department has received from Messrs. Geo. R. Hill & Co., Alexandria, Va., a sample of offal from their hominy mills, with the following communication:

Recent experiments by farmers in Connecticut and New Jersey having determined that corn-meal is a most valuable fertilizer, (equal in some cases to guano,) we have the honor to forward this day, by express, a specimen of the offal from our hominy mills, composed principally of the *hearts* or *germs* of the corn, and hence believed to be the more valuable, (as the phosphatic element so largely predominates,) and respectfully ask that you will cause an analysis of the same to be made at an early day.

In response to the request embodied in the above communication, a complete analysis has been made, the following results having been obtained:

One hundred parts of the material contain:

Moisture	.....		6.38
Organic matter	{ Oil.....	7.50	} 91.4875
	{ Sugar.....	1.50	
	{ Gum.....	2.4982	
	{ Zein.....	1.8400	
	{ Starch.....	65.9732	
	{ Albuminoids.....	6.1961	
Inorganic matter	{ Cellulose.....	5.9800	} 2.1319
	{ Silica.....	0.1479	
	{ Lime.....	0.0797	
	{ Magnesia.....	0.1014	
	{ Peroxide of iron.....	0.0424	
	{ Phosphoric acid.....	0.9698	
	{ Potassa.....	0.6237	
{ Soda.....	0.1670	99.9994	

## One hundred parts of mineral matter contain

Silica .....	6.937
Lime .....	3.729
Magnesia .....	4.756
Peroxide of iron .....	1.988
Phosphoric acid .....	45.489
Potassa .....	29.251
Soda .....	7.834
	<hr/>
	99.984
Nitrogen in organic matter .....	1.1203

We find that the quantity of ash amounts to 2.13 per cent.,<sup>f</sup> making the total amount of phosphoric acid about 0.97 per cent., and potassa about 0.62 per cent. Comparing these figures with those found in the analyses published by Wolff,\* we find that the average amount of ash found in corn is about 1.40 per cent., making the total amount of phosphoric acid in the grain about 0.66 per cent., and potassa 0.39 per cent. This shows that in the hominy-offal there is an increase of but about one-third in the amounts of these constituents, and when we calculate the value of the material according to the standard for commercial fertilizers, and admitting that the phosphoric acid, potash, and nitrogen are all available as plant-food, it would be \$3.70 per ton of two thousand pounds. Now, when it is so easy to procure fertilizing materials in a much more concentrated condition, at the same rates, it is quite evident that it would not be profitable to make use of the material in question as a fertilizer. But if we consider its value as feeding material, upon comparing the above analysis with that of the analysis of white corn grown upon the eastern shore of Maryland,† we see that the material difference is not very great. The total amount of cellulose and mineral matter, 8.11 per cent. in the former and 2.77 per cent. in the latter, would not make a difference of more than two or three dollars per ton in their value, even if we admit that these constituents are valueless for this purpose. So that when the price of corn-meal averages from \$35 to \$40 per ton, it is plain that it would be much more practical and economical to make use of the hominy-offal as feeding-material for cattle than for the purpose indicated by our correspondent.

SCIENTIFIC NOTES.—*Passage of matter in plants.*—In a late number of "*Die landwirtschaftliche Versuchs-Stationen*," Dr. L. Rissmüller has published the results of some experiments upon the above subject, in the course of which he made analyses of the leaves of the beech at different stages of development. He finds that the proteine bodies and hydrocarbons, as well as the phosphoric acid and potassa, increase until the month of July, when they reach a maximum, and that after this time they steadily decrease until the close of the season. He has been led to the conclusion, from the results of all his investigations, that there is a relation between the potash and the formation of hydrocarbons, as well as between the phosphoric acid and protein bodies. These mineral constituents not only vary with the organic constituents during the entire period of growth of the leaves, but also pass with them into other organs of the plants which continue over to succeeding years, increasing them or serving as a reserve for nourishment for the next period of growth. He considers that it does not follow that the lime and silica in any way affect the production of cellulose, but that they merely

\* Ashcen-Analysen page 36.

† Monthly Report, April, 1873, p. 169.

act as incrusting materials, or particularly in case of the lime, to combine with acids, such as oxalic, which undergo no further metamorphosis at the close of the period of growth. We give below a table showing the analytical results which he obtained :

*One thousand parts of fresh beech-leaves gave—*

Water .....	766.5	597.9	563.6	492.6	525.8	496.3	594.5
Dry substance .....	233.5	402.1	436.4	507.4	474.2	403.7	455.5

*One thousand parts dry substance gave—*

Cellulose .....	144.60	209.70	219.60	221.90	214.40	212.50	255.20
Non-nitrogenous extract .....	502.60	524.73	494.58	489.58	505.08	504.10	493.08
Fat .....	23.60	24.20	18.20	20.10	48.40	55.40	49.40
Proteine bodies .....	282.50	189.37	193.12	178.12	143.12	120.00	78.12
Ash .....	46.70	52.00	74.50	90.30	89.00	108.00	114.20
Soda .....	1.53	0.68	0.28	0.75	1.03	1.70	1.58
Potassa .....	14.53	11.31	8.84	8.86	9.37	8.28	6.60
Peroxide of iron .....	0.35	0.51	0.58	0.75	1.03	0.60	0.59
Lime .....	6.78	12.93	20.81	28.96	28.86	33.80	37.60
Magnesia .....	3.57	5.95	6.85	7.59	7.25	7.55	8.20
Phosphoric acid .....	9.93	4.39	3.91	4.09	3.77	3.47	1.24
Silicic acid .....	0.87	5.44	12.13	17.31	16.23	25.15	26.4

*One hundred parts of ash gave—*

Soda .....	3.28	1.32	0.37	0.83	1.16	1.58	1.34
Potassa .....	31.23	21.74	11.85	9.81	10.53	7.67	5.78
Peroxide of iron .....	0.76	0.99	0.78	0.84	1.17	0.56	0.58
Lime .....	14.96	24.25	27.82	32.08	30.37	31.29	32.92
Magnesia .....	7.65	11.44	9.18	8.40	8.15	7.00	7.15
Phosphoric acid .....	21.27	8.43	5.24	4.53	4.24	3.22	1.08
Silicic acid .....	1.87	10.47	16.26	19.17	18.23	22.36	23.18
Undetermined .....	18.98	21.36	28.50	24.34	26.15	26.32	27.96

*Liberation of ozone by plants.*—In a note by J. Bellucci upon this subject, presented to the Academy of Sciences of Paris, the author reviews the statements of M. Scoutetten and M. Cloëz with this regard, and their methods for obtaining the results which formed the basis of their conclusions. Believing that they were erroneous, he instituted a series of experiments to substantiate his own views. He caused a current of air to pass into a glass vessel of ten liters capacity, containing growing plants, and in some cases branches or leaves recently cut. Before entering the vessel the air passes through a glass tube sixty centimeters in length, half of which is covered with black paper, the other half remaining under the ordinary conditions. Having entered the vessel it passes out through another tube similar to that just described, and from this into the atmosphere. In the interior of each of these tubes are placed iodized starch papers, one in the clear part and another in the dark portions of the tube. The air, which traverses the apparatus at the rate of 20 liters per hour, may be humid and may contain  $\frac{1}{100}$  its volume of carbonic acid. The apparatus is completely exposed to direct sunlight during the experiment.

The results thus obtained are shown in the following table :

Date.	Duration of experiment.	Condition of atmosphere.	Names of the plants placed in the apparatus.	First tube.		Second tube.	
				Clear portion.	Dark portion.	Clear portion.	Dark portion.
LIVING PLANTS.							
1871.	rs.						
July 22	1	Clear	<i>Pelargonium hortulanorum</i>	0.5	0.0	0.5	0.0
22	3	do.	do.	2.0	0.0	1.5	0.0
Aug. 3	3	do.	<i>Pelargonium odoratissimum</i>	2.5	0.0	2.5	0.0
3	3	do.	do.	3.0	0.0	3.0	0.0
8	2	Slightly cloudy	<i>Thymus vulgaris</i>	1.5	0.0	1.5	0.0
8	3	do.	do.	3.0	0.0	3.0	0.0
10	3	do.	<i>Dictamnus albus</i>	3.5	0.0	3.5	0.0
10	1	do.	do.	0.0	0.0	0.5	0.0
12	3	do.	<i>Lactuca sativa</i>	2.0	0.0	2.0	0.0
12	3	do.	do.	3.0	0.0	3.0	0.0
19	3	do.	Grasses with <i>triticum repens</i> and <i>trifolium repens</i> .	2.0	0.0	2.5	0.0
19	3	do.	do.	2.5	0.0	2.5	0.0
PORTIONS OF PLANTS RECENTLY CUT.							
21	1	Clear	Leaves of <i>Lactuca sativa</i>	1.0	0.0	1.0	0.0
21	2	do.	do.	1.0	0.0	1.5	0.0
27	2	do.	Roots of <i>Salvia officinalis</i>	1.0	0.0	0.5	0.0
27	2	do.	do.	1.0	0.0	1.0	0.0
29	2	Slightly cloudy	Roots of <i>Juniperus Virginiana</i>	2.0	0.0	2.0	0.0
29	2	Clear	do.	2.5	0.0	2.5	0.0
1872.							
Aug. 14	3	Slightly cloudy	Leaves of <i>Acer platanoides</i>	1.5	0.0	2.0	0.0
14	3	do.	do.	2.5	0.0	2.5	0.0

The following are the conclusions arrived at by Bellucci from the results shown in the preceding table :

1. Since the papers are not colored alike in the dark and lighted portions of the tubes, this reaction cannot be attributed to the ozone supposed to be in the atmosphere passing through the apparatus.

2. That since the papers in the lighted portions of the tubes, both at the inlet and outlet of the apparatus, are similarly colored, the coloration of the latter cannot be due to the chemical activity of the air caused by its transmission over the green plants.

3. That since the possibility of the presence of ozone is excluded by the preceding considerations, the reactions in question prove the theories of M. Cloez, who attributes the coloration to the complex and simultaneous action of oxygen and solar light independently of ozone.

4. The fact that it is quite evident from these experiments that ozone is not produced by living plants, gives a value also to the results obtained from the experiments with the parts recently cut, since it is well known that the functions of the chlorophyll continues the same in the cuttings as in the plants from which they are taken.

*Sausages colored with fuchsin.*—The artificial coloring of meat has been carried on to such an alarming extent at Jena as to attract the attention of scientific men. The red coloration of fresh meat is due to blood corpuscles or blood-coloring matter, which disappears upon the approach of decomposition. This also takes place in smoking beef when the operation is not carried on quickly, and want of this coloration is considered a sign of poor quality. To restore this some of the dealers have made use of fuchsin, and the consumption of meat treated with this substance has in all cases been followed with injurious results. The results, which

might be due to the action of the aniline color alone, are also due to a certain extent to the arsenic it contains, as well as to the partial decomposition of the meat which it often masks, but does not, by any means, remove. This fraud may be easily detected by treating a sample of the suspected meat with alcohol or ether; the fuchsin, if it be present, being soluble, will be extracted, while the blood-coloring matter will remain behind. The aniline red will appear, but, upon addition of a little acid, it will be removed. Soda or potash will change the red to yellow, or render the solution almost colorless.

*Uredo, its chemical properties.*—In certain localities this species of fungus is very abundant, appearing upon the corn, increasing the grain to a large oval bladder, which becomes filled with a brown or reddish powder; the ear is sometimes entirely covered, thus increasing so much in size and weight as to cause the peduncle by which it is supported to bend. M. Harsten, who has examined it chemically, reports upon it as follows:

The coloring-matter seems to be intimately incorporated in the material forming the cell-walls, and cannot be extracted by any of the solvents generally used for this purpose, since it fails to be taken up by ether, absolute alcohol, benzole, petroleum, chloroform, acetic acid, or caustic potassa. This fungus, when heated dry at 100° C., is perfectly odorless, but when boiled with water it liberates an intense bituminous and very disagreeable odor. By condensation of these vapors a fetid liquid is obtained, in which, after standing twenty-four hours, small drops of a camphorous material are formed, which, when examined with a microscope, show a crystalline structure. The cell-walls show considerable resistance to the action of acids. Warm sulphuric acid attacks them but slightly, producing sulphurous acid; acetic acid and boiling caustic potassa fail to produce a noticeable effect, but if it be boiled with dilute sulphuric acid a strong odor of bees-wax is developed, a volatile acid and an inflammable gas are liberated. A cold mixture of sulphuric and nitric acids in proportions necessary to the production of pyroxyline renders the color of *uredo* pale, without otherwise changing its appearance. After being washed and dried it burns easily, without explosion. Nitric acid causes it to swell, and then attacks it, producing a strong odor of bitter almonds; the cell-walls gradually disappear and the liquid contains oxalic and suberic acids, and a very considerable quantity of fat. The weaker reagents seem to be incapable of extracting the fat from the *uredo*, unless the cell-walls be first destroyed or modified by nitric acid, chlorine, sulphuric acid, bichromate of potassa, &c. These substances cause it to yield its fat to benzine. The odor of acroleine was not perceived in its decomposition. Glycerine is also wanting. Boiling water extracts a small quantity of fixed matter partially precipitable by acetate of lead.

*Tannic acid as a wood-preserved.*—M. Hatzfeld presented, at one of the late meetings of the Academy of Sciences of Paris, a paper upon the preservation of wood by means of tannic acid and protoxide of iron. He urges that the tannic acid, combining with the albuminoids of the wood, is able to form insoluble tannates, and thus remove in a great measure the support of the vegetable and animal parasites, which are so abundant; that the more durable woods are those containing the greatest amount of tannic acid, and that this substance is therefore the true natural preservative. Besides injecting tannic acid into the softer woods for their preservation he proposes to harden them by further treatment with protoxide of iron. This may be applied after the tannic acid or in conjunction with it. The tannate of the protoxide of iron being perfectly colorless, blackens upon exposure to the air, and when injected into the wood, is deposited in the cells on account of this transformation, thus increasing its density to a wonderful extent.

## BOTANICAL NOTES.

BY DR. GEO. VASEY, BOTANIST.

THE FLORA OF COLORADO.—Professor Hayden has recently issued in pamphlet form a "Synopsis of the Flora of Colorado," which embodies the results of the botanical investigations of his party in that Territory, together with those of several botanists who have made collections in that region. The work is prepared by Professor Porter, of Lafayette College, Pennsylvania, and Mr. John M. Coulter, who acted as botanist of the survey. Taken in connection with Mr. Watson's Botany of the Fortieth Parallel, it presents in a very satisfactory form our knowledge of the vegetation of that line from the Missouri to the Sierra Nevada Mountains. To show the prevalence of certain orders in that region we observe that *Astragalus* and *Carex* are each represented by 43 species, *Pentstemon* by 17, *Ranunculus*, *Potentilla*, and *Eviogonum*, each by 16, *Erigeron*, and *Aster* each by 15, *Oenothera*, and *Artemisia* each by 11 species, and *Saxifraga* by 13 species.

Of coniferous trees there are 5 species of pines, and 4 of abies or spruce. Of oaks there are but 2 species, both of a shrubby character, 2 birches, 10 willows, mostly low shrubs, and of *Populus* 3 species. These are the principal trees and large shrubs of that region. If a little more time had been taken in the preparation of the work it might have been made more complete, but as it is it will be a valuable aid to those making collections in that region, as well as to all persons interested in its vegetable productions.

*Comptes Rendus* for January contains a valuable essay on the production of gum in fruit-trees, by Ed. Prilling, the substance of which we give below. He treats of the production of gum under three heads, as follows:

1. *Production in vessels*.—In the wood of a tree so diseased as to produce gum, a large number of vessels are more or less filled with it either through their entire length or forming a coating more or less thick around them, or on one side. The most recent observers have admitted that the gum results from the disorganization and transformation of the inside of the walls of the vessels, but an attentive study of the production of gum in the vessels has led me to an different conviction. The gum shows itself first in very fine drops, which increase in size, touch each other, become confluent and form irregular masses, with sinuate edges. This mode of origin of gum contained in vessels appears irreconcilable with the opinion professed by German observers. The examination of large masses of gum taken from the vessels of the apricot has led to the same conclusion. These vessels are marked with areolar cavities and a spiral projection formed by a thickening of the cell-walls on the interior, and the masses of gum present on their surface furrows corresponding to the spiral lines which jut out from the walls of the vessel, and even little projections corresponding to the cavities. It is then very certain that, in this case, the gum is deposited in the interior of the vessels, and has taken the impression of the interior. This gum is of the same nature with that M. Trécul calls *cérdsone*.

2. *Production in cells*.—*Transformation of starch*.—Gum is often seen in the medullary ray and there offers particular interest, because its appearance is connected with the disappearance of the starch originally contained in the cells. The change of starch into gum has been noted by former observers, but never to my notion precisely described. On

the first appearance of gum in the cell, the grains of starch, still entire, are gathered into little groups, around which appears a thin layer of gum, also small portions of which may be seen deposited in other parts of the cell. The masses of starch enveloped by gum diminish continually as the layer of gum increases in thickness, but when treated by iodine the two substances preserve their special properties without modification till the starch finally disappears, usually leaving a small cavity in the center of the little mass of gum. When the production of gum commences in the tissues, an increased amount of starch is observable in the neighboring cells which seems absorbed, and immediately changed into gum, but ordinarily the gum in this case does not appear to be deposited in the cells, but passes into the neighboring reservoirs where it accumulates in considerable quantity.

3. It is neither in vessels nor cells, but rather in the lacunæ formed in the interior of young tissues, the voluminous masses of gum accumulate, which we often observe. These lacunæ are most frequently found in the cambial zone, but may be seen at different depths in the wood, disposed concentrically like successive annual layers. They are formed in the germinal layer, and then occupy the interval between the medullary rays. When not too largely developed, a new woody layer forms outside of them, and the growth is not sensibly altered. On the contrary, if growth cease at this point, a flow of gum is caused, the woody tissue necroses and cannot be covered except by the extension of lateral portions where the germinal layer is uninjured.

The tissues next to these lacunæ suffer an important modification of development; the cambium, instead of forming woody tissue, produces cells in which an abundance of starch is deposited. There arises then, wherever gum is developed, a particular tissue (woody parenchyma) which does not exist in healthy stems, and whose appearance is so intimately connected with the morbid formation of gum, that it may be considered as a pathologic tissue. The starch, which accumulates in this special woody parenchyma, is used, as in the medullary rays, to form gum, which accumulates in large quantities in the lacunæ. These lacunæ increase at the expense of the neighboring tissue, which is disorganized; nevertheless, the cells which border the lacunæ often manifest extreme vital activity, and give birth to true pathologic formations. They develop, multiply, and ramify in the interior of the lacunæ, even when separated from the rest of the tissue, and absolutely isolated in the middle of the gum.

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## MICROSCOPIC OBSERVATIONS.

BY THOMAS TAYLOR.

J. M. Steel, of Harrisburgh, Ark., under date of August 16, 1873, writes to the Commissioner of Agriculture as follows:

I desire to make inquiry in reference to the apple-speck, or rot. Our apples on Browley's Ridge are all seriously damaged this season by a speck or blister, of the size of a dime or less, which appears on their skin. The speck becomes larger as the season advances, and the apples at length decay on the trees and fall off. This speck has been observed on our apples for some years past, but has never been so destructive to the fruit as during the last season. The fruit begins to rot when it has attained its full size, apparently from a deficiency of proper food necessary for maturing it. We sometimes think that the rot is occasioned by the sting of a curculio, but as we have no means of searching out the cause, we



apply to you, hoping that you will be able to give us a remedy. Apples, pears, plums, grapes, and berries of various kinds do well here until the ripening season approaches; when a blight comes over them, and our flattering prospects are also blighted.

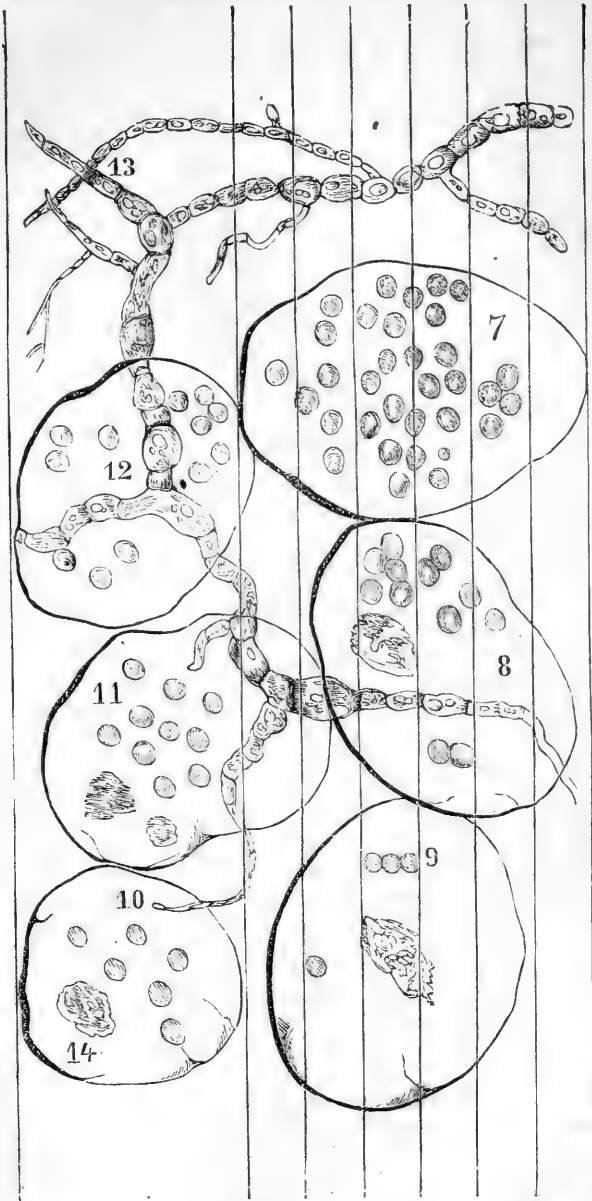
Our winter-apples are so badly damaged from rot that we seldom think of saving any for winter use. Many of our young orchards are just coming into bearing, and the prospect is quite discouraging to our farmers when they consider the prevalence of this destructive disease. Our climate has a damp and humid atmosphere, and is peculiarly adapted to cotton. Any information which will tend to improve our winter-fruit will greatly benefit the eastern third of our State.

In a subsequent letter to the Commissioner, dated October 8, 1873, Mr. Steel gives the history of the apples alluded to, and forwards a small package of them for examination. He says that the tree which bore them was a graft from the Rochester nurseries, N. Y., and was considered to be one of their best winter-apples. "Here they ripen in August and September, too early to be kept longer than December. The apple is known here as the 'Little Russet.' We esteem it a fine apple, but not a good winter-fruit. I have about forty trees from Rochester, and there are several hundred in this county, but they all ripen too early by one or two months. Apples, to keep in this climate, must hang on the trees till November or the middle of October; those that fall earlier than this will not keep through the winter. If trees can be procured which will hold their fruit till the first of November, we should be pleased to be informed where they can be obtained."

The specimens of the Little Russets, received from Mr. Steel, were subjected to several experiments. Portions of their skin were examined under low and high powers of the microscope. The dotted parts were found to be composed of clusters of circular spores of fungi combined with very small portions of mycelium. Under excessive moisture, and a morbid condition of growth, these fungi would mature rapidly, and produce fermentation in the apple. Some of the apples were cut into halves, and submitted to a temperature of about 70° Fahr. In a short time they dried up, and are now in a perfect state of preservation, thus showing that although they will not keep when whole, yet they may be preserved by allowing a portion of their superfluous moisture to escape. Another portion of the apple was placed in a quart bottle with a glass-stopper, ground to fit, and moisture was excluded. The room in which this experiment was conducted was kept at an average temperature of 70° Fahr. The apple thus inclosed was in ten days in a high state of fermentation. Portions of the rotting pulp were placed on a microscopic slide, divided into hundredths and thousandths of an inch.

Plate I, A B, represents such a scale, the larger division, A B, representing the one-hundredth of an inch, and the smaller subdivision the one-thousandth of an inch; 7, 8, 9, 10, 11, 12, represent the cells of which the apples are mostly composed. The granular dottings represent apple-starch. The branching cellular structure represents the mycelium of a fungus penetrating the cells. At 9, three small starch-granules are represented in a line, and are confined within the division of the one-thousandth of an inch. Some kinds of fruit, as the grape, under favorable conditions will eliminate a sufficient amount of saccharine matter to convert them into a candied condition while hanging on the vine, and they are by this natural process preserved from rot. Other kinds, as the apple, cannot be preserved in this way. Apples can be preserved only for a limited time on the tree. Unripe apples are composed mostly of cellulose cells, starch, organic acids, and water. During the process of ripening their starch is gradually converted into a liquid, which is saccharine. The decay of apples really sets in when their starch begins

to become liquid; because the relative amount of sugar produced, when compared with the organic acids and water present, is very small.



With a moderate heat all the conditions are presented for ordinary fermentation. The albuminoids being always present in the apple will supply the necessary food for fungi. The cells of the apple sent for examination contained very little starch and could not therefore be expected to keep well. Apples of good-keeping qualities for the Southern States should be charged with starch as late as the 1st of September, or, still better, to the middle of October. Such favorable conditions of

growth, it is believed by the most noted pomologists of the United States, can be attained only by the production of winter varieties of seedlings in the Southern States in which they are to be cultivated.

**APPLES FOR THE SOUTHERN STATES.**—The opinion has prevailed that the climates of the States south of Maryland are not adapted to the culture of the apple. This erroneous impression is not confined to the best apple-regions of the Northern and Western States, but it has been held by southern cultivators themselves, especially as regards good winter-keeping varieties, when grown in warmer and equally congenial climates.

Southern pomologists have long seen this matter in its true light, and have been quietly but industriously collecting winter-varieties among the seedlings originating in those States, and they can now present a list of winter-apples which, for size, beauty, and quality, are equal to those of any other section on this continent, and possessing, in addition, a peculiar texture and solidity, to be found only in fruit produced in climates where the season of growth is extended and genial, and the winters are of only moderate severity.

The following list includes a few of the most popular summer, fall, and best winter varieties known to the Department adapted for the Southern States:

*Summer-apples.*—Julian, Aromatic, Carolina, Large Summer, Queen, Red June, Horse-apple, American Summer Pearmain, Summer Cheese.

*Fall-apples.*—Hunge, Hubbard's Sugar, Bonum, (synonym: Magnum Bonum, Downing;) Cummings' Red, Golden Russet, (synonyms: English Golden Russet; English Russet; Russet Golden, Buckingham;) synonyms: Queen, Fall Queen, Winter Queen, Kentucky Queen, Lexington Queen, Byer's Red, Frankfort Queen, Ladies' Favorite, Equinately, Ox-Eye, Bachelor, Merit, Blackburn, Henshaw, Sol. Carter, Ne Plus Ultra, King, Red Horse, Red Gloria Mundi, (Downing.)

*Winter-apples.*—Walker's Yellow, Camack's Sweet, Boran's Winter, Broadnax, Hall, (synonyms: Hall's Seedling, Hall's Red, Jenny Seedling, Downing;) White Winter Pearmain, (synonym: Campbellite, Downing,) and the Michael Henry Pippin of some southern nurseries; Gladney's Red, Edwards's, Payne's Winter, Rawle's Janet, (synonym: Never-fail;) Limbertwig, Faust, (synonyms: Faust's Winter, Faust's Downing;) Hoyal's Greening, Shockley, Golden Wilding, Clark's Pearmain, (synonyms: Yellow Pearmain, Gloucester Pearmain, Columbian Russet, Golden Pearmain, Downing;) Matimuskeet, Nickajaek, (synonyms: Caroline, Berry, Summerhour, Accidental, Red Pippin, Howard, Hubbard, Mobbs, Cheatan, Pound, Edward, Shantee, Wall, Aberdeen, Trenham, Big Hill, Carolina Spice, Cheatan Pippin, Chatham Pippin, Wander, Winter Rose, Red Hazel, Forsythe's Seedling, Ruckman's Red, Alleghany, Chaltram Pippin, Gowden, Graham's Red Warrior, Walb, Winter Horse, Missouri Pippin, Missouri Red, Leanham, Jackson Red, World's Wonder, (Downing,) Gilpin, (synonyms: Carthouse, Roman Knight, Small Romanite, Gray Romanite, Little Romanite, (Downing;) Winesap, Aunt Peggie, Disharoon, Winter Horse, Sharpe's Greening, Cullasaga, Ben Davis, (synonyms: New York Pippin, Victoria Red, Kentucky Pippin, Baltimore Red, Carolina Red Streak, Funkhouser, (Downing;) Ferdinand, Hemphill, Guilford Red, Green Cheese, (synonyms: Green Crank, Southern Golden Pippin, Green Skin, Yellow Crank, Winter Greening, Winter Cheese, Carolina Greening, Turner's Cheese, (Downing.)

These varieties are supposed to be nearly all seedlings of the Southern States. At page 184 to 198 of the Agricultural Report for 1869 will be found an illustrated paper (by William Saunders) on the subject, of which the above is a condensed abstract.

## FACTS FROM OFFICIAL SOURCES.

**FAMINE AND FOOD-SUPPLY IN BENGAL.**—The Indian branch of the British government is largely occupied with the practical problems growing out of the failure of crops in the Bengal presidency. It is admitted that there are millions of laborers within the district covered by the failure who receive, as the reward of their labor, barely enough for the sustenance of their families in seasons of average prosperity, and therefore have no means of providing for themselves in this emergency; and that there are millions more of ryots (farmers of rented land) whose means are so limited that exorbitant prices must very soon exhaust them. It is also admitted that to depend on the ordinary law of demand and supply for making up the deficiency must inevitably result in widespread starvation. From what sources to obtain the needed supply of food, how it can be seasonably imported and distributed, and how extortionate prices can be prevented, are questions upon the prompt and right solution of which prevention of death by starvation to millions depends. The Indian economist assumes "that there must be abundance of food in Lower Bengal to feed the people throughout the coming distress; and that it is upon keeping down prices and stimulating and equalizing the distribution of food that the government should concentrate its attention." And again, "If the Burmah harvest is to be of any assistance to us, we shall want it here between February and May. The question of transport, therefore, becomes a very important one, and the propriety of trusting to freight being forthcoming exceedingly doubtful. To bring 700,000 tons of rice here in four months we shall want 250 ships of 1,000 tons each, with screw-power to make their voyage short and certain, so that they might each make three trips during the period." Beyond the food in reserve in Bengal, the nearest available source of supply is Burmah. An estimate, based on statistics of export for several years past, makes the normal annual surplus of food in Bengal about 500,000 tons, and in Burmah about the same. This 1,000,000 tons, chiefly rice, would supply about one-thirteenth of the population of Bengal with food one year. The opinion is expressed that in the presidency of Madras there is a surplus of food sufficient to supplement the short harvest in Bengal, but it is impracticable to secure it on account of the disposition of the ryots to hoard it. It is estimated that supplies of wheat might be obtained as follows: from Kurrachee, 30,000 tons; Persian Gulf, 30,000; Egypt, 70,000; Southern Russia, 200,000; Canada, 100,000; The United States, 100,000. This 1,430,000 tons would make 1,400 ship-loads of 1,000 tons each, and if it could be seasonably secured, would supply from seven to eight millions with food for one year.

**IRRIGATION IN BRITISH INDIA.**—The Statistical Reporter of Calcutta furnishes a list of irrigation works in progress and projected (not including those already completed) in the different provinces of India, and the estimated expenditure required for the completion of each. The total number of these works is 26, and the total estimated cost £20,325,000, or \$101,625,000; of this the sum of £18,487,000 is for works having already received government sanction, and the remainder for those as yet only projected. The actual expenditure on those several works up to the first of April, 1872, is placed at £4,589,000. It is represented that, although there are not thus far data sufficiently extended and accurate to establish a positive inference, yet the latest statistics point to the conclusion that past expenditures on irrigating

works have been financially profitable. For works in operation in the provinces of Madras, Bombay, Bengal, Punjab, Sindh, and the north-western provinces, according to the best available information, the account stands thus: Total capital invested up to the end of the year 1871-'72, £10,659,000; interest at 4 per cent., £426,360. Net income, £890,000.

**AREA AND POPULATION OF SWEDEN.**—The following facts are stated upon the authority of Dr. Elis Sidenbladh, secretary of the Royal Swedish Bureau of Statistics:

The Scandinavian peninsula consists of the two kingdoms of Sweden and Norway, Sweden occupying 58 per cent. of the total area of 761,500 square kilometers, and Norway 42 per cent. The population is 6,000,000, of which 70 per cent. is in Sweden and 30 per cent. in Norway. The population in 1750 was 1,763,338; 1800, 2,347,303; 1850, 3,482,541; 1870, 4,168,525; 1871, 4,204,177.

Sweden extends, in a northern direction, to 69° 3' 21" north latitude: toward the south to 55° 20' 18". The entire length of Sweden, north to south, is about 1,500 kilometers; its width 300 to 400 kilometers.

The surface of Sweden consists of 407,446.51 square kilometers \* of land and 37,367.49 square kilometers of water. Total, 444,814 square kilometers.

High mountain-ranges divide Sweden from Norway. The highest summits in Sweden are the Sulitelma, 1,874.9 meters in height, the only mountain in that country having glaciers; the Areskutan, 1,472 meters high; the Staedjan, 1,176 meters, and others not beyond 300.

About 8 per cent. of the area of Sweden lies 600 meters above the level of the ocean; the entire central and southern portion, not over 240 meters; about one-third, less than 90 meters. Lakes and running waters occupy an area of 37,367 square kilometers. Over 2,500 kilometers are sea-coast. Among the many rivers are the Angermann-Elf, the Goeta-Elf, the outflow of Lake Wener, famous for the cataract Trohæta, (111 feet.)

**UTILIZATION OF PARIS SEWAGE.**—During the last fall the inspectors-general of French agriculture assembled at Gennevilliers to examine the works undertaken by the city of Paris for the purpose of drawing off a portion of the sewage of that city and applying it as a fertilizer to farms. Their conclusions were embodied in a decree of the minister of agriculture, in which prizes are offered to persons who, by the use of these waters, may secure special improvements in production. These prizes will consist of works of art and of medals of gold, silver, and bronze, and will be awarded by a jury, consisting of two inspectors of agriculture, a deputy, a municipal counsellor of Paris, a horticultural gardener, and two agriculturists.

**ALCOHOLIC PRODUCTION IN FRANCE.**—The production of alcohol in France during 1873 amounted to 1,486,233 hectoliters, or 36,260,006 gallons. Adding the foreign import, 42,477 hectoliters, or 1,122,118 gallons, and the stock in the country amounted to 40,385,124 gallons. Compared with 1872 the above figures indicate a falling off of 302,202 hectoliters, or 7,983,511 gallons. A great reduction is indicated in alcohol from wine and beet-sugar and in imported alcohols. On the contrary, an increased production is indicated in alcohols from farinaceous substances, molasses, fruits, and other substances. The consumption in 1873 amounted to 1,654,759 hectoliters, or 43,717,092 gallons, showing a decrease of 283,029 hectoliters, or 7,576,983 gallons.

\* 1 square kilometer = 247.1134 acres, United States. 1 meter = 1.09363 yards, United States.

**BET-SUGAR IN FRANCE.**—The amount of juice expressed from the sugar beet in France during the year ending October 31, 1873, was 485,746,810 gallons, a falling off from the previous year of 38,642,523 gallons. Its saccharine qualities, however, were improved, the density being 4, while that of 1872 was 3.9. In 1873 the sugar product was 224,268,210 pounds, a reduction of nearly 20,000,000 pounds compared with 1872. The export amounted to 22,362,382, about half of that of the previous year. French sugars have found in the English markets a formidable rival in Austrian sugars, a fact which sufficiently explains the reduced export. The French ministry proposed additional taxes upon sugar in November last, on the grounds that it was not an article of prime necessity, that the increased market-price of the article would enable it to bear the imposition, and that the pressure of public burdens demands additional sacrifices from this as from other productive interests. The *Journal Pratique d'Agriculture* combats this measure, and urges that high taxes alone have prevented sugar from becoming an article of general use, and that the proposed increase of taxes will defeat its purpose by restricting production.

**MEAT PRICES IN EUROPE.**—The increasing dearness of meat is the chronic complaint in England, France, Germany, and Russia. The Saint Petersburg journal *Golas* blames the railroads for this result, their high tariffs and vicious arrangements rendering it impossible to supply the markets. The transit from Moscow to Saint Petersburg, which should not occupy more than thirty-six hours, is lengthened to six days. The accommodations for live stock are so imperfect that about 20 per cent. die on the passage. The temperature of the cars rises to 40° Reaumer. Common roads are so bad and food along the route so scarce that destructive epizootics break out in the droves.

**THE NEW ENGLAND AGRICULTURAL CLUB.**—This new association, Hon. Daniel Needham, Groton, Mass., president, and Daniel Round, Norfolk, Mass., secretary, held its first public meeting at Waterville, Me., on the 26th, 27th, and 28th of March. It proposes as its objects, institutes for discussion; collection of statistics respecting the leading crops of New England; dissemination of the same through the press; investigations of facts respecting supply and demand; facilities and cost of transportation; and systems of marketing farm products. The principal topics presented were: The meat-supply of our large cities; adaptation in farming; better culture; anatomy and diseases of the horse's hoof; and the resources of the State of Maine.

**FRUIT PROSPECTS.**—Our correspondent in Wicomico, Maryland, says: Fruit-raising has proved very profitable to farmers; they realize from a few acres thus planted as much as they formerly did from a considerable grain-farm. Peaches, according to quality and earliness of ripening, net from one to two and a half dollars per tree, each season; though the sudden cold of the 24th and 25th, and subsequently the sleet of the 31st of March, have killed this crop for the present year. Strawberries and blackberries, according to thoroughness of culture, net from three to eight hundred dollars per acre; raspberries and grapes promise equally well.

**THE PORTUGAL ONION.**—Hon. A. V. Dockery, United States consul at Oporto, Portugal, furnishes an interesting account of the onion raised in that Kingdom, which is published below. With reference to testing the adaptability of this valuable variety in this country, the Department has signified its wish for an early importation of the seed. The consul says:

Oporto is the chief port of exportation for the large variety of onion known in trade as the Spanish or Portugal onion. The principal part of the product is sent to the English market, where it commands a much higher price than do the onions of any other variety, on account of mildness of flavor and great size. The average weight of the onion is about two pounds, and I have seen some which weighed as high as five pounds. The yield, with proper cultivation, is, perhaps, extraordinary. I saw a crop this summer of \$600 worth made on an acre of ground. This was in August, soon after they had been taken out of the earth.

The cultivation is as follows: In the month of October, the seed is sown in a sheltered spot, in very well manured seed-beds. In about ten days, the plants appear, and are watered in dry weather, weeded, and the surface occasionally stirred with a sharp-pointed stick. The young plants not subjected to any severe frost (for the thermometer seldom falls below 30° F.) enjoy an uninterrupted growth till spring-time. In March they are taken up, being then some 5 to 8 inches in height, and planted from 12 to 15 inches apart, in furrows made by the hoe in well plowed and harrowed land. The furrows are filled to the depth of 3 or 4 inches with well-rotted manure, with which the roots of the young plants are placed in actual contact. A very essential condition of the cultivation of the onion is water. The abundant and timely irrigation of the growing crop requires great and constant care. After transplanting, it has two to five hoeings and weedings. With the last weeding are sown either turnips, maize, or, more rarely, grass-seed. The onion crop is off the ground in August, and sometimes in July. After drying a couple of weeks, they are made up in strings, put into boxes, and ready for shipment.

**YIELD AND PROFIT OF MANGEL-WURZEL.**—Our correspondent in Plymouth County, Massachusetts, sends us the statistics of a crop of mangel-wurzel produced by Mr. Albert Fearing. Three-fourths of an acre produced 38½ tons, value \$10 per ton, \$385; cost, 9 cords of manure, \$90; seed, \$2; plowing, \$4; cultivation, \$16.50; harvesting, \$12; total, \$124.50; net profit, \$260.50. This is at the rate of 1,708 bushels, or 51½ tons, per acre, at a profit of \$347.33.

**FARMING IN THE BED OF A MILL-POND.**—A correspondent in Richmond County, Virginia, reports that he emigrated from New York, and purchased a farm in that county, some seventy acres of which had once been a mill-pond. In 1871 he cleared it of weeds, brush, &c., and ditched where necessary, and has since raised on it, without fertilizers, excellent crops of corn, wheat, rye, and oats. In August, 1872, he sowed on a portion of it buckwheat and rye, sowing both on the same ground at the same time. The buckwheat made a good crop. After it was harvested, the rye came forward rapidly, and afforded much pasture for calves during the winter. When harvested in 1873, it was the best crop he ever saw. Most of it was seven feet high, with long heads and good grain. Some of the straw was sold in Washington for \$1.25 per hundred-weight. He also, in 1873, harvested from some of this mill-pond land a bountiful crop of timothy hay, some of the heads of which were over one foot in length.

**THE MOST PROFITABLE FERTILIZERS.**—A correspondent sends us an account of a discussion by an agricultural association in the parish of Catahoula, Louisiana, respecting the relative advantages of purchasing fertilizers in the market, or producing them on the farm. After interchanges of views, illustrated by statements of experience in trying the one and the other theory, it was decided that for the soil of that parish the manure derived from its productions is not only the cheapest as to cost, and most profitable for the crop to which it is first applied, but is more permanent than foreign fertilizers in its good effects. The principal reason assigned was that it returns to the soil the very ingredients taken from it by the crops from which it is derived. Hence it was recommended that measures be taken to economize manures on the farm in all practicable ways, among which were specified the free use of litter and other absorbents in stables and yards for horses, cows, and hogs, so as to save all the liquid manure; and the saving of all the bones from beef, pork, and every other source, breaking them up, keep-

ing the fragments in a water-tight receptacle until dissolved by ashes or other solvent, and then composting them.

**STOCK AND GRAIN IN NEBRASKA.**—A correspondent in Thayer County reports that in that section stock have required but little feed, and have wintered well. Also, that more small grain will be sown this spring than heretofore, especially barley, for which the price through the winter has been \$1.25 per bushel. As yet no attempt has been made in that county at raising cultivated grasses, the wild grass, which is very good, being the only dependence for hay.

**WHEAT PROSPECTS IN SOUTHEAST MISSOURI.**—A correspondent in Reynolds County reports that, notwithstanding the chinch-bug for the last two years has been very destructive to the wheat-crop in that and adjoining counties, about 20 per cent. more than average had been sown, and the growing crop was looking better than he had ever seen it before, especially drilled wheat.

**ONIONS IN INDIANA.**—Our correspondent in Switzerland County writes as follows:

The crops of onions and onion-sets are to us crops of the greatest importance. The red onion, from top-sets, is the kind most relied on and most raised. The ground is prepared in the fall by plowing, and thoroughly pulverizing with the harrow, and as soon as the surface is dry enough, in February and March, the work of planting is commenced. The ground is marked off with a large wooden rake, with the teeth one foot apart. In the rows so made the onion-set is merely stuck in the ground, leaving a space of three inches between each onion. For onions and onion-sets the ground should be thoroughly cultivated and kept clear of weeds, either with a hoe or a small cultivator. From 18 to 25 bushels of sets are planted to the acre, producing, in an average season, from 300 to 350 bushels per acre, (48 pounds to the bushel.) The crop is harvested in the latter part of July, by pulling the onions and throwing them in rows, leaving them for a day, and then gathered and spread thinly on the floors and lofts of out-houses or barns. They are hauled to market within one month from gathering, and packed by shippers in slack-barrels, holding 2½ bushels each, and shipped South. The crop sometimes reaches the aggregate of 120,000 bushels, and is sold to shippers at prices ranging from 40 cents to \$1 per bushel. The price has advanced materially, notwithstanding large arrivals of French onions in the New Orleans market during the past two months. Onions are now selling at \$1.75 per bushel, with a constantly-increasing demand.

Onion-sets, the crop of which will sometimes amount to over 50,000 bushels, are raised by preparing the ground in the fall and planting the bulbs in rows two feet apart, three inches in the row, and cultivating with a small cultivator. The crop is gathered by cutting the sets off, and gathering and spreading thinly on floors the same as the onions. After the first year the old onions, called "scallions," are taken up to thoroughly cultivate and loosen the ground, and are then replanted. If properly cared for the "scallions" will remain productive for several seasons. The market for sets is South, West, and Northwest, and the time for shipping from September to the latter part of April. For transportation they are packed in barrels holding from 3 to 4 bushels, (28 pounds to the bushel.) The price ranges from \$1 to \$4 per bushel, and has reached this season \$5 per bushel in first hands. The production is about 300 bushels per acre. One bushel of onions produces one bushel of sets. The bottom-lands of the Ohio and Miami Valleys should be the source of supply for the Union.

**AGRICULTURAL INDUSTRIES IN FLORIDA.**—An intelligent correspondent writing from Florida says that there is a very noticeable desire in the southern part of the State to abandon the cultivation of long-staple cotton for something better. Cultivation of fruit, growing of sugar-cane, and cattle-raising are in popular thought. In the vicinity of Little River one thousand Scuppernong grape-vines have been set, and a number of peach-orchards have been planted; at the same time twenty proprietors in a single neighborhood have started apple, pear, and cherry orchards. All the trees here referred to are from southern nurseries. Our correspondent, however, regards the grass question as of the greatest importance, feed for cattle being of prime need. Guinea-grass he regards as fully meeting the want.



**BLUE-GRASS IN ARKANSAS.**—Dr. A. Guthrie writes to the Department as follows :

I have a tract of land of 125 acres, cleared land, situated in Van Buren County; its character, good upland, partly valley land. In summer there is good "stock range" throughout this and adjoining counties, but in winter the native grasses are of little value. It has been on my part an object of great solicitude to cultivate a portion of my land successfully in grass suitable for hay and winter pasturage. In the spring of 1872 I sowed with my oats seven acres of timothy, one of blue-grass, and one of red clover. All have done well; but the clover does not seem to withstand the hot, dry season as well as the other two. Having long been a resident in the blue-grass region of Kentucky, I have observed my experiment here with interest, and I can say that while blue-grass does not grow quite as well as in Kentucky, Indiana, and Ohio, it grows finely here, and will succeed and keep green in summer. Mine has afforded pasturage for my horses till the middle of January.

**GUINEA-GRASS.**—A correspondent writing from Greensborough, Ala., says that Guinea-grass is largely raised in that section; those who have tried it most like it best. He thinks if it could be confined within proper bounds, it would be invaluable. In good years it may be cut from two to three times, and yields an enormous amount of hay. The great trouble experienced by some arises from their neglect to cut it at the proper stage of growth. It ought never to be allowed to go to seed before cutting, as it is then too hard and woody for good hay, but it should be cut when from 2 to 3 feet high, when it makes a palatable, nutritious hay, of which all kinds of stock are very fond. The great and only objection to the grass is, that when it once "takes hold" it can never be eradicated, and, unless great care is taken, it spreads rapidly. It is the earliest grass to make its appearance in the spring, and stock are very fond of it when young and tender.

**PROFITS ON HENS.**—A farmer of Maine reports his experience in keeping forty hens. He kept an accurate account of expenditure and receipts for one year, beginning in December. He says :

In the course of the year 2 died. On 14th of June, dressed and sold 26 hens for \$15.50. On 9th July, had 158 chickens. Lost 6 by hawks and 27 by fire, which left 125. Of this number, 40 were sold as poultry for \$39.68; also, one pair Black Cochins for \$6. Remaining on hand at end of year, 83—26 to make my stock of hens good, and 57 for which I would not take \$57. Number of eggs during the year, 257 dozen, sold for \$54.66. Total income, exclusive of loss, \$172.84. Total expense, \$70.36, leaving balance in favor of hens of \$102.48. No credit for eggs used in family, nor for the 27 chickens lost. Therefore, I consider it safe to account a clear profit of \$2.50 per head on the hens.

**INTER-DEPENDENCE OF AGRICULTURAL AND MANUFACTURING INTERESTS.**—That farmers and manufacturers are mutual producers and consumers—that is, that each is a consumer of the other's products—is quite plain. It ought to be equally plain that it is for their mutual advantage and profit that they be in juxtaposition. The cost of transportation between them is a tax on both, and it increases with the distance between them. If the price were fixed to the producer, whether of agricultural or mechanical products, then the cost to the consumer must increase with the distance between them; if the price were fixed to the consumer, then the profits to the producer must be diminished as the distance between them increases. As a matter of fact, the cost of intervening transportation is a tax which is divided between them, and this would still hold true were that cost reduced to its minimum. To transportation companies and middle-men distance may "lend enchantment to the view," but he is an unwise farmer who does not do all in his power to encourage manufacturers to locate beside him. A former correspondent of this department, who has emigrated from Indiana to Morgan County, Alabama, calls attention to the great disadvantage agriculture labors under in that section for the reason that it has hitherto been made the

exclusive industry. He says: "If ever a country needed manufactures this certainly does. Our wagons are shipped from Northern Indiana; plows, hoes, and even ax-handles, as well as every other manufactured article, come from the North, although the country abounds in the finest timber for manufacturing purposes."

**EGGS OF GRASSHOPPERS IN THE SOIL.**—Our correspondent in Martin County, Minnesota, reports: "Our people have been experimenting by taking a quantity of earth and placing it in boxes by the side of the stove, where, in about a week the grasshoppers hatch out; showing that the ground is full of eggs which the frosts of winter have not killed." But since the first freeze kills the young grasshoppers, he thinks there is a fair chance that those hatched in the course of nature, in the spring, may be destroyed in like manner.

**PEACH-GROWING IN DELAWARE.**—The secretary of the Lincoln Agricultural Association, Sussex County, Delaware, reports to this Department that during the season of 1873, 36,000 baskets of peaches were shipped from that county by Lincoln Station, and 300,000 by the Junction and Breakwater Railroad, in addition to shipments, not reported, by another road through the county.

**RESULT OF SEED DISTRIBUTION.**—Our former correspondent in Union County, South Carolina, reports that, as the result of the introduction into that county by this Department, through him, of four quarts of Tappahannock wheat, that variety has now come into general use, and is regarded as the best produced. He also represents that the turnip-crop and several varieties of garden-products have been much improved in consequence of the distribution of new varieties of seeds which were first obtained from the Department and tested on a small scale.

**MINERALS IN SOUTH CAROLINA.**—Mr. Charles Petty, for the past eight years our correspondent in Union County, South Carolina, has recently taken charge of a female seminary at Limestone Springs, Spartanburgh County. He reports that the seminary building rests on the bed of marble from which the "South Carolina block" in the Washington monument was taken. He adds that blue limestone and iron-ore are abundant in that locality, and that a "flexible sandstone" and lead in unknown quantity exist there.

## MARKET-PRICES OF FARM-PRODUCTS.

The following quotations represent the state of the market, as nearly as practicable, at the beginning of the month.

Articles.	Prices.	Articles.	Prices.
NEW YORK.		NEW YORK—Continued.	
Flour, superfine State . . . . per bbl.	\$5 60 to \$6 15	Rye . . . . . per bush.	\$0 98 to \$1 03
extra State . . . . . do.	6 35 to 6 70	Barley . . . . . do.	1 85 to —
superfine western . . . . do.	5 60 to 6 15	Corn . . . . . do.	80 to 88
extra to choice western,		Oats . . . . . do.	56 to 63
per barrel . . . . .	6 25 to 11 00	Hay, first quality . . . . per ton.	24 00 to 25 00
common to fair southern		second quality . . . . do.	21 00 to 23 00
extra, per barrel . . . .	6 40 to 7 25	Beef, mess . . . . . per bbl.	10 00 to 11 50
good to choice southern,		extra mess . . . . . do.	12 50 to 13 50
per barrel . . . . .	7 30 to 11 00	Pork, mess . . . . . do.	— to 16 75
Wheat, No. 1 spring . . . . per bush.	1 57 to 1 62½	extra prime . . . . . do.	14 00 to 14 50
No. 2 spring . . . . . do.	1 50 to 1 56½	prime mess . . . . . do.	14 75 to 15 75
winter, red, western, do.	1 58 to 1 65	Lard . . . . . per lb.	9½ to 10
winter, amber, western,		Butter, western . . . . do.	30 to 38
per bushel . . . . .	1 66 to 1 68	State dairy . . . . . do.	35 to 45
winter, white, western,		Cheese, State factory . . . do.	15 to 16½
per bushel . . . . .	1 50 to 1 90	western factory . . . . do.	13 to 16

## Market-prices of farm-products—Continued.

Articles.	Prices.	Articles.	es.
<b>NEW YORK—Continued.</b>		<b>PHILADELPHIA—Continued.</b>	
Cotton, ordinary to good ordinary, per pound.....	\$0 12½ to \$0 15½	Pork, mess.....do.....	\$16 50 to \$17 00
low middling to good middling, per pound.....	15½ to 18½	prime mess.....do.....	16 00 to —
Sugar, fair to good refining per lb. prime refining.....do.....	7 4-10 to 7½	prime, extra.....do.....	14 50 to —
Tobacco, lugs.....do.....	44 to 64	Lard.....per lb.....	9½ to 12½
common to medium leaf, per pound.....	64 to 84	Butter, choice middle State.....do.....	40 to 44
Wool, American XXX and picklock.....per lb.....	62 to 70	choice western.....do.....	35 to 42
American X and XX.....do.....	45 to 60	Cheese, N. Y. factory.....do.....	16½ to 17½
American combing.....do.....	52 to 60	Ohio factory.....do.....	15 to 16½
pulled.....do.....	25 to 33	Sugar, fair to good refining.....do.....	7½ to 7½
California spring clip.....do.....	13 to 35	Cotton, ordinary to good ordinary.....per lb.....	12½ to 15
California fall clip.....do.....	20 to 27	low middling to good middling.....per lb.....	16 to 17½
Texas.....do.....	23 to 35	Wool, Ohio X and XX.....do.....	55 to 57
		Ohio combing.....do.....	— to 65
		pulled.....do.....	46 to 50
		unwashed, clothing and combing.....per lb.....	37 to 45
<b>BOSTON.</b>		<b>BALTIMORE.</b>	
Flour, superfine western.....per bbl.....	5 50 to 6 00	Flour, superfine.....per bbl.....	5 00 to 5 50
western extras.....do.....	6 25 to 8 00	extra.....do.....	6 50 to 8 00
western choice.....do.....	8 50 to 10 00	family and fancy.....do.....	8 25 to 10 50
southern extras.....do.....	6 25 to 6 75	Wheat, white, fair to choice, per bushel.....do.....	1 60 to 1 85
choice Baltimore.....do.....	9 00 to 10 00	amber.....per bush.....	1 60 to 1 80
Wheat.....per bush.....	1 50 to 1 85	red.....do.....	1 50 to 1 60
Rye.....do.....	1 10 to 1 12	Rye, common to prime.....do.....	85 to 89
Barley.....do.....	1 75 to 2 15	Corn, white southern.....do.....	80 to 84
Corn.....do.....	89 to 93	yellow southern.....do.....	80 to 83
Oats.....do.....	60 to 66	Oats, southern.....do.....	61 to 66
Hay, eastern and northern per ton.....	24 00 to 25 00	western.....do.....	59 to 63
western choice.....do.....	24 00 to 25 00	Hay, Pennsylvania.....per ton.....	17 00 to 20 00
Beef, western mess.....per bbl.....	13 00 to 14 00	Maryland.....do.....	16 00 to 20 00
western mess extra.....do.....	16 75 to 17 00	western.....do.....	16 00 to 20 00
Pork, prime.....do.....	14 50 to 15 00	Beef, Baltimore mess.....per bbl.....	15 00 to 20 00
mess.....do.....	14 50 to 15 00	extra.....do.....	23 00 to 25 00
Lard.....per lb.....	9½ to 10½	Pork, mess.....do.....	16 50 to 16 75
Butter, N. Y. and Vt.....do.....	33 to 39	Lard.....per lb.....	9½ to 10½
western.....do.....	30 to 38	Butter, western.....do.....	28 to 38
Cheese, N. Y. and Vt. factory.....do.....	15 to 17	eastern.....do.....	35 to 42
western factory.....do.....	14 to 16½	Cheese, eastern cutting.....do.....	16½ to 17
Sugar, fair to good refining.....do.....	7½ to 7½	western cutting.....do.....	16½ to 17
Tobacco, lugs.....do.....	6½ to 8	Sugar, fair to good refining.....do.....	7½ to 7½
common to medium leaf.....per lb.....	8½ to 10	Tobacco, lugs.....per cental.....	5 00 to 7 00
Cotton, ordinary to good ordinary.....per lb.....	13 to 15½	common to medium leaf per cental.....do.....	7 00 to 8 00
low middling to good middling.....per lb.....	16 to 18½	Cotton, ordinary to good ordinary.....per lb.....	13 to 14½
Wool, Ohio and Pa.....do.....	50 to 60	low middling to middling.....per lb.....	15½ to 16½
Michigan.....do.....	45 to 53	Wool, fleece, common to fine.....do.....	45 to 50
other western.....do.....	44 to 52	tub.....do.....	55 to 60
pulled.....do.....	25 to 55	unwashed.....do.....	35 to 38
combing fleece.....do.....	60 to 64	pulled.....do.....	35 to 40
California.....do.....	17 to 36		
Texas.....do.....	20 to 37		
<b>PHILADELPHIA.</b>		<b>CINCINNATI.</b>	
Flour, superfine.....per bbl.....	5 00 to 5 35	Flour, superfine.....per bbl.....	5 00 to 5 50
Pa. extra.....do.....	— to 6 37½	extra.....do.....	6 35 to 6 60
Pa. family and fancy.....do.....	7 50 to 8 00	family and fancy.....do.....	6 70 to 8 00
western extra.....do.....	6 37½ to 7 50	Wheat, red winter.....per bush.....	1 37 to 1 40
western family.....do.....	7 50 to 8 75	hill winter.....do.....	1 43 to 1 47
Wheat, winter, red.....per bush.....	1 58 to 1 64	white winter.....do.....	1 45 to 1 50
winter, amber.....do.....	1 70 to 1 76	Rye.....do.....	1 03 to 1 05
winter, white.....do.....	1 85 to 1 92	Barley.....do.....	1 45 to 1 70
spring.....do.....	1 48 to 1 52	Corn.....do.....	63 to 69
Rye.....do.....	95 to —	Oats.....do.....	50 to 57
Barley.....do.....	1 75 to 1 90	Hay, baled, No. 1.....per ton.....	13 00 to 15 00
Corn.....do.....	81 to 84	lower grades.....do.....	9 00 to 12 00
Oats.....do.....	58 to 65	Beef, plate.....per bbl.....	14 00 to —
Hay, fresh baled.....per ton.....	22 00 to 24 00	Pork, mess.....do.....	16 00 to 16 25
common to fair shipping.....do.....	20 00 to 22 00	Lard.....per lb.....	9½ to 9½
Beef, western mess.....per bbl.....	8 00 to 10 00	Butter, choice.....do.....	36 to 40
extra mess.....do.....	9 00 to 12 00	prime.....do.....	34 to 36
Warthman's city family.....do.....	16 00 to —	Cheese, factory.....do.....	16½ to 17
		pine-apple.....do.....	— to —

## Market-prices of farm-products—Continued.

Articles.	Prices.	Articles.	Prices.
CINCINNATI—Continued.		SAINT LOUIS—Continued.	
Sugar, N. O., fair to good . . . . .	\$0 8½ to \$0 9	Sugar, N. O., common to fine . . . . .	— to —
prime to choice . . . . .	9½ to 9¾	prime to choice . . . . .	— to —
Tobacco, lugs . . . . .	6 to 15	Cotton, ordinary to good ordi-	
leaf . . . . .	8 to 26½	nary . . . . . per lb.	\$0 11½ to \$0 13½
Cotton, ordinary to good ordi-		low middling to good	
nary . . . . . per lb.	12 to 14	middling . . . . . per lb.	15 to 16½
low middling to good mid-		Wool, tub-washed . . . . .	51 to 53
dling . . . . . per lb.	15 to 17	unwashed, combing . . . . .	30 to 35
Wool, fleece-washed, common to		fleece . . . . .	40 to 46½
fine . . . . . per lb.	45 to 47		
tub-washed . . . . .	48 to 50	NEW ORLEANS.	
unwashed, clothing . . . . .	30 to 32	Flour, superfine . . . . . per bbl.	4 75 to —
unwashed, combing . . . . .	33 to 35	extra . . . . .	5 25 to 6 75
pulled . . . . .	35 to 38	choice to fancy . . . . .	7 25 to 9 50
		Corn, white . . . . . per bush.	75 to 76
CHICAGO.		yellow . . . . .	80
Flour, white winter, fair to good,		Oats . . . . .	62 to 65
per barrel . . . . .	7 00 to 8 00	Hay, choice . . . . . per ton	21 00 to 22 00
Flour, white winter, choice, per		prime . . . . .	17 00 to 19 00
barrel . . . . .	8 50 to 9 25	Beef, Texas . . . . . per bbl	12 00 to —
Flour, red winter . . . . . per bbl.	5 50 to 7 00	Philadelphia . . . . .	16 60 to 16 25
medium to fancy spring extra,		Fulton market . . . per half bbl.	12 00 to —
per barrel . . . . .	5 75 to 6 75	western . . . . .	9 00 to 9 25
spring superfine . . . . . per bbl	3 00 to 4 75	Pork, mess . . . . .	16 87½ to 17 00
Wheat, No. 1 spring . . . . .	1 25 to —	Lard . . . . . per pound.	9 to 10½
No. 2 spring . . . . .	1 19 to 1 22½	Butter, choice Goshen . . . . .	45 to 46
No. 3 spring . . . . .	1 17 to —	western . . . . .	33 to 38
Corn, No. 2 . . . . .	5½ to 6¾	Cheese, choice western fac-	
Oats, No. 2 . . . . .	42½ to 48	tory . . . . .	17 to —
Rye, No. 2 . . . . .	90 to 93	N. Y. cream . . . . .	19 to 20
Barley, No. 2 . . . . .	1 52 to —	Sugar, fair to full fair . . . . .	7 to 7½
Hay, timothy . . . . . per ton.	10 50 to 14 00	prime to strictly	
prairie . . . . .	8 00 to 10 00	prime . . . . .	7½ to 7¾
Beef, mess . . . . . per bbl.	8 75 to 9 00	clarified, white and	
extra mess . . . . .	9 75 to 10 00	yellow . . . . .	9 to 9½
Pork, mess . . . . .	15 00 to 15 50	Cotton, ordinary to good ordi-	
prime mess . . . . .	13 00 to 13 25	nary . . . . .	12½ to 14½
extra prime . . . . .	11 75 to 12 00	low middling to good	
Lard . . . . . per cental.	9 20 to 9 22½	middling . . . . .	15½ to 17½
Butter, choice to fancy . . . . .	36 to 40	Tobacco, lugs . . . . .	4½ to 5½
medium to good . . . . .	32 to 34	low leaf to medium	
Cheese, N. Y. factory . . . . .	17 to 18	leaf . . . . .	5½ to 8
Ohio and western fac-		Wool, lake . . . . .	nominal.
tory . . . . . per lb.	16 to 17		
Sugar, N. O., prime to choice . . .	9 to 9½	SAN FRANCISCO.	
common to fair . . . . .	7½ to 8½	Flour, superfine . . . . . per bbl.	4 50 to 5 00
Wool, tub-washed . . . . .	48 to 55	extra . . . . .	5 25 to 5 50
fleece-washed . . . . .	36 to 48	family and fancy . . . . .	5 75 to 6 00
unwashed . . . . .	25 to 32	Wheat, California . . . per cental.	1 90 to 2 00
pulled . . . . .	35 to 40	Oregon . . . . .	1 90 to 2 00
		Barley . . . . .	1 55 to 1 75
SAINT LOUIS.		Oats . . . . .	1 60 to 1 80
Flour, spring . . . . . per bbl.	— to —	Corn, white . . . . .	1 65 to 1 70
winter . . . . .	5 20 to 8 50	yellow . . . . .	1 65 to 1 70
Wheat, red winter . . . . . per bush.	1 30 to 1 51	Hay, state . . . . . per ton	16 00 to 18 50
white winter . . . . .	— to —	Beef, mess . . . . . per bbl.	8 50 to 9 00
spring . . . . .	1 23 to 1 26	family mess . . . . . half bbl	9 00 to 10 00
Corn . . . . .	60½ to 63½	Pork, mess . . . . . per bbl.	17 00 to 17 50
Rye . . . . .	98 to —	prime mess . . . . .	16 50 to 17 50
Oats . . . . .	50 to 55	Lard . . . . . per lb.	10 to 13
Barley . . . . .	1 30 to 1 72½	Butter, overland . . . . .	15 to 25
Hay, timothy . . . . . per ton	13 50 to 21 00	California . . . . .	30 to 35
Beef, prime mess . . . . . per bbl.	— to —	Oregon . . . . .	15 to 20
mess . . . . .	13 00 to —	Cheese . . . . .	15 to 18
extra mess . . . . .	— to —	Wool, native . . . . .	14 to 16
Pork, mess . . . . .	15 50 to 16 25	California . . . . .	16 to 22
Lard . . . . . per lb.	8½ to 9½	Oregon . . . . .	16 to 22
Butter, choice . . . . .	32 to 34		
inferior grades . . . . .	20 to 30		
Cheese, Ohio and N. W. fac-			
tory . . . . . per lb.	16 to 17		
N. Y. factory . . . . .	16 to 17		

## LIVE-STOCK MARKET.

Articles.	Value.	Articles.	Value.
NEW YORK.		CHICAGO—Continued.	
Cattle, extra beeves.....per cental.	\$12 75 to \$13 00	Cattle, choice beeves, 3 to 5 years old, 1,250 to 1,450 pounds, per cental.....	\$5 65 to \$6 00
good to prime.....do.....	— to 12 50	good beeves, 1,200 to 1,300 pounds.....per cental.	5 25 to 5 60
common to fair.....do.....	10 00 to —	medium grade, 1,150 to 1,300 pounds.....per cental.	5 00 to 5 25
milch-cows.....per head.	35 00 to 80 00	lower grades, natives, per cental.....	3 20 to 5 00
calves.....per cental.	6 50 to 10 50	Texans, choice corn-fed, per cental.....	4 50 to 5 25
Sheep, good to extra.....do.....	7 25 to 9 25	Texans, North wintered, per cental.....	3 75 to 4 25
Swine, common to fair.....do.....	5 50 to 6 00	Texans, through-droves, per cental.....	2 75 to 3 50
BOSTON.		milch-cows.....per head.	— —
Cattle, choice.....per cental.	7 25 to 7 50	veal calves.....do.....	— —
extra.....do.....	6 50 to 7 00	Sheep, poor to medium, per cental.	5 50 to 6 50
first quality.....do.....	5 50 to 6 00	good to choice.....do.....	7 25 to 8 12½
second quality.....do.....	4 50 to 5 00	Swine, good to extra.....do.....	5 55 to 6 15
third quality.....do.....	— to 4 00	inferior to medium.....do.....	5 10 to 5 45
working oxen.....per pair.	100 00 to 250 00	SAINT LOUIS.	
milch-cows with calves, per head.....	35 00 to 95 00	Cattle, choice native steers, 1,300 to 1,600 pounds, per cental.....	6 00 to 6 25
yearlings.....per head.	10 00 to 18 00	prime second class, 1,150 to 1,400 pounds, per cental.....	5 50 to 5 75
Sheep, extra.....do.....	5 25 to 7 25	good third grade, 1,050 to 1,300 pounds.....per cental.	4 25 to 4 75
inferior grade.....do.....	3 00 to 4 75	fair butchers' steers, 1,000 to 1,200 pounds, per cental.....	4 50 to 4 75
Swine.....per cental.	6 25 to 6 50	inferior native grades, per cental.....	2 75 to 4 50
PHILADELPHIA.		Texans and Cherokees, corn-fattened, per cental.	3 50 to 4 00
Cattle, common to choice, per cental.....	4 50 to 7 75	inferior.....per cental.	2 00 to 3 00
Sheep, common to choice, per cental.....	6 00 to 8 62½	Sheep.....do.....	2 50 to 5 60
Swine, corn-fed.....per cental.	8 59 to 9 00	Swine.....do.....	5 00 to 5 25
BALTIMORE.		Horses, plug.....per head.	30 00 to 60 00
Cattle, best beeves.....per cental.	6 25 to 7 12	street-car horses.....do.....	80 00 to 90 00
first quality.....do.....	5 25 to 6 25	good work-horses.....do.....	85 00 to 100 00
medium.....do.....	4 75 to 5 25	driving-horses.....do.....	100 00 to 140 00
ordinary.....do.....	3 12 to 4 75	heavy draught.....do.....	125 00 to 165 00
general average.....do.....	5 87 — —	Mules, 14 to 15 hands high.....do.....	50 00 to 100 00
most of the sales between.....per cental.	5 50 to 6 50	15 to 16 hands high.....do.....	115 00 to 165 00
Sheep.....do.....	4 50 to 8 50	extra.....do.....	150 00 to 200 00
Swine, corn-fed.....do.....	8 00 to 8 37½	NEW ORLEANS.	
CINCINNATI.		Cattle, Texas beeves, choice, per head.....	40 00 to 55 00
Cattle, good to prime butchers' steers.....per cental.	5 25 to 5 75	first quality.....per head.	35 00 to 40 00
common to good medium, per cental.....	3 50 to 5 00	second quality.....do.....	20 00 to 28 00
milch-cows.....per head.	30 00 to 60 00	western beeves, per cental.	10 00 to 12 50
Sheep, common.....per cental.	4 50 to 5 50	milch-cows.....per head.	35 00 to 100 00
good to prime butchers', per cental.....	5 50 to 7 00	calves.....do.....	7 00 to 10 00
Swine, shipping grades, per cental.....	5 25 to 5 90	Sheep, first quality.....do.....	4 00 to 5 00
good to prime butchers', per cental.....	6 10 to 6 20	second quality.....do.....	3 00 to 4 00
CHICAGO.		Swine.....per cental.	5 00 to 7 00
Cattle, extra graded steers, 1,400 to 1,500 pounds, per cental.....	6 15 to 6 50		

## FOREIGN MARKETS.

WHEAT.—The month of March, in Europe, was generally mild, with, however, a wintry reaction which pervaded the whole continent about the middle of the month. Ice re-appeared at Odessa and at many other points. This was followed by more seasonable weather. These variations created considerable sensitiveness in the markets. Advices from the United Kingdom still indicate short supplies and an anxious outlook to the coming harvest. Weekly deliveries in March show an average falling off, as compared with last year, of 5,667 quarters, the deficiency of January and February amounting to 400,000 quarters. To supply bread to the British nation till the end of August, nearly 7,000,000 quarters will be required, or nearly half the reported stocks at New York and other great supply markets. French farmers have sold out their stock with unusual closeness, and the wants of Southern Europe will probably divert early deliveries of the next harvest from the United Kingdom. The weekly imports of foreign wheat during the four weeks ending March 21, respectively, were as follows: 1,120,694 quarters, 800,764 quarters, 910,533 quarters, and 639,537 quarters. The London averages during the third week of March were 64s. 11d. on 1,533 quarters. The wheat-trade of France shows an upward tendency. In Paris, California brought 68s. 9d. per quarter, American red winter 63s. 6d.; spring ditto, 62s. In Mark Lane, London, Essex, and Kent, new white brought from 53s. to 66s. per quarter; ditto red, 55s. to 62s.; Norfolk, Lincolnshire, and Yorkshire, new red, 55s. to 60s. Of foreign wheats, Dantzic, mixed, was quoted 58s. to 69s.; Königsberg, 58s. to 68s.; Rostock, 61s. to 67s.; Silesian red, 56s. to 57s.; ditto white, 61s. to 63s.; Pomerania, Mecklenburgh, and Uckermark, red, 58s. to 60s.; Russian hard, 52s. to 55s.; Danish and Holstein, red, 58s. to 60s.; American, 55s. to 57s.; Chilean, white, 62s.; California, 65s.; Australian, 67s. to 69s.

In Liverpool, American white was quoted at 12s. 6d. to 12s. 9d. per cental; red winter and southern, 12s. to 12s. 2d.; No. 1, spring, 12s. to 12s. 6d.; Canadian white, 12s. 9d. to 13s.; ditto red, 12s. to 12s. 2d.; California white, 12s. 6d. to 13s.; Chilean, 12s. to 12s. 2d.; Australian, 14s.; Spanish white, 12s. 2d. to 12s. 5d.; Danubian, 7s. to 9s.; Ghirka, 11s. 6d. to 12s.; Egyptian, 10s. to 12s. 2d.

FLOUR.—The third week in March opened, in London, upon moderate supplies, both of English and foreign flour, yet the trade was quite slow upon English samples at the prices of the previous week. In foreign flour prices were unchanged, but the demand was less urgent. The Paris market collapsed 4 francs per 157 kilograms on flour for consumption, the range being from 48s. to 49s. 4d. per 280 pounds. In Mark Lane, London, the best town households brought from 50s. to 57s. per sack of 280 pounds; best country households, 44s. to 46s.; Norfolk and Suffolk, 38s. to 43s.; American, per barrel, 28s. to 29s.; extra, 29s. to 31s. In Liverpool English and Irish superfines were quoted at 44s. to 45s. 6d. per 280 pounds; extra ditto, 45s. 6d. to 50s.; French, 56s. to 60s.; Spanish, 49s. to 52s. 6d.; Trieste and Hungarian, 66s. to 78s.; Chilean and Californian, 46s. to 52s.; American, Western States, per 196 pounds, 30s. to 32s.; extra State, 31s. to 33s.; Baltimore and Philadelphia, 30s. to 32s.; Ohio, 31s. to 35s.; Canadian, 33s. to 37s.

MAIZE.—In Mark Lane, London, white is quoted at 40s. to 44s. per quarter; yellow, 37s. to 40s. In Liverpool American white brought 40s. to 40s. 6d. per 480 pounds; ditto yellow, 40s.; Danubian, 38s. to 38s. 6d.; Galatz, 40s.

MONTHLY REPORT

OF THE

DEPARTMENT OF AGRICULTURE

FOR

JUNE, 1874.



WASHINGTON:  
GOVERNMENT PRINTING OFFICE.  
1874.





# MONTHLY REPORT.

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DEPARTMENT OF AGRICULTURE,  
*Statistical Division, June 18, 1874.*

SIR: I present herewith a digest of the returns of the regular corps of statistical correspondents for June; a brief view of the proceedings of the National Agricultural Congress; some statistics of the German Empire; and other current official matter.

J. R. DODGE,  
*Statistician.*

Hon. FREDERICK WATTS,  
*Commissioner.*

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## DIGEST OF THE JUNE RETURNS.

### WHEAT.

The breadth of wheat, both winter and spring, has been increased. The indicated aggregate increase is 107 per cent. Combining fall and spring sown, the area in comparison with last year in each State is thus indicated: Maine, 90; New Hampshire, 92; Vermont, 95; Massachusetts, 89; Connecticut, 100; New York, 100; New Jersey, 99; Pennsylvania, 103; Delaware, 101; Maryland, 103; Virginia, 103; North Carolina, 106; South Carolina, 108; Georgia, 115; Alabama, 107; Mississippi, 150; Texas, 135; Arkansas, 149; Tennessee, 120; West Virginia, 102; Kentucky, 109; Ohio, 103; Michigan, 103; Indiana, 106; Illinois, 109; Wisconsin, 103; Minnesota, 100; Iowa, 110; Missouri, 111; Kansas, 123; Nebraska, 116; California, 110; Oregon, 115.

The reduction of acreage in Vermont and elsewhere in New England is owing to the lingering of winter in the lap of spring, which caused a portion of the land intended for wheat to be planted in other crops. The increase of area in the South is due to a realization of the necessity of growing home-supplies on the part of a few planters. The remunerative prices of the past year have had a stimulating effect on grain-growing in the West.

The condition of wheat is better than the average of a series of years. In Vermont, Massachusetts, and Connecticut, spring-wheat looks well, slightly better than in the remaining New England States. In New York, the depreciation in condition is 10 per cent. The effect of frost in clay soils could not be utterly overcome by subsequent favorable weather. In Seneca County, late-sown wheat was nearly ruined and has been largely plowed up or intersown with other grain. Recent rains are improving the prospect in this State. In the remaining Middle States, and in all the Southern States, except Mississippi and Texas, the condition of wheat is represented by figures ranging from 104 in South

Carolina to 119 in Tennessee. These figures would be still higher but for occasional injury from floods or too heavy rains in April, and rust in May and June. In some instances rust has attacked the stalk and destroyed the heads, but generally is confined to the leaves. In North Carolina, depredations of the chinch-bug are reported. While the average in Texas is not high, the quantity of wheat produced will be largely in excess of former supplies, and in some counties the yield informally reported is very high, 20 bushels per acre being the estimate for Dallas, and 20 to 25 for Hood. In one instance, in Prairie County, Arkansas, a field yielding 40 bushels per acre in prairie-sod is reported. The crop will be heavy in Tennessee. The varieties sent from the Department have generally, though not in every instance, given great satisfaction; our correspondent in Sullivan County, Tennessee, reports 59 stalks from one kernel of Fultz wheat.

In West Virginia and in all the Northwestern and Pacific States an increased acreage is reported. In West Virginia wheat, in some quarters, stands drought better than any other crop. Several counties anticipate the finest crop for years. In Russell, Ky., rust has spoiled a splendid crop; in some other counties drought has prevented the filling of the grain, but the general condition is 25 per cent. above average. North of the Ohio River the crop was considerably winter-killed. The chinch-bug is reported as injurious in some counties of Illinois and Wisconsin. The prospect is below average in all these States except Illinois, which reports winter-wheat 117 and spring-wheat 108. In some counties of Minnesota there is a tendency to introduce winter-wheat. The grasshopper is at work in Steele and Faribault Counties. In Iowa, Missouri, and Kansas the chinch-bug is threatening extensive injuries; otherwise the crop is generally very promising. The dry weather in some localities has greatly shortened the straw, but the heads were filling rapidly. In Wilson, Kansas, chinch-bugs were more destructive on upland crops. The Tappahannock and Fultz wheats are generally well reported. The Touzelle succeeds in some cases; in others it is a complete failure. Dry weather in the fall reduced a superior prospect of winter-wheat in Nebraska to about average; spring-wheat is reported at 109. On the Pacific coast there has been a considerable increase in acreage; the condition is above average. In Del Norte, California, the Fultz, Tappahannock, and White Surrey varieties have lately been tried, with excellent results, the Tappahannock being the special favorite. In some localities excessive rains have injured the crops, but the conditions of growth are generally favorable.

#### RYE.

In most of the States the acreage in winter-rye is fully equal to or surpasses that of last year. The comparative aggregate area is 101. A remarkable increase, 50 per cent., is found in Nebraska, and 20 per cent. in Vermont. The States reporting a decrease are Rhode Island, New York, Pennsylvania, Virginia, South Carolina, Tennessee, West Virginia, Kentucky, Ohio, Indiana, Illinois, Wisconsin, Minnesota, and Missouri. The condition of the crop is below average in all the New England States except Connecticut, and also in New York, Pennsylvania, Virginia, South Carolina, Florida, Mississippi, Texas, Ohio, Michigan, Indiana, and Wisconsin. The maximum, 115, is in Nebraska; the minimum, 80, in Vermont. In the Northwest the crop, in several counties, was greatly injured by the chinch-bug. In some parts of Pennsylvania the yield is annually lessening. In some counties of Virginia, on the other hand, the prospect is better than for years.

## OATS.

The breadth of oats is increased 2 per cent. The States reporting the same area as last year are—Maine, New Hampshire, Rhode Island, Delaware, Tennessee, West Virginia, Illinois, Nebraska, Oregon. Those showing an increase—Alabama, Iowa, 1 per cent.; Florida, 2; Wisconsin, 3; Minnesota, 4; Vermont, Ohio, Michigan, 5; North Carolina, 106; Indiana, 107; Louisiana, 110; Arkansas, 114; South Carolina, 116; Texas, 117; Georgia, 125. Those indicating decrease—California, 5 per cent.; Massachusetts, 4; Connecticut, New York, 3; New Jersey, Missouri, 2; Maryland, Virginia, Kentucky, 1.

The condition of the crop is slightly below average. The only States not showing inferior averages are Massachusetts, 100; California, 102; Vermont, 104; North Carolina, Texas, 105; Nebraska, 106. The Western States range from 91 in Wisconsin to 98 in Illinois.

Almost the only variety of oats successfully grown in the South is the "red rust-proof," which has been cultivated twenty years in a single locality without rusting. The testimony is general, almost universal, to its exemption from rust. In a few cases some signs of rust are reported. Drought in May, after long-continued rains in April, has been a prominent cause of inferior condition.

## COTTON.

It is evidently much easier to increase the cotton-acreage than to reduce it. The exceedingly unpropitious season for planting, aided by the counsels of Patrons of Husbandry to produce needed home-supplies and be independent, has scarcely sufficed to reduce the breadth of cotton to that occupied in 1872. Our correspondents have been urged to exercise extreme care in their estimates, and their returns cover the larger portion of the area producing cotton. The result of accurate calculations of State-averages from such data is as follows, the comparison being with the area of 1873: North Carolina, 89; South Carolina, 91; Georgia, 90; Florida, 91; Alabama, 86; Arkansas, 89; Tennessee, 92; Mississippi, 88; Louisiana, 80; Texas, 102; Missouri, 75. The aggregate reduction slightly exceeds 10 per cent.

The condition of the crop is represented by the following figures, 100 being normal or fair condition: North Carolina, 89; South Carolina, 81; Georgia, 80; Florida, 90; Alabama, 82; Mississippi, 78; Louisiana, 70; Texas, 90; Arkansas, 90; Tennessee, 85. The report of condition in June, 1873, is more favorable in every State except Texas, the record standing as follows: Virginia, 93; North Carolina, 85; South Carolina, 88; Georgia, 94; Florida, 102; Alabama, 93; Mississippi, 92; Louisiana, 94; Texas, 86; Arkansas, 92; Tennessee, 90.

The season has been remarkable for heavy and frequent rains during the month of April throughout the cotton States. In some sections the aggregate reported exceeds 16 inches. All rivers, creeks, and "spring branches" even, overflowed their banks, destroyed the plants, and prevented germination on newly-planted lands. In the more southern belt replanting was general both on bottoms and uplands. From the first week in May to its close drought was almost universal. The soil was afterward baked by the hot sun, retarding cultivation and preventing growth. The stand is therefore very poor, many plants not having made their appearance on the 1st of June.

Since the last of May light showers have been general and prospects

are much improved. Fields are much cleaner than at this date last year, and can easily be kept free from weeds. With favorable weather, rapid improvement is certain and a fair comparison with July quite probable at the next report.

The returns are so similar in tenor that unnecessary repetition in extracts will be avoided. In North Carolina the complaint is general of slow germination, on account of cool, dry weather. The soil has been cloddy, rendering cultivation difficult and imperfect. The stand is better in States farther south, where planting was general before the April rains. In some counties the plant has come up quite evenly. In Greene County the stand is the best for several years. There was a frost in Craven on the 9th of May sufficient to kill cotton. The improvement has been very satisfactory during this month and the last week of May. Fields are generally chopped out reasonably clean, and in good condition to make the most of growing weather.

The stand in South Carolina is not uniform in different localities, and there is wide difference in reports of condition. Rains in May brought up replanting in Edgefield, and late seeding has been successful in Georgetown, on the coast. The stand is poor in Union, Beaufort, Barnwell, Chester, York, and Richland. In Laurens one-fourth of the spaces were unfilled on the 1st of June; plants were dying out in Newberry; in York the cotton planted since May 4 was not half up; and there was the worst stand for years in Marlborough. The crop is late, but promising, in Marion. Early planting was injured by cold rains and frost, especially that of April 29.

The reports from Georgia are full of complaints of the drowning-out of cotton in April by overflow of bottoms and saturating and packing the soil of uplands, making replanting generally necessary. These rains continued till about the 5th of May, ceasing then entirely, the ground becoming so dry that new seed germinated very slowly, and in some cases not until the coming of the showers of June, if at all. There was some difficulty in obtaining seed to plant, and some of that used may have been deficient in vitality. Some plants came up freely, and afterward withered and died. It would have been better, in the opinion of some correspondents, not to have planted till May. The planters have been incessant in efforts to repair damages and secure the required area in culture. The quantity of commercial fertilizers used in Georgia this year is evidently less than for several years past, and labor is somewhat cheaper. The later reports are more promising; seasonable showers, with increasing heat, has given the crop a start indicative of rapid improvement. Returns relative to cotton were received from fifty-nine counties of Georgia.

The stand is better in Florida than in neighboring States. The weather was mild until April, when cold rains became frequent, generally with high winds or hail. For a time the plants felt the effects of these unfavorable changes, but have largely recovered, and now begin to look quite promising. Some correspondents say there is *talk* about increase of supplies and decrease of cotton, but think there will be little change. In Madison there is less cotton and also less corn. With an absence of worms and equinoctial gales, or similar causes of loss, correspondents are hopeful of a good harvest. Much of the first planting was destroyed by floods and cold, saturating rains. The replanting was at first favored by dry weather, afterward retarded by continued drought, and the germination was very slow in the baked, indurated soil.

Mississippi reports conditions similar to those affecting the crop of Georgia and Alabama; the same rains in April, frost the last two nights

of that month, replanting, drought, and slow germination. In Lee, planting was not over on the first of June; in Marion planting was still in progress; so in many other countries. In Wilkinson, from January 1 to May 1, there were fifty-five days of rain, four of snow, and only two absolutely fair days. In Clark 16.7 inches of rain fell in April. The crop made very little show above ground until late in May, and chopping out was correspondingly delayed. As soon as showers came, and plowing and chopping out were finished, a new impetus was given to growth.

In Louisiana the overflow of the Mississippi overbore all other calamities. An immense area was submerged, and the crops totally destroyed. Some of the parishes were mostly under water. Our Madison correspondent reports "where the water left the land, it is so hard that it is impossible to plow." In the eastern part of State the overflow of the Pearl and Bogue Chitto Rivers caused much injury to plantations. In Saint Mary, two-thirds of the area was submerged; in Terre Bonne, more than one-half; in Richland, one-third. In the latter parish the rain-fall reported for April is 20 inches. The rain was so heavy in Iberia as to prostrate the plants and strip them of their leaves. The weather was very dry for a month subsequent to the 25th of April.

The crop is in better condition in Texas than elsewhere. The stand is more uniform, and the vicissitudes of the season less injurious. In some counties there is complaint of injury by wet weather. The growth is less advanced than usual, but the plant is generally healthy and the fields clean. Our correspondent in Austin says cotton is a surplus crop, supplies of other products being grown at home. The area planted is fully equal to last year, as might be expected from the constant immigration received from other States.

Arkansas has suffered much from the overflow of the Mississippi and tributary rivers. The rains in April and drought in May injured the crop in the uplands. Recent showers and sunshine have conspired to give new vigor to the plant, and the prospects are brightening.

The season has been very unpropitious for cotton in Tennessee. Little was planted till May, and in some places not a row had been worked on the 1st of June. There is much complaint of poor stands and unpromising appearance. Over 17 inches of rain in April fell in Knoxville.

## FRUITS.

The bloom of all orchard-fruits has been generally abundant. The frosts of April, especially those of the 29th and 30th, were not too early in the Southern States to be harmless. They proved exceedingly destructive to fruit-prospects throughout the entire region south of the thirty-ninth parallel and the Ohio River. There are exceptions in the vicinity of rivers and in other protected locations, but they are very few. Scarcely a southern county makes so positive a statement as Boone, Arkansas. "Almost every tree is loaded. Thousands of bushels of apples and peaches will doubtless rot in the orchards." A reduced yield is the nearly universal expectation, and many reports indicate less than a fourth of an average crop, and some scarcely a tenth. In cases where the germ escaped destruction by frost the young fruit is rapidly withering and falling off to a very discouraging extent.

In the Eastern States the bloom is generally quite full, but the fruit was not developed sufficiently to make a report of condition satisfactory. Reports from the fruit regions of Western New York, Ohio, Michigan, Missouri, Kansas, Texas, and California are variable, but of fully average promise. In Pennsylvania the prospect for fruit is

generally good. Increasing attention is paid to fruit culture in some portions of this State. It is stated that in Wyoming County "millions of fruit-trees and vines have been set out within the past fifteen years, and all are loaded with bloom and set with fruit." Fruit-culture is also attracting much attention throughout the South.

*Apples.*—The States reporting condition, average, or above, are as follows: Maine, Ohio, Indiana, Kentucky, Texas, 101; Rhode Island, New York, Minnesota, 103; Vermont, Illinois, Wisconsin, 104; Iowa, California, 105; Pennsylvania, Missouri, Nebraska, 106; Michigan, 107; New Jersey, 111; Massachusetts, Kansas, 118; Connecticut, 119. Those below average: Virginia, 59; Mississippi, 67; Louisiana, 75; North Carolina, 76; Georgia, 82; Alabama, 83; Delaware, 88; Tennessee, 90; Maryland, 92; Arkansas, West Virginia, 96; South Carolina, 97.

There is some complaint of injuries of insects in different portions of the country. "Caterpillars are more numerous than ever" in New London County, Connecticut, and very abundant in other sections of New England, and the pest is reported "in countless millions" in Ripley, Ind. In Decatur, Iowa, "the leaf-roller has taken nearly half the apples." The ravages of the measuring-worm are also reported. In Montgomery, Ala., a blight similar to that affecting pear-trees is injurious to apple-trees.

*PEACHES.*—The eastern peach-growing regions do not present very favorable reports of condition. The average for Delaware is but 60; that of Maryland, 61; and New Jersey is placed at 80. Mild weather in winter advanced the buds, and late frosts and sleet brought much injury throughout this belt. A report from Kent, Maryland, after the great April frost, stated that peaches would be abundant; but ten days later, after the occurrence of further frosts, our correspondent wrote that there would scarcely be a fourth of a crop—a full crop of Hale's Early, but scarcely any of Crawford's Early or Crawford's Late. Hale's Early has also measurably escaped in Caroline and Queen Anne. A similar injury of late frosts is reported from Wicomico and other peach counties. The reports concerning the Michigan peach-region are favorable, and the average for each of the States west of the Ohio is not less than 100. The Middle States, (excepting Pennsylvania,) Ohio, and all the Southern States east of the Mississippi, will have a comparatively small production this season. The destruction was caused by frost and hail. The storm of the 29th of April, which was of snow as far south as Washington and throughout the plateaus of the South, was peculiarly destructive to young fruit or its germs. A portion of Indiana and Illinois report excellent prospects. It is reported from Jasper County, Missouri, that seedlings are a failure, while budded trees bear half a crop. In orchards of Bourbon, Linn, and Wilson, Kansas, the leaf is curling and the fruit dropping. The past winter has proved very destructive to peach-trees in Oregon, especially those growing on a good soil, highly cultivated, and still worse on lands irrigated late in the season. In some localities in California the crop will be reduced by the effects of curled leaf and mildew.

*PEARS.*—The condition of the pear-crop is below average in nearly all the States east of the Mississippi, the principal exceptions being Southern New England, New Jersey, and Pennsylvania. The bloom was abundant, but frosts proved very destructive. In Queen Anne, Maryland, "all are gone except some Seckels and Duchesses." In Anderson, Kentucky, "a large part dropped off." In Montcalm, Michigan, "the trees are about all dead, the effect of the winter of 1872-'73"—a statement which is made elsewhere relative to peaches as well as pears. In

the vicinity of Concord, Massachusetts, the old favorite, the reliable Bartlett, has died out in considerable numbers, and many others are visibly declining in vigor.

**LOCAL STATISTICS OF FRUIT-GROWING.**—The following items of information concerning orchard interests are received from correspondents:

*Niagara, N. Y.*—The apple is our leading fruit, of which there has been sold from the county, in one year, 600,000 barrels. The export of apples in any considerable quantity commenced twenty-five years ago, and has steadily increased. There are thousands of trees of only a few years' growth, and many large orchards are now being put out. Thousands of trees in the county, from twelve to twenty years' growth, once in two years produce from three to seven barrels of apples, worth about \$2.50 per barrel in the orchard, including barrels. Older trees often exceed these figures. Peaches come next in order of importance. The early Crawford takes the lead of all other varieties. Pears claim considerable attention, and under favorable circumstances and judicious management are paying well. They bear very regularly, and bring from \$5 to \$8 per barrel. Quite a large amount of cherries and plums are sent off. Grapes are made a specialty by a few and with profitable returns.

*Baltimore, Md.*—A number of small vineyards are in a flourishing condition, varying in size from one acre to five, a few exceeding the latter number, and pay from \$300 to \$500 per acre. Apples are our main crop of fruit. Almost every farm has an apple orchard containing from 100 to 800 trees. The profit is in late-keeping fruit, in many instances paying better than cereals; the demand for good fruit is greater than the supply. With careful and judicious culture apple-orchards are paying from \$100 to \$200 per acre, the refuse not included, which is profitable to convert into cider and food for hogs. Pear-culture is receiving more attention lately, paying better than apples, paying from \$200 to \$300 per acre. Cherries are also a noted fruit, and profitable. The trees need no cultivation or manures, and are not expensive in any respect. From trees that bore from six to eight bushels per tree, the fruit has been sold at \$4 per bushel. The census of 1870 states the value of our fruit-crop at about \$103,200, the crop reported being a partial failure. The value of our marketable fruit in a favorable year is not less than \$200,000.

*Albany, N. Y.*—An apple-orchard of twelve acres in 1872 produced 3,000 barrels of apples, and \$90 worth of fruit was sold from three pear-trees in 1873.

*Steuben, N. Y.*—Of summer and autumn apples we cultivate the Early Joe, Early Strawberry Harvest, Tart Bough, Sweet Bough, Fall Pippin, Gravenstein, Hawley, Porter, Rambo. Winter-apples, in the order of their prominence, Baldwin, Northern Spy, King, Lucky Apple, Rhode Island Greening, Seek-no-further, Swaar, Wagoner, Russet. The number of bushels reported for 1873 was 492,327; cider, 22,116 barrels. Peaches are grown in some of our towns; more particularly in Pultney, Bath, Cohocton, and Corning. The varieties cultivated are: Early York, Early Crawford, Alberge, George IV, Tillotson. The first two are the most productive and profitable. The yield in 1873 was 5,697 bushels. Pears are grown along the shores of the Crooked Lake with profit. The Bartlett is the leading variety in yield and profit; six trees in this vicinity yielded, in 1873, 14 bushels, which sold at \$6 per bushel. The Flemish Beauty, Dix, Duchess d'Angouleme, Napoleon, and Seckel do well with us. The report for 1873 was 1,798 bushels. Grapes constitute a notable feature of our fruit-production. Several hundred acres of vineyards are cultivated in the towns of Pultney, Wayne, and Urbana, and the yield in 1873 reached the enormous amount of 3,000 tons, two-thirds of which were sold in New York and the balance made into wine and brandy. The yield per acre is from 1 to 2½ tons. One vineyard of five acres produced 12½ tons, which sold for \$1,500, but the usual net product is about \$125 per acre. A vineyard of Delaware grapes has netted for the last three years \$275 per acre. The Catawba and Isabella are deemed the standard varieties, and the Concord and Delaware the best early varieties.

*Tompkins, N. Y.*—The Duchess d'Angouleme, Bartlett, Virgalieu, Flemish Beauty, Seckel, Sheldon, Beurre d'Anjou, Vicar of Wakefield, Howell, Onondaga, Beurre Diel are a few of the many kinds of pears. I raised over 500 bushels upon 250 dwarf Duchess d'Angouleme trees, that occupied less than one acre of land, and which sold for over \$1,100, besides transportation and commission. The prospects this spring are as favorable for a large crop as one year ago.

*Burlington, N. J.*—J. S. Collins, of Moorestown, reports his strawberry-crop, on five acres, as averaging \$350 per acre; his raspberry-crop, five acres, averaging \$250 per acre; blackberry-crop very light. The above are gross receipts. Year before last his gross receipts from 75 acres of blackberries were \$22,500, or \$300 per acre. This last-named crop was not grown on his home farm, but on his farm in Camden County. The Park Cranberry Association, formed in the spring of 1865, and purchased 164 acres of cranberry-land in New Hanover Township, and proceeded at once to prepare the ground and plant cranberry-vines. The first season about 15 acres were planted,

and for the three or four following years a portion was planted each spring, until the quantity in vines amounted to about 90 acres. The expense was heavy and at times looked discouraging. The amount received from commission-merchants, each year, after they had deducted the charges for freight, cartage in the city, and their commissions, is as follows: for the crop of 1867, \$590; 1868, \$2,334.46; 1869, \$5,776.16; 1870, \$16,981.17; 1871, \$12,058.58; 1872, \$34,732.70. The crop of last year was a good one, amounting to over 10,000 bushels, but owing to the derangement in financial matters prices were low and the amount received was much below that of the preceding year.

William Parry, of Burlington County, New Jersey, writes: Strawberries are more extensively grown in this neighborhood than other fruits. The system adopted of covering the beds all over with stable-manures at the approach of winter has the most salutary effect; it protects the crowns of the plants from the bleak winds and severe weather; prevents the roots from being thrown out by alternate freezing and thawing; the strength of the manure penetrates the ground and supplies the roots with nourishment to produce an abundance of large berries. The principal objection urged against the practice, that the covering retards ripening the fruit, is now considered a gain, as it allows southern berries to disappear and there is a demand for fine strawberries something later.

*Eric, Pa.*—The lake-shore plain, from 30 to 100 feet above the level of the water and about two miles wide across our country, with a gradual rise of about 300 feet above the lake-level, has proved very prolific in the culture of the vine. The leading varieties are the Concord, Hartford Prolific, Ives's Seedling, Delaware, and Catawba. The Delaware is sometimes injured by frost in the fall, before ripening. The other varieties generally ripen well.

*Hillsdale, Mich.*—Our orchards range from 50 to 500 trees, more or less, many of them shipping from 50 to 400 barrels. One orchard (that of B. B. Willett's) produced 600 barrels; he has about 800 trees. Among the most prominent varieties raised here are the Russets, Swaar, Spitzenberg, Seek-no-further, Peck's Pleasant, Belmont, and Talman Sweet. Among the most prominent pear-orchards is that of H. B. Tucker, of Janesville, containing 1,300 trees, 400 in bearing—standard and dwarf. His principal varieties are Bartlett and Sheldon for standard, and Duchess, L. B. De Gersey, and Seckel for dwarf. Mr. Tucker has also the largest peach-orchard, I think, in the county, containing 2,000 trees eight years old, and a prospect now of a full crop. In 1872 he shipped 300 bushels, but last year was a failure.

*Washtenaw, Mich.*—Thomas Wood, of Pittsfield Township, from 1,000 Baldwin trees, thirteen years from setting, produced a net income of \$2,665 in 1872. The purchaser packed them and Mr. Wood picked them, and the culls more than paid for picking. Mr. Groves, of Northfield, in 1872, from 600 trees,  $\frac{2}{3}$  Baldwins,  $\frac{1}{3}$  Steele's Red, produced a net income of \$1,300 to \$1,400. Same man, in 1873, \$900 from same orchard. G. N. B. Renwick, of Salem, in 1872, from 600 Baldwins and Steele's Red, thirteen years from setting, produced a net income of \$2,000, and in 1873, \$1,500. Noah Donaldson, of Saline, in 1872, from 32 Baldwin trees, thirteen years from setting, sold \$250.

## CLOVER.

In the New England and Middle States the acreage of clover does not vary much from average. Indiana indicates a decrease of 1 per cent.; Michigan, 6; Ohio 9; West Virginia, Kentucky, and Wisconsin, no change; from Florida, Louisiana, and Texas there are no returns for clover; the remaining States report an increase: Nebraska of 31 per cent.; California, 23; Arkansas and Kansas, 15; South Carolina, 12; Missouri, 8; Mississippi only 1; others range from 3 per cent. in Virginia to 7 in Iowa and Oregon. The condition reported is average in New England. In New York, 11 per cent. below, being extensively winter-killed. Niagara reports that old clover-meadows never looked so badly. Pennsylvania is 2 per cent. and Michigan 14 below, for like reasons; Ohio, 16 below, and Indiana 9, owing to the combined effects of winter-killing and drought; Tennessee, 14 below, drought being specified in several counties. The following States report the condition above average: South Carolina, 104; Arkansas and Oregon, 103; Missouri, 102; California, 109. In the last-named State, Napa reports that alfalfa, which is being cultivated on a large scale, in favorable localities yields three crops of hay per annum, besides affording rich pasture and Placer, that it has become a favorite, and in future will be exten-



sively cultivated, as it produces six to ten tons of hay per acre. Newton, Missouri, reports that clover does so well that it will soon be the crop of the county; Fulton, Arkansas, that the encouraging results of experiments thus far will cause extensive sowing; and Antelope, Nebraska, that the first sowed, last year, promises well. The average condition for all the States is 97.

### SPRING PASTURES.

The late spring caused pastures to be generally backward at the time of reporting. It is evident that the figures were somewhat reduced, owing to this circumstance, though it is one from which a speedy improvement almost necessarily follows. The only State in New England in which the average condition is below 100 is Maine, 96; the cause indicated is winter-killing. The following States report that pastures are suffering to a greater or less extent from dry weather: Virginia, 99; Alabama, 92; Tennessee, 91; West Virginia and Indiana, 90; Kentucky, 97; Ohio, 88; Iowa, 94. Returns from New York indicate an average condition of 94; Pennsylvania, 93; California, 110; Texas, 109; New Jersey, Delaware, Maryland, Florida, Arkansas, Illinois, Missouri, Nebraska, and Oregon range from 100 to 105; the remaining States, from 90 in West Virginia to 99 in Minnesota. The average condition for all the States is about 99.

### FARM-STOCK.

**Cows.**—Milch-cows have generally entered on the 1st of June in fair condition. The average for the entire country is 100. The highest condition reported, 25 per cent. above average, is in Texas, where the winter was unusually mild and free from hard storms. The next highest, 11 per cent. above, is in Arkansas. The lowest, 15 per cent. below, is in Kansas, owing chiefly to suffering in the winter and spring for want of shelter in severe storms, aggravated by scarcity of feed. Ohio and Missouri report a condition averaging 8 per cent. below. In the remaining States the averages range between 94 and 106.

**CALVES.**—Returns from all the States, of the number of calves dropped indicate an average increase over last year of 1 per cent. The largest increase, 9 per cent., is in Nebraska; South Carolina, 8; Texas, 7; Wisconsin, Minnesota, 6; Iowa, Virginia, 5; Maine, 3; Pennsylvania, Michigan, Louisiana, 2; Vermont, North Carolina, Florida, Mississippi, West Virginia, Oregon, 1 per cent.; Illinois averages the same as last year, and Indiana 2 per cent. less.

**SHEEP.**—The loss of sheep the past winter averages for all the States 7 per cent. of the whole number. The heaviest losses were in Louisiana, averaging 14 per cent.; Georgia, 13; North Carolina, 12; Alabama, 11; Mississippi and Tennessee, 10; South Carolina 10; Missouri, 9; Arkansas, 9. In New England and the Middle States, where the flocks are generally small and well sheltered, the losses average about 6 per cent. The report from Licking, Ohio, calls attention to the well-known fact that losses are much greater in proportion in large than in small flocks. Madison, North Carolina, reports that sheep recently shorn were frozen to death in a snow-storm occurring on the 29th of April. The snow was 2 to 12 inches deep, according to locality, and remained on the ground four days. In Missouri, Crawford, Johnson, and Franklin report that the losses are chiefly by dogs. Similar reports come from Wicomico, Md.; Gloucester, Essex, Louisa,

Southampton, and Powhatan, Va.; Bedford, Tenn.; Logan, Ky.; and Kosciusco, Ind. In Iowa, Mitchell reports that sheep-husbandry is generally discontinued, and Benson that it is growing in disfavor, owing, principally, to destruction by dogs—"more deaths from this source than from all others." Clackamas, Oreg., reports that the dog-law has to a great extent lessened the mortality among sheep.

LAMBS.—The average of lambs lost in all the States is 11 per cent. of the number dropped. The largest losses are in Louisiana, 24 per cent.; Rhode Island, 16; Wisconsin, 16; Kansas, 16; Ohio, 15; Michigan, 15; California, 15; Missouri, 14; Iowa, 13; Kentucky and New Hampshire, 13. One clew to these high figures is given in the report from Placer, Cal.: "A heavy loss of lambs from the poor condition of sheep in lambing-time." Blount, Tenn., reports that losses of sheep and lambs have resulted almost entirely from shearing followed by cold storms. Texas, Arkansas, and Oregon report the lightest loss—8 per cent. Of the other States the maximum—13—is in Vermont.

#### MAPLE-SUGAR.

The season for maple-sugar was unusually favorable, and the quantity, both of sugar and sirup, manufactured was largely above an average. Compared with last year, the average increase reported for New England is, of sugar and sirup, about 50 per cent. for each; for New York, 27 and 18; for Pennsylvania, 6 and 12; for the four States, Ohio, Michigan, Indiana, and Illinois, nearly as much increase. In Wisconsin and Minnesota, and in the other States farther south which manufacture maple-sugar on a small scale, the quantity of both kinds is 4 to 12 per cent. below that of last year. Furnas, Neb., reports that, while no maple-sugar is made, an article equally good is manufactured to considerable extent from box-elder.



Table showing the condition of the crops, &amp;c.—Continued.

States.	MAPLE SUGAR AND MOLASSES.		COWS.		CALVES.		SHEEP.		COTTON.		APPLES.		PEACHES.		PEARS.	
	Product of sugar this year compared with last.	Product of molasses this year compared with last.	Average condition of cows this spring.	How many calves have been dropped this spring for every 100 dropped last spring?	How many calves have been dropped this spring for every 100 dropped last spring?	How many sheep in every 100 have been lost by disease or other casualties?	How many lambs have died in every 100 dropped this spring?	Average compared with last year.	Average condition June 1.	Average and amount of bloom this spring.	Average condition June 1.	Average and amount of bloom this spring.	Average and amount of bloom this spring.	Average condition June 1.	Average and amount of bloom this spring.	Average condition June 1.
Maine.....	152	108	103	103	103	6	9	.....	.....	110	101	.....	.....	111	103	
New Hampshire.....	136	140	96	100	100	7	13	.....	.....	130	110	.....	.....	100	.....	
Vermont.....	146	185	101	101	101	6	14	.....	.....	110	104	.....	.....	86	96	
Massachusetts.....	170	162	103	103	103	3	11	.....	.....	131	118	.....	.....	120	107	
Rhode Island.....	.....	.....	103	100	100	7	16	.....	.....	118	103	.....	.....	100	100	
Connecticut.....	115	106	100	100	100	3	11	.....	.....	127	119	.....	.....	109	114	
New York.....	127	118	97	100	100	6	11	.....	.....	110	103	.....	.....	95	97	
New Jersey.....	.....	.....	97	100	100	5	9	.....	.....	119	111	.....	.....	103	102	
Pennsylvania.....	116	112	97	114	102	7	12	.....	.....	114	104	.....	.....	106	103	
Delaware.....	.....	.....	102	100	100	.....	.....	.....	.....	100	88	.....	.....	105	50	
Maryland.....	.....	.....	102	100	100	5	10	.....	.....	105	92	.....	.....	101	79	
Virginia.....	83	80	101	105	101	8	10	80	90	91	59	.....	.....	30	89	
North Carolina.....	.....	.....	105	101	101	12	12	89	89	95	76	.....	.....	100	64	
South Carolina.....	.....	.....	105	108	108	13	11	91	81	97	105	.....	.....	103	87	
Georgia.....	.....	.....	100	100	100	13	12	90	80	94	82	.....	.....	96	86	
Florida.....	.....	.....	106	101	101	7	9	91	90	90	82	.....	.....	101	96	
Alabama.....	.....	.....	104	100	100	11	10	86	82	93	83	.....	.....	89	86	
Mississippi.....	.....	.....	106	101	101	10	10	88	78	98	67	.....	.....	93	59	
Louisiana.....	.....	.....	108	102	102	14	24	80	70	92	75	.....	.....	90	46	
Texas.....	.....	.....	125	107	107	6	8	102	90	100	101	.....	.....	100	105	
Arkansas.....	.....	.....	111	98	98	8	8	89	90	100	96	.....	.....	99	93	
Tennessee.....	69	78	101	101	101	10	12	92	83	105	90	.....	.....	96	80	
West Virginia.....	91	84	104	101	101	9	13	.....	.....	107	96	.....	.....	112	85	
Kentucky.....	92	96	101	99	99	7	13	.....	.....	109	101	.....	.....	103	99	
Ohio.....	117	111	92	98	98	15	15	.....	.....	103	101	.....	.....	104	96	
Michigan.....	113	112	95	102	102	5	15	.....	.....	113	107	.....	.....	103	97	
Indiana.....	111	101	95	102	101	7	12	.....	.....	105	101	.....	.....	103	96	
Illinois.....	108	142	94	100	100	8	10	.....	.....	116	104	.....	.....	106	99	
Wisconsin.....	96	84	98	106	106	16	16	.....	.....	104	104	.....	.....	111	99	
Minnesota.....	.....	.....	105	106	106	6	10	.....	.....	105	105	.....	.....	92	91	
Iowa.....	100	101	97	105	105	6	13	.....	.....	104	103	.....	.....	107	104	
Missouri.....	96	95	92	98	98	9	9	.....	.....	110	105	.....	.....	107	104	
Kansas.....	.....	.....	85	105	105	8	16	75	95	108	106	.....	.....	110	106	
Nebraska.....	.....	.....	99	100	100	8	10	.....	.....	135	118	.....	.....	120	108	
California.....	.....	.....	96	96	96	10	15	.....	.....	111	106	.....	.....	110	102	
Oregon.....	.....	.....	96	101	101	10	8	.....	.....	105	105	.....	.....	103	104	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	113	105	.....	.....	110	104	

## EXTRACTS FROM CORRESPONDENCE.

**PEA-NUT HAY.**—*Hickman, Tenn.*—The pea-nut has been our principal crop since the war until last year, 1873, for which I estimate the crop at 50,000 bushels. The hay saved is worth to the farmer about half the market-price of the pea. It is very nutritious, and, when carefully gathered and cured, all kinds of stock will eat it greedily. The pea-digging time commences in the latter part of September, and continues until about the 1st of November. The implement used is something like a subsoil-plow; a furrow is run on each side of the row, loosening the vine without turning it. A boy or girl follows the plow, after the second furrow is turned, catches the top of the vine and turns it bottom upwards, exposing the pea to the sun, where it lies from one and a half to three days, if clear weather. An 8-foot stake is then driven into the ground sufficiently deep to prevent the wind from blowing it down. The vines are gathered and packed around the stake, pea inside, in which position the pea will remain all winter without injury. Those who have barns or sheds, under which to pick off the pea, commence hauling these small stacks as soon as their other farm duties will permit, and then commences the picking season. As the pea is picked off the vine is carefully housed for the stock. Those who have no barns or sheds let the stacks remain in the field and pick off the pea, restacking the hay as leisure or the weather will permit. They subsequently haul the hay as it is needed. The average yield per acre is about 1,200 pounds; in a wet season the yield is greater. The hay is fed alone. It will increase the milk of a cow threefold. I know of many instances where cows have been kept in good beef condition and giving an abundance of milk all winter. A neighbor informed me that he wintered 16 head of beef-cattle on his hay, (pea-hay,) feeding nothing else, and drove them to market last spring, receiving a fair price, though not so much as he would have realized had they been fed on grain.

**PROFIT IN RAISING SUGAR.**—*Suwannee, Fla.*—Sugar-cane is the most profitable crop raised in this county, as the following experiment will show: One acre of sugar-cane will make 2,000 pounds of sugar, worth 8 cents per pound, \$160; drippings or molasses from the same, 100 gallons, worth 40 cents per gallon, \$40; total, \$200. Expenses: seed for one acre, \$30; manuring, \$10; cultivating, \$5; manufacturing sugar, \$55; total expenses, \$100, leaving a clear profit of \$100.

**SCUPPERNONG GRAPES.**—*Randolph, Ga.*—Grape-culture is assuming considerable importance. Our climate is peculiarly adapted to the culture of the Scuppernong variety. Being indigenous and exempt from any of the casualties of the bunch grape in the more northern climate, it will in time render this the *grape country*. The yield is enormous—from 400 to 500 bushels per acre, and from 4 to 4½ gallons per bushel. This yield, at a small price, will make the production a lucrative business. One hand can cultivate ten acres. The vines live from twenty to one hundred years, and need nothing but virgin earth and scuffling to insure a bountiful yield every year.

**DAMAGES BY RAIN AND FLOODS.**—*Perry, Ala.*—During the month of April an unprecedented amount of rain fell, and farm-work has greatly suffered. Less than half the days in the month were fit for work in the lime-lands. Wheat, though good, has been somewhat injured by the rains. Corn has suffered from the rain and cold weather. The cotton crop is in a very bad condition, and farmers are more gloomy about it than I have ever seen them.

*Arkansas, Ark., April 26.*—For the last seven weeks the weather has been so wet that nothing has been done. The Arkansas River is still rising. Many bridges are gone, most of the bottoms on the south side are under water, and cattle and stock of all kinds, where the owners can save them, are being rafted over to the north side, so that our prairies are now dotted over with poor, starving cattle. Hundreds have lost all, and it is reported that many lives have been lost. On the north side we are out of the reach of the river, but not a furrow has been turned over yet in this section.

*Tensas, La., May 1.*—Our parish is now almost entirely under water, consequently there is no other subject on which to report. A few small fields and parts of fields, just behind the levees that have not given way, are out, but the rains have been so frequent and so heavy that this land has no crops on it. All will require replanting. The amount of rainfall in the month of April was never before witnessed by any person living—nearly 22 inches in thirty days. And still the weather is unsettled, and the water rising. What is to become of the people is the question. The low price of last year's cotton crop left the laborers without any surplus proceeds. The corn crop, much better than the preceding year, but not nearly sufficient to carry them through, is now about exhausted. No money, no credit, no provisions; that is the condition of most of our laboring people. Their stock is on the mounds and up in the barns and houses. One man has his six mules in the kitchen adjoining his dwelling.

*Osage, Kans.*—In my April report I stated that cattle were coming out of winter quarters in good condition. Since then we have had a succession of sleets and storms which, in connection with great scarcity of feed, have caused the death of thousands upon thousands of cattle in Kansas. From the best information I can get the loss in

Osage County alone will amount to not far from \$150,000. At this date, May 1, the grass is just starting a little, so that the cattle which are still on their feet, may possibly live.

*Marion, Miss.*—The rains in the latter part of April exceeded anything within the memory of the oldest inhabitant. The flood in Pearl River was higher by three feet than has been known since the settlement of the country. One-half at least of the lands in cultivation in the river swamps is totally ruined, either from washing away or by immense deposits of sand. In consequence, the crops in this county will be reduced at least one-half, even if we are favored with a good season. Cotton is just now, May 1, being planted. Cotton on lands not submerged has been killed up to the present time by the rain and cold.

**GROWING AND PRESERVING POTATOES.**—*Marion, Miss.*—The destitution likely to result from the failure of the corn crops this year has led me to consider the improvidence of the people of this section in failing to plant, in sufficient abundance, those food crops which can be raised in unlimited quantities with a small expenditure of labor compared with that required for corn. The first of these is the Irish potato, which now constitutes the staple article of food of the laboring classes in the most thickly settled parts of the earth. It is a singular fact that, although the Irish potato can be raised with no more labor, and with far more certainty than in the North, it is universally regarded in the South as a sort of luxury to be planted in the garden and enjoyed only during three months in the year. Sufficient to supply any family during the whole year can be raised with ease on one acre of ground, and to a large extent take the place of corn as now used. The only drawback is the fancied impossibility of keeping them sound; but I know of one farmer who has Irish potatoes all summer, simply by letting them remain in the ground, after they come to maturity in May, until it is time to plant again in the fall. He never has a rotten potato. When he is obliged to dig he spreads them out on a dry floor and has no trouble from the rot. I think they might be kept sound, also by burying them when dug, under two or three feet of earth. Please call attention of farmers through the South to this matter, and invite discussion as to the most certain means of keeping the Irish potato free from rot after digging. Another objection made to its culture in this section is, that it "runs out," thus requiring the purchase of new seed every year. The experience of several planters during the war has shown this to be a mistaken notion. I know several who raised Irish potatoes from their own seed for five years in succession, and they suffered no deterioration.

Another substitute for the corn we buy so largely from the West is the sweet potato. This flourishes here in the greatest perfection, the yield being often above 300 bushels per acre. It is now used to a considerable extent for food, but I think the greatest advantage might be realized from its use as feed for horses and other stock. It can be raised at a cost of 8 cents per bushel, and as a feed for horses two bushels are equal to one of corn or oats, which costs on the average \$1. By raising sweet potatoes the saving in money would be great, even if it took five bushels to equal in nutritive capacity one of corn. Here, again, the difficulty of keeping them, in the mode practiced by the majority of farmers, is the only obstacle in the way of increased use of them for feed. But last year I saw, in October, 3,000 bushels in one pile on the farm belonging to the Lunatic Asylum of this State. The superintendent stated that he had sweet potatoes during the whole year, and explained his method of keeping them. He puts his whole crop in one bank. This, at the time named, was at least 60 feet in length, 14 in breadth, and 1 in height; over the whole pile dry grass was thrown to the depth of one foot; the earth was thrown on the bank to the same depth, extending to the top on the north side, but only about half way to the top on the south. The whole was covered with long plank laid on from the north side at an angle of 45°, extending over so as to protect the whole bank from the weather, and supported by posts standing in the middle of the bank at intervals of 4 feet. The posts were hollow and full of auger-holes, so as to afford ventilation and the escape of moisture generated in the heap. The superintendent, Dr. Compton, stated that his potatoes banked in this manner remained sound during the whole year.

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## NATIONAL AGRICULTURAL CONGRESS.

The third annual session of this body, composed of representatives of the various open and secret local organizations in aid of rural interests, convened at Atlanta, Ga., May 13, and continued in session for three days. The proceedings were entirely harmonious, and characterized by a fraternal and progressive spirit.

The meeting was called to order by Gen. W. H. Jackson, of Tennessee; opening prayer was offered by Rev. David Wills, of Atlanta; speeches of welcome were made by the mayor, Samuel B. Spencer, in behalf of the city, and by Gen. A. H. Colquitt in behalf of the Georgia Agricultural Society; and a response was made by the secretary, C. W. Greene. In the afternoon a paper from Mr. Lawton, of South Carolina, was read as a partial report of the committee on transportation, favoring a line of narrow-gauge railroads from the Mississippi Valley to Savannah. A communication was presented from Prof. C. G. Forshey and Hon. P. H. Herbert, of Louisiana, relative to the proposed Fort Saint Philip Canal.

On Thursday, the 14th, a resolution was passed pledging aid to the sufferers by the disastrous overflow of the Mississippi; another for a committee to memorialize Congress for the passage of a bill for the further endowment and support of colleges for the advancement of practical industrial education. The committee consists of Messrs. Bishop, of Arkansas; Beverly, of Virginia; Colquitt, of Georgia; Aiken, of South Carolina; and Winter, of Alabama.

By invitation, the Direct-Trade Convention occupied seats in the hall during the delivery of addresses of the morning, and Governor Smith and the State officers were also present. General Jackson then proceeded to deliver his annual address as president, which was received with much favor. This was followed by an attempt to deduce from agricultural statistics certain practical lessons of vital importance to the agriculture of different sections of the country, by the statistician of this Department. The matter of both of these efforts was strongly indorsed by subsequent action of the congress.

A paper from Prof. C. V. Riley, on the use of paris-green as a remedy for the cotton caterpillar, was read.

On the third day a paper from Hon. C. W. Flagg was presented on cheap transportation and the power of the National Government over inter-State commerce.

The committee on transportation, consisting of Messrs. Peyton of Virginia, Dodge of the District of Columbia, Colquitt of Georgia, West of Illinois, and Maxwell of Tennessee, made the following report:

Whereas it is evident that cheap transportation of the commodities of a country is a necessity of agricultural prosperity and national development; that the agriculture of the interior of our country is now paralyzed for want of facilities for transportation of its products to the seaboard; that while we recognize the value of railroads, and the necessity of further railway extension, we deem the cost of transporting the crude products of the field, the forest, and the mine so disproportionate to the cost of water-carriage as to render imperative the duty of Congress to improve the navigation of the rivers of the interior, and connect them with the ocean by artificial water-ways, thus giving to the Mississippi Valley continuous lines of water transit to the seaboard; and that the railway system has engendered monopoly and unjust discrimination, the evils of which can only be obviated by completion of water-lines under Government control: Therefore,

*Be it resolved by the National Agricultural Congress,* That it is the duty of the National Government, which has so long and so liberally fostered foreign commerce, to enter at once upon the work of constructing a system of water-ways adequate to the present and prospective wants of inland transportation, and continue it by annual installments of aid to full completion, until unrestricted channels of trade shall be opened, not only through the entire length of the Mississippi, but connecting that great river with the Atlantic Ocean, by way of the lakes, by the Ohio, Kanawha, and James, and by the Tennessee and Savannah Rivers.

*Resolved,* That this convention consider appropriations by Congress for such a system wise national investments, which will at no distant day repay the Government by increased revenue created by enhanced production and developed wealth of the country.

The chairman, Col. H. E. Peyton, sustained the report in a speech replete with striking fact and telling argument. The discussion was general, resulting in the adoption of the report by a large majority.

A resolution was also passed opposing national abridgment of the authority of States in railway control.

A paper from Dr. John A. Warder, on forestry, was read. It recommends a national commission, the establishment of forest schools, and would make forestry a leading study in agricultural colleges.

The speculations and abuses practiced under United States patent-laws, and desired changes in patent legislation, intended to "secure the greatest good to the greatest number," came up for discussion, and a committee was appointed to prepare a suitable memorial to Congress on the subject.

A resolution, presented by Mr. Winter, of Alabama, was adopted, deprecating so exclusive a reliance upon cotton as at present, declaring that planting must remain unremunerative while it fails to furnish agricultural supplies of prime necessity, and urging a better culture and a greater diversity of production.

Col. R. L. Ragland, of Virginia, from the committee on the tobacco tax, made a report favoring the reduction of the tax to a uniform rate of 12 cents per pound, which was adopted.

Cincinnati was selected as the place of meeting in September, 1875, and the following officers were chosen for the ensuing year :

*President.*—Gen. W. H. Jackson, of Tennessee.

*Secretary.*—Geo. E. Morrow, of Washington.

*Treasurer.*—J. J. Poole, of Indiana.

*Vice-Presidents.*—Alabama, C. C. Langdon, Mobile ; North Carolina, T. M. Holt, Tar River ; South Carolina, W. M. Shannon, Camden ; Virginia, H. E. Peyton, Waterford ; Arkansas, A. W. Bishop ; Tennessee, J. O. Griffith, Nashville ; Mississippi, C. E. Hooker, Jackson ; Florida, W. H. Scott, Midway ; Georgia, R. A. Alston, Decatur ; District of Columbia, J. S. Grinnell, Washington ; Illinois, W. C. Flagg, Moore ; Indiana, Alexander Heron, Indianapolis.

In accordance with the request of the congress as expressed by unanimous vote, the address on agricultural statistics, by the statistician of the Department of Agriculture, is herewith presented :

#### PRACTICAL HINTS FROM AGRICULTURAL STATISTICS.

The members of the National Agricultural Congress too thoroughly appreciate the importance of a systematic collection of the facts of agriculture, which necessarily include those illustrating almost every branch of natural and social science, to require an elaborate argument to prove the utility and beneficence of agricultural statistics. The range of such facts is quite too wide for bodily presentation, in however concise a form, in the time allotted to the opening of this discussion. Nor is such epitome especially required in this presence. Rather would it seem preferable to present a few deductions drawn from classes of facts, designed to be eminently practical in tendency, suggestive of grand schemes of needed improvement, perhaps provocative of wholesome criticism, and stimulative of thought and suggestion for the amelioration and advancement of American agriculture. A brief consideration of the means and appliances of statistical collection may also be deemed appropriate and timely.

#### USES OF AGRICULTURAL STATISTICS.

It is the province of agricultural statistics to measure the extent of our vast resources ; to contrast the actual with the possible in production, by living examples of accomplished results ; to weigh the effect of overproduction in the diminution of prices ; to illustrate the folly of dependence on distant and uncertain markets for primary products ; to show the correlation of the industries, and the advantage of augmenting numbers of consumers upon the prices and profits of agriculture ; and to mark the progress of the sciences, in their application to the business of the cultivator, and to aid the ruralist in keeping pace with such progress.

There is great activity of statistical inquiry at the present time, and but little patience of investigation ; there is frequency and flippancy in statement, but less of accuracy and thoroughness. There is a feverish desire to accomplish the census of a continent in one day, and proclaim its results the next. Few take time to weigh facts, sift error from truth, and reach broad and philosophical conclusions. What is wanted in statistics is more of thought and less of flurry, more industry and less precipitancy,



· sounder judgment and less zeal without knowledge. Few have yet learned the logic of statistics, and some even of our lawgivers are prone to build by proxy the framework of their political economy, and liable to give it a fantastic and incongruous finish.

#### THE BREADTH OF OUR STATISTICAL FIELD.

When we consider that less than a third of the area of the States, and less than a fifth of the entire domain of the United States, is mapped into farms, and I remember that of this farm-area only one-fourth is tilled or mowed; and when we further reflect that the average yield per acre could be doubled if the many could be brought up to the plane of the few in the practice of intensive culture, then we begin to realize what numbers our country is capable of feeding, and what waste of toil and effort comes from neglect of the economic lessons taught by the statistics of scientific agriculture.

We now know that our wheat occupies an area less than the surface of South Carolina; and, if the yield should equal that of England, half of that acreage would suffice. We know of our national crop, maize, which grows from Oregon to Florida, and yearly waves over a broader field than all the cereals beside, that it covers a territory not larger than the Old Dominion, and might produce its amplest stores within narrower limits than the present boundaries of Virginia. The potato-crop could grow in the area of Delaware, though yielding less than a hundred bushels per acre; the barley for our brewing requires less than the area of a half-dozen counties; and the weed of solace, sufficient to glut our own and European markets, is grown on the area of a county twenty miles square.

#### STATISTICAL TEST OF CURRENT PRACTICES.

The dictum of the poet, "Whatever is, is right," must have in agriculture, as in morals, a restricted acceptation. The prevailing practice may have an obvious and even a specious reason for its existence, when its contravention by science and experimental test is undeniable. We often fail to do what we know is best, because custom has made easy what has become habitual. The deductions of agricultural statistics reveal many a popular error or short-coming in agricultural practice. Perhaps I may not better illustrate the province and proper use of this science than by a few examples showing the prevalence of such misconception and remissness in different sections of our common country.

#### THE WEAK POINT IN NEW ENGLAND AGRICULTURE.

The average farmer of the Eastern States disregards the logic of facts which reveals success only in high culture. His brother of the West has cheap lands, very fertile, easily worked, without obstructions interfering with the most varied employment of agricultural machinery. His own lands may be low in price, because poor in plant-food; his sons have gone into trade and manufactures, and to virgin soils toward the sunset; his surplus earnings have gone to the savings-bank, or to Illinois or Kansas, as a loan at 10 per cent., until, rheumatic, and declining with age, he finds production also declining, his herds and flocks decreasing, and the conclusion inevitable that "farming does not pay." Labor is scarce and high because in demand by other industries, which in turn offer high prices for farm-products; fertilization is needed everywhere, draining in many situations, and irrigation in some others. But these things cost money, and he has neither the ambition nor the confidence for its expenditure, and, worse still, in many instances the money is lacking. These may be potent reasons for discouragement, but they do not prove that farming there, with money, youth, enterprise, and skill, may not be highly profitable. And the teaching of statistics, in examples of high success with high culture, disproves the current assumption of unprofitableness. There are numerous cases in which the gross return per acre has been hundreds of dollars instead of tens. I know an instance there in which a common vegetable, usually known in field-culture rather than in gardening, returned in 1873 \$12 for every day's labor expended on it. The lesson of statistics of Great Britain, of Holland, of all countries of dense population, proves success to be only possible by enriching the soil and increasing the yield. Though Massachusetts farmers constitute but one-eighth of the aggregate of all occupations, there is no reason why they should not be able to feed all, if Great Britain with one-sixteenth of her population can furnish more than half her required food-supplies. And if, in the present state of Massachusetts agriculture, the value of her annual product be \$442 to each farmer, while the cultivator of the rich prairie State, Illinois, earns but \$560, (and in point of fact it is probable that unenumerated products of the former State would swell the total to the latter figures,) then the results of intensive culture throughout the Commonwealth would be comparatively munificent. This is a valuable lesson which New England will ultimately learn from statistics, far more thoroughly than is now known and practiced by a few of her best cultivators.

## A WESTERN FALLACY.

The West has also much to gain from the teachings of statistics. Iowa, vigorous and ambitious, too young for despondency, is in a spasm of indignation against monopoly and an excess of middlemen, and yet in trade and transportation she has but 8 per cent., or little more than half the proportion of the Middle States. She may have too many and too greedy go-betweeners, and she needs justice in the transportation of her products; but these evils remedied, the burden of her trouble would still remain. The great difficulty is, *her corps of industry has 61 per cent. of farmers instead of 25*. Double-track railroads, canals vexed with steam-propellers, grange-association, free-trade, and every other fancied boon obtained, she will still remain in comparative poverty and positive discontent while she continues to have less than 14 per cent. of her people engaged in manufacturing and mechanical industry. History does not point to a permanently prosperous people having such preponderance of population in agricultural pursuits.

## FOLLY OF FOREIGN DEPENDENCE.

Minnesota is only happy when the people of Great Britain are supposed to be in danger of starvation. That danger is greatly overestimated. Statistics will show that in some years but 3 per cent. of our wheat-export, and but a trifling proportion in any season, can be sold to any except subjects of Great Britain. On one-sixteenth the area of that island is grown in a good year one hundred million bushels of wheat; in an average season ninety millions; and in fifteen years, from 1858 to 1872 inclusive, the deficiency made good by importation was a fraction less than sixty-six millions per annum. Could home-culture be extended to meet this demand, the total breadth required would be equal to one-ninth the surface of Minnesota. An increase in the average yield of wheat in France from fifteen bushels to eighteen, by a small advance in culture, would fully equal the British deficiency, as was recently stated by the well-known statistician, Mr. James Caird. Russia, with her broad and cheap acres, also stands near to compete for this deficiency. Minnesota, meanwhile, as her crop is maturing, can never ascertain whether the want will be forty millions or ninety, or whether the home price will be 50 cents or \$1, or the ultimate result debt or competence. And yet 70 per cent. of the cultivated area of Minnesota is put in wheat, and 57 per cent. of her people are engaged in its cultivation; 8 per cent. in sending it to market; a large proportion of its 14 per cent. of mechanics and manufacturers are building mills and grinding wheat; and its 21 per cent. of professional men expect much of their income from wheat. There are reasons why wheat should be temporarily grown there, but dependence upon foreign markets, evidently felt by many, for a permanent and increasing demand, is shown by statistics to be foolish and futile. The home-market is the only reliable and permanently valuable one for this cereal, and the nearer to the place of growth the surer and larger the benefit derived.

## THE ERROR OF THE SOUTH.

The cotton States have been especially persistent in disregarding the teachings of statistics and defying the laws of political economy. Every intelligent publicist knows that a certain amount of money, say a present average of \$300,000,000, may be derived from cotton. If the average quantity is increased the price diminishes, and *vice versa*.

If fluctuations are frequent the speculator or manufacturer, and not the producer, derives an advantage. If you choose to produce five million bales, you obtain 10 cents per pound and lose money; if you grow but three, you get 20 cents and obtain a profit. Now it is better for the world, and in a series of years better for the grower, to produce regularly enough to supply the current wants of the trade at a medium and remunerative price, or as near a regular supply as possible, for the vicissitudes of the season will inevitably cause injurious fluctuations despite the highest effort of human wisdom and foresight. As the uses of cotton increase, and markets are extended throughout the world, its manufacture will be enlarged, and its culture should obtain corresponding enlargement. To overstep the boundary of current demand and glut the market, may be pleasing to the speculator and to the manufacturer, so far as he combines speculation with weaving, but it is death to the grower.

There is much false reasoning on this matter. A planter may truly affirm that he obtains \$30 per acre for his cotton and but \$25 for his corn, and he thereupon and therefore declares that he will plant no more corn. Let all act upon this suggestion, and instead of \$55 for the acre of cotton and that of corn, the total return of the two acres of cotton will be but \$30. A surplus of corn may be put into meat, and wool, and whisky, or used to eke out a scarcity of some kind of forage for animals; but a surplus of cotton must wait for the slow grinding of the mills of the fabricating gods, usually until disgust at low prices reduces production correspondingly.

Thus, while cotton is and long will be the leading product and the most profitable field-crop at fair prices, its prominence in the list has kept, and is now keeping these States

in comparative poverty, which is unnecessary as it is inconvenient and injurious. It does not produce money enough to give wealth to a population of nine millions. The other crops, instead of barely equaling in the aggregate the receipts from this, should represent at least \$4 for every one of cotton. The census-record of production in these States is but \$558,000,000; the record should be made to read \$1,500,000,000. With three-fourths of the people of ten States employed in agriculture, the value of agricultural products exceeds but little that of the States of New York and Pennsylvania, where only one-fourth are so employed. The averages for each person employed in agriculture in those States are respectively, as deduced from the census, \$677 and \$707, while those of Georgia and Mississippi are \$239 and \$282. For the ten States the average is \$267; for the four populous Middle States, \$686. Even the States producing cheap corn show a larger return, the average for one man's labor in the five States between the Ohio River and the lakes being \$498, while the six sterile Eastern States produce \$490 for each farmer. It may be the census is less complete in the cotton States, but it is undeniable that agricultural industry makes a smaller aggregate return there than in any other section. Nor is the reason wanting; it is due to the prominence of cotton, the return for which is substantially a fixed quantity, and the neglect of all other resources.

Let us glance at the topography and capabilities of this section. The area occupied by cotton, allowing 10 per cent. addition to usual estimates, is less than one-fortieth of the surface of these States; it is but one-thirtieth of the proportion actually occupied as farms. Forty-six per cent. of the census crop was grown in 81 counties, which are all that produce as much as ten thousand bales each; and 77 per cent. grew in 215 counties, making not less than five bales each. The total acreage in cotton is scarcely more than one-sixteenth of the surface of Texas. What is to be done with the other fifteen-sixteenths? A very large proportion of the area of these States is unadapted to cotton, either by reason of elevation or of soil.

There is no other section of the country with resources so varied; none presenting such a field for new and promising enterprises. Competition is possible with the sea-islands in oranges and bananas and other fruits in Florida, and with New York and Michigan in apples and other fruits, on the table-lands of the Alleghanies. More than half the value of all cotton-exports is paid for imports of sugar, which could and should all be grown in these States. But one pound in ten of the required supply is now made, upon a smaller surface than half of a single county twenty miles square. The demand of the world for oils—cotton, rape, *palma christi*, and many other—is large, and prices are remunerative, and this section is peculiarly adapted to their production. A hundred million pounds of cheese, to compete with an equal quantity in New York, without danger of glutting the market, could be made from grasses of the glades that grow on lands costing one-twentieth the value of Empire State pastures. More than two hundred millions of acres of these States are covered with wood, and the ax is still brought into requisition to girdle the monarchs of the forest, and await a slow decay for replacing fields worn out by a wasteful culture, while a timber-famine threatens other sections of the country, and a thousand forms of woody fabrication can readily be transmuted into gold—at least into greenbacks, which seem to be preferred to gold in certain districts. Even the forest-lands, certainly those of the coast-belt, are covered with wild grasses, only partially utilized, which, in connection with the herbage of the prairie sections, are worth, in flesh and wool, at a meager estimate, half the value of the cotton-crop. The list might be increased indefinitely. With the introduction of the best machinery, the most economical methods, and the most efficient means of fertilization, with well-directed and persistent labor, adapted to the wants of all classes of workers, the present population is amply sufficient to double the gross product of agricultural industry, and far more than double its profits.

#### SOUTHERN MANUFACTURING.

I have hitherto only spoken of agricultural industry. The suggestions relative to the necessity of other productive industries in the West apply with augmented force to the South. While the proportion engaged in them ranges from 14 per cent. in Iowa to 24 in Ohio, it only runs from 3 per cent. in Mississippi to 6 per cent. in Georgia. The intelligent planter of Georgia knows perfectly well, by the test of local experience, that the manufacture of cotton in his State is far more remunerative than the same business in Massachusetts, not only on account of saving freights and commissions both on raw material and manufactured goods, but in the greater abundance and cheapness of labor. It might be considered a fair division of the crop, and certainly a generous one on the part of the South, to keep one-third for home manufacture, to send a third to the North for manufacture into finer goods, and the remaining third to Europe. This would insure a steady and imperative demand, and a great enlargement of net profits. If you can do this without a tariff, you can afford to let the tariff slide; if not, far better for twenty years a tariff utterly prohibitory of all cottons than to forego this opportunity to make the country prosperous and rich beyond your present imaginings.

There is no good reason why Virginia should not equal Pennsylvania in manufaturing and mining production, as she ever does in resources of mine and forest. There is no sufficient cause why 25 per cent. of the people of Pennsylvania should produce in agriculture a value of \$52 annually for each inhabitant of the State, while 59 per cent. of the people of Virginia should only divide \$42 per head of total population. The influence of home markets on prices, with the reflex influence of prices on fertilization and culture, is sufficient to answer for all this difference. I ask, in all sincerity and deference, if it is manly or just to deery others who take advantage of opportunities enjoyed in equal fullness by ourselves, while we utterly refuse to use them. In this connection permit me to repeat what I said years ago, in the sincerest and most friendly spirit, of the unsurpassed facilities for mining and manufacturing enjoyed by the southern portion of the Atlantic slope :

"This path of progress has been equally open to all ; laws supposed to favor a diversified industry have been applicable to all States alike ; the best water-power and the cheapest coal are in States that make no extensive use of either ; milder climates and superior facilities for cheap transportation have furnished advantages that have not been transmuted into net profits ; and yet such communities, daily inflicting irreparable injuries upon themselves by neglecting the gifts of God, and spurning the labor of man, are wont to deem themselves injured by the prosperity flowing from superior industry and a practical political economy."

#### THE COLLECTION OF STATISTICS.

Leaving considerations bearing on the value and uses of agricultural statistics, a few thoughts may be essayed upon means and appliances for statistical collection. More attention is now drawn to this subject than ever before. It is work that requires great industry and conscientiousness in collecting and arranging, and presupposes intelligent appreciation and willing co-operation on the part of the people. Hence statistics is a science that did not flourish in the dark ages. There is even now great difficulty in statistical collection, on account of popular ignorance and prejudice, in European countries, and not a little in our own country. There is yet in many minds a suspicion that the census marshal is only a harbinger of the tax-gatherer. As an extreme illustration, the State census of Ohio returned 38,000,000 pounds of tobacco as the crop of 1869; the General Government, which levies a tax on tobacco, obtained returns of only 18,000,000 for the same crop. Ordinarily, the census makes larger figures than State assessors. For instance, in the same State, the United States reported 15,000,000 bushels of wheat in 1860, and the State only 12,000,000. Intelligent people should combat this prejudice among their neighbors, and educate them as to the value to themselves of an accurate knowledge of local resources.

The means employed and lines of investigation undertaken in the countries of the globe, which encourage systematic collection of agricultural statistics, are of great variety, and the degree of efficiency attained is equally various. Specific investigations, and independent research, may be conducted irregularly by individuals ; societies often do successful work within their own organization ; but general investigation, involving every portion of the territory of a country, can only command success with the aid of the dignity and authority of government. The European governments are very generally committed to some system of obtaining the *acreage* cultivated annually in the principal farm crops, though not all of them. In this respect they are in advance of our own, which has never included in census laws a provision for this initial point in statistical inquiry. The agricultural census of Great Britain, which is annual, is almost confined to an enumeration of farm animals, and the establishment of the area of each crop. The quantity becomes a matter of estimate. In this country, we are left to guess the size of our fields, and the rate of production, and only once in ten years do we venture to obtain a record of gross quantities. These quantities, in the case of cereals, may, and often do, vary 200,000,000 bushels in a single year. The census of 1860 made the corn-crop of the previous year 838,000,000 bushels ; that of 1870 credited but 760,000,000 to the crop of 1869 ; whereupon short-sighted statisticians proclaim a great decline in the culture of maize. Such an assumption is utterly unfounded. Not only is the aggregate quantity increasing, but the ratio to population—bushels *per capita*—is certainly not decreasing in any marked degree. The crop of the year 1869 was considered a failure, when Illinois actually obtained 130,000,000 bushels, though expecting in the previous July fully 230,000,000. So in wheat, the apparent increase from 173,000,000 to 287,000,000 bushels is deceptive in a less degree, and partially due to the exceptionally increased yield of 1869. The need is imperative for a census at least every fifth year, and an agricultural census, embracing area and quantity and number of farm animals, should be taken yearly. Agitation should be continued till the people, and the Congress that does their bidding, shall be educated up to the realization of such a necessity.

The State governments have an important work to do in this direction. Ohio has

long and successfully taken the initiative; Minnesota and Kansas have made a brave beginning; Iowa takes a comparatively full agricultural census biennially, and New York and Massachusetts have made quite thorough work in decennial periods intermediate to those of the national census. Other States have made partial enumerations: I am glad to learn that Georgia has commenced the work, and I hope all the people will aid in making it a thorough one. Most of the States have literally done nothing.

The collection of agricultural statistics has been made an important function of the Department of Agriculture, in accordance with its organic act. It gathers the official records of foreign governments, societies, technical schools, and those of individual workers in experimental science; of the United States census, of State assessors, and of agricultural organizations; and in addition, has an enthusiastic corps of reporters in all sections of the United States, working unselfishly for the benefit of local agriculture, and for the general weal, and monthly—sometimes oftener—aiding in a comprehensive and systematic investigation upon any topic deemed practical and important, sometimes reaching the whole country and sometimes of limited range. The work includes the reporting the condition of growing crops, the comparative area in cultivation, and ultimately the estimated product. It has proved the most reliable source of current information obtainable, has been increasing in efficiency, and can be rendered still more efficient. It is of course not a census, and is not so regarded. In the older and settled States, as to principal crops and numbers of farm animals, the degree of reliability has compared favorably with the results of an average census, and in some points has far exceeded in completeness and accuracy the results of several State enumerations. In Kansas, for instance, it proved the assessor's enumeration of sheep to be little more than half the real numbers in the State. The official enumeration of farm animals, in every State or Territory west of Missouri, either by census or assessors, is exceedingly incomplete. In the minor crops, and in all crops in new States, there is more or less incompleteness or inaccuracy in the estimates of the Department, from the present necessity of the case, as there is in many points in State and national enumerations.

Only Ohio has for any considerable period made such enumeration; a few others have barely commenced the work; the great State of Illinois only returns stock and two of the principal crops; and all of these publications are too late by months to aid in perfecting Department estimates. There is also a difficulty in constant, sometimes enormous, fluctuations in cultivated area. The wheat-crop in Ohio may in one year be 8,000,000 bushels, in another, 28,000,000. Yet, in the settled States, especially as to principal crops, approximated accuracy has been attained. For seven years the Illinois estimates of each year were based respectively on those of the preceding; the estimated percentage of the previous year's crop was returned for each county, and these local returns were combined with due reference to the relative crop-value of each county, to form an accurate State average. In this time, not one scintilla of aid was obtained either from local official returns or unofficial estimates. What could be expected in such a case but discrepancy? Opportunity for verification was naturally awaited with misgivings. When the census was complete, the estimates and the returns of domestic animals were as nearly alike as two independent enumerations could be expected to be. The corn-crop had met sudden disaster by early frost, and the expected yield in August had been relentlessly reduced in October by more than 40 per cent., equal to the enormous difference of 90,000,000 bushels; the census showed a reduction only about 2 per cent. less. The figures for wheat were still closer. In fact, the substantial identity on all important points was remarkable. Was this mere guess-work, or something more? The same year the estimate of wheat in Minnesota was deemed too large by local official authority, yet the census sustained the accuracy of the national estimate, and proved the State enumeration incomplete. A highly esteemed rural publicist, in New York, called in question the Department estimate of wheat of the same year, as quite too high both for New York and the entire country, and yet the census figures, afterward published, were higher still.

In the South, with a gap of years in its comparisons of production, its industrial disturbances amounting to convulsion and partial destruction, equal accuracy was impossible, and of course unattained. Information concerning the cotton-crop has been more complete and of greater accuracy than all other current data upon that subject. It is true that the preliminary estimates made during the picking season have usually been under rather than over the actual outcome; and commercial estimates have usually been placed about 10 per cent. higher. The result has been, whenever a crop decidedly short has occurred, as in 1871, the commercial authorities have been sadly at fault.

As to acreage generally, of all our crops, there has been no reliable authority, no basis whatever being furnished by the census, and none by States with very few exceptions. The Department has attempted estimates, deducing crop-acreage from estimates of aggregate production and estimated yield per acre. Now while a county estimate of total product is liable to be slightly too low, the estimated yield per acre is quite apt to be slightly too high, and if uncorrected it would necessarily make the area of crops

too small, a tendency against which I have continually had occasion to labor. Some critics have flatly disputed this tendency to overestimate the yield per acre, but they have done it in ignorance of proven facts. From this consideration I have for years believed that the reported cotton acreage might be proven by accurate enumeration somewhat too low, but have not felt authorized to enlarge it without positive proof that it is so—proof that I hope soon to be able to accumulate. I recognize fully the importance of the utmost accuracy, as the Department figures for acreage of cotton are the only basis for all published statements of such areas. As an illustration of this fact, it will be remembered that during the war, great efforts were made to grow cotton largely near the northern limits of its possible maturity, and the area was estimated accordingly, and strange to say, though the effort was long since mainly abandoned, those same figures, (ten times too large for the present day,) with annual percentage modifications, are still doing duty in journalistic statistics.

But the subject is one of difficulty; no authority is infallible, and the degree of modesty with which it is treated will distinguish the superficial tyro from the experienced in statistics. Could annual enumeration be not only inaugurated by States, with a common schedule, which should include only a few plain and practical points of inquiry, but be also thoroughly made and promptly published, current estimates on such bases might be closely approximate and of greatly enhanced value. I would urge upon this body the importance of laboring to establish uniformity, to encourage in every State an annual census on such a plan, and to attempt the more difficult task of educating public sentiment to the necessity of appreciation and careful and conscientious co-operation on the part of the people.

#### CONCLUSION.

In conclusion, allow me to express the hope that the wise deliberation and efficient action of this body may tend to hasten the day when 25 per cent. of our people shall furnish a better and more varied agricultural supply than is now obtained by the 47 per cent. employed in agriculture; when the 21 per cent. now engaged in mining, manufacturing and the mechanic arts, may become 42; when two blades of grass shall grow instead of one, twenty-five bushels of wheat instead of twelve, and an acre of cotton always bring a bale; when clover shall appear in place of broom-sedge, the sun cease to smite with barrenness the southern slope, and many fields shall be green with mangolds for the fattening of lazy bullocks grazing on a thousand hills; when superior and more various implements shall, while dividing, multiply the labor of human muscle, and steam shall supplement and save the costly strength of beasts; when a moiety of the farmer's income may suffice to pay his taxes, his bills for commercial fertilizers, and all purchases of farm produce that he fails to procure from his own fair acres; when railroads shall cease from troubling with unscrupulous exactions, and unnecessary middlemen are ever more at rest; when the farmer's home shall be beautiful with flowers, his farm a smiling landscape, and his barns shall groan with the burden of plenty; and, finally, when the farmer shall in every section of a broad and prosperous land be recognized as nature's nobleman, the most intelligent, just, healthy, and happy of his countrymen—"an honest man, the noblest work of God."

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## THE GERMAN EMPIRE.

From a statistical memoir of the German Empire prepared by T. Bödiker, and published as an introduction to the official catalogue of the German department of the late Vienna International Exposition, the following notes have been compiled:

**GEOGRAPHY AND CHOROGRAPHY.**—As now constituted, the German Empire occupies almost the entire center of the European continent; its western neighbor, France, extends to the Atlantic Ocean; while on the east, Russia stretches to the Ural River, the frontier of Asia. The transverse diameter of the empire runs northeastwardly, eight hundred miles, from Metz to Tilsit; its extreme breadth, from Hadersleben, near the north border of the late Danish province of Sleswig, to Kempten, near the Swiss frontier, is five hundred and thirty-four miles. The total area is stated at 9,887.4 German square miles, which, according to the late imperial standard of 7,500 meters to the mile, gives an area of 214,711 English square miles.

The northern part of the country, skirting the Baltic Sea and the German Ocean, is low and level, constituting the depressed westward projection of the great Russo-Polish plateau, which extends eastward to the Ural River. In some places the depressed shore-line renders necessary the erection of dikes to keep out the German Ocean. West of the Elbe the coast is frequently lined with fertile meadows, back of which is a considerable waste of swamps and moors, interspersed with sand-hills. From Denmark to the Ural River the plateau is broken by the Baltic-Uralian ridges, which reach their maximum elevation of about 900 feet in the Karthaus plateau near Dantzig.

The mountain ranges appear to converge near Minden in Westphalia, spreading with a fan-like expansion southward. The principal systems are: 1. The Westphalian Rhine Slate Mountains, of Devonian origin, running southwest across the Rhine. 2. The Rhine system, running south-southwest and stretching from the celebrated Black Forest to Sollinger Forest on the Weser. 3. The southern system, embracing several ranges starting from near Passau and the sources of the Oder, and running northwest to the valley of the Ems. On the south flanks of this system are found the Bohemian, Bohmerwald, Thuringian and Teutoburger forests. The principal rocks are granite, gneiss, mica, and hornblende slate. 4. Portions of the Alpine system, the Algäuer, the Bavarian, and the Salzburg ranges cross the southern frontier.

Germany participates in ten large streams, of which three are important rivers, besides one hundred and fifty smaller streams, of which sixty are navigable. A large number of brooks afford immense water-power, driving 39,000 flour-mills. The Pregel, Vistula, Weichsel, and Oder, empty into the Baltic; the Eider, Elbe, Weser, Ems, and Rhine, into the German Ocean; the Danube into the Black Sea. Considerable lakes are formed at the foot of the Alps, in Brandenburg and in the neighborhood of Posen.

CLIMATE.—According to Dove, the Atlantic Gulf Stream exercises a considerable influence upon the German climate. The cold arctic currents not having direct access to the Baltic, this ameliorating influence is not greatly counteracted. The principal winds are the equatorial, which raises the winter temperature, bringing rain and snow, and the polar. The general temperature is higher than is usual in the same latitudes. The average temperature of leading points is shown in the following table.

*Average temperatures, centigrade.*

Places.	Winter.	Spring.	Summer.	Autumn.	The whole year.
Tilsit .....	-3.62	5.02	16.91	6.99	6.38
Kiel .....	0.85	7.08	16.35	9.15	8.35
Berlin .....	0.25	8.14	18.50	9.20	8.90
Oldenburg .....	1.05	7.50	16.63	8.69	8.51
Cleve .....	1.98	8.10	16.55	9.45	9.03
Trier .....	1.75	9.11	17.71	9.83	9.60
Stuttgart .....	1.64	9.94	18.89	10.28	10.19
Issny, (in Würtemberg) .....	-1.40	6.83	15.79	7.69	7.23
Munich .....	0.28	9.20	17.58	9.34	9.10
Leipzig .....	-0.14	8.09	17.28	8.73	8.49
Breslau .....	-1.20	7.63	17.89	8.64	8.24

The above temperatures may be transmuted into degrees Fahrenheit by multiplying them by 1.8 and adding the product to 32°, the freezing point. In case of *minus* temperatures the product should be subtracted from 32.

The yearly rain-fall in the Rhine provinces is 24 Paris inches; in Bavaria, 32.9; in Wurtemberg, 28.2; in Elsass Lotharingen, 28.6; in East Prussia, 22.6; in West Prussia, 19.9. The last spring frost occurs at the end of April in the eastern provinces, and three weeks earlier in the western; the first fall frost in the east is about the middle of October, and in the west about a month later. In the east the annual number of days above 19° centigrade, or 66.2 Fahrenheit, ranges from 26 to 28; in the central provinces, 40; at Cologne, 42. Spring work begins the last of February in the Rhine provinces, but as late as May in the mountains of Pomerania and Silesia. Rye harvest ranges through July. Potatoes are dug in October. The grape and the maize find their northern limit along the isotherm of 9° centigrade, (48.2 Fahrenheit.) The climatic conditions of both animal and vegetable growth are on the whole favorable.

**SOIL.**—About 49 per cent. of the empire is rated as garden and plow land; 18 per cent. meadows and pastures; 25 per cent. woodland; 8 per cent. waste. The soil is not remarkably fertile. In the level northern portions it is light and by no means rich, except in East Prussia, where less favorable climatic conditions reduce its full productiveness. The regular rain-fall, however, favors the untiring and intelligent cultivation which extorts good harvests. The conditions of growth are more favorable in Middle and South Germany, but far below those of Lombardy, Belgium, and England.

**LAND-TENURE.**—The farms of Germany are generally of medium size and are held in fee-simple. Near Treves and Coblenz, and in Baden, Nassau, and Wurtemberg the allotments are small. In the north-eastern provinces and on the Upper Elbe more than half the land is held in tracts exceeding 370 acres. On the west the land-tenures resemble those of France; on the east those of Russia. Thus in social organization as well as in climate, Germany occupies middle ground between Southwestern and Northeastern Europe.

**TILLAGE, LIVE STOCK, ETC.**—Saxony leads in high farming, but is not quite able to raise her own grain. Next follows the Lower Rhine, Hesse, Baden, Elsass-Lotharingen, Bavaria, and Wurtemberg. The richest grain-lands are in Schleswig-Holstein, Mecklenburg, Hanover, and the Danube Valley. Gardening prevails in the middle and south. The seed and flower gardens around Bamberg, Nuremberg, Ulm, and Frankfort rival those of Belgium and Holland. Baden, Hesse, and Wurtemberg export considerable quantities of fruit, while a small surplus is annually found in the Palatinate, the Rhine provinces, Thuringia, and Saxony. The flax fibers and fabrics of Silesia, Westphalia, and Hanover have a world-wide reputation. Bavaria, Elsass, and Posen raise superior hops. In 1872 Saxony, Silesia, Brandenburg, Anhalt, and Brunswick produced 61,000,000 centners\* of sugar-beets. The vine, cultivated since the time of the Romans on the hills of the Rhine, in the Palatinate, Wurtemberg, &c., covers 308,887 acres. Baden, Elsass, Hesse, Middle Franconia, the Palatinate, and a small portion of Prussia, in 1871, had 54,860 acres in tobacco. The average yield of wine is about 118,879,100 gallons; of tobacco 77,000,000 pounds. In 1871-'72 the aggregate yield of tobacco was 78,533,950 pounds, valued at 6,068,500 thalers, or about \$4,247,950. Of this aggregate Baden produced 22,557,590 pounds; Prussia, 21,877,900 pounds; Bavaria, 15,856,830 pounds; Elsass, 12,706,980 pounds; Hesse, 3,906,210 pounds.

Fine meadow and pasture land is distributed throughout the empire

\* By late imperial decree the centner has been fixed at 50 kilograms, or a little over 110 pounds.



giving large scope to live-stock raising, especially in Schleswig-Holstein, Mecklenburg, Hanover, Oldenburg, and Algau. The last census enumerated 3,500,000 horses, 15,000,000 cattle, 30,000,000 sheep, 8,000,000 hogs, and 2,000,000 goats. The wool-clip of 1869 amounted to 82½ million pounds, mostly in Prussia, Posen, Silesia, and Mecklenburg.

**FORESTRY.**—Forestry, an important branch of German rural economy, dates back to Charlemagne, who afforested the Ardennes and Osnabruck woods. German forestry is the best in the world. The empire embraces a forest-area of 56,460 square miles, about equal to the State of Michigan. Of this area 34 per cent. belongs to government; 16 per cent. to individuals, or societies, and the remainder to individual proprietors. Upland forests embrace 81 per cent. of the whole, and conifers 55 per cent. About 310,000 acres are devoted to oak for tanning. The net profits of forest-land range from 56 cents to \$3.56 per acre. At an average income of 77 cents per acre, the value of the German forests is computed at \$466,000,000. This large area of forest gives scope to a considerable yield of wild game, of which, however, no trustworthy statistics are accessible.

The fisheries are decreasing in yield, but measures have been taken to arrest this decline. Several sorts of fishes, especially the bream, are abundant in the waters of East Prussia; 100 tons, worth \$5.60 per ton, have been taken at a single haul.

**POPULATION.**—The total population is stated at 41,058,632.

The following table shows the population and area of the different states of the empire, in English square miles:

States.	Area.	Population.	Population per sq. mile.
	<i>Sq. miles.</i>		
Kingdom of Prussia, (including Lauenburg) .....	137,264	24,691,307	180
Bavaria .....	29,919	4,863,450	163
Saxony .....	5,903	2,556,244	433
Württemberg .....	7,694	1,818,539	236
Grand Duchy of Baden .....	6,038	1,461,562	242
Hesse .....	3,027	852,894	282
Mecklenburg-Schwerin .....	5,247	557,897	106
Saxe-Weimar .....	1,434	286,183	200
Mecklenburg-Strelitz .....	1,075	96,982	90
Oldenburg .....	2,524	314,777	124
Duchy of Brunswick .....	1,455	311,764	214
Saxe-Meiningen .....	927	187,184	192
Saxe-Altenburg .....	521	142,122	273
Saxe-Coburg-Gotha .....	776	174,339	222
Anhalt .....	916	203,407	222
Principality of Schwarzburg-Rudolstadt .....	372	75,523	203
Schwarzburg-Sonderhausen .....	338	67,191	199
Waldeck .....	442	56,224	127
Reuss, ältere Linie .....	108	45,094	418
Reuss, jüngere Linie .....	327	89,032	272
Schaumburg-Lippe .....	175	32,059	183
Lippe-Detmold .....	447	111,135	249
Free Cities—Lubeck .....	113	52,158	461
Bremen .....	101	122,407	1,212
Hamburg .....	162	338,074	2,087
Crown-lands of Alsace-Lorraine .....	5,715	1,549,459	271
Total .....	213,020	41,058,632	192
Adding the coast-harbors, &c., and the area is .....	214,711		

The nationalities of the population are stated as follows: Poles, 2,500,000; French, 270,000; Lithuans, 150,000; Tcherkin, 150,000; Danes, 150,000; Wends, 140,000; the remainder are Germans.

In regard to religion, 25,549,781, or 62.2 per cent., are Evangelical Lutheran; 14,851,455, or 36.3 per cent., are Catholics; 512,069, or 1.2 per cent., are Jews. A smaller number profess other forms of belief.

Of the total population, 20,149,800 are males, and 20,903,800 females, the ratio of the sexes being as 100 to 103.8. The proportion of individuals of the "productive" and "non-productive" ages is as follows:

Population.	Under 15 years.	Between 15 and 70 years.	Over 70 years.
	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
Total population .....	31.1	63.6	2.3
Males.....	34.1	63.1	2.2
Females.....	33.6	64.0	2.4

The average annual number of marriages, births, and deaths, during eighteen years, in Prussia, Austria, England, and France, were as follows:

Countries.	Marriages, per 1,000 souls.	Births, per 1,000 souls.	Deaths, per 1,000 souls.
	Prussia .....	8.41	38.99
Austria.....	8.56	40.17	31.99
England.....	8.37	34.67	24.43
France.....	7.86	26.33	24.02

The population has doubled in fifty years, and has increased 150 per cent. in eighty years, though depleted by emigration at an accelerating rate during the past and current generation. About 2,700,000 have settled in the United States, including 133,141 in 1873.

The percentages of married, single, widowed, and divorced were as follows:

Condition.	Total population.	Males.	Females.
	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
Married .....	51.2	52.3	50.1
Widowed .....	8.6	5.3	11.7
Single .....	40.0	42.2	37.9
Divorced.....	0.2	0.2	0.3

There is a marked tendency in the population to forsake the country and to gather into cities and towns. In Prussia each recurring census had shown some increase in the agricultural population up to 1867, when, for the first time, a positive decrease was shown in all except the factory-districts. The growth of cities has been enormous. In forty years Berlin has expanded her population from 249,000 to 825,000. In Westphalia and on the Rhine a large number of unimportant villages have become cities of 20,000 to 50,000 inhabitants. In the empire there are 32 cities of 50,000 people; 48 ranging from 20,000 to 50,000; 140 from 10,000 to 20,000; 307 from 5,000 to 10,000; 1,052 towns under 5,000. The population of some of the leading cities is as follows: Berlin, 825,389; Hamburg, 240,251; Breslau, 208,025; Dresden, 177,089; Munich, 169,478; Cologne, 129,233; Magdeburg, 114,552; Leipzig, 106,925; Hanover, 104,248; Stuttgart, 91,623, &c.

The number of habitations is stated at 5,263,000; of families, 8,665,000, showing the ratio of dwellings to families to be as 1 to 1.65; the ratio of dwellings to individuals is as 1 to 7.80; of families to individuals as 1 is to 4.74. The number of dwellings per square mile averages 25; of families per square mile, 40. The cities and towns embrace 20 per cent. of the dwellings, 32 per cent. of the families, and 31 per cent. of the people; the remainder are in the country.

TRANSPORTATION AND TRADE.—On the 1st of January, 1872, the German railways embraced 12,118 miles, of which 7,363 belonged to the government. The capital invested, in 1845, was 301,885 thalers, or \$211,219 per mile; in 1860, 480,586 thalers, or \$336,410; in 1870, 553,067 thalers, or \$387,147. The volume of both transportation and travel has rapidly increased during later years. In 1870 the railroads carried nearly 80,000,000 tons of merchandise and 112,889,495 passengers. In 1872 the post-office department transported 569,967,075 letters, 24,552,504 registered letters, 310,042,987 papers, 40,859,443 packages, 14,758,817 and 3,634,502 postal orders, besides 7,215,510 postal travelers. The length of telegraph-wires in operation was 77,839 miles, of which 23,340 were of recent construction. The number of dispatches delivered was 9,626,295, being about one-fourth of the number actually sent over the wires.

The aggregate transactions of the Prussian banks rose from 810,000,000 thalers in 1850 to 9,283,000,000 in 1872. The commercial marine of Germany in 1871 included 179 steamers, 4,943 sail-vessels, with an aggregate tonnage of 1,305,372. During that year 68,155 ships, with a tonnage of 8,435,000, entered the German harbors; the clearances embraced 67,451 vessels and 8,364,000 tons. The imports of Hamburg and Bremen rose from 293,803,000 thalers in 1867 to 473,279,000 thalers in 1871; about three-fourths having been received at Hamburg.

The currency of the empire is now in transition from a silver to a gold standard. By the law of December 4, 1871, a pound of pure gold is to be divided into 139½ pieces, each valued at ten marks. Each mark is divided into 100 pfennige. Nine parts of gold are alloyed with one part of copper. Besides these the old North German thaler and the South German gulden are used, the former running 30 pieces and the latter 522 pieces to the pound of pure silver.

By order of August 17, 1868, the metric system of weights and measures was introduced, but with some modifications. The mile of 7,500 meters, the scheffel of 50 liters, the schoppen of half a liter, and the centner of 50 kilograms were added to the regular denominations, while the names in some cases were translated into German. Half a kilogram is called a pound; 1,000 kilograms, or 2,000 pounds, consti-

tute a ton. Only sealed weights and measures are used in public markets.

Insurance is practiced on a large scale, both by mutual and stock companies. Some life-insurance companies take risks outside the Empire; on the other hand, some thirty foreign companies have agencies in Germany. It is estimated that 500,000 policies are pending, covering an aggregate risk of 440,000,000 thalers, and paying an annual premium of 14,000,000 thalers. Fire-insurance operations are still more extensive; 337 German companies and unions represent an aggregate capital of 7,440,000,000 thalers, while 25 foreign companies take German risks to the amount of 500,000,000 thalers. It is estimated that 14,000,000,000 of thalers' worth of property are insured, at an annual premium of 25,500,000 thalers. Besides the above, there are four companies who insure mirrors at an annual risk of 1,500,000 thalers, and several local and general associations insuring crops against hail; a very large number of live-stock insurance companies do an extensive business, especially in the stock-raising districts. Quite a number of private parties also assume insurance risks.

An important factor in domestic economy was founded, in 1850, by Schulze-Delitzsch under the name of "loan, credit, and consumers' unions." At the close of 1871 there were 1,239 loan and credit unions, with 236,016 members, and 405 consumptive unions, with 22,333 members. At the close of 1872 a combination of trades-unions had been effected, embracing 16 confederated general unions, 282 affiliated local unions, and 13 independent local unions, numbering 18,823 members. This organization embraces about half the trades-unions of the empire.

Mutual-benefit societies and savings banks are numerous. In Prussia, in 1871, there were 1,865 mutual-benefit societies for independent traders, with 300,917 members, and an income of 387,359 thalers, with a reserve-fund of 1,898,359 thalers. For workmen there were 4,655 funds, with 632,212 members, an income of 1,907,418 thalers, (of which 416,977 thalers came from employers,) and a reserve of 2,316,981 thalers. Savings-banks originated, in 1818, at Berlin. At the close of 1871 they numbered 830, with an aggregate deposit of 192,920,802 thalers, equal to 7.86 thalers *per capita* of the population. The maximum proportion, 25 thalers *per capita*, is found in Westphalia and Schleswig-Holstein; in Posen and Prussia proper it falls below 1 thaler.

**MILITARY ESTABLISHMENT.**—Military duty is inflexibly required of every able-bodied citizen. The military age is from twenty to thirty-two, seven of which are in the standing army—three years in active service and four in the regular reserve. The remaining five years is passed in the landwehr or embodied militia. The peace-establishment embraces 1 per cent. of the entire population, and actually enrolls 401,659 privates, 17,036 officers, and 3,644 surgeons and enlisting-officers. The artillery consists of 1,200 field-pieces, served by 96,158 horses. The navy includes 3 armored vessels, 2 monitors, 10 corvettes, 2 dispatch-boats, 18 gun-boats, &c. Several armored vessels are in process of construction.

**TAXATION.**—The expenses of the Empire in 1873 were met in part by 110,505,466 thalers of ordinary and 8,335,023 thalers of extraordinary taxes. Their deficiency was met, first, by the surplus revenue of the post-office department and telegraphs; and, secondly, by direct allotments to the states of the Empire in proportion to population. Since the organization of the empire all internal custom-houses have been abolished, and no restrictions can be placed on the commerce between the states. The customs-union embraces also Luxembourg, though it

does not belong to the empire. The empire has no debt. The state debts amount to 504,500,000 thalers; railroad debts, 589,300,000 thalers; total, 1,093,800,000, or 27 thalers *per capita* of the population. In 1870 Great Britain owed 193 thalers *per capita*; Austria, 48; Holland, 185; France, 80; Russia, 29.

**LOCAL GOVERNMENT.**—The local government of Germany corresponds very nearly to our county and township organization, the local administrators being elected by ballot. The ancient Teutonic traditions of tribal organization are still an important element in German political life. This local government controls the police, sanitary, school, and pauper services. Each district must provide for its own paupers, either native or foreign.

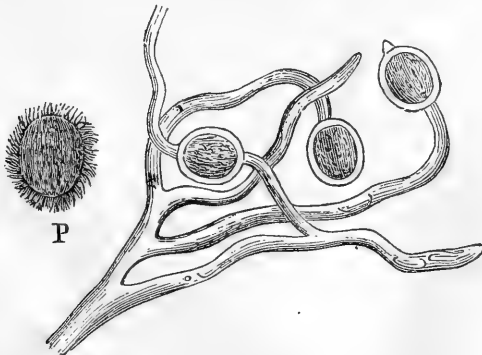
**EDUCATION.**—The educational system is thorough and compulsory. In 60,000 public schools there are 6,000,000 pupils. For higher instruction there are 330 gymnasia, 14 real gymnasia, 214 progymnasia and latin-schools, and 485 real and high schools, with an aggregate attendance of 177,379 pupils. There were also 21 universities, with four faculties, theology, law, medicine, and philosophy. In some a fifth, that of political economy, is maintained. The instructors of all grades numbered, in 1872-73, 1,620; the students, 17,858. In technical culture, 10 polytechnic schools, with 360 teachers, gave instruction to 4,500 pupils. Other special schools are maintained, including 45 obstetric schools; art-schools, musical conservatories, commercial colleges, navigation and trade schools, &c., in great numbers. In Prussia, Bavaria, and Saxony there are 14 mining-schools, a military academy, an artillery school, and several cadet-schools, riding-schools, &c.

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## MICROSCOPIC OBSERVATIONS.

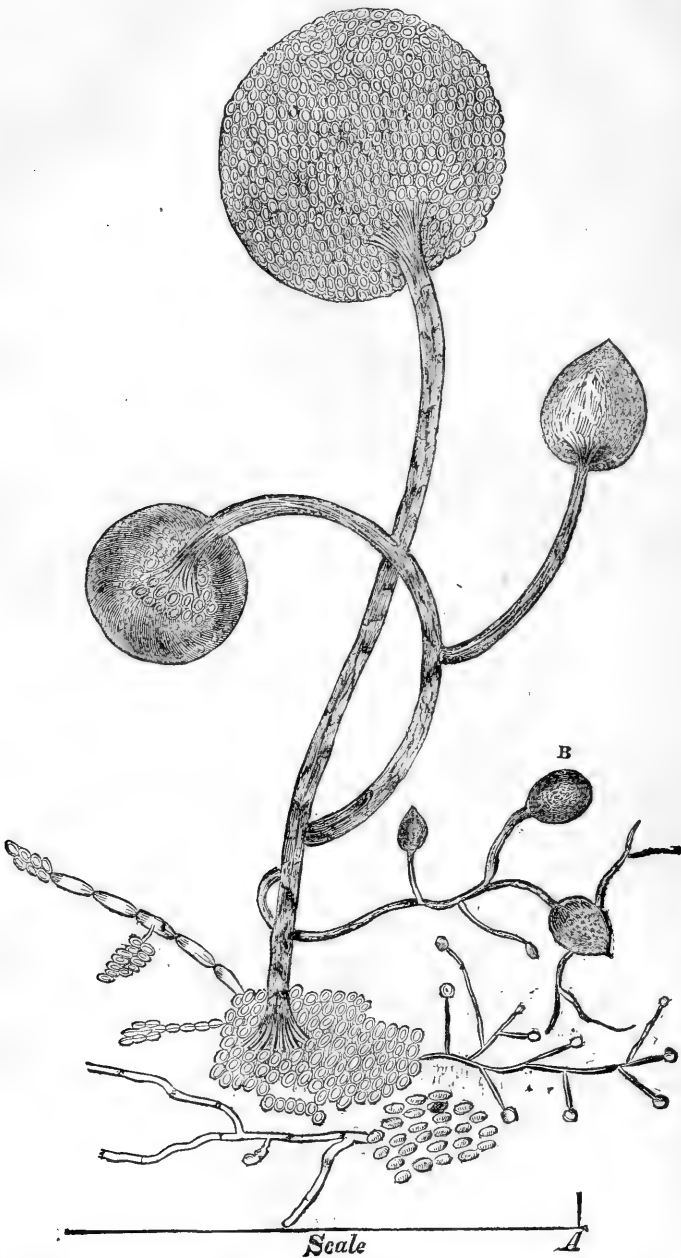
BY THOMAS TAYLOR, MICROSCOPIST.

In Hardwicke's Science Gossip for October 1, 1872, page 225, is illustrated a fungus, which was first discovered by Doctor Payen growing among the mycelium in the intercellular passage of spent potatoes affected with rot. Fig. 3 presents the illustration given in that journal.



This fungus has been named by Montague *Artotrogus hydno sporus*, although considered by Berkeley and others to be probably a secondary form of fruit (oospores) of the potato-fungus itself. In order to test the matter more fully I placed a portion of a rotting potato affected with

*Peronospora infestans* in a clear glass jar, and allowed it to ferment. After the lapse of two months a mold, or mildew, formed on its sur-



face. Placing a small portion of this on a glass slide six inches long by two inches wide I inclosed the latter in a jar containing about an ounce of distilled water, and secured its contents with a ground-glass

stopper. I examined it in its different stages of growth, every twenty-four hours, for several weeks. I have repeated these experiments many times during the last six months, always getting the same general result. The figure illustrates the various stages of growth. The fruit B represents the thousandth of an inch, and the scale A one  $\frac{1}{100}$  of an inch. The color of the fruit resembles that of matted silver, rich and somber. The principal fruit-stalk, although represented as branched, is not always so in nature. The stalk is frequently found supporting but one head or fruit. The stalks, when fully ripe, are cellular and of a peculiar structure.

In order to ascertain whether a rotting potato, which had decayed from ordinary fungus fermentation, *Penicillium glaucum*, would produce, under similar treatment, a fungus like Fig. 3, or one of a similar type, I instituted a second set of experiments, using a mush made directly from healthy potatoes. The experiments were conducted in the same manner as those already described, extending over a period of six months. The result was that the pulp of the healthy potato invariably produced *Penicillium glaucum*, while that of potatoes infested with *Peronospora infestans*, with a like uniformity, produced the fungus represented by Fig. 4.

It would seem from experiments that the fungus *Artotrogus hydnosporus* is in some way peculiarly connected with *Peronospora infestans*, or "potato rot;" and during its highest stages of fermentation it would also seem to have the power of destroying the germ of the fungus *Penicillium glaucum*.

One of my early experiments with rotting potatoes consisted in placing some of those affected with the fungus *Peronospora infestans* in a saturated solution of sulphate of copper. After a lapse of four weeks I removed the affected potatoes from the copper solution and placed them in pure water, changing the latter every twenty-four hours, as long as the liquid at the end of that time had the bluish tinge indicating the presence of copper in solution. I next placed the potatoes in separate glass jars. After the lapse of several weeks the water became slightly blue in color still showing the presence of sulphate of copper. To my surprise the mycelium of a fungus had grown in profusion on the potato, its branches extending upward to the surface of the liquid. In the course of the next two months little white specks appeared on the surface. These specks ultimately developed into distinct circular forms, resembling a lady's low-crowned hat, having a thickness of about one-eighth of an inch at the center of the crown, with a diameter of about half an inch, and a pure snow-white color. All these disks finally united, covering the surface of the liquid with a felt-like substance, which apparently derived its sustenance from the potato, through the fungus branches above referred to. On examining portions of this substance under a power of three hundred diameters I found it to consist of white *Penicillium* thickly matted together and in full fruitage.

Sulphate of copper in solution has been frequently recommended as a reliable antidote to fungoid growth. In the present experiments it evidently destroyed the *Peronospora infestans*, but did not destroy the *Penicillium*, the germs of which must have existed in the potato, as well as those of the former fungus; though it has already been seen that where *Peronospora infestans* produced putrefaction the *Penicillium* never made its appearance, its germs having probably been destroyed by the more powerful fungus. It may be remarked, in conclusion, that the failure of the solution of sulphate of copper to destroy *Penicillium* renders it probable that it would prove ineffective as an antidote to other forms of the fungi belonging to the family *Muscedines*.

## FACTS FROM VARIOUS OFFICIAL SOURCES.

TEA PRODUCTION IN BENGAL, BRITISH INDIA.—In the entire presidency about 800,000 acres are “held for purposes connected with the tea industry.” Of this only about 70,000 acres are occupied with tea-plants in bearing. This portion is subdivided into “mature-plant land” and “immature-plant land.” The average yield of the mature-plant land is about 237 pounds per acre; that of the immature, about 80 pounds; of the whole, 208 pounds per acre.

The total production is about 15,000,000 pounds. The following are the statistics for the several “divisions:”

Divisions.	Taken for tea-culture.	Cultivated.	Under mature plants.	Under immature plants.	Total yield in 1872.
	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Pounds.</i>
Assam .....	364,990	26,853	21,890	4,963	6,150,764
Decca .....	221,174	26,751	23,031	3,720	5,296,169
Cooch Behar.....	133,024	14,639	10,181½	4,457½	2,955,926
Chittagong .....	23,890	1,203	1,034	196	204,112
Chota Nagpore.....	1,504	894	835	59	53,200
Total.....	804,582	70,367	56,971½	13,395½	14,660,171

The above statistics for the Assam division are exclusive of those for the tea-gardens of Luckimpore, (not being reported;) and of the 6,150,764 pounds reported, 1,500,000 pounds were produced by the Assam Company, which was the first one organized for producing tea in Bengal, and which had to experiment six or seven years before it began to receive much encouragement in profitable returns.

A NOVEL THEORY.—The following dispatch was sent by A. N. Duffre, the consul of the United States at Cadiz, Spain, and communicated to this Department by the Secretary of State. It is now published because of the novelty of the idea—that the same influence which operates to govern the ebb and flow of the tides, produces a like corresponding effect upon the flow of sap in growing vegetation:

A Madrid paper of respectable standing, entitled *La Epoca*, has published, in its issue of the 12th instant, an article signed by Don Luis Alvarez Alvistur, on the influence of the tides of vegetation, in which the writer announces a new theory, based on the results obtained during fourteen years devoted to experimental research, by an enlightened landed proprietor of Lorca, in the province of Murcia.

The theory adopted was the direct influence of the tide on the circulation of the sap, and its experimental application after determining the meridian of the estate and tabulating the corresponding hours of ebb and flow, has been the felling and lopping of forest-trees solely during the hours pertaining to the ebbing tide. The results are stated to have been conclusive, the decay annually observable formerly in some portion of the timber having ceased completely in the many years that have elapsed during the application of the new principle. The system was then applied to an olive-grove, the yield of which had ceased to cover the annual costs of culture, by removing every dried portion of the trees exclusively during ebb tide. The result is stated to have been the complete transformation of the grove, a great development of foliage, and abundant crops.

Equally admirable results ensued from the similar treatment of orange, lime, and other fruit trees, which were thenceforth unaffected by larvæ or other plagues which smote adjoining orchards; and finally the vineyard of the Lorca landlord, though surrounded by those of other proprietors which were devastated by the oidium which appeared in the district at the period when the new system was first essayed, have never exhibited the faintest trace of the presence of the malady.

It is likewise asserted that experiments made with equal sets of silk-worms, respectively fed on leaves of trees treated by the ordinary and by the new system, the leaves



under the new plan being gathered exclusively at the hours corresponding to the ebb tide, resulted most decidedly in favor of the latter.

Though thoroughly incompetent to judge the merits of the theory thus added to the many which have contended for the solution of the mystery attending vegetable life, I have still not hesitated in calling your attention to it, impressed by the proclamation of facts, which can easily be tested, encouraged by the hope that some benefit may accrue to the agricultural interests even from the mere experimental and scientific investigation which it may induce or foster.

**LIVE STOCK IN DENMARK.**—The demands of British markets have stimulated the raising of live stock as a regular branch of Danish agricultural industry. The annual export is rapidly increasing, while efforts are being made to conduct the business upon scientific and economic principles. In 1873 the Danish Agricultural Society held two national expositions of fattened animals, one for the islands three days, commencing May 12, and another for the Peninsula of Jutland, May 26 and 27; the former at Copenhagen and the latter at Aarhus, the leading points of live-stock exportation. The success of the exposition of 1873 has emboldened the society to make still greater efforts.

**GRASS IN MISSISSIPPI.**—Mr. H. O. Dixon, of Jackson, Miss., contributes his experience with grasses:

My experiments with clover and grass have thus far been so successful as to induce me to extend the area, the past fall and winter, to thirty acres. All of this appears to be doing well, although necessarily much retarded by the excessive and continuous rains. My old clover is now (May 9) knee-high and blooming, having been pastured during the winter, until the 10th of March, by my breeding-ewes. I also have a piece of clover now in its fourth year, which has been closely pastured the two past winters, to the middle of March, by cattle and mules. That is apparently as far from giving out as at first. It is now over a foot high. The orchard grass, on good high land, is very fine, and is now throwing up seed-heads. The red-top or herd's-grass (not timothy) does well on both high and low lands. It is now about a foot high. All these grasses have been severely tested by drought, as intense as ever visits this region, without the least appearance of failure; so that I can truthfully and knowingly assert that this part of Mississippi is well adapted to the grasses named above.

Mr. Dixon calls attention to the fact that by herd's-grass he means red-top, (*Agrostis vulgaris*,) and not timothy, (*Phleum pratense*,) which is the more reputable synonym for herd's-grass in the North. While he has been very successful with red-top, he has found timothy wholly unsuited to that climate.

**FLAX-CULTURE IN MINNESOTA.**—The growth of this textile plant is rapidly increasing in Minnesota. In Watonwan County 8,000 acres have been sown and the crop looks finely. In Stearns County an experimental crop realized large results, and, in consequence, the acreage has been increased five-fold. It is a third more profitable than wheat.

## MARKET-PRICES OF FARM-PRODUCTS.

*The following quotations represent the state of the market, as nearly as practicable, at the beginning of the month.*

Articles.	May.	June.
<b>NEW YORK.</b>		
Flour, superfine State .....	\$5 85 to \$6 05	\$5 25 to \$5 75
extra State .....	6 30 to 6 75	6 00 to 6 60
superfine western .....	5 85 to 6 05	5 25 to 5 75
extra to choice western .....	6 15 to 11 00	5 85 to 11 00
common to fair southern .....	6 40 to 7 30	6 15 to 7 00
good to choice southern .....	7 35 to 11 00	7 05 to 11 00
Wheat, No. 1 spring .....	1 61 to 1 65	1 50 to 1 51
No. 2 spring .....	1 52 to 1 58	1 45 to 1 48½
winter, red, western .....	1 63 to 1 66	1 50 to 1 55
winter, amber, western .....	1 66 to 1 70	1 56 to 1 58
winter, white, western .....	1 55 to 1 87	1 50 to 1 75
Rye .....	----- to 1 13	1 04 to 1 13
Barley .....	----- to 1 50	----- to 1 80
Corn .....	83 to 88	76 to 81½
Oats .....	63 to 68	62 to 66
Hay, first quality .....	24 00 to 33 00	25 00 to 31 00
second quality .....	20 00 to 21 00	----- to 23 00
Beef, mess .....	10 00 to 12 00	10 00 to 12 00
extra mess .....	12 50 to 14 00	12 50 to 14 00
Pork, mess .....	16 90 to 17 05	17 60 to -----
extra prime .....	14 25 to 14 62½	14 75 to 15 00
prime mess .....	15 25 to 15 75	15 50 to 16 00
Lard .....	10½ to 10¾	11¾ to 11¾
Butter, western .....	22 to 27	20 to 26
State dairy .....	28 to 33	24 to 30
Cheese, State factory .....	15 to 17½	----- to -----
western factory .....	----- to -----	----- to -----
Cotton, ordinary to good ordinary .....	13¾ to 16	15 to 16¾
low middling to good middli'g. do .....	16¾ to 19¾	17½ to 20
Sugar, fair to good refining .....	7¾ to 8	7¾ to 8½
prime refining .....	8½ to -----	8½ to -----
Tobacco, lugs .....	4½ to 6½	4½ to 6½
common to medium leaf .....	6 to 8½	6 to 8½
Wool, American XXX and picklock .....	62 to 70	53 to 65
American X and XX .....	45 to 60	47 to 57
American, combing .....	52 to 60	50 to 65
pulled .....	25 to 50	33 to 52
California, spring-clipped .....	19 to 35	23 to 37
California, fall-clipped .....	20 to 27	20 to 27
<b>BOSTON.</b>		
Flour, superfine, western .....	5 50 to 6 00	5 00 to 5 50
western extras .....	6 50 to 7 50	5 75 to 7 25
western choice .....	8 00 to 10 50	7 75 to 10 00
southern extras .....	6 50 to 7 00	5 75 to 6 00
choice Baltimore .....	9 00 to 10 50	8 75 to 10 00
Wheat .....	1 50 to 1 85	1 50 to 1 85
Rye .....	----- to 1 20	----- to 1 20
Barley .....	----- to -----	----- to -----
Corn .....	92 to 95	82 to 86
Oats .....	62 to 70	62 to 70
Hay, eastern and northern .....	12 00 to 27 00	14 00 to 29 00
western choice .....	24 00 to 25 00	25 00 to 27 00
Beef, western mess .....	11 00 to 12 00	12 00 to 13 50
western mess extra .....	13 00 to 14 00	14 00 to 14 50

## Market-prices of farm-products—Continued.

Articles.	May.	June.
BOSTON—Continued.		
Pork, prime .....	\$14 50 to \$15 00	\$15 00 to \$15 50
mess.....do.....	17 50 to 18 00	18 50 to 19 00
Lard .....	10 <sup>3</sup> / <sub>8</sub> to 11 <sup>3</sup> / <sub>4</sub>	11 <sup>1</sup> / <sub>2</sub> to 12
Butter, New York and Vermont.....do.....	28 to 37	23 to 28
western .....	25 to 33	22 to 26
Cheese, New York and Vermont.....do.....	15 to 17 <sup>1</sup> / <sub>4</sub>	15 <sup>1</sup> / <sub>2</sub> to 16
western factory.....do.....	14 to 17	15 to 15 <sup>1</sup> / <sub>2</sub>
Sugar, fair to good refining.....do.....	7 <sup>3</sup> / <sub>8</sub> to 8 <sup>3</sup> / <sub>4</sub>	7 <sup>3</sup> / <sub>8</sub> to 8
Tobacco, lugs.....do.....	6 <sup>1</sup> / <sub>2</sub> to 8	6 <sup>1</sup> / <sub>2</sub> to 8
common to medium leaf.....do.....	8 <sup>1</sup> / <sub>2</sub> to 10	8 <sup>1</sup> / <sub>2</sub> to 10
Cotton, ordinary to good ordinary.....do.....	13 to 16 <sup>1</sup> / <sub>2</sub>	15 to 17
low middling to good middling.....do.....	16 <sup>3</sup> / <sub>4</sub> to 19 <sup>1</sup> / <sub>2</sub>	17 <sup>1</sup> / <sub>2</sub> to 21
Wool, Ohio and Pennsylvania.....do.....	49 to 60	49 to 60
Michigan.....do.....	45 to 53	45 to 53
other western.....do.....	44 to 52	44 to 52
pulled.....do.....	25 to 57	25 to 56
combing-fleece.....do.....	60 to 62	57 to 62
California.....do.....	18 to 38	18 to 38
Texas.....do.....	20 to 35	20 to 35
PHILADELPHIA.		
Flour, superfine .....	5 00 to 5 50	4 75 to 5 25
Flour, Pennsylvania extra.....do.....	5 75 to 6 50	6 00 to —
Pennsylvania family and fancy.....do.....	6 75 to 8 25	— to 8 75
western extra.....do.....	6 75 to 7 00	5 50 to 6 75
western family.....do.....	7 50 to 8 50	6 25 to 9 75
Wheat, winter, red .....	1 50 to 1 63	1 45 to 1 55
winter, amber.....do.....	1 50 to 1 80	1 60 to 1 68
winter, white.....do.....	1 90 to —	1 65 to 1 69
spring.....do.....	1 45 to —	1 45 to 1 49
Rye.....do.....	98 to 1 00	98 to —
Barley.....do.....	— to —	— to —
Corn.....do.....	84 to 90	82 to 89
Oats.....do.....	62 to 65	61 to 67 <sup>1</sup> / <sub>2</sub>
Hay, fresh, baled.....per ton.....	23 00 to 25 00	24 00 to 26 00
common to fair shipping.....do.....	21 00 to 23 00	21 00 to 23 00
Beef, western mess .....	8 00 to 10 00	8 00 to 10 00
extra mess.....do.....	9 00 to 12 00	9 00 to 12 00
Warthman's city family.....do.....	16 00 to —	17 00 to —
Pork, mess.....do.....	17 00 to 17 25	18 00 to 18 25
prime mess.....do.....	16 00 to —	16 00 to 16 50
prime.....do.....	14 50 to —	15 00 to —
Lard .....	10 <sup>1</sup> / <sub>8</sub> to 13	11 <sup>1</sup> / <sub>4</sub> to 15
Butter, choice middle State.....do.....	33 to 40	28 to 33
choice western.....do.....	35 to 36	25 to 28
Cheese, New York factory.....do.....	16 <sup>1</sup> / <sub>2</sub> to 17 <sup>1</sup> / <sub>2</sub>	15 to 17
Ohio factory.....do.....	16 to 16 <sup>1</sup> / <sub>2</sub>	12 to 15 <sup>1</sup> / <sub>2</sub>
Sugar, fair to good refining.....do.....	7 <sup>3</sup> / <sub>8</sub> to 7 <sup>3</sup> / <sub>4</sub>	7 <sup>3</sup> / <sub>8</sub> to 7 <sup>3</sup> / <sub>8</sub>
Cotton, ordinary to good ordinary.....do.....	13 to 15 <sup>1</sup> / <sub>2</sub>	15 to 16 <sup>1</sup> / <sub>2</sub>
low middling to good middling.....do.....	16 <sup>1</sup> / <sub>2</sub> to 18 <sup>1</sup> / <sub>2</sub>	18 to 20 <sup>1</sup> / <sub>2</sub>
Wool, Ohio X and XX.....do.....	56 to 58	53 to 58
Ohio combing.....do.....	60 to 63	57 <sup>1</sup> / <sub>2</sub> to 65
pulled.....do.....	47 to 49	46 to 55
unwashed, cloth'g and comb'g.....do.....	21 to 37 <sup>1</sup> / <sub>2</sub>	22 to 45
BALTIMORE.		
Flour, superfine .....	5 00 to 5 50	4 50 to 5 25
extra.....do.....	5 75 to 7 50	5 50 to 6 50
family and fancy.....do.....	7 25 to 10 50	6 75 to 10 00

## Market-prices of farm-products—Continued.

Articles.	May.	June.
BALTIMORE—Continued.		
Wheat, white .....	\$1 60 to \$1 85	\$1 50 to \$1 65
amber .....	1 60 to 1 80	1 62 to 1 65
red .....	1 50 to 1 60	1 30 to 1 45
Rye .....	85 to 89	1 05 to 1 10
Corn, white, southern .....	80 to 84	90 to 92
yellow, southern .....	80 to 83	78 to 79
Oats, southern .....	61 to 66	70 to 74
western .....	59 to 63	62 to 65
Hay, Pennsylvania .....	17 00 to 20 00	19 00 to 22 00
Maryland .....	20 00 to 24 00	18 00 to 25 00
western .....	19 00 to 20 00	_____ to _____
Beef, Baltimore mess .....	15 00 to 20 00	_____ to _____
extra .....	23 00 to 25 00	_____ to _____
Pork, mess .....	16 50 to 16 75	18 25 to 18 50
Lard .....	9 $\frac{3}{4}$ to _____	11 $\frac{1}{2}$ to 12
Butter, western .....	28 to 38	18 to 25
eastern .....	_____ to 42	20 to _____
Cheese, eastern cutting .....	16 $\frac{1}{2}$ to 17	16 to 16 $\frac{1}{2}$
western cutting .....	16 $\frac{1}{2}$ to 17	15 $\frac{1}{2}$ to 16 $\frac{1}{2}$
Sugar, fair to good refining .....	7 $\frac{5}{8}$ to 7 $\frac{5}{8}$	7 $\frac{3}{4}$ to 8
Tobacco, lugs .....	5 00 to 8 00	5 00 to 8 00
common to medium, leaf .....	7 00 to 8 50	7 00 to 8 50
Cotton, ordinary to good ordinary .....	13 to 14 $\frac{1}{2}$	_____ to 16
low middling to middling .....	15 $\frac{1}{2}$ to 16 $\frac{1}{2}$	17 $\frac{1}{2}$ to _____
Wool, fleece, com. to fine .....	45 to 50	45 to 48
tub-washed .....	55 to 60	_____ to _____
unwashed .....	35 to 38	25 to 30
pulled .....	35 to 40	_____ to _____
CINCINNATI.		
Flour, superfine .....	5 00 to 5 50	4 85 to 5 25
extra .....	6 20 to 6 50	5 75 to 6 00
family and fancy .....	6 60 to 8 00	6 00 to 7 50
Wheat, red winter .....	1 43 to 1 48	1 23 to 1 30
hill winter .....	1 45 to 1 48	1 38 to _____
white winter .....	1 50 to 1 60	1 28 to 1 30
Rye .....	1 08 to 1 10	1 05 to 1 06
Barley .....	1 40 to 1 50	1 20 to 1 25
Corn .....	66 to _____	65 to 67
Oats .....	50 to 57	50 to 58
Hay, baled, No. 1 .....	15 00 to 18 00	16 00 to 19 00
lower grades .....	9 00 to 12 00	10 00 to 14 00
Beef, plate .....	_____ to _____	15 00 to _____
Pork, mess .....	16 70 to 17 00	17 75 to 18 00
Lard .....	10 to 10 $\frac{1}{2}$	10 $\frac{3}{4}$ to 11 $\frac{1}{2}$
Butter, choice .....	32 to 36	20 to 22
prime .....	27 to 30	18 to _____
Cheese, factory .....	15 to 16	13 $\frac{1}{2}$ to 14
pine-apple .....	_____ to _____	_____ to _____
Sugar, New Orleans, fair to good .....	8 $\frac{1}{2}$ to 9	8 $\frac{1}{2}$ to 9 $\frac{1}{2}$
prime to choice .....	9 $\frac{1}{2}$ to 9 $\frac{3}{4}$	9 $\frac{1}{2}$ to 9 $\frac{3}{4}$
Tobacco, lugs .....	6 to 20	6 to 20
leaf .....	8 to 29 $\frac{3}{4}$	8 to 29 $\frac{3}{4}$
Cotton, ordinary to good ordinary .....	13 $\frac{1}{2}$ to 15 $\frac{1}{2}$	14 to 16
low middl'g to good middl'g .....	16 $\frac{1}{2}$ to 17 $\frac{3}{4}$	17 to 18 $\frac{3}{4}$
Wool, fleece-washed .....	45 to 47	40 to 42
tub-washed .....	48 to 50	42 to 45
unwashed, clothing .....	30 to 32	28 to 30
unwashed, combing .....	33 to 35	35 to 37
pulled .....	38 to 40	35 to 38

## Market-prices of farm-products—Continued.

Articles.	May.	June.
CHICAGO.		
Flour, white winter, fair to good..per barrel..	\$7 00 to \$8 00	\$6 75 to \$8 00
choice.....do.....	8 50 to 9 00	8 00 to 9 00
red winter.....do.....	5 50 to 7 00	5 50 to 7 00
medium to fancy, spring extra...do.....	5 37½ to 10 00	5 25 to 10 00
spring, superfine.....do.....	3 50 to 4 87½	3 50 to 4 87
Wheat, No. 1 spring.....per bushel..	1 29 to 1 33	1 20½ to 1 21
No. 2 spring.....do.....	1 28½ to ———	1 16 to 1 16½
No. 3 spring.....do.....	1 19¾ to ———	1 13 to ———
Corn, No. 2.....do.....	63½ to 66½	56½ to 56½
Oats, No. 2.....do.....	46¾ to 47	43½ to 45
Barley, No. 2.....do.....	1 60 to 1 65	1 40 to 1 45
Rye, No. 2.....do.....	91 to 92	90 to 92
Hay, timothy.....per ton.....	16 00 to 18 50	15 00 to 19 00
prairie.....do.....	14 00 to 15 00	8 00 to 12 00
Beef, mess.....per barrel..	9 75 to 10 00	10 75 to 11 00
extra mess.....do.....	10 75 to 11 00	11 75 to 12 00
Pork, mess.....do.....	16 45 to ———	17 30 to ———
prime mess.....do.....	——— to ———	——— to ———
extra prime.....do.....	——— to ———	——— to ———
Lard.....per cental..	10 00 to 10 27½	10 60 to ———
Butter, choice to fancy.....per pound..	33 to 36	23 to 25
medium to good.....do.....	27 to 30	18 to 22
Cheese, New York factory.....per pound..	15 to 15½	14 to 15
Ohio and western factory.....do.....	15 to 15½	13 to 14½
Sugar, New Orleans, prime to choice..do.....	8¾ to 9½	9½ to 9¾
common to fair.....do.....	7½ to 8½	7½ to 8½
Wool, tub-washed.....do.....	48 to 55	48 to 52
fleece-washed.....do.....	35 to 47	35 to 42
unwashed.....do.....	25 to 33	25 to 52
pulled.....do.....	35 to 40	——— to ———
SAINT LOUIS.		
Flour, spring.....per barrel..	——— to ———	——— to 5 20
winter.....do.....	——— to 8 15	4 85 to 8 50
Wheat, red winter.....per bushel..	1 38 to 1 46	1 25 to 1 45
white winter.....do.....	1 40 to 1 46	1 20 to 1 32
spring.....do.....	——— to ———	1 05 to 1 12
Corn.....do.....	68 to 75½	56 to 70
Rye.....do.....	96 to 98	95 to ———
Oats.....do.....	51 to 52	48 to 51
Barley.....do.....	1 20 to 1 50	——— to ———
Hay, timothy.....per ton.....	20 00 to 23 00	14 00 to 20 00
Beef, prime mess.....per barrel..	——— to ———	——— to ———
mess.....do.....	12 50 to 13 00	12 00 to ———
extra mess.....do.....	——— to ———	13 50 to ———
Lard.....per pound..	10 to 10½	10 to 12½
Butter, choice.....do.....	31 to 32	20 to 23
inferior grades.....do.....	20 to 29	15 to 18
Cheese, Ohio and N. W. factory.....do.....	16 to 16½	14½ to 14¾
New York factory.....do.....	16 to 16½	15 to 15½
Sugar, New Orleans, common to fair..do.....	8¾ to ———	——— to ———
prime to choice.....do.....	9½ to 9¾	——— to ———
Cotton, ordinary to good ordinary...do.....	——— to ———	——— to ———
low middling to good mid.....do.....	——— to ———	——— to ———
Wool, tub-washed.....do.....	48 to 53	48 to 50½
unwashed, combing.....do.....	33 to 35	27 to 29
fleece-washed.....do.....	40 to 45	35 to 45
NEW ORLEANS.		
Flour, superfine.....per barrel..	4 80 to 5 00	——— to ———
extra.....do.....	5 25 to 6 75	6 00 to 6 50

## Market-prices of farm-products—Continued.

Articles.	May.	June.
NEW ORLEANS—Continued.		
Flour, choice to fancy.....per barrel..	\$7 00 to \$9 50	\$6 75 to \$9 50
Corn, white.....per bushel..	88 to 90	70 to —
yellow.....do.....	88 to —	70 to —
Oats.....do.....	60 to 62	58 to 60
Hay, choice.....per ton.....	23 00 to —	— to —
prime.....do.....	20 00 to —	23 00 to 25 00
Beef, Texas.....per barrel..	12 00 to 12 25	12 00 to 12 25
Philadelphia.....do.....	16 00 to 16 25	16 00 to 16 25
Fulton Market.....half barrel..	12 50 to —	12 00 to —
western.....do.....	9 00 to 9 25	9 00 to 9 25
Pork, mess.....per barrel..	17 75 to 18 00	18 75 to —
Lard.....per pound..	10 to 11	12½ to 12¾
Butter, choice Goshen.....do.....	38 to 40	36 to 38
western.....do.....	33 to 40	28 to 30
Cheese, choice western factory.....do.....	17 to —	15 to 15½
New York cream.....do.....	19 to 20	18 to —
Sugar, fair to fully fair.....do.....	7½ to 8½	8½ to 8¾
prime to strictly prime.....do.....	8¾ to —	9 to —
clarified, white and yellow.....do.....	9¼ to 10½	10 to —
Tobacco, lugs.....do.....	4 to 4½	4 to 6
low leaf to medium leaf.....do.....	6½ to 8	6½ to 8
Cotton, ordinary to good ordinary.....do.....	13½ to 15½	13¼ to 15½
low middling to good mid.....do.....	16¾ to 17½	16¾ to 18¾
Wool, lake.....do.....	— to —	32½ to 34
SAN FRANCISCO.		
Flour, superfine.....per barrel..	4 50 to 4 75	4 50 to 4 75
extra.....do.....	5 00 to 5 25	5 00 to 5 25
family and fancy.....do.....	5 50 to 5 75	5 50 to 5 75
Wheat, California.....per cental..	1 75 to 1 95	1 65 to 1 85
Oregon.....do.....	1 75 to 1 95	1 65 to 1 85
Barley.....do.....	1 60 to 1 90	1 50 to 1 85
Oats.....do.....	1 55 to 1 65	1 50 to 1 75
Corn, white.....do.....	1 65 to 1 75	1 90 to 2 00
yellow.....do.....	1 65 to 1 75	1 95 to 2 00
Hay, State.....per ton.....	14 50 to 19 00	10 00 to 17 00
Beef, mess.....per barrel..	8 50 to 9 00	8 50 to 9 50
family mess.....per half barrel..	9 00 to 10 00	9 00 to 10 00
Pork, mess.....per barrel..	18 50 to 19 00	18 00 to 19 00
prime mess.....do.....	17 00 to 17 50	18 00 to 18 50
Lard.....per pound..	11 to 13	11¾ to 12¾
Butter, overland.....do.....	15 to 20	15 to 20
California.....do.....	25 to 28	25 to 30
Oregon.....do.....	15 to 20	15 to 20
Cheese.....do.....	12½ to 16	12½ to 16
Wool, native.....do.....	14 to 16	15 to 17
California.....do.....	20 to 25	20 to 28
Oregon.....do.....	20 to 25	20 to 28

## LIVE-STOCK MARKETS.

NEW YORK.		
Cattle, extra beeves.....per cental..	— to \$12 75	— to \$12 75
good to prime.....do.....	\$4 50 to —	\$11 50 to —
common to fair.....do.....	10 00 to —	10 00 to —
milch-cows.....per head..	— to —	— to —
calves.....per cental..	4 75 to 8 00	5 00 to 8 00
Sheep, good to extra.....do.....	5 00 to 8 50	4 00 to 6 50
Swine, common to fair.....do.....	— to 7 50	7 25 to 7 50

## Live-stock markets—Continued.

Articles.	May.		June.	
BOSTON.				
Cattle, choice .....	per cental..	— to —	\$7 37	to —
extra .....	do.....	— to —	7 00	to \$7 25
first quality .....	do.....	— to —	6 00	to 6 50
second quality .....	do.....	— to —	5 00	to 5 50
third quality .....	do.....	— to —	4 25	to 4 75
working-oxen .....	per pair..	— to —	100 00	to 250 00
milch-cows with calves .....	per head..	— to —	35 00	to 95 00
yearlings .....	do.....	— to —	10 00	to 18 00
Sheep, extra .....	do.....	— to —	6 00	to 8 75
inferior grades .....	do.....	— to —	4 00	to 6 00
Swine .....	per cental..	— to —	6 00	to 6 50
BALTIMORE.				
Cattle, best beeves .....	per cental..	\$6 50 to \$7 25	6 62	to 7 45
first quality .....	do.....	5 62 to 6 50	5 75	to 6 62
medium .....	do.....	5 25 to 5 62	5 25	to 5 75
ordinary .....	do.....	4 50 to 5 25	4 50	to 5 25
general average .....	do.....	6 50 to —	6 62	to —
most of the sales between .....	do.....	6 00 to 7 00	6 00	to 7 00
Sheep .....	do.....	6 00 to 8 00	4 00	to 6 00
Swine, corn-fed .....	do.....	7 50 to 8 25	7 50	to 8 25
CINCINNATI.				
Cattle, good to prime butchers'				
steers .....	per cental..	— to —	5 00	to 5 75
common to good medium .....	do.....	— to —	4 00	to 4 75
milch-cows .....	per head..	— to —	30 00	to 65 00
Sheep, common .....	per cental..	— to —	3 75	to 4 50
good to prime butchers' .....	do.....	— to —	—	to —
Swine, shipping grades .....	do.....	— to —	5 25	to 5 80
good to prime butchers' .....	do.....	— to —	—	to 6 15
CHICAGO.				
Cattle, extra-graded steers, 1,400				
to 1,500 pounds .....	per cental..	6 10 to 6 40	6 15	to 6 40
choice beeves, 3 to 5 years				
old, 1,250 to 1,450 pounds .....	do.....	5 60 to 5 85	5 90	to 6 90
good beeves, 1,200 to 1,300				
pounds .....	do.....	5 25 to 5 50	5 40	to 5 70
medium grades, 1,150 to				
1,300 pounds .....	do.....	4 75 to 5 10	4 50	to 5 50
lower grades, natives .....	do.....	3 00 to 4 75	3 00	to 5 25
Texans, choice corn-fed .....	do.....	4 75 to 5 25	5 25	to 5 65
Texans, north-wintered .....	do.....	4 00 to 4 50	4 25	to 5 00
Texans, through droves .....	do.....	— to —	3 00	to 4 00
milch-cows .....	do.....	— to —	—	to —
veal calves .....	do.....	— to —	—	to —
Sheep, poor to medium .....	do.....	4 50 to 6 50	3 50	to 4 50
good to choice .....	do.....	6 75 to 8 25	6 00	to 7 25
Swine, good to extra .....	do.....	5 50 to 5 90	5 45	to 5 80
inferior to medium .....	do.....	4 50 to 5 00	4 75	to 5 40
SAINT LOUIS.				
Cattle, choice native steers, 1,300				
to 1,600 pounds .....	per cental..	5 75 to 6 00	6 00	to 6 25
prime second class, 1,150				
to 1,400 pounds .....	do.....	5 25 to 5 50	5 00	to 5 75

## Live-stock markets—Continued.

Articles.	May.	June.
SAINT LOUIS—Continued.		
Cattle, good third-grade, 1,050 to 1,300 pounds . . . . . per cental..	\$4 50 to \$4 75	\$4 75 to \$5 00
fair butchers' steers, 1,000 to 1,200 pounds . . . . . do . . . . .	4 20 to 4 25	4 50 to 4 75
inferior native grades . . . . . do . . . . .	2 75 to 5 00	3 00 to 4 50
Texans and Cherokees, corn-fattened . . . . . do . . . . .	3 75 to 4 75	4 25 to 5 00
inferior . . . . . do . . . . .	2 75 to 3 50	2 00 to 3 50
Sheep . . . . . do . . . . .	4 25 to 6 10	4 00 to 6 00
Swine . . . . . do . . . . .	4 50 to 5 45	4 80 to 5 60
Horses, plug . . . . . per head..	30 00 to 60 00	_____ to _____
street-car horses . . . . . do . . . . .	80 00 to 90 00	_____ to _____
good work-horses . . . . . do . . . . .	85 00 to 100 00	_____ to _____
driving horses . . . . . do . . . . .	100 00 to 140 00	_____ to _____
heavy draught-horses . . . . . do . . . . .	125 00 to 165 00	_____ to _____
Mules, 14 to 15 hands high . . . . . do . . . . .	50 00 to 100 00	_____ to _____
15 to 16 hands high . . . . . do . . . . .	115 00 to 165 00	_____ to _____
extra . . . . . do . . . . .	175 00 to 200 00	_____ to _____
NEW ORLEANS.		
Cattle, Texan beeves, choice . . . . . per head..	40 00 to 55 00	40 00 to 55 00
first quality . . . . . do . . . . .	35 00 to 40 00	35 00 to 40 00
second quality . . . . . do . . . . .	20 00 to 28 00	20 00 to 28 00
western beeves . . . . . per cental..	10 00 to 12 50	_____ to _____
milch-cows . . . . . per head..	35 00 to 100 00	35 00 to 100 00
calves . . . . . do . . . . .	7 00 to 10 00	7 00 to 10 00
Sheep, first quality . . . . . do . . . . .	4 00 to 5 00	4 00 to 5 00
second quality . . . . . do . . . . .	3 00 to 4 00	3 00 to 4 00
Swine . . . . . per cental..	5 00 to 7 50	5 00 to 7 50

## FOREIGN MARKETS.

WHEAT.—The spring in Europe has been, on the whole, favorable to the wheat crop. An early harvest was confidently anticipated, but the succession of cold days and frosty nights, together with lack of rain, amounting almost to drought in some regions, about the middle of May, destroyed that hope. In France wheat in many places began to turn yellow, and in other localities to show signs of rust. The exhaustion of home stocks of wheat in Europe, caused by two scanty harvests, becomes more painfully apparent as each week develops its results. Although the increased facilities of ocean transport, and the enhanced efficiency of the Suez Canal route, places England in closer relations with the wheat-producing regions of the world, she yet fails to realize any important relief from the terrible pressure of short crops. With a demand for foreign wheat, absorbing not less than a million quarters per month, she finds her supplies constantly shortening. In the four weeks ending May 9 her actual receipts from abroad were but 595,000 quarters. The stocks in London were but 203,160 quarters, or less than one month's supply for the metropolis alone, with its three and one-third millions of hungry mouths. English wheat is almost entirely exhausted, the small supplies in first hands being held by large and wealthy farmers, holding for maximum prices. The facts now show that 1873 was a short wheat year throughout the world. The yield of South Australia is esti-



mated at 500,000 quarters, only two-thirds of the previous crop of the colony. In Hungary the high prices of flour caused such a general disuse of that article of diet as to extort a concession of 1 shilling per quarter on wheat. Fine wheat had begun to come to Odessa in considerable quantities, but was met by an ample demand at high prices. French, Belgian, and Dutch country markets gave signs of close exhaustion; while Switzerland and Italy are heavy importers of wheat, and Germany also feels the stress. The Indian famine adds its depressing influence. All indications seem to point to a scramble for breadstuffs in Europe before the coming harvest. The weekly deliveries in London during the last week in May were nearly 15,000 quarters short of the corresponding week of 1873. The aggregate of deliveries for seven and a half months of the cereal year, ending April 11, amounted to 7,190,805 quarters, requiring 4,809,105 before harvest. The shortening foreign supplies of the harvest of 1873, as shown by the startling growth of weekly deficiencies, give but poor prospect of meeting this demand in England, where farmers will have to purchase largely for bread for their own families. In France the pressure is still more severe, all the country markets showing a serious rise in prices. Late rains in the south of France have materially enhanced the prospect of the growing crop.

The London averages during the last week in May were 63 shillings per quarter on 1,322 quarters. Full half of the current arrivals from abroad were from New York. In Mark Lane, Essex, and Kent, white wheat brought 53s. to 67s. per quarter; ditto, red, 55s. to 63s.; Norfolk, Lincolnshire, and Yorkshire, 55s. to 61s. Of foreign wheats, Dantzic mixed, all grades, is quoted at 60s. to 70s.; Konigsberg, 59s. to 69s.; Rostock, 63s. to 69s.; Silesian red, 58s. to 60s.; ditto white, 63s. to 68s.; Pomeranian, Mecklenberg, and Nolenmark, red, 59s. to 62s.; Ghirca, 56s. to 60s.; Russian, hard, 54s. to 57s.; Saxouska, 60s. to 61s.; Danish and Holstein, red, 60s. to 62s.; American, 58s. to 62s.; Chilian, white, 65s.; Californian, 66s.; Australian, 64s. to 67s. In Liverpool American white brought 12s. 6d. to 13s. per cental; red winter and southern, 12s. 4d. to 12s. 6d.; No. 1 spring, 11s. 10d. to 12s.; No. 2 spring, 11s. 2d. to 11s. 9d.; Canadian white, 12s. 6d. to 12s. 10d.; ditto, red, 12s. to 12s. 2d.; California white, 12s. 7d. to 13s. 3d.; Chili, white, 12s. 2d. to 12s. 4d.; Australian, 13s. 6d. to 13s. 9d.; Spanish, white, 12s. to 12s. 2d.; Danubian, 7s. 6d. to 9s. 6d.; Egyptian, 10s. 8d. to 12s. 6d. In Paris French wheats brought 67s. to 73s. 6d. per quarter. At Rouen and Havre, California was quoted at 69s. 6d.; Chili, 68s.; American spring and Polish, 63s. 6d.

**FLOUR.**—The supply of flour in London at the opening of the last week of May was very moderate, the imports of the previous week being only 86,394 cwt. In Mark Lane the best town households brought 47s. to 54s. per 280 pounds; best country households, 44s. to 47s.; Norfolk and Suffolk, 38s. to 44s.; American, per barrel, all grades, 30s. to 34s. In Liverpool English and Irish superfines were quoted at 43s. 6d. to 50s. per 280 pounds; French, 55s. 6d. to 59s. 6d.; Spanish, 48s. 6d. to 52s.; Trieste and Hungarian, 65s. 6d. to 77s. 6d.; Chilian and California, 45s. 6d. to 51s. 6d.; American, Western State, per barrel, 25s. 6d. to 32s. 6d.; Baltimore and Philadelphia, 29s. 6d. to 31s. 6d.; Ohio, 29s. 6d. to 34s. 6d.; Canadian, 29s. 6d. to 36s. 6d. In Paris prices for consumption were strengthening, from 51s. 4d. to 54s. per 280 pounds.

**MAIZE.**—In Mark Lane, London, white is quoted at 41s. to 44s. per quarter; yellow at 37s. to 39s. In Liverpool American white brought from 39s. to 39s. 6d. per 480 pounds; ditto yellow, 37s. 6d.; Danubian, 38s. to 38s. 6d.; Galatz, 44s. 6d. to 45s.



MONTHLY REPORT

OF THE

DEPARTMENT OF AGRICULTURE

FOR

JULY, 1874.



WASHINGTON:  
GOVERNMENT PRINTING OFFICE.  
1874.

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# MONTHLY REPORT.

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DEPARTMENT OF AGRICULTURE,  
*Statistical Division, July 21, 1874.*

SIR: I submit for publication a digest of the returns of acreage of certain crops and condition of crops for July, a record of market-prices for the month, together with current results of investigation in other divisions of the Department, and other matter.

J. R. DODGE,  
*Statistician.*

Hon. FREDERICK WATTS,  
*Commissioner.*

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## DIGEST OF CROP RETURNS.

### CORN.

An increase in the corn area of fully 2,000,000 acres is apparent, or 6 per cent. above the breadth of last year. The percentage is largest in the South; the increase in acres is largest in the West. Returns make the gain in Iowa over 300,000 acres; in Missouri, about the same; in Illinois, about 200,000; in Indiana, fully 200,000; in Kansas, about 170,000. Georgia shows almost as large an increase as Iowa and Missouri; Alabama, 180,000 acres; Mississippi, 120,000 acres; Texas, 200,000 acres. The inducement to enlarge the corn area of the cotton States appear to have been less influential in the Mississippi Valley than in the more eastern States, Georgia particularly. The increase in Texas is simply due to the natural expansion of crop areas from immigration, and is equally noticeable in cotton and other crops.

The number of States reporting a decrease in area is small, including only Maine, New Hampshire, Vermont, Florida, Louisiana, Tennessee, West Virginia, Kentucky, and California. In Northern New England a late unfavorable spring interfered with planting, and in Louisiana the area is less by reason of the overflow.

The States making increase are as follows: Maryland, Virginia, Wisconsin, 101; Pennsylvania, Ohio, Nebraska, 102; Massachusetts, Oregon, 103; Connecticut, North Carolina, Illinois, 104; South Carolina, Michigan, 106; Indiana, 108; Iowa, 109; Mississippi, Minnesota, 110; Alabama, Arkansas, 112; Kansas, 114; Georgia, 115.

The condition of corn is generally good in the West, but elsewhere variable. The only States reporting average condition, or above, are Massachusetts of the Eastern States, Pennsylvania of the Middle States, Maryland, South Carolina, Georgia, Florida, and Texas of the Southern States, and the Western States, except Minnesota, reporting 94, and California and Oregon.

The percentages of condition above average are as follows: South Carolina, 101; Massachusetts, Florida, Michigan, Kansas, 102; Maryland, Iowa, 104; Illinois, 105; Texas, 106; Indiana, Nebraska, 109. The States averaging 100 are Pennsylvania, Georgia, Wisconsin, Missouri.

On the northern Atlantic coast the late planting and cold storms are the causes of somewhat inferior condition, though the color is generally good and present growth promising. The inundations, soaking rains, and consequent replantings in the Southern States make the appearance of corn quite variable, and account for condition below average in certain States, while in others such disadvantages, existing to a less degree, have been overcome by good culture and good weather. There is complaint of local drought, but it is not of long continuance or involving wide areas. It has been most serious in Arkansas, some counties having had little or no rain in two months. In the Ohio Valley there is some complaint of drought; in West Virginia, Ohio, and Kentucky, and in some parts of Illinois, and to some extent in States west of the Mississippi. So far the injury from this cause throughout the country is less than usual, but should the droughts existing July first be continued and intensified through the month, great injury may result. Cut-worms have been generally injurious, and chinch-bugs in the West, after devastating wheat-fields, have attacked corn vigorously in many localities.

The following condensed exhibit of remarks accompanying returns will illustrate further peculiarities of condition:

MAINE.—*York*: Too wet and cool. *Cumberland*: Not much planted; season too late and cool.

NEW HAMPSHIRE.—*Hillsborough*: Backward; injured by worms. *Rockingham*: Backward. *Belknap*: Backward.

VERMONT.—*Lamoille*: Kept back by cold and wet; poor condition. *Windsor*: Backward on account of late spring. *Rutland*: Late. *Franklin*: Kept back by late spring, but of good color. *Chittenden*: Small and backward. *Caledonia*: Smallest for thirty years.

MASSACHUSETTS.—*Berkshire*: Corn has made a good growth considering the late spring.

CONNECTICUT.—*New London*: Very promising.

NEW YORK.—*Columbia*: Planting delayed by rain and cold; crop backward. *Livingston*: Growing finally. *Rockland*: Late planted, and backward, but of good color; weather now propitious. *Montgomery*: Corn-fields grown over with weeds; a succession of thunderstorms prevented working them, especially in low lands. *Wyoming*: Stands well and looks well. *Otsego*: Backward; needs warm, dry weather.

NEW JERSEY.—*Hudson*: Late planted and backward, May and June being unusually cool. *Burlington*: Fields very clean, and weather good for cultivation. *Warren*: Looks well except some late plantings.

PENNSYLVANIA.—*Northampton*: Doing well; no replanting. *Clearfield*: About ten days late, but doing well. *Washington*: Very uneven; dry weather has given start to worms. *Westmoreland*: Suffering for rain, *Hantingdon*: Shortened by drought, but looks healthy. *Lycoming*: Promising. *Lehigh*: A little backward through late planting. *Indiana*: Doing well. *Lancaster*: Average increased to take the place of tobacco. *Beaver*: Very short and not growing. *Pike*: Looks well.

DELAWARE.—*Sussex*: Retarded by heavy rains early in June and by subsequent drought.

MARYLAND.—*Baltimore*: Crop in fine condition, but somewhat backward. *Washington*: Looks well. *Calvert*: Crops very favorable. *Saint Mary's*: Small, and injured by cut-worms. *Queen Anne's*: Promising, with seasonable showers.

VIRGINIA.—*Pohatan*: Being late planted, the crop shows poorly. *Rappahannock*: Wet weather has restricted cultivation. *Fluvanna*: Stand backward, but good and clean. *Warwick*: Suffering from drought. *Pittsylvania*: Prospect good. *Dinwiddie*: Looks poor; late planted and badly cultivated. *Nelson*: Looks well, but is threatened by chinch-bugs from the exhausted wheat-fields. *James City*: Small, but well worked. *Mecklenburgh*: Small for the season. *Prince George's*: Growth stunted, but healthy. *Prince Edward's*: Acreage increased by failure of tobacco-plants. *Buckingham*: Threatened by chinch-bugs. *Clarke*: Suffering for rain. *Albemarle*: Chinch-bugs. *Chesterfield*: Late, but clean and promising. *Campbell*: Looks well, but chinch-bugs are after it in places. *Henry*: Generally well tilled. *King and Queen*: Backward, but looks well. *Lunenburg*: Late, and difficult to cultivate. *Madison*: Well worked and looks well. *Westmoreland*: Backward; late planted; season

cold and wet. *Gloucester*: Badly injured by bud worms. *Henrico*: Large crop planted; short through drought. *Halifax*: Late, and suffering from drought and chinchies. *Buchanan*: Late planted. *Bath*: Looks well, but badly needs rain.

**NORTH CAROLINA.**—*Edgecombe*: Stand good; plants small. *Person*: Injured by drought. *Rowan*: Promising, though small for the season. *Caswell*: Late, but looking well. *Gaston*: Season favors both cultivation and growth. *Greene*: Injured by cut-worms. *Chowan*: Unusually late; small plants. *Moore*: Backward; injured by bud-worms. *Alamance*: Poor. *Haywood*: Injured by drought. *Madison*: Late, but promising. *Wayne*: About 23,000 acres planted in the county. *Nelson*: Large acreage but bad stand. *Newberry*: Promising. *Fairfield*: Crop promises to equal that of 1873. *Spartanburgh*: Uneven. *Burke*: Two or three weeks late.

**SOUTH CAROLINA.**—*Williamsburgh*: Plants look finely, but stand inferior. *Marlborough*: Unusually fine. *Marion*: A little under size, but promising. *Darlington*: Better than for many years. *Clarendon*: Stand injured by bud-worms; crop late, but looking well. *Union*: Two weeks or a month late. *Edgefield*: Another good rain within ten days will make the upland crop. *Lexington*: Low in the stalk, having been injured by April frosts. *Laurens*: Good, but small.

**GEORGIA.**—*Columbia*: Season very favorable. *Harris*: Looks well. *Upson*: Stalks small but growing finely. *Gordon*: Late, but looking well. *Mitchell*: Crop about made. *Muscogee*: Much cotton acreage plowed up for corn. *Clinch*: Crop will be made in two weeks, and will be ample for home-consumption. *Randolph*: Fine. *Wilkinson*: Promises a large yield. *Gwinett*: Late and small, but otherwise promising. *Wayne*: Rain becoming excessive; injured by cut-worms and then by another worm cutting the stalk off at the ground. *Hancock*: Suffering for rain. *Dougherty*: Rainy weather favorable. *Baker*: Very fine. *Cobb*: Very good. *Dooly*: Backward through early rains and late drought. *Liberty*: Fine. *Milton*: Growing fast; promises more corn than ever before. *Richmond*: Early corn injured 15 per cent. by drought.  *Heard*: Fine prospect of grain-crops. *Morgan*: Not rain enough to bring up late plantings.

**FLORIDA.**—*Columbia*: Much improved by recent rains. *Leon*: Crop made; good where cultivated. *Jackson*: The late rains have rescued the corn-crop; sufficient for home-consumption, but none to spare. *Jefferson*: Very satisfactory. *Gadsden*: Acreage increased 10 per cent.; crop about made, and a full average yield; a surplus of old corn selling at 75 cents per bushel.

**ALABAMA.**—Looking very fine; excellent season. *Dale*: Low, but well-eared. *De Kalb*: Late, but promising. *Chambers*: Looks well. *Montgomery*: Promising. *Macon*: Grassy through excessive rain. *Conochee*: Bad stands on account of the ravages of cut-worms and bud-worms. *Clarke*: Suffered first from excessive rain and then partial drought, but is doing finely. *Franklin*: Not promising; planting delayed by drought. *Lauderdale*: Very backward; stand poorest on the bottoms and upland flats; too wet. *Pike*: Damaged by drought, but fine rains lately. *Dallas*: Promising. *Perry*: Excessive rains. *Marshall*: Floods have prevented planting the best corn-lands. *Bullock*: Excellent where the land is not too wet. *Clay*: Small and poor. *Baldwin*: Excessive rains benefited upland crops, but almost destroyed bottom crops.

**MISSISSIPPI.**—*Amite*: Too much rain, with hail, yet the crop is of average promise. *Copiah*: Small, but clean and promising. *Newton*: Looks finely. *Warren*: Grows rapidly on recently overflowed land. *Jasper*: A month late. *Grenada*: Promising. *Wayne*: Excessive rains prevented good stands, but subsequent drought enabled planters to work it clean. *Tunica*: Great destruction by cut-worms. *De Soto*: Not large, but healthy and fine. *Lowndes*: Stands irregular. *Kemper*: Promising. *Wilkinson*: Damaged by rain in some places, and by drought in others. *Lauderdale*: Great improvement lately. *Hinds*: Well worked. *Holmes*: Backward.

**LOUISIANA.**—*Morehouse*: Corn six weeks late and quite irregular, though generally looking well. *East Baton Rouge*: Suffered from drought following excessive rains. *Union*: Suffered from drought; too late for great improvement. *Rapides*: Much improved, but too late to make more than the three-fourths of a crop. *Franklin*: Early corn inferior in quality; late corn mostly promising. *Cameron*: Promising. *Caddo*: Half crop; suffered from drought. *Tensas*: Planting retarded by the overflow; rain wanted. *Washington*: Injured by drought. *Richland*: Early corn in some places plowed up; late corn looks well.

**TEXAS.**—*Hood*: Prospect finer than ever known. *Austin*: Reduced below average by drought. *Bosque*: Good, but late. *Red River*: Great difficulty in getting stands. *Upshur*: Good. *Bee*: Only late crops benefited by the late rains. *Bandera*: Early corn killed by April frosts. *Grimes*: Shortened by drought. *Harrison*: Lack of rain will reduce the crop one-half. *Houston*: Reduced by excessive drought. *Lamar*: Very promising. *Milam*: Recent rains too late to overcome the two months' preceding drought. *Robertson*: Looks well where well cultivated, but needs rain. *Washington*: Early drought enabled the farmers to work the crop thoroughly, and later rains have insured a good crop. *Cherokee*: Retarded by wet, cold spring and late frosts; fine growing weather succeeding drought; Pennsylvania white corn, from the Department, is the best in the neighborhood. *Matagorda*: Very fine; improving rains will greatly benefit the crop. *Bell*: Generally clean,

but need rain. *Anderson*: Succumbing to drought. *Uvalde*: Suffering for rain. *Lavaca*: Prospects favorable. *Cooke*: Looks well, but need rain. *Marion*: Suffering for rain. *Lampasas*: Crop safe; grain fine. *Medina*: Prospective yield doubled since June. *Nacogdoches*: Short through drought. *Shelby*: Late planted, but better cultivated than last year. *Kaufman*: Promise of best crop for twelve years.

ARKANSAS.—*Boone*: Backward, but coming on finely; recent warm rains. *Franklin*: In fine condition. *Clark*: Affected by drought; good weather may raise it to 75. *Pulaski*: Much injured by eight weeks' drought; two weeks more will ruin it. *Union*: Eight weeks' drought. *Craighead*: No general rain since April 5. *Garland*: No rain for nine weeks; corn dead. *Jackson*: Rain badly needed. *Bradley*: Drought of ten weeks has cut down the corn-crop very seriously. *Columbia*: Three weeks more of drought will finish the crop; not over half a crop at best. *Independence*: Greatly damaged by protracted drought. *Hempstead*: Almost ruined by a seven weeks' drought. *Washington*: Suffered severely from drought. *Sebastian*: Farmers, during the drought, put the crop in fine order for the late genial rains. *Fulton*: Generally well cultivated, of good color, and growing finely in spite of drought. *Arkansas*: Damaged by drought and cut-worms.

TENNESSEE.—*Loudon*: Less than I ever saw it at this season of the year. *Madison*: Bad stands and looking badly on account of drought. *Lincoln*: Badly affected by drought. *Grundy*: Backward. *Sumner*: Drought since May 14, seriously affecting the crop; still of good color though very low. *Carter*: Improved by late rains. *Hickman*: Small, but healthy and growing fast. *Bedford*: Injurious drought. *Blount*: Still very small and suffering for rain in some quarters. *Hardin*: Damaged by drought. *Hawkins*: Late planted on account of wet spring; not further advanced than it usually is June 1. *Monroe*: Late planted, but growing finely; seasonable rains. *Polk*: The variable season prevented proper cultivation. *Roane*: Very backward on account of unfavorable weather at planting and now shortened by drought. *Cannon*: Drought prevented the planting of 10 per cent. of the land intended for corn. *Bradley*: Corn planted about May. It is very promising; later or earlier plantings poor. *Macon*: Small and drying up. *Maury*: Worst prospect for many years. *Montgomery*: Early corn well tended in good ground, is growing some; some seed in the hill as sound as when it was planted; result of extreme drought. *Wayne*: Very late; looks well. *Hancock*: Never looked better. *Giles*: Well worked. *Lauderdale*: Stand poor.

WEST VIRGINIA.—*Harrison*: Very backward and short. *Brooke*: Looks well; crops clean. *Monroe*: Came up badly on thin old land. *Wayne*: Drought. *Cabell*: Extreme drought; doing badly. *Hardy*: Extreme need of rain. *Marion*: Growing fast; very seasonable weather. *Morgan*: Needs rain very much. *Grant*: Beginning to suffer severely from drought. *Kanawha*: Drought. *Lewis*: Drought. *Mercer*: Short and unpromising through drought and worms. *Monongalia*: Backward, but may turn out well. *Fayette*: Drought restricted the acreage planted; it was too dry to plow.

KENTUCKY.—*Shelby*: Looks green, but grows slowly; from 12 to 18 inches high. *Boyle*: May yet make an average crop. *Franklin*: Drought. *Adair*: Will make a tolerable crop if rain comes soon. *Hardin*: Smaller than ever known at this season. *Montgomery*: Backward, but recent rains will bring it forward. *Laurel*: Late plantings of no account; early plantings look well. *Anderson*: Low and backward, but healthy; *Hopkins*: Corn lost without speedy rain. *Butler*: Color fine, but beginning to suffer from drought; not all planted yet. *Graves*: Damaged by drought and chinch-bugs. *Livingston*: Chinch-bugs very destructive. *Logan*: Looks bad; not over a half stand, and that very uneven; some fields replanted five or six times; plants range from 3 to 36 inches; ground too dry. *Marion*: Put in in bad condition, and growing slowly. *Mason*: Well-rooted, healthy, and clean. *Ohio*: Extreme heat and drought. *Mercer*: Suffering from severe drought. *Russell*: Suffering severely; no rain since April 28; probably not over a fourth of a crop. *Scott*: Not over a half-crop. *Owsley*: Gloomy prospect. *Nelson*: Drying up. *Grayson*: Light showers kept corn growing in some places. *Henry*: Looks well in some localities, but the general prospect is very unpromising; chinch-bug very destructive.

OHIO.—*Trumbull*: Abundant. *Coshocton*: Late, but looks well. *Delaware*: Good stand, well-worked, and promising. *Montgomery*: Backward through drought. *Monroe*: Threatened by the long drought, lasting from May 1. *Adams*: Threatened by drought and chinch-bugs. *Crawford*: Doing finely. *Hancock*: Surpasses all previous crops, both in acreage and condition. *Mahoning*: Injured by drought. *Marion*: Never promised better at this season. *Scioto*: Backward, and a bad stand. *Washington*: Early plantings on good ground are doing well; late plantings small, and a poor stand. *Meigs*: Suffering from continued drought. *Columbiana*: Driest season since 1854; corn-leaves rolled up like cigars; no rain since May.

MICHIGAN.—*Saginaw*: Sed-corn injured by cut-worms. *Kalamazoo*: Coming on finely; warm, with abundant rain. *Tuscola*: Looks remarkably well; growth rank and color good. *Montcalm*: Looks finely.

INDIANA.—*Madison*: Never looked better; fine rains of late. *Howard*: Prospect never better. *Decatur*: Corn lay in the ground without sprouting for six weeks; no rain from April 24 to June 25; bad stand and the chinch-bug after it. *Kosciusko*: Very fine. *Perry*: Looks badly; no rain for six weeks; chinch-bugs at work; *Pecsey*: Poor stand and late.



*Putnam*: Over average. *Ripley*: Growing finely and clean. *Shelby*: Chinch-bugs commencing to eat the crop. *Washington*: Improved by late rains, but threatened with the chinch-bug. *Gibson*: Uneven, small for the season. *Harrison*: Late and small; suffering for rain. *Brown*: Generally good; dry weather improved in clearing the crop; greatly improved by late rains. *Cass*: Clean and growing fast. *Clay*: Clean and of good color; some damage from chinch-bugs. *Crawford*: Threatened by chinch-bugs. *Floyd*: Promises well, but needs rain very much. *Hamilton*: A remarkably good stand, and looks well, though in some places injured by too much rain. *Jasper*: Looks well, but needs rain. *Marion*: Improved by late rains. *Noble*: Prospect never better. *Pike*: Late corn threatened by chinch-bugs. *Steuben*: Never looked better. *Wabash*: Never looked better; seasonable rains. *Tippecanoe*: Rarely had such a prospect; crops forward and well tended. *Warren*: Promises a large yield. *Whiteley*: Has done finely.

ILLINOIS.—*Iroquois*: Promising; growth not large, but even and well cultivated. *Woodford*: Large crop promised. *Grundy*: Withering from drought. *Jersey*: Planted late, but growing fast and doing well. *Kankakee*: Prospects exceedingly fine. *Macon*: Generally good; chinch-bugs commencing operations in places. *Madison*: Late, and suffering from chinch-bugs. *Pope*: Threatened with chinch-bugs. *Mason*: Drought, and chinch-bugs injurious. *Saint Clair*: Very precarious; poor stand and greatly injured by drought and chinch-bugs. *Cass*: Chinch-bugs commencing their work. *Clinton*: One-third of the acreage destroyed by chinch-bugs, and the rest threatened. *Effingham*: Injured by chinch-bugs. *Jackson*: Badly damaged by drought and chinch-bugs. *Macoupin*: Chinch-bugs have commenced at the crop. *Moultrie*: Better than for years in spite of chinch-bugs. *Richland*: In many places injured by chinch-bugs. *Morgan*: Prospects declined within two weeks. *Sangamon*: Planting stimulated by high prices. *Vermillion*: Never better. *Washington*: Late planted, and would be average but for the chinch-bugs; many fields destroyed. *Wayne*: Badly damaged by drought and chinch-bugs. *Piatt*: Chinch-bugs working hard on corn. *Perry*: Attacked by chinch-bugs; will be a failure if rain does not come soon. *Schuyler*: Threatened by the second brood of chinch-bugs.

WISCONSIN.—*Dodge*: Average on old land; sod-corn injured by cut-worms and other insects. *Douglas*: Somewhat drowned out. *Green Lake*: Somewhat injured by cut-worms. *Juneau*: Backward; but a good, even stand. *Calumet*: Late, but prosperous. *Green*: Good.

MINNESOTA.—*Steele*: Never so promising as now. *Houston*: Rather low, but advancing with the hot weather. *Olmstead*: Cold, wet weather of May and June injurious. *Sherburne*: Backward and weedy. *Jackson*: Planted late to escape grasshoppers. *Stearns*: Retarded by the cool, wet weather of early June; late rains and warmth bringing it along finely. *Sibley*: Late, but heavy. *Isanti*: Much corn injured by rain.

IOWA.—*Cass*: Especially promising. *Linn*: Looks splendidly; crop clean. *Mahaska*: Looks remarkably well; best stand for years. *Washington*: Will suffer from drought. *Clinton*: Unusually good stand; a little late, but growing rapidly. *Lee*: Never looked better. *Mitchell*: Growing fast. *De Moines*: Injured by worms; some pieces had to be replanted three times. *Harrison*: Much corn planted in place of spring-wheat. *Henry*: Corn well worked and clean, but needs rain. *Hovard*: Early plantings kept clean are extra; late are about average. *Iowa*: Well tended and promising. *Taylor*: Fine weather since June 10 has greatly improved the crop. *Tama*: Good stand; unusually free from weeds.

MISSOURI.—*Caldwell*: Looks remarkably well, but is injured by chinch-bugs. *Cass*: Very seriously injured by chinch-bugs. *Vernon*: Chinch-bugs destructive. *Saint Clair*: Chinch-bugs. *Greene*: Beginning to feel the drought. *Moniteau*: Chinch-bugs injurious. *Barton*: Threatened by chinch-bugs. *Daviess*: Fine; not so rank as last year, but much better cultivated. *Taney*: Well cultivated; Pennsylvania Yellow especially promising. *Bates*: Chinch-bugs. *Benton*: Badly injured by chinch-bugs, especially on prairie soils. *Carroll*: Crop looked splendid until the chinch-bugs came. *Cape Girardeau*: Affected by drought and chinch-bugs. *Christian*: Chinch-bugs. *Clinton*: Chinch-bugs. *De Kalb*: Chinch-bugs. *Harrison*: Looks fine. *Montgomery*: Chinch-bugs very bad. *Miller*: Chinch-bugs numerous in some fields. *Perry*: Drought prevented planting on the best corn-lands, the black Mississippi bottoms. *Potter*: One-fourth destroyed by chinch-bugs. *Polk*: Fields adjacent to wheat, mostly destroyed by chinch-bugs. *Ralls*: Suffering from drought. *Newton*: Unusually clean; injured in places by chinch-bugs. *Dallas*: Chinch-bugs sweeping whole fields. *Cole*: Late but promising. *Laclede*: Backward; infested with chinch-bugs. *Pike*: Looking fine. *Crawford*: Very backward and poor; ruined by chinch-bugs. *Clay*: Drought and chinch-bugs. *Hovard*: Just shooting, and already injured by drought. *Jasper*: Corn-fields adjoining wheat and oats are eaten by chinch-bugs; others are doing well.

KANSAS.—*Leavenworth*: Early planted is doing well where closely tended; late plantings have either failed to come up or are feebly struggling against heat and drought. *Woodson*: Fearfully ravaged by chinch-bugs near wheat-fields. *Douglas*: Chinch-bugs have taken 10 per cent. of the crop. *Wyandotte*: Never looked so well, but needs rain. *Allen*: Damaged by chinch-bugs. *Anderson*: Injured by chinch-bugs. *Bourbon*: Chinch-bugs sweeping crops on thin, light, high prairie soil. *Chase*: Badly damaged by chinch-bugs; not over a half crop. *Cherokee*: Injured by chinch-bugs in fields adjoining wheat-fields. *Ellsworth*: Must have rain soon. *Doni-*

*phan*: Condition excellent, but in some places poor seed has made a thin stand. *Franklin*: Every day hundreds of acres are destroyed by chinch; a field within 20 rods of a wheat-field stands no chance; most of the corn-fields, however, are too far from the wheat to be seriously injured. *Jackson*: Chinch; at work. *Lyon*: Chinch; in corn; no rain since May 19. *Linn*: Damaged by chinch. *Montgomery*: Will suffer severely from chinch. *Morris*: Threatened by chinch. *Sumner*: Threatened by chinch. *Butler*: Chinch; after the corn. *Greenwood*: Threatened by chinch. *Osage*: Suffering from chinch. *Wabausee*: With ten days more of drought the crop will be a failure. *Republic*: More than half sod-corn; a very uncertain crop. *Wilson*: Cut down by chinch. *Atchison*: Greatly damaged by chinch. *Neosho*: Stalks black with chinch; much will be destroyed. *Rice*: Suffering from drought.

NEBRASKA.—*Lincoln*: Backward, but looking well. *Antelope*: Magnificent. *Adams*: Remarkably good. *Burt*: Retarded by rain and hail. *Cass*: Looks fair, but needs rain.

CALIFORNIA.—*Sacramento*: Affected injuriously by the unusually cold and backward season.

OREGON.—*Clackamas*: Injured by excessive rains; difficult to keep down weeds.

UTAH.—*San Pete*: Prospect good.

## WHEAT.

The average condition of winter-wheat for the whole country is 104. The most favorable conditions of growth were found in several of the States in which other crops suffered most severely. Arkansas the maximum, 144; Tennessee, 119; West Virginia, 118; Kentucky, 117. In these States a severe and destructive drought, commencing shortly before wheat-harvest, gave to this grain a fine opportunity for ripening thoroughly, but told fearfully upon all spring and summer crops. In the Middle States the crop was generally above average, and in the States north of the Ohio nearly or quite average. Ohio, where drought has most prevailed, shows the highest average, 105. West of the Mississippi the crop was generally very good, and above average, except where late sowings were caught by chinch-bugs, which, with other causes, reduced the average of Kansas to 90. This plague was also felt in a few localities in Virginia and North Carolina, but the crop in the southern wheat States generally showed a considerable margin above average, though Texas reached only 84. In New England the small acreage of winter-wheat was somewhat injured by winter-killing. The Fultz wheat, from seed furnished by the Department, is favorably reported in Chester, Pennsylvania, but rusted badly and yielded lightly in Talbot and Calvert, Maryland. In Buckingham, Virginia, it excelled all other varieties; in Augusta it ripened several days before any other; in Madison it retained its prestige, as also in Bath; but in Spottsylvania it yielded only a half crop, and rusted badly in Dinwiddie. In Stanly, North Carolina, binders complain of the weight of the sheaves. In Fannin, Georgia, it was very fine. In Knox, Tennessee it was hardy, vigorous, and productive, excelling all other varieties. Tappahannock wheat is also reported as very successful in several portions of the county, its occasional failures being generally traceable to special abnormal conditions.

Spring-wheat shows a general average of 96. In New England it was on the whole considerably above average, though backward in several counties. In the few counties growing this crop in the Middle States it is below average. In Ohio, Nebraska, and on the Pacific coast the crop was above average. In the Northwestern States it especially suffered from the ravages of chinch-bugs and other insects. In several counties of Indiana this insect was demonstrating seriously; in Morgan several fields were destroyed and were plowed up to be put in other crops. Illinois reports numerous casualties of similar character, and in those districts of Wisconsin where droughts prevailed the same misfortune is noted. In several localities in Iowa timely rains destroyed the young

insects and saved the crops from their ravages, but not till after considerable damage had been done. The grasshoppers were also injurious here. In Missouri the chinch nuisance was quite serious. In Caldwell County the injury to the crop was estimated variously from 35 to 50 per cent. It is noticed in Benton that, while the crop was badly injured on prairie soils, on timber-land it reached a full average. Pettis reports the insects as reducing the crop from 25 to 30 per cent. In other counties, however, the pest is hardly noticeable, and the crops are uncommonly promising. The chinch also infested the spring-wheat of Kansas; in Anderson they nearly ruined the crop; in Franklin and Wilson, farmers propose to sow no more wheat till secured against this risk. In some counties, as in Montgomery, early sowings were but lightly affected, especially of drilled wheat, but broad-cast crops were badly affected. In Nebraska, where the pest did not appear, the crop was above average. In one or two counties an aversion to improved machinery for harvesting is noted; farmers preferred hiring extra labor to purchasing reapers and mowers. In some localities of California the crop was affected by hot, dry weather and north winds. In some counties of Oregon heavy rains produced a heavy growth, which it was feared might prove excessive. In Utah the crop was injured by cut-worms.

MAINE.—*Cumberland*: Spring-grain looks well.

NEW HAMPSHIRE.—*Rockingham*: Spring-grain average.

VERMONT.—*Rutland*: Late. *Lamoille*: Late. *Franklin*: Backward. *Windsor*: Backward. *Grand Isle*: Considerably winter-killed; spring-wheat late; season backward.

CONNECTICUT.—*Hartford*: All cereals ten days late, but of unusually vigorous growth.

NEW YORK.—*Steuben*: Need rain. *Westchester*: Grain-crops look well. *Washington*: Growing. *Livingston*: Growing finely. *Wyoming*: Improved during the last few weeks. *Jefferson*: Weather favorable for grain. *Wayne*: What escaped winter-killing is promising.

NEW JERSEY.—*Burlington*: Wheat harvests splendid. *Warren*: Fine; no rust or bugs. *Sussex*: Much better than usual.

PENNSYLVANIA.—*Northampton*: Straw longer and the crop better than last year; harvest later than usual. *Snyder*: Very fine, and of good quality. *Clearfield*: Never better. *Bucks*: Ripening rapidly, and very promising. *Washington*: Many fields rusted; grain shriveling in some cases. *Cameron*: Promises an early harvest and a good yield. *Chester*: Ripening rapidly; Fultz already cut, showing a good yield. *Lycoming*: Thin on the ground, and short-strawed; heads light. *Buller*: Winter-wheat the only crop that will reach an average. *Lehigh*: A fine prospect injured by drought; grains light. *Union*: Benefited by late rains. *Dauphin*: Damaged by a worm which eats out the inside of the grain, leaving the hull. *Fayette*: Finest crop in twenty years; uniformly good, well filled, evenly ripened, bright and in prime condition. *Indiana*: Filling finely. *Lancaster*: Looks remarkably well. *Lancaster*: Tappahannock, from Department, very fine; Jennings winter shows larger heads than any other variety; wheat looks fine generally. *Crawford*: Most promising crop for years.

MARYLAND.—*Caroline*: Harvested in good order; the heads are not so plump as last year, but the yield will be greater, for the stand was good and uniform on both high and low lands. In some cases the grain is shriveled by innumerable small green lice, (*Aphis avenae*), which sucked the milk while the grain was in the milky state. These pests appeared too late to do great mischief. *Charles*: Yield somewhat disappointing. *Baltimore*: Fine yield, though somewhat injured by the Hessian fly. *Dorchester*: Winter-wheat extra good, and harvested in good order. *Washington*: Remarkably well filled. *Talbot*: Fultz nearly a total failure; grain small and light; straw rusty, falling down in many fields before ripening. *Wicomico*: Somewhat shriveled, but yielding well. *Calvert*: Much injured by mildew and rot. *Saint Mary's*: Fultz a failure; red wheat better, but a third short of average. *Queen Anne*: Extreme heat ripened our red wheat all at once; straw heavy, but it is feared that the grain is shriveled; Fultz very popular; ripens three or four days earlier than red wheat; it will probably stand ten days after ripening.

VIRGINIA.—*Northumberland*: Badly rusted and smutted; fell down green, instead of ripening, in many cases; many lose their whole crops. *Tazewell*: Promising till within the last few days; considerable damage from an insect, probably the wheat midge, (*Diplosis tritici*), sucking the milk of the grain. *Warwick*: Failure through rust. *Pulaski*: Somewhat injured by drought. *Buckingham*: Improved surprisingly in the early part of June; Fultz, from the Department, excels all others; Touzelle also grows finely, but ripens rather too late for the climate. It and the Weeks wheat suffered severely from chinch-bugs. *Spottsylvania*: Yield curtailed by rains during the blooming season; early-sown injured by hot, wet weather; later-sown escaped. Tappahannock and Fultz only half crops; grain good. *Dinwiddie*:

All varieties injured except Lancaster red, which yielded very finely; Fultz rusted badly; Touzelle winter-killed and rusted; Tappahannock did well. *Fauquier*: Best crop for thirty years. *Nelson*: Chinch-bugs have spoiled the finest prospect for ten years; loss from 30 to 40 per cent. *Orange*: Ripened prematurely by hot weather, impairing both yield and quality. *Augusta*: Fultz, from the Department, ripened several days earlier than any other; Tappahannock next; Touzelle will not ripen for a week yet. *Charles City*: Some crops rusted. *James City*: Rusted three days before harvest. *Page*: Most promising for twenty-five years; quality good; labor scarce for harvesting. *Pohatan*: Good. *Rappahannock*: More favorable weather of late. *Mecklenburgh*: Shortened by rust. *Prince George*: Largely injured by rust on leaves; but for the large amount of Lancaster wheat sown there would not be half a crop. *Prince William*: Red-rust, occasioned by rainy and foggy weather, has caused a great shrinkage of grain. *Prince Edward*: Crop short and inferior. *Clarke*: Heads light. *Albemarle*: Chinch. *Campbell*: Considerably injured by rust and chinch. *Culpeper*: Not well filled. *Highland*: Never better. *King and Queen*: Rusted; grain shriveled. *Lunenburg*: Rusted and filled imperfectly. *Madison*: Rusted, but crop average; Fultz retains its prestige. *Smyth*: Best crop since 1867. *Westmoreland*: Red-rust, owing to extreme heat in June. *Gloucester*: Grain light. *Henrico*: White wheat failed to fill well. *Halifax*: Injured by chinch and rust. *Buchanan*: Blade-rust. *Bath*: Fultz, from the Department, very fine; also the Tappahannock and the Touzelle.

**NORTH CAROLINA.**—*Ashe*: Fultz harvested very finely. *Caldwell*: Promised an extra crop a month ago; reduced 10 per cent. by rust. *Cleveland*: A third better than last year both in quantity and quality. *Kocon*: Head short, but the grain is good. *Stanley*: Grain generally heavy; rusted in spots; Fultz steadily improves; binders complain of its weight in gathering; Tappahannock still maintains its reputation; we thank the Department for its introduction. *Caswell*: A promising crop, reduced to a third below average by rust and chinch-bug. *Forsyth*: Best crop for six years. *Gaston*: Rusted in some fields. *Greene*: Best crop in five or six years. *Warren*: Injured by rust. *Moore*: Injured by rust, especially late wheat. *Davidson*: Yield large and quality good. *Alamance*: Injured by late and wet spring; some of it blighted; some failed to mature; much of it very light. *Madison*: Fifteen days earlier and a fourth better than last year. *Macon*: Excellent, though somewhat rusted in places. *Burke*: Best crop for years.

**SOUTH CAROLINA.**—*Lexington*: Injured by rust or mold. *Fairfield*: Very good in good land. *Laurens*: Turns out well; best yield for twenty years; good flour; culture will increase next year.

**GEORGIA.**—*Harris*: Disappointed expectation. *Dawson*: Prospect declining. *Gordon*: Damaged by rust; quantity average, but quality depreciated. *Fannin*: Fultz very fine. *Gwinnett*: Rust cut down the crop a little below average. *Marion*: Better than for many years; Tappahannock, from the Department, very fine. *White*: All cereals about average. *Stewart*: Unusually good.

**FLORIDA.**—*Gadsden*: Tappahannock, from the Department, has been very satisfactory. We would be glad to find some party prepared to furnish seed for a large cultivation.

**ALABAMA.**—*De Kalb*: Yield above average, but quality depreciated by rust. *Calhoun*: Grain fine and well filled.

**MISSISSIPPI.**—*Kemper*: Rusted somewhat.

**TEXAS.**—*Kerr*: Much wheat frost-killed; winter-wheat averages 6 bushels per acre; a fourth of a crop; spring-wheat 8 bushels, or a third of a crop. Tappahannock, from the Department, averaged 16 bushels of beautiful grain. *Bosque*: Depreciated in quantity and quality by rust. *Red River*: Badly damaged by drought following excessive rains. *Comal*: Will average 10 bushels per acre. *Collin*: Does not thrash out as well as was expected. *Kendall*: Winter-wheat badly rusted. *Burnet*: Frosted in some cases and rusted in others. *Bandera*: Winter-wheat averaged 9 bushels per acre; spring wheat 18½ bushels. *Ellis*: Yield small, but grain good; average about 7 bushels per acre. *Hunt*: Black rust has done some injury. *Lamar*: Does not fulfill the promise of early spring; too wet. *Wood*: Rusted. *Cooke*: Did not fill well; average yield about 10 bushels per acre. *Kaufman*: Light, through rust; will average 10 bushels per acre.

**ARKANSAS.**—*Craighead*: Unusual acreage sown. *Independence*: Crop never better; some of it already marketed. *Washington*: Full average, or 10 bushels per acre. *Fulton*: Universally good, and harvested in fine condition. *Marion*: Better than for years. *Arkansas*: Good. *Boone*: Fine and abundant.

**TENNESSEE.**—*Loudon*: Heavy straw and very light heads. *Lincoln*: Full average and of good quality. *Grundy*: Splendid. *Carter*: Many fine forward fields damaged by snow and frost during the last days of April. *Hickman*: Thrashes out 50 per cent. more than last year. *Blount*: Damaged by drought and rust. *Greene*: Failed to meet expectations. *Grainger*: Very fine. *Hawkins*: Largest acreage and yield ever known. *Knox*: Fultz the most valuable variety yet received; it is hardy, vigorous, and productive. *Monroe*: Slightly rusted. *Polk*: Somewhat rusted. *Roane*: Better than for several years. *Bledsoe*: Unusually good, free from smut, cheat, or cockle; a little rust on the blade. *Lawrence*: Best crop for ten years. *Cannon*: Quality extra. *Eradley*: Upland wheat finer than any since 1857; rust quite fatal along the water-courses. *Montgomery*: Fine. *Hancock*: Best crop for many years. *Giles*: Extra good.

**WEST VIRGINIA.**—*Putnam*: Above average on our best lands; below average on poor soils, owing to severe drought in May. *Harrison*: Finest crop for eighteen or twenty years. *Brooke*: Better than for many years. *Monroe*: Heavy yield and excellent quality. *Nicholas*: Good. *Cabell*: Better than for many years. *Hardy*: Superior in quality and quantity. *Barbour*: Good. *Grant*: Considerably reduced by drought. *Jefferson*: Injured in some places by chinch-bugs and rust; filled finely, but straw not heavy. *Mercer*: generally good, though injured in some places by the midge and grub-worm. *Monongalia*: Largest and best crop in twenty years; equal to the last two crops.

**KENTUCKY.**—*Rowan*: Wheat the only successful crop. *Shelby*: Above average in spite of drought. *Franklin*: As good as any previous crop. *Aclair*: Better than usual. *Montgomery*: Never better. *Laurel*: Good. *Bracken*: Some smut and midge, but yield is good and quality better than for many years. *Anderson*: Good; somewhat injured by the midge. *Christian*: Best for years, both in quantity and quality. *Lincoln*: Good. *Lewis*: Largest harvest ever known. *Warren*: Best crop ever raised in the county. *Graves*: Reduced 10 per cent. by wet spring and dry June. *Logan*: Large yield of fine, plump grain. *Mason*: Excellent in quality, but the yield short of expectation. *Mercer*: Approximates the great crop of 1855. *Touzelle*, from the Department, heads well, but the straw is rather delicate; Tappahannock much better. *Scott*: Unusually good; the only crop approaching average. *Owsley*: The only successful crop. *Nelson*: Excellent, having matured before the drought. *Metcalf*: Good. *Gallatin*: Above average.

**OHIO.**—*Trumbull*: Abundant. *Coshocton*: Largest and best crop for years; Fultz superior to other varieties. *Delaware*: May and June very favorable; crop recovered from winter-freezing, and is fine in yield, stand, and plumpness of berry. *Licking*: Harvest early and abundant; better crop than for many years. *Montgomery*: Good. *Erie*: Quality fine. *Hancock*: Unusually fine; some fields will average 30 bushels per acre. *Marion*: Spring-wheat about abandoned. *Scioto*: Better than for years. *Athens*: Average in spite of drought.

**MICHIGAN.**—*Saginaw*: Injured by spring frosts. *Kalamazoo*: Ripening finely. *Hillsdale*: Tappahannock 10 inches above the Touzelle, both sown at the same time; the Deal and Treadwell our most usual varieties. *Tuscola*: What survived winter-killing is doing very well. *Calhoun*: The dry, windy, hot weather may injure the crop. *Montcalm*: Never better. *Cass*: Just ripening; if well secured, the yield will be larger than ever.

**INDIANA.**—*Grant*: Very seriously damaged by chinch-bugs.—*Elkhart*: badly winter-killed on clay soils; filled unusually well on sandy soils. *Madison*: Moderate. *Howard*: Nearly half-destroyed in March, but the remaining half is 10 per cent. better than last year. *Decatur*: Injured by storms in harvest. *Kosciusko*: The crop, on other than clay soils, never filled better; a week or ten days early; fine season. *Perry*: Injured by chinch-bugs. *Putnam*: Chinch-bugs cut the crop down below average. *Ripley*: Yield good and grain fine; harvest hastened by drought. *Shelby*: Chinch-bugs very injurious to late-sown winter-wheat. *Washington*: Best crops since 1869; chinch-bugs injured it a little. *Gibson*: Berry good; will average 20 bushels per acre. *Harrison*: Winter-wheat above average. *Brown*: Early-sown good; late sown damaged by chinch-bug. *Cass*: Some fields thin, but with large heads. *Crawford*: Somewhat injured by chinch-bugs, but will probably be average. *De Kalb*: Winter-wheat a failure on clay and flat grounds; very good on sandy soils. *Floyd*: Best crop in twenty years. *Hamilton*: Damaged by rain and wind; much will be lost in cutting. *Morgan*: Some fields taken by chinch-bug; some had been plowed for corn; yield reduced. *Noble*: One-fifth of the wheat on clay ground was badly winter-killed; the rest as good as ever. *Pike*: Never better; some farmers average 25 bushels per acre. *Steuben*: Greatly improved since early spring. *Switzerland*: Surpasses any previous crop. *Wayne*: The grains unusually good. *Franklin*: Unusually good. *Tippecanoe*: Unusually fine fields on drained lands. *Warren*: Somewhat damaged by chinch-bugs in places. *Whiteley*: Badly frozen out, but what survived did well. *Paoli*: Injured by chinch-bugs in some cases slightly, and in others very severely.

**ILLINOIS.**—*Pike*: Looks well; straw heavy; some rust; and a great many chinch-bugs. *Logan*: Spring-wheat injured some by rust and chinch-bugs. *McLean*: Grain of all sorts looks well; less injured by insects than was supposed; weather warm and showery. *Cumberland*: Somewhat injured by chinch-bugs. *Jersey*: A tornado, June 28, scattered the shocks and sheaves; the crop will be well saved. *Macon*: Winter-wheat heads well filled; some pieces infested with bugs. *Madison*: Generally good; some fields infested with chinch-bugs. *Saint Clair*: Harvested in fine order. *Carroll*: Too dry to fill well. *Cass*: Spring-wheat eaten by chinch-bugs. *Clinton*: Much injured by chinch-bugs. *Winnebago*: Prospects dampened within a few days. *Montgomery*: Mostly good and fine, but somewhat injured by chinch-bugs. *Moultrie*: Not over a fifth will be cut; the rest ruined by chinch-bugs. *Sangamon*: Dry, hot weather favorable to winter-wheat, but not to spring crops. *Vermilion*: Injured by chinch-bugs to some extent, but the yield will be full average. *Washington*: Largest crop ever ches in the south part of the county; winter-wheat generally good, being fine and raised here; wheat superseding other crops. *Piatt*: Spring-wheat destroyed by chinch-plump. *Perry*: Good, although chinch-bugs were very troublesome. *Schuyler*: Winter-wheat harvested in fine order; quality extra; spring-wheat mostly destroyed by chinch-bugs. *White*: But for chinch-bugs the wheat-crop would have exceeded any prior one. *Mercer*: Rapidly drying up.

**WISCONSIN.**—*Crawford*: Winter-wheat suffered from drought. *Pierce*: Many fields thin and weedy. *Clark*: Increased attention to winter-wheat. *Dodge*: Thin and short. *Douglas*: Somewhat drowned out. *Green Lake*: Promising. *Jefferson*: Damaged somewhat by chinchies. *Calumet*: Drilled wheat far ahead of broadcast. *Dane*: Fultz wheat a fine yield, though winter-wheat is not much grown; spring-wheat threatened by chinchies. *Fond du Lac*: Berry shrinking through excessive heat. *Green*: Chinch-bugs flourishing in the drought; some farmers have plowed up their spring-wheat.

**MINNESOTA.**—*Steele*: Some pieces, through drought in May, did not stool out thick, but, on the whole, it now looks very promising. *Chippewa*: Spring-wheat, our staple crop, promises finely; no grasshoppers. *Goodhue*: Spring-wheat affected by drought, especially on old land. *Houston*: Growing finely, but it is feared the wet weather will produce an excessive growth of straw. *McLeod*: Wet weather enhances the growth of straw. *Mecker*: Improved by the wet weather. *Mower*: Exceeding all expectation since the rain of last month. *Sherburne*: Best crop for many years. *Wabashaw*: Shortened by May drought. *Jackson*: But few pieces left by the grasshoppers. *Faribault*: Eaten by grasshoppers. *Douglas*: Prospect for small grain never better. *Sibley*: Stands well; promising. *Renville*: Looks fine where not devoured by grasshoppers. *Rock*: Injured by grasshoppers fully one-tenth. *Isanti*: Late rains gave small grain a start.

**IOWA.**—*Cass*: Never a better prospect for wheat and all other cereals. *Marion*: Cereal crops shortened by drought. *Clinton*: Wheat just heading out; extreme heat may produce rust. *Clarke*: Rains destroying the young chinchies and perfecting the small grains. *Lee*: Winter-wheat an unusually large crop; spring-wheat will not pay for cutting. *Mitchell*: Growing rapidly. *Greene*: Did not stool at the proper time on account of drought; hence crop shortened. *Hancock*: On new breakings spring-wheat is full 15 per cent. better than last year; on old lands as much poorer; grasshoppers, in some places, have swept the fields. *Harrison*: Much spring-wheat destroyed by grasshoppers and plowed up for corn; three-fourths of the crop destroyed. *Henry*: Looks well, though it suffered from the hot sun while in blossom. *Howard*: Early sowings on new soil are excellent; late sowings injured by drought. *Hardin*: Thinner than usual, but clean and free from rust. *Jefferson*: Seriously injured by drought and chinchies. *Taylor*: Spring-wheat rather short-strawed; a little damaged by chinchies. *Humboldt*: Injured by grasshoppers. *Webster*: A third of the wheat in the northern part of the county destroyed by grasshoppers.

**MISSOURI.**—*Lawrence*: Chinchies not very injurious, but Hessian flies threaten the whole crop. *Texas*: Fifty per cent. better than last year. *Caldwell*: Threatened by chinchies; crop damaged already 35 to 50 per cent. *Cass*: But few fields of good wheat. Chinchies have been very destructive. *Nodaway*: Fall-wheat leaf-rusted; spring-wheat injured by drought. *Greene*: Fine in quality. *Moniteau*: Finest crop ever raised here. *Barton*: Best crop for many years. *Daviess*: Excellent; chinchies behind time. *Taney*: Never better. *Bates*: Chinchies nearly destroyed the crop. *Benton*: Wheat on prairie soil badly injured by chinchies. On timber-land the crop is average. *Carroll*: Spring-wheat eaten by chinchies; winter-wheat did not entirely escape. *Cape Girardeau*: Suffering from drought. *Clinton*: Chinchies. *De Kalb*: Winter-wheat somewhat injured by chinchies. *Harrison*: Chinchies in spring-wheat. *Iron*: Best crop for years. *Johnson*: Chinchies destructive in some places. *Sage*: Harvest ten days early; crop better than for many years. *Perry*: Excellent in quantity and quality. *Pettis*: Damaged by chinchies 25 to 30 per cent. *Polk*: Fultz, from the Department, a very superior crop. *Ralls*: Chinchies have done great damage in a few fields. *Randolph*: Chinchies injured a few late-sown fields. *Reynolds*: Better than for many years. *Riply*: Finer than ever. *Stoddard*: Largest and best crop we ever raised. *Adair*: Damaged by chinchies. *Cole*: Prices sinking, crop so large and fine. *Laclede*: Best crop ever known here. *Clay*: Chinchies too late. *Howard*: Good quality; crop safe. *Jasper*: Largest crop ever harvested.

**KANSAS.**—*Leavenworth*: Threatened by chinchies. *Douglas*: Spring-wheat mostly destroyed by chinchies. *Wyandot*: Never better; secured in excellent condition. *Allen*: Damaged by chinchies. *Anderson*: Nearly ruined by chinchies. *Barton*: Winter grain good, and well secured. *Bourbon*: Harvested in good condition. *Chase*: Spring-wheat badly damaged by chinchies. *Cherokee*: Ripened too soon for chinch-bugs; a very superior yield. *Franklin*: Wheat-fields full of chinchies. Farmers say they will sow no more wheat. *Jackson*: Chinchies injured fall-wheat and almost ruined spring-wheat. *Jefferson*: Badly injured by chinchies. *Lyon*: Chinchies in spring-wheat. *Linn*: Damaged by chinchies. *Montgomery*: Early sowing got the crop mostly out of the way of chinchies. Early varieties, drilled, suffered but little; late broadcast crops suffered more. *Morris*: Spring-wheat threatened by chinchies. *Smith*: Spring-wheat from the Department will yield 40 bushels per acre. *Sumner*: Spring-wheat injured by chinchies. *Washington*: Spring-wheat the best yield I have seen in this State for twenty years. I am satisfied that our prairie sub-soil, so rich in gypsum and iron, cannot be exhausted by cereal crops. *Butler*: Largest and best yield of winter-wheat—30 bushels per acre. Some fields reach 40 bushels. Spring-wheat almost totally destroyed by chinchies. *Greenwood*: Winter-wheat affected, and spring-wheat almost destroyed by chinchies. *Marion*: Winter-wheat could not be better. Spring-wheat injured by drought in May and by chinchies. Many fields will not be cut. *Labette*:

An unparalleled success, but in some cases cut too green in order to escape chinchies; some of it damaged in the sheaf. Tappahannock gives poor satisfaction. Fultz does well. *Osage*: Chinchies destroyed the spring-wheat and most of the fall-wheat. *Wabaunsee*: Spring-wheat largely destroyed by chinchies. *Republic*: In fine condition where early sown. *Wilson*: Castor-beans and flax taking the place of small grain till the chinchies get out of the way. *Atchison*: Chinchies very injurious. *Neosho*: A magnificent crop but for the chinchies; in the north part of the county one-fourth of the grain was left standing, not being worth cutting.

NEBRASKA.—*Nicholls*: Late-sown wheat affected by the drought. *Cass*: Our wheat was blighted considerably. *Antelope*: Very promising. *Merrick*: Some wheat "fired" by hot south winds following a wet spring. *Boone*: Lack of harvesting-machinery; many prefer hiring labor to purchasing implements. *Hall*: Grain-crops improved with late warm south winds. *Adams*: Remarkably good. *Nemaha*: Spring-wheat somewhat "scabbed."

CALIFORNIA.—*San Diego*: Better crops than for five years. *Napa*: Sowing delayed, and acreage restricted by heavy winter-rains; yield subsequently injured by dry-north winds. *Del Norte*: Grain looks well, but is late. *Santa Clara*: Affected seriously by hot, dry weather and north winds. *Santa Cruz*: Grain-crops fine, especially early sown; late sown greatly improved by recent rains, and will be a fair average crop. *Stanislaus*: Overestimated as usual. *Merced*: Lately injured by northwest winds; all grain except summer-fallow is more or less shrunk; crop, however, in cents, will be a full average. *Alameda*: Considerably rusted, especially near San Francisco Bay; ships loading new wheat at Oakland wharves. *Mendocino*: Late wheat looks remarkably well. *Placer*: Poorer than in any other county of the State owing to excessive winter rains.

OREGON.—*Multnomah*: Grain-crops heavy on account of unusual rain-fall; some fear that the crops may overgrow and fall. *Benton*: Spring unusually cool, with frequent rains; harvest will be late, but the yield abundant. *Columbia*: Looks exceedingly well.

UTAH.—*Weber*: All our cereals promise abundant crops. *San Pete*: One-fourth destroyed by cut-worms. *Utah*: Injured by cut-worms.

## COTTON.

The cotton-planters report to the Department of Agriculture, in accordance with the conditional promise of the June report, an improvement in the condition of the plant in every State. The percentages of average condition are higher than in June, by the following figures: 3 in Louisiana, 4 in Arkansas, 6 in Florida, 7 in South Carolina, 9 in Mississippi, 10 in Alabama, 11 in Georgia, 12 in Tennessee and Texas, 13 in North Carolina. Texas and North Carolina return condition above average. The following are the State averages: North Carolina, 102; South Carolina, 88; Georgia, 91; Florida, 96; Alabama, 92; Mississippi, 87; Louisiana, 73; Texas, 102; Arkansas, 94; Tennessee, 97. As compared with July of last year, condition is higher, except in Florida, Louisiana, and Arkansas, though the difference is slight in Tennessee and Georgia, and not very wide in Mississippi and Alabama.

In North Carolina temperature has been high, rains seasonable, and growth rapid; the plant is still small and ten days late in certain counties. Fields have generally had good preparation and clean culture. Edgecomb, which produces one-eighth of the cotton of the State, returns condition 110.

Improvement has been rapid in South Carolina, and is still progressing, though growth is not advanced to an average. Lice infest some fields. Darlington, yielding one-seventh of the fiber of the State, returns condition at 90.

Seventy-three counties in Georgia, representing two-thirds of the crop, report a backward season, too much rain, better and cleaner tillage than last year; less of fertilizers used. Rumors of the caterpillar come up from Southwestern Georgia.

Improvement is manifest in Florida, with too abundant rains in some counties, and a tendency to the shedding of forms.

While rains have been frequent in Alabama, fields have generally been kept clean. Of seven counties, which yield a third of the crop of the State, condition is placed at 90 in Bullock, Barbour, Montgomery,

Marengo, and Russell; 80 in Hale, and 100 in Dallas. None are lower than 75 or higher than 100.

The crop is late in Mississippi, but growing rapidly. It is grassy in places, yet much cleaner than last year. Condition ranges from 50 in Tunica, where it was destroyed by overflow, to 110 in De Soto and several other counties.

The Louisiana planting continued after the overflow until June 15, and the crop is therefore later than elsewhere, and has suffered in places from cut-worms, drought, and excessive rains. The caterpillar has appeared in Rapides.

Rarely has Texas had better promise of a fine crop. In some counties growth is not well advanced; in a few localities plants made their appearance late in June. The stand is generally better than in other States.

Drought has been injurious in Arkansas. Some localities have had no rain in eight weeks. In one township in Independence 1,000 acres were left uncultivated on account of drought. Rains have been more general of late in portions of the State; yet fully half the counties report 100 and above.

A majority of the counties of Tennessee return average condition; a few range from 65 to 100, and Shelby County, which yields one-sixth of the State aggregate, is placed at 110.

The following extracts from remarks of correspondents are made:

VIRGINIA.—*Dinwiddie*: Looks well, though planted late; season favorable and crop clean.

NORTH CAROLINA.—*Cleveland*: Good season; land better prepared, and more commercial fertilizers than usual. *Edgecombe*: Good stand. *Rowan*: Promising, though small for the season. *Wake*: Greatly improved by the hot dry June weather; crop perfectly free from grass; fine rains beginning to fall. *Gaston*: Last six weeks favorable to working the crop; crop looks flourishing, but it is ten days late. *Lincoln*: Acreage increased at the expense of corn and tobacco. *Greene*: Stand good, and generally clear of grass and weeds; better cultivated than for six years. *Chowan*: Plants small, but look well. *Warren*: Injured by late spring. *Pitt*: Very little grass in the crop. *Moore*: Doing well. *Davidson*: Greatly benefited by recent rains. *Wayne*: About 20,000 acres in the county this year planted in cotton. *Wilson*: Acreage decreased, but the improved condition will make up the deficiency.

SOUTH CAROLINA.—*Union*: From two weeks to a month later than usual. *Clarendon*: Small and two or three weeks late, but growing very well, and of healthy appearance. *Darlington*: Early spring very unfavorable. *Marion*: Generally in good condition, and growing rapidly; improved 10 per cent. in June. *Marlborough*: Late and infested with lice; cultivation improved; with a favorable season a decreased acreage will make an average yield. *Williamsburgh*: Poor stand. *Edgefield*: Almost average; improved by late showers. *Richland*: Improved by recent rains, but stand generally bad. *Lexington*: Backward. *Newberry*: Yield will be short without a seasonable fall. *Orangeburgh*: Clean and growing fast. *Fairfield*: Doing well. *Spartanburgh*: Doing pretty well; bloom almost as early as usual.

GEORGIA.—*Columbia*: Season fine; crop healthy but grassy and backward. *Harris*: Considerable replanting, putting the crop back three weeks; injured by frost and rains; if everything is favorable we will have two-thirds of a crop; labor easier. *Worth*: Cut off by frost, rain, and cut-worms; stand poor. *Muscogee*: Much of the cotton acreage plowed up for corn; improving though rains have been excessive; alarming rumors of caterpillars in southwest Georgia. *Clinch*: Very promising. *Randolph*: Looks well, though small. *Schley*: Two weeks late; can't make more than 80 per cent. of an average. *Wilkinson*: Small but promising. *Guinnett*: 6 weeks late; much replanted; first bloom June 27, generally not before July 4. *Terrell*: Running considerably to weed; bad stand; injured by rains. *Taliaferro*: Acreage reduced 25 per cent.; only half the guano of last year used; stand irregular; better tillage than last year, but the yield will fall short 25 or 33 per cent. *Wayne*: Rain becoming excessive. *Hancock*: Small, but good and growing tolerably fast. *Dougherty*: June favorable for growth but not for cultivation; grass growing fast. *Brooks*: Greatly improved by rains of June. *Baker*: Only tolerable; too much rain. *Carroll*: The crop has taken a fresh start and will be fair with a late fall. *Cobb*: Weed growing rapidly from late rains. *Douglass*: Crop clean. *Dooley*: Poorer than ever known. *Fulton*: Vigorous; first bloom June 20; last year June 15. Freedmen doing well. *Lincoln*: Three to four weeks late; 50 per cent. less of fertilizers used; season promising. *Liberty*: Culture



-diminishing; highland rice taking its place; cotton stolen from the fields by night; stand late. *Milton*: Have been growing fast for four weeks; still a little late but promising. *Putnam*: A month backward. *Richmond*: At least twenty days behind last year; damaged by storms. *Twiggs*: Three weeks late; would greatly improve with favorable weather. *Heard*: Some indications of boll-worms. *White*: A little better. *Early*: One worm reliably identified. *Oglethorpe*: Bloomed three weeks later than last year and about half the size of this time last season. *Stuart*: Badly in the grass; rained twenty-seven days in June. *De Kalb*: Healthy but late. *Morgan*: Not rain enough to bring up late plantings; crops clean.

FLORIDA.—*Jefferson*: Satisfactory. *Gadsden*: Some complaint of defective stands, and of a tendency to shed forms, but the condition has greatly improved and is now quite satisfactory. Constant rain for two weeks. *Jackson*: Cotton doing well. *Leon*: Crop greatly improved in June; some fields grassy. *Columbia*: Stand inferior, but looks well.

ALABAMA.—*Greene*: Heavy spring rains caused much of the cotton to be replanted; it looks healthy, and is doing well, though backward; stand defective. *De Kalb*: Late, but weeding finely. *St. Clair*: Has been backward, but has started to growing finely. *Chambers*: Three weeks late. *Montgomery*: Backward, but looks well. *Macon*: Grassy, through excessive rain. *Crenshaw*: Some complaint of poor stands, but generally flourishing. *Concuh*: Too much rain; looks badly. *Clarke*: Bad stands, through defective seed and a wet, cold April, but greatly improved with recent rains; plants thrifty and growing finely. *Franklin*: Looks unusually well; though planted fifteen days later than usual the first bloom was seen June 25, a week earlier than usual. *Limestone*: Early plantings full average; later, not so good. *Lauderdale*: Improved wonderfully during the month of June; has been well cleaned, and is growing finely with recent showers. *Hale*: Behind time twenty days but growing finely. *Pike*: Stand poor; fruit formation backward; acreage reduced 20 per cent.; labor improving. *Dallas*: Promising. *Perry*: Weeding rapidly, but fruit does not appear; daily rains injurious. *Clay*: Poor stand and growth. *Bullock*: Stand poor; plants small. *Wilcox*: Stand defective, but the plants look well. *Calhoun*: Greatly improved, but still behind in growth.

MISSISSIPPI.—*Anite*: Rain following drought; hail-storms injured the crop, but still it is of average promise. *Copiah*: Small, but clean and promising. *Harrison*: Growth somewhat retarded by unfavorable weather and insects. *Pike*: A month backward. *Newton*: Good stand; doing well. *Warren*: Grows rapidly on recently overflowed land; much replanted. *Jasper*: A month late. *Grenada*: An unusual amount in grass; prospect fair where well worked. *Wayne*: Excessive rains prevented good stands, but subsequent drought enabled the planters to work it clean. *Coahoma*: Late, but looks well. *De Soto*: Fine. *Lovendes*: Stands irregular; late rains have improved the crop in some localities. *Kemper*: Promising. *Smith*: Ten days behind, but of average promise; first bloom June 23, usually June 10 to 15. *Lauderdale*: Great improvement lately. *Lee*: Improved astonishingly within a month; weed large and full of squares. *Marion*: Cotton-flies in immense numbers have appeared in one field. *Madison*: Late eighteen days, but well worked; plants small but thrifty. *Jefferson*: Small, but growing well.

LOUISIANA.—*Morehouse*: Three weeks late, but is as large as last year, and in better condition; planting delayed by excessive rains. *East Baton Rouge*: Suffered from drought following excessive rains, yet the crop is about average. *Union*: Suffered from drought. *Rapides*: Growing finely, but two weeks late; caterpillars have been seen. *Franklin*: More late cotton than usual; looks well but cannot bring a full crop. *Cameron*: Promising. *Concordia*: Planting, after the overflow, continued till June 15; acreage decreased 30 per cent.; May drought kept the seed from germinating; stand generally good, but cannot make over half a crop. *Caddo*: Has done remarkably well; unusually clean. *Tensas*: Doing as well as late cotton can be expected to do; some of it looks badly; injured by cut-worms; rain needed. *West Feliciana*: Replanted cotton late; stand irregular; many bad spots. *Washington*: Suffered some from drought. *Madison*: Improving for thirty days past. *Richland*: Early planted doing well; no good rain for nine weeks; plantings on overflowed lands suffering from drought.

TEXAS.—*Hood*: Prospect finer than ever known. *Austin*: Late but doing well; yield will be below average. *Bosque*: Good; improved by the late fine weather. *Collin*: Never more promising. *Waller*: Growing steadily and fruiting finely; cotton fly reported. *Upshur*: Crop clean, and stand excellent. *Burnet*: Looks well generally; season favorable. *Bandera*: Low, but looks well; growing fast. *Ellis*: Never in better condition. *Fayette*: A little backward, but very promising. *Fort Bend*: Prospects better than at any time since the war. *Gonzales*: Good where good stands were obtained before the drought. *Grimes*: Fine. *Harrison*: Late, but looks well; needs rain. *Hunt*: Fine looking, but late. *Lamar*: Prospect very fine. *Milam*: One-fourth rotted by recent rains; the rest promising. *Robertson*: Looks well where well cultivated. *Smith*: Has rapidly improved with the last six weeks of dry hot weather; growing finely. *San Jacinto*: Three weeks late, but well worked. *Williamson*: Poor stands, especially on new lands; only slight showers for seventy days; plants small. *Washington*: Well cleaned during the dry weather, and now profiting from the seasonable rains. *Wood*: Better condition than last year; threatened with worms. *Matagorda*: Some fine crops, but mostly indifferent; about 30 per cent. has

just come up. *Bell*: Generally clean, but needs rain. *Anderson*: Late; sustains the drought wonderfully. *Uvalde*: Suffering for rain. *Lavaca*: Prospects favorable. *Atascosa*: Hot and showery. *Marion*: Looks well. *Medina*: Early plantings killed by April frosts, replantings promise well. *Nacogdoches*: Rather promising. *Falls*: Injured by heavy spring rains, frosts, &c. *Kaufman*: Promises the best crop in twelve years.

ARKANSAS.—*Pulaski*: No rain for eight weeks; at least 20 per cent. of the cotton planted on the blackland has never come up; on the sandy ground the condition is average; blooming prematurely on account of drought; 5 per cent. of the cotton-land is not in cultivation on account of bad condition of plantations. *Union*: Eight weeks' drought; crops clean and promising. *Dallas*: Part of the crop has had no rain for eight weeks, but will compare with last year's condition. *Craighcad*: No general rain since April 5. *Garland*: No rain for nine weeks; cotton dead; wet spring delayed or prevented planting; what was planted had to be replanted in many cases; what plants have come up failed to mature. *Jackson*: Extremely wet up to June 1, and no rain since; cotton stands drought better than any other crop. *Crittenden*: Floods made cotton three to four weeks late; doing as well as could be expected; boll-worms attacking the squares, but not in large numbers yet. *Columbia*: Doing well in spite of eight weeks' drought; crop clean; stands average. *Independence*: In one township 1,000 acres, intended for corn and cotton, were left uncultivated on account of the drought. *Hempstead*: Cotton doing very well against a seven weeks' drought, but cannot stand it much longer. *Sebastian*: Drought enabled farmers to put the crop in good condition; recent rains have been very invigorating. *Fulton*: Best crop I ever saw. *Yell*: Season favorable; crop clean and in fine condition. *Marion*: Generally smaller than last year, especially on old land; wet spring caused the ground to bake; on new land and on bottoms the crop is fine. *Arkansas*: Short; wet in the early spring, and dry afterwards for seven weeks; not over a half crop. *Boone*: Backward but growing finely.

TENNESSEE.—*Madison*: Bad stand and looking poorly on account of drought. *Lincoln*: Healthy but very small; two weeks' late. *Bedford*: Cotton stands the drought better than the other crops. *Giles*: Well worked. *Lauderdale*: Stand poor.

MISSOURI.—*Ripley*: Cotton late and a bad stand.

CALIFORNIA.—*Fresno*: Cotton squaring out, and some early cotton in bloom; temperature 105° Fabr. in the shade, at 2 p. m.

## OATS.

The average condition for the whole country is 90, the maximum being, in Nebraska, 113; and the minimum, in Kentucky, 54. In general the condition of the crop is better in the higher latitudes, though Mississippi and Louisiana are full average or above. In New England and the Middle States the crop, though in many places backward, promised favorably, except in Pennsylvania. Here, in many counties, drought at the critical period shortened both straw and grain, reducing the State average to 83. The same cause, together with rust, depreciated the crop in the South Atlantic coast States, and in most of the Gulf States; in Arkansas to 80; Tennessee, 56; West Virginia, 62; and Kentucky, 54. North of the Ohio, Michigan and Wisconsin are above average, and the other States below. West of the Mississippi the condition ranges from 101 in Iowa, to 65 in Kansas. Here and in Missouri the chinch-bug was very troublesome in many counties. In Nebraska, and on the Pacific, the crop stands considerably above average. From Utah Territory come complaints of cut-worms.

VERMONT.—*Rutland*: Backward. *Franklin*: Backward. *Windsor*: Backward. *Lamoille*: Backward.

MASSACHUSETTS.—*Berkshire*: Look finely.

CONNECTICUT.—*New London*: Excellent.

NEW YORK.—*Washington*: Growing finely. *Westchester*: Look very well. *Livingston*: Need rain. *Wyoming*: Very promising. *Sullivan*: Remarkably fine. *Wayne*: Large and heavy.

NEW JERSEY.—*Camden*: Very short; but with good rains may fill well. *Warren*: A little late, but making a good stand and growing well. *Mercer*: Drought injurious. *Hudson*: Sown late, but with a good season they will do well.

PENNSYLVANIA.—*Northampton*: Very poor and backward. *Bucks*: Will be ruined without rain. *Perry*: Injured by drought. *Washington*: Very short-strawed. *Westmoreland*: Very short crop. *Huntingdon*: Almost ruined by drought. *Lehigh*: Short-strawed; injured by drought. *Fayette*: Very short, owing to late spring-droughts. *Indiana*: Short

and needing rain. *Pike*: Not promising. *Tioga*: Shortened by drought. *Crawford*: Best crop for years.

DELAWARE.—*Sussex*: Retarded by drought following excessive rain.

MARYLAND.—*Caroline*: Early yellow oats from the Department are very fine, superseding all others. *Baltimore*: Crop will be short if rain does not come soon. *Washington*: Will be shortened by drought. *Harford*: Suffering from drought. *Queen Anne*: Doing well; heads full of grain.

VIRGINIA.—*Spottsylvania*: Very short; no rain for two weeks while heading. *Fauquier*: Heading low, and will be short. *Nelson*: Light crop. *Orange*: Crop short, except winter-oats sown in autumn. *Augusta*: Improved by late rains. *James City*: Winter-sowings are magnificent. February and March sowings very good; later, chaffy, and scarce fit to cut. *Elizabeth City*: Injured by drought and extreme heat. Since June 6 not enough rain has fallen to moisten the rain-gauge. *Mecklenburgh*: Promising till the rust set in about ten days ago. *Prince George*: Spring-oats seriously affected by drought. *Buckingham*: Threatened by chinch-bugs. *Albemarle*: Chinch-bugs. *Chesterfield*: Winter-seeding good; spring-seeding damaged by drought. *Campbell*: Indifferent. *Highland*: Injured by drought. *King and Queen*: Favorable. *Smyth*: Affected by drought. *Halifax*: Shortened by drought. *Buchanan*: Unfavorable season. *Bath*: Light and short.

NORTH CAROLINA.—*Ashe*: Very short through drought. *Caldwell*: Shortened by drought; very poor. *Cleveland*: Fall-sown oats a good average; spring-sowings cut short by drought. *Rowan*: Winter-oats good; spring crops almost a failure on the uplands. *Transylvania*: Almost a failure through rust. *Caswell*: Damaged by drought and rust. *Randolph*: Spring-oats scarcely worth harvesting; destroyed by rust; fall-oats (early sown) are excellent. *Haywood*: Injured by drought. *Wilson*: Poorest crop for years.

SOUTH CAROLINA.—*Clarendon*: Fall-sowings generally good; spring-sowings generally destroyed by rust. Potato-oats ten days later than the common varieties; Somerset will probably do well, if fall-sown. *Richland*: Spring-oats greatly improved by late rains.

GEORGIA.—*Columbia*: Almost a failure from rust. *Upson*: Some rust. *Pickens*: Rust. *Gordon*: Fall-sowings good; spring-sowings trifling. *Harris*: Benefited by June rains. *Troup*: Fall-oats good. *Gwinnett*: Fair; rust on bottom-lands. *Montgomery*: Average in spite of rust; better than for many years. *Forsyth*: Badly rusted. *Baldwin*: Acreage nearly or quite doubled. *Baker*: Rust-proof here, never fails; crop fine. *Cobb*: Shortened a third by cold spring. *Upson*: Suffering from dry rust. *Carroll*: Rusted.

FLORIDA.—*Jackson*: Acreage constantly increasing; rusted in some localities, but a good crop on the whole.

ALABAMA.—*De Kalb*: Damaged by rust. *Conceh*: Shortened by rust. *Clarke*: The anti-rust variety is the only one that has done anything. *Bullock*: Very fine. *Calhoun*: Damaged by rust and storms; Somerset oats from the Department rusted and fell down before ripening.

MISSISSIPPI.—*Kemper*: Fair. *Atlanta*: Red oats our only safe crop. *Grenada*: Potato-oats from the Department did well. *Wilkinson*: Damaged by rain and wind. *Newton*: Shortened by drought. *Jasper*: Spring-oats injured by the May drought. *Rankin*: Even the anti-rust oats have rusted; fall-sowing, full crop; spring-sowings, half a crop; White Schonen and Somerset from the Department destroyed by rust.

LOUISIANA.—*Caddo*: Ruined by drought.

TEXAS.—*Austin*: Rust. *Bosque*: Fine; yield from forty to eighty bushels per acre. *Red River*: Suffered from rains and drought. *Victoria*: Winter-oats more extensively sown; average yield, fifty bushels per acre. *Caldwell*: Oats from the Department rusted. *Grimes*: Shortened by drought. *Lamar*: Excessive rains have made a poor crop on flat lands. *Shelby*: Only red rust-proof escaped rust.

ARKANSAS.—*Independence*: Suffering from drought. *Sebastian*: Shortened by drought of May and June. *Fulton*: Nearly ruined by drought. *Marion*: Almost a failure; early season wet, later very dry. *Arkansas*: Shortened by drought in places.

TENNESSEE.—*Grundy*: Rust cut the crop down one-third. *Carter*: Shortened by drought. *Hickman*: Almost ruined by drought and rust. *Bedford*: Injurious drought. *Blount*: Damaged by drought and rust. *Greene*: Shortened by drought. *Grainger*: Short. *Monroe*: Cut off by drought and storms. *Polk*: Materially injured by rust; some fields fell before ripening. *Roane*: Shortened one-half by drought. *Lawrence*: Very indifferent, owing to drought and rust. *Bradley*: Spring-oats extremely short. *Macon*: About knee-high. *Montgomery*: Too low to be cut. *Hancock*: Some rust. *Giles*: Almost a failure.

WEST VIRGINIA.—*Harrison*: Cannot make over a half crop. *Preston*: Both early and late sown, poor. *Jackson*: Shortened by drought of thirty-five days. *Brooke*: Almost a total failure through drought. *Monroe*: A failure, except on good rich soil. *Nicholas*: Half a crop; drought. *Ritchie*: Shortened by drought. *Cabell*: A total failure; drought. *Morgan*: Shortened by drought. *Barbour*: More or less injured by drought. *Grant*: Almost ruined by drought. *Mercer*: Short-strawed, but heading out well; injured by drought. *Pendleton*: Injured by drought. *Monongalia*: One-fourth short. *Fayette*: A large acreage will not be harvested.

KENTUCKY.—*Jefferson*: Shortened by drought. *Shelby*: From 10 to 18 inches high; almost a failure. *Trimble*: Damaged by drought. *Boyle*: Will be but a fractional crop.

*Adair*: Almost a total failure. *Hardin*: Almost an entire failure. *Laurel*: Cut off one-half by drought. *Taylor*: Nearly cut off by drought; three-fourths of the acreage will not be cut. *Anderson*: Almost a failure through drought. *Christian*: Ruined by drought. *Hopkins*: Will not pay for cutting. *Lincoln*: Almost a failure. *Warren*: Shortened by nine weeks of drought. *Carroll*: Shortened by drought of May and June. *Russell*: A complete failure. *Rockcastle*: Nearly a failure. No rain since May 1, except a light shower June 26. *Owsley*: Not over half a crop. *Owen*: An entire failure; in some places they are too low to cut. *Gallatin*: Very short. *Metcalfe*: Poor.

OHIO.—*Vinton*: Will scarce pay for cutting; but little rain since May 1. *Jackson*: A failure. *Coshocton*: Seriously injured by drought. *Delaware*: Rather dry, but promise an average yield. *Licking*: Shortened by drought; no rain since May 1. *Perry*: Injured by drought. *Montgomery*: Shortened by drought. *Adams*: Chinch-bugs eating the oats. *Mahoning*: Shortened by drought. *Meigs*: Suffering from continued drought.

MICHIGAN.—*Menomonee*: Season favorable. *Cathoun*: Look well.

INDIANA.—*Orange*: Greatly damaged by chinch-bugs. *Howard*: Fine. *Decatur*: Almost a failure. *Perry*: Almost a failure. *Putnam*: Not very rank, but heading up well. *Ripley*: About half a crop. *Washington*: Short through drought. *Harrison*: Oats almost a failure. *Brown*: Short through drought; some too short to cut. *Clay*: Short, but fairly headed. *Crawford*: Threatened by chinch-bugs. *Floyd*: Average about a foot in height; some crops not worth cutting; most will be mowed as hay. *Hamilton*: Extra fine. *Marion*: Shortened by drought. *Wayne*: Shortened by drought. *Franklin*: Shortened by drought. *Whitely*: Rather dry.

ILLINOIS.—*Kankakee*: Late rains saved the oats. *Madison*: Very short. *Clinton*: Injured by chinch-bugs. *Efingham*: Shortened by drought. *Jackson*: Damaged by drought and chinch-bugs. *Montgomery*: Very short. *Richland*: Largely destroyed by chinch-bugs. *Sangamon*: Too dry and hot; injured by chinch-bugs. *Washington*: Many fields destroyed by chinch-bugs. *Wayne*: Badly damaged by drought and chinch-bugs. *Perry*: Nearly destroyed by chinch-bugs. *Schuyler*: Very little damaged by chinch-bugs, though these are very numerous. *Mercer*: Rapidly drying up. *Dodge*: Nearly average; late sown.

WISCONSIN.—*Greene*: Below average.

MINNESOTA.—*Mecker*: Look well; growing very stout. *Mower*: Flourishing since the June rains. *Wabasha*: Shortened by May drought. *Rock*: But slightly affected by grasshoppers.

IOWA.—*Marion*: Shortened by drought. *Henry*: Looks well. *Howard*: Early-sown very fine; late-sown injured by drought. *Taylor*: Rather short-strawed. *Tama*: Look finely. *Humboldt*: Injured by grasshoppers. *Webster*: A third of the oats in the northern part of the county destroyed by grasshoppers.

MISSOURI.—*Caldwell*: Promising, but threatened by chinch-bugs. *Cass*: Hundreds of acres destroyed by chinch-bugs. *Vernon*: Prematurely ripened by ravages of the chinch-bugs. *Saint Clair*: Chinch-bugs making havoc. *Greene*: Beginning to feel the drought. *Moniteau*: Chinch-bugs injurious. *Taney*: Injured by June drought. *Carroll*: Destroyed in many places by chinch-bugs. *Cape Girardeau*: Affected by drought. *Clinton*: Chinch-bugs. *DeKalb*: Chinch-bugs. *Montgomery*: Chinch-bugs bad. *Sage*: Injured by drought in May and June. *Miller*: Damaged by chinch-bugs. *Perry*: Failed from excessive rains at sowing-time and subsequent drought. *Potter*: In many places the chinch has made the crops not worth cutting. *Reynolds*: Shortened by drought. *Ripley*: Shortened by drought. *Newton*: Low; injured by chinch-bugs in some places. *Adair*: Fine. *Dallas*: Very short. *Laclede*: Shortened by drought in May; infested with chinch-bugs. *Pike*: Damaged by rust. *Crawford*: Prospect never so poor. *Clay*: Drought and chinch-bugs.

KANSAS.—*Douglass*: Mostly destroyed by chinch-bugs. *Allen*: Damaged by chinch-bugs. *Anderson*: Injured by chinch-bugs. *Barton*: Shortened by drought. *Bourbon*: Shortened by chinch-bugs. *Jefferson*: Injured by chinch-bugs. *Linn*: Damaged by chinch-bugs. *Montgomery*: Injured by drought. *Morris*: Threatened by chinch-bugs. *Sumner*: Injured by chinch-bugs. *Greenwood*: Badly injured by chinch-bugs. *Marion*: Light. *Osage*: Injured by chinch-bugs. *Wilson*: Cut down by chinch-bugs. *Atchison*: Greatly damaged by chinch-bugs. *Neosho*: Terribly injured by chinch-bugs.

NEBRASKA.—*Lincoln*: Looks well. *Antelope*: Very promising.

CALIFORNIA.—*Alameda*: Very good.

UTAH.—*San Pete*: One-fourth destroyed by cut-worms.

## RYE.

Winter-rye is full average, or above, in most of the States, and very nearly average in several others. Its maximum condition is in Connecticut 116; and its minimum 88 in South Carolina. The New England, Middle, South Atlantic, and Gulf States generally show superior condition. The crop ranges above average also in the inland Southern States, in which grain and fruit crops suffered so disastrously. Spring-

rye is reported in none of the States south of the line of the Ohio River. In most of the other States it is full average, or above. Its maximum, 107, is in Oregon; its minimum, 78, in Minnesota and Kansas.

NEW YORK.—*Wyoming*: Largely winter-killed.

PENNSYLVANIA.—*Clearfield*: Fair. *Indiana*: Filling finely. *Lancaster*: Short.

MISSOURI.—*Madison*: Very good.

NORTH CAROLINA.—*Greene*: Good.

GEORGIA.—*Marion*: Better than for many years.

TEXAS.—*Burnet*: Disappointed expectations.

KENTUCKY.—*Jefferson*: Fine. *Shelby*: Above average in spite of drought. *Franklin*: As good as any previous crop. *Anderson*: About average. *Lincoln*: Good. *Graves*: Reduced by wet spring and dry June.

INDIANA.—*Floyd*: Extra good.

ILLINOIS.—*Woodford*: Injured by freezing. *Moultrie*: Good. *Humboldt*: Injured by grasshopper.

KANSAS.—*Douglas*: Winter-rye badly injured by chinch.

## BARLEY.

Winter-barley attains its highest average, 103, in Kentucky and Kansas. It is full average, or above, in Massachusetts, New York, Georgia, Michigan, Missouri, California, and Oregon. Its minimum is noted in Illinois, 87; it is reported in about half the States. Spring-barley shows its maximum in Oregon, 106, and its minimum in Ohio, 78. It is not reported in any State south of the Ohio River, nor in New Jersey and Indiana. In the Northwest it is generally somewhat below average, but on the Pacific coast it rises above.

NEW YORK.—*Livingston*: Needs rain. *Wyoming*: Backward and small. *Wayne*: Large and heavy.

PENNSYLVANIA.—*Tioga*: Shortened by drought.

TEXAS.—*Lamar*: Did not realize its early spring promise.

OHIO.—*Montgomery*: Good. *Sciota*: Better than for years; same fields yield from forty to sixty bushels per acre.

INDIANA.—*Floyd*: Extra good.

WISCONSIN.—*Douglas*: Somewhat drowned out.

IOWA.—*Marion*: Shortened by drought. *Humboldt*: Injured by grasshoppers.

NEBRASKA.—*Antelope*: Very promising.

CALIFORNIA.—*Napa*: Average retarded by winter rain, and yield shortened by dry north winds. *Alameda*: Promising. *Humboldt*: Retarded by wet spring.

UTAH.—*San Pete*: Injured by cut-worms. *Utah*: Injured by cut-worms.

## POTATOES.

The acreage in potatoes is about 2 per cent. in advance of last year. The States showing an increase are Michigan, 121; Massachusetts and Kansas, 113; Connecticut, 112; South Carolina and Nebraska, 109; Ohio, 108; Indiana, 107; Iowa, 106; New York, 105; Maine, Illinois, and Missouri, 103; Vermont, Arkansas, and California, 102; Alabama, 101; North Carolina, Wisconsin, and Oregon report an acreage equal to last years; the other States show a decrease, the minimum, 85, being in Tennessee. The crop is reported in highest condition in Connecticut, 110; next Massachusetts and Nebraska, 108; Texas and Kansas, 106; Michigan, 103; Missouri, 102; New York, Florida, Wisconsin, and Iowa, 101; all the other States are below average, the minimum, 50, being in Kentucky; Tennessee reports 65; West Virginia, 71; Arkansas, 78; North Carolina, 84. The Colorado beetle is extending its destructive operations to the eastward, while in many sections of the West its virulence is unabated. In other localities, however, the nuisance seems on the decline. The persistent use of Paris-green and other remedies is reported as entirely successful in many places. The

presence of parasites, destroying the eggs of the beetle, is gratefully acknowledged in several counties. It is not at all improbable that the enormous multiplication of these beetles will call forth destructive enemies to feed upon them, and that thus the pest will be mitigated or removed by natural causes. The following notes have been compiled from our correspondence:

VERMONT.—*Caledonia*: Potatoes small and late.

MASSACHUSETTS.—*Berkshire*: Doing well, considering the late spring; some plantings delayed till June 20. *Plymouth*: Look well, but ten days late.

NEW YORK.—*Cattaraugus*: Very promising; beetles less injurious than was expected. *Madison*: Bugs on hand. *Tioga*: Bugs on hand, but have not done much damage yet. *Wyoming*: Promising; bugs few and not very injurious. *Wayne*: Bugs on hand; not very severe.

NEW JERSEY.—*Burlington*: Early plantings injured by drought, *Warren*: Tops growing well.

PENNSYLVANIA.—*Northampton*: Threatened by Colorado beetles. *Snyder*: Potato-bugs very bad. *Clearfield*: Bugs very injurious. *Perry*: Early plantings destroyed by bugs. *York*: Bugs very mischievous. *Philadelphia*: Colorado beetles in great numbers. *Adams*: Potato-bugs in great numbers, but kept in check with Paris-green. *Cameron*: Colorado beetles at work. *Chester*: The Colorado beetle shortening the crop. *Huntingdon*: Bugs numerous, but the early crop was rescued by great efforts from their destructive influence. *Lycoming*: Bugs very troublesome. *Wayne*: Bugs in some places. *Franklin*: Some early plantings ruined by bugs. *Butler*: Colorado beetles very injurious, but resisted in a great variety of ways. *Armstrong*: Threatened by bugs. *Union*: Bugs at work; here called the California bug. *Dauphin*: Bugs injured early crops, but are disappearing, and leaving the later plantings uninjured. *Forest*: Colorado beetles leaving; crops not much injured. *Indiana*: Doing well in spite of bugs; not much damage. *Lancaster*: Considerably injured by bugs. *Beaver*: Bug and drought threaten the whole crop. *Elk*: Look well; first brood of Colorado beetles too young to do much injury. *McKean*: Bugs threaten total destruction. *Luzerne*: Bugs; Paris-green somewhat successful.

MARYLAND.—*Frederick*: Injured by beetles; may be an entire failure. *Caroline*: Threatened by Colorado beetles. *Baltimore*: Colorado beetles at work, but successfully resisted with Paris green. *Carroll*: Considerable damage from Colorado beetles. *Wicomico*: Crop promising. *Montgomery*: Colorado beetles. *Harford*: Colorado beetles very general, but will not be so injurious as was thought; great efforts to destroy them; crop suffering also from drought. *Prince George*: Colorado beetles have just come. *Queen Anne*: Colorado beetles too late for serious damage in early potatoes, but are demonstrating against the tomato-crop. *Cecil*: Colorado beetles doing considerable damage.

VIRGINIA.—*Warwick*: suffering from drought. *Dinwiddie*: Early crop injured by April frosts. *Fauquier*: Threatened by Colorado beetles; great efforts to keep them down. *Prince William*: Threatened by Colorado beetles; farmers afraid of Paris green. *Prince George*: Injured by drought. *Clarke*: Early potatoes almost a failure from drought. *Campbell*: Good, but short. *Culpeper*: Colorado beetles. *Highland*: Injured by drought and a very destructive bug. *Henrico*: Shortened by drought. *Haywood*: Injured by drought.

NORTH CAROLINA.—*Allamance*: Poor.

GEORGIA.—*Upson*: Fair. *Pickens*: Killed by late frosts. *Wilkinson*: Fine.

FLORIDA.—*Wakulla*: Fine season for growing sweet potatoes. *Gadsden*: Unusual acreage planted in Irish potatoes, and the yield, both in quality and quantity, surpassed the most sanguine expectations; one field averaged 300 bushels per acre, some of the single tubers weighing twenty-three ounces. A second crop is frequently planted about the last of August and matures before frost. Our potatoes, with proper care, keep very well. The sweet-potato crop is rapidly increasing in acreage, as the propagation by slips will last till August. The root-planted crop is in fine condition. With proper facilities for transportation Gadsden County would find the sweet-potato crop a valuable industry. The best varieties bring from thirty to forty cents per bushel. *Jackson*: Recent rains have caused a great extension of sweet-potato culture.

ALABAMA.—*Montgomery*: Sweet potatoes doing well. *Clarke*: Irish potatoes never better.

LOUISIANA.—*Franklin*: Sweet potatoes late in maturing.

TEXAS.—*Austin*: Good though shortened by drought. *Bee*: Crop matured before the drought; yield unprecedented. *Burnet*: Greatly injured by frost.

ARKANSAS.—*Jackson*: Cut down half already by drought. *Bradley*: Irish and sweet potatoes reduced by drought to half a crop. *Independence*: Suffered severely from drought. *Hempstead*: Very few sweet potatoes planted yet. *Washington*: Both Irish and sweet potatoes suffered from drought. *Sebastian*: Injurious drought.

TENNESSEE.—*Grainger*: Shortened by drought. *Hardin*: Injurious drought. *Monroe*: Ruined by drought in April. *Lawrence*: Potatoes a total failure from drought and bugs.

*Bradley*: Potatoes nearly destroyed by the May drought and bugs; sweet potatoes very promising.

**WEST VIRGINIA.**—*Harrison*: Good rains will make a large crop in spite of the bugs. *Preston*: Infested with bugs; hand-picking the only remedy used. *Brooke*: Drought has almost ruined the crop saved from the bugs with such great effort. *Nicholas*: Cut down half by drought. *Cubell*: Early plantings about ruined by drought and bugs. *Hardy*: Early plantings injured and later threatened by the Colorado beetle. *Hancock*: Colorado beetles very destructive; Paris green the only successful remedy. *Jefferson*: Colorado beetles still destructive. *Brazton*: Potatoes planted in March not so promising as those planted in May.

**KENTUCKY.**—*Jefferson*: Nearly destroyed by Colorado beetles. *Shelby*: Will be an entire failure if rain does not come soon. *Hardin*: Ruined by drought and bugs. *Harrison*: Almost ruined by bugs. *Taylor*: Crop nearly ruined by Colorado beetles. *Anderson*: Greatly shortened by drought and Colorado beetles. *Lincoln*: Almost ruined by drought and Colorado beetles. *Grant*: Almost a failure through Colorado beetles. *Graves*: Will hardly return their seed. *Russell*: A complete failure. *Rockcastle*: Almost a failure. *Scott*: Almost destroyed by bugs. *Spencer*: Attacked by bugs twenty-seven days earlier than last year.

**OHIO.**—*Trumbull*: Better than last year; bugs numerous, but successfully resisted; not much damage done. *Delaware*: Drought and bugs. *Monroe*: Will be destroyed if the drought continues. *Cracford*: Doing finely. *Erie*: Bugs plenty, but killed with Paris green; our potatoes have never failed. *Lucas*: Colorado beetles numerous; Paris green a successful exterminator. *Meigs*: Suffering from drought.

**MICHIGAN.**—*Lenaee*: Colorado beetles threatening the crop. *Antrim*: Bugs plenty. *Bay*: Bugs troublesome. *Van Buren*: Colorado beetles less numerous; kept in check with Paris green. *Tuscola*: Promising; bugs less numerous than formerly. *Cass*: Promise to more than meet home-demand.

**INDIANA.**—*Elkhart*: Planting deterred by the bugs. *Perry*: Early plantings; no crop. *Washington*: Shortened by drought. *Harrison*: Early plantings failed. *Cass*: Colorado beetles less numerous than when they first appeared this season. *Clay*: Colorado beetles less troublesome than for two years past. *Floyd*: Few and small. *Jasper*: Colorado beetles less destructive than usual. *Marion*: Colorado beetles did little damage on account of strenuous efforts for their destruction. *Whiteley*: A big crop promised.

**ILLINOIS.**—*Cumberland*: Colorado beetles and old-fashioned potato-bugs are numerous. *Hancock*: Potato-bugs have been bad, but are decreasing. *Kankakee*: Bugs not so bad as in the last two years. *Macon*: Promise better crop than for last two years; bugs doing but little damage. *Madison*: Very few Colorado beetles, but a new enemy in the form of black lice greedily eating the tops. *Tazewell*: Bugs plenty; destroying them with Paris green. *Carroll*: Colorado beetles checked by the rain, and the great efforts made for their destruction. *Henderson*: Will soon dry up. *Ogle*: Colorado beetles have mostly disappeared. *Putnam*: Parasites have destroyed the eggs of the Colorado beetles. *Wayne*: Colorados injurious. *Pulaski*: Early plantings almost a total failure, owing to extreme drought.

**WISCONSIN.**—*Pierce*: Bugs thick as ever. *Walworth*: Reduced below average by Colorado beetles. *Clark*: Colorado beetles destructive. *Dodge*: Do well in spite of innumerable Colorado beetles. *Douglas*: Colorado beetles have come in great numbers, but men, women and children are fighting them. *Green Lake*: Bug war still continues. *Door*: Colorado beetles not so injurious, but the black potato-bug is worse. *Outagamie*: Colorado beetles and black beetles very injurious, especially the latter.

**MINNESOTA.**—*Steele*: Colorado beetles at work, but not very injurious. *Chisago*: Colorado beetles very numerous. *Meeker*: Colorado-beetles destructive. *Sibley*: Good in spite of bugs.

**IOWA.**—*Cass*: Some Colorado beetles, but a plentiful use of Paris green will secure a large crop. *Howard*: Colorado beetles in full force. *Mahaska*: Look very fine. *Clinton*: Fewer potatoes planted, and bugs more numerous than usual.—*Tama*: Colorado beetles as numerous as ever.

**MISSOURI.**—*Greene*: Drought affecting the crop. *Phelps*: Some bugs reported both in potatoes and sweet potatoes. *Adair*: Fine.

**KANSAS.**—*Mitchell*: Lady-bugs destroying the eggs of the Colorado beetle. *Woodson*: Colorado beetles very threatening. *Wyandot*: Very fine, but need rain. *Barton*: Crop of extra promise till June 15, when it was attacked by the large green-tobacco-worm. Not over a half crop will be harvested. *Ellsworth*: Will be a failure if the drought continues. *Jackson*: Threatened by drought. *Sumner*: A large worm is destroying the vines. *Greenwood*: Crop injured by Colorado beetles and a slender slate-colored bug, (probably one of the *Cantharidae*.)

**NEBRASKA.**—*Antelope*: Ravaged by Colorado beetles and tobacco-worms. *Thayer*: Potatoes and tomatoes badly injured by Colorado beetles.

**CALIFORNIA.**—*Alameda*: First crop ran to tops.

**OREGON.**—*Clackamas*: Injured by excessive rains. *Columbia*: Potato blight has appeared. Earlier kinds too far advanced. Late plantings hardly worth digging.

## WOOL.

The wool-clip was larger than last year. In Nebraska, 151; Oregon, 124; California, 120; Connecticut, 117; Minnesota, 110; Texas, 104; Massachusetts, Louisiana, and Indiana, 103; Arkansas and Missouri, 102; South Carolina, 101. It was equal to last year in New Jersey, Michigan, and Iowa. The greatest decrease, 11 per cent., was in Vermont. Among the larger wool-producing States Ohio decreases her clip 3 per cent.; Illinois, 4 per cent.; New York and Pennsylvania, 2 per cent.; Wisconsin, 3 per cent.; Kentucky, 9 per cent. There is a very marked increase of wool production in the States west of the Mississippi and on the Pacific coast.

VIRGINIA.—*Northumberland*: Without protection from dogs the wool industry must perish. *Page*: Worthless dogs are cutting down the flocks of sheep.

NORTH CAROLINA.—*Transylvania*: Wool of better quality and sheep in better condition than last year. *Lincoln*: Many sheep killed by dogs. O for a stringent dog-law!

GEORGIA.—*Worth*: Sheep dying out.

TEXAS.—*Victoria*: Wool production increasing. *Nueces*: Large increase in sheep husbandry.

OHIO.—*Marion*: Fleeces from three-quarters of a pound to a pound lighter average than last year. Assessor reports 12,000 sheep less than last year. A large percentage died. The flocks were poorly kept on short feed and poor corn. *Monroe*: Wool in improved condition; better care of sheep.

MICHIGAN.—*Cathoun*: Looks well.

ILLINOIS.—*Winnebago*: Lightest clip in proportion to the number of sheep for many years back.

WISCONSIN.—*Fond du Lac*: Clip heavier than usual per sheep; but this is because of the number lost. One farmer lost 757.

## TOBACCO.

The severe drought prevailing in sections specially devoted to tobacco-culture, together with the destruction of plants by insects, has reduced the acreage in this crop to less than half of that of 1873. The only tobacco State showing an increased acreage is Maryland, 109. The heaviest reduction is found in Kentucky, which returns an acreage of but 26 per cent. of the previous year. As Kentucky produced two-fifths of the last census crop, this reduction is significant of a thorough and extensive demoralization of the tobacco interest. Tennessee makes almost as gloomy a return, 31 per cent.; Ohio, 33; Massachusetts, 50; Indiana, 58; Virginia, 61; West Virginia, 62; North Carolina, 65; Pennsylvania, 79; Illinois, 87; Missouri, 88; New Hampshire, 89; Connecticut and New York, 90. The condition of the crop planted is above average in only two States: Connecticut, 110, and Alabama, 103; it is full average in Massachusetts, but in all the other States it is below, the minimum, 42, being in Kentucky. West Virginia reports 62; Tennessee and Ohio, 69; Virginia and North Carolina, 79; Texas, 88; New York, 91. In some localities early-set plants look promising, but later ones look poorly, on account of insect injuries and drought. In other places the low prices of last year greatly discouraged planting. In portions of North Carolina the tobacco-culture, once a flourishing industry, is reported as dying out. In Greene, Tennessee, the crop has nearly ceased, on account of the law forbidding sales to any but manufacturers and shippers. Our Kentucky correspondence, especially, is full of gloomy accounts and presages in regard to the crop. How far the present reports are influenced by the panic prevailing in the tobacco regions it is now impossible to say. It seems sufficiently clear that in the most hopeful aspects of the case the aggregate yield will be much less than half of



last year's, even if the conditions of growth should be most favorable for the remainder of the season.

The following notes from our correspondence will give some of the more striking local aspects of this crop :

PENNSYLVANIA.—*Cumberland* : Acreage limited by drought. *Lancaster* : Crops discouraged by low prices.

MARYLAND.—*Charles* : Great scarcity of plants. *Montgomery* : But little tobacco planted, on account of drought and scarcity of plants ; probably not a half crop will be set out. *Calvert* : About 75 per cent. of a crop set out ; plants looking well. *Prince George's* : A large proportion of the crop not planted.

VIRGINIA.—*King William* : Acreage diminished by failure of plant-beds. *Powhatan* : Plants nearly all destroyed by the fly ; not a third of a crop will be planted. *Fluvanna* : Lack of plants will cut down the acreage one-half. *Orange* : Late planting and scarcity of plants will cut down the crop. *Mecklenburgh* : Early-set plants look well ; later have considerably died out, with little prospect of re-setting from the scarcity of plants. *Prince George* : Stunted, but healthy. *Prince Edward* : Failure of plants. *Pittsylvania* : Season very discouraging. *Campbell* : Prospect bad ; much tobacco-land was put in corn. *Henry* : A third of a crop planted. *Lunenburg* : Three-fourths of a crop planted ; plants inferior. *Madison* : Half-crop planted. *Halifax* : Unprecedented failure of plants.

NORTH CAROLINA.—*Person* : Scarcity of plants cut down the acreage one-half. *Caswell* : Planting reduced one-half ; fly destroyed the plants. *Randolph* : Crop growing weaker every year ; will soon be raised only for medicinal purposes. *Warren* : Plants injured by late spring. *Haywood* : Shortened by drought. *Madison* : Acreage and condition reduced by drought.

FLORIDA.—*Gadsden* : Cuba tobacco made a poor stand, but the plants are growing well.

TEXAS.—*Austin* : Backward ; drought.

TENNESSEE.—*Greene* : Tobacco-growing has nearly ceased since the enactment of the law forbidding sales to any except manufacturers and shippers ; grown mostly for home consumption. *Montgomery* : Almost an entire failure.

WEST VIRGINIA.—May drought fatal to tobacco-seeds ; have never known plants so scarce. *Cabell* : A small black fly destroyed nearly all the tobacco-plants. *Randolph* : Nearly a failure.

KENTUCKY.—*Shelby* : Want of plants, and of a season for setting them, will make an extraordinarily short crop. *Adair* : This county produced, last season, 2,300,000 pounds ; up to June 25 not over 25 acres had been planted ; flies destroyed many plants, others dried up. *Bracken* : Flies, bugs, and drought have almost entirely prevented tobacco-planting ; plants set out died ; not over a fourth of a crop. *Taylor* : A failure ; plants destroyed by fly. *Anderson* : Badly injured by drought. *Christian* : No tobacco set as yet ; plants burned up in their beds ; those set dried up. *Hopkins* : Not over a tenth of a crop. *Warren* : Shortened by nine weeks' drought. *Carroll* : Drought prevented the setting out of plants. *Grant* : Almost a failure through the fly. *Graves* : Only a fifth of the usual acreage. *Logan* : Almost an entire failure. *Marion* : Too dry to put out tobacco ; drought since May 15. *Mason* : Almost a failure ; plants scarce and dying in the bed ; too late now to set them. *Russell* : A complete failure. *Edmonson* : Fly destroyed more than half the tobacco-plants ; not a tenth of a crop will be made. *Owen* : Tobacco is our great staple ; drought destroyed two-thirds of the plants, and it is already late for transplanting. *Grayson* : Not a fiftieth part of a crop planted ; nine weeks' drought. *Henry* : Not a fourth of a crop will be planted, and the plants mostly destroyed. *Trimble* : Damaged by the fly. *Metcalf* : None planted ; no rain since May 6. *Gallatin* : Plants mostly destroyed by worms ; very little tobacco planted.

OHIO.—*Vinton* : Drought and fly destroyed most of the plants. *Monroe* : Drought ; not over a fourth of a crop. *Guernsey* : Almost an entire failure, from the great yield and low prices of last year, and from the efforts of eastern dealers to discourage planting this season ; to say nothing of the failure of plants through drought.

WISCONSIN.—*Dane* : Growth discouraged by low prices ; much difficulty in getting plants ; much of the seed did not germinate.

IOWA.—*Humboldt* : Injured by grasshoppers.

MISSOURI.—*Randolph* : Looks well. *Adair* : Looks well.

## SUGAR-CANE.

Six States report the cultivation of sugar-cane, in all of which the acreage has been increased, viz : Alabama, 131 ; Mississippi, 120 ; Texas, 110 ; Georgia, 108 ; Louisiana, 104 ; Florida, 103. The condition in all these States is above average, viz : Louisiana, 108 ; Mississippi and Texas, 105 ; Florida, 104 ; Alabama, 102 ; and Georgia, 101. It is the prevalent opinion that the Louisiana sugar-product will be equal to that of 1873, notwithstanding the overflow.

## SORGHUM.

Alabama has increased her acreage 11 per cent.; Minnesota, 9 per cent.; Texas, 6 per cent.; Mississippi and Arkansas, 5 per cent.; Kansas, 1 per cent.; Delaware reports the same acreage as last year. In other States there is a decline, the minimum, 77 per cent., being in Maryland. New England, New York, New Jersey, Pennsylvania, South Carolina, Florida, Louisiana, California, and Oregon make no returns of the crop. The condition is 1 per cent. above average in Texas; full average in Delaware, Michigan, and Wisconsin; in the other States it is deficient, Kentucky showing the greatest decline, 43 per cent. below average. Several counties in different parts of the country report a declining interest in sorghum-culture.

## FRUIT.

The fruit-crop has suffered from a number of casualties during the past season. The bloom was uncommonly full in most of the counties reporting, but for some reason the fruitage in a large number of cases was small. Late spring frosts and destructive insects are reported as the specific causes of the decline in such cases.

APPLES.—Apples are above average in Arkansas, 121; Connecticut, 120; Maine, 110; New Jersey, 105; Kansas, 105; New York, 103; Texas, 103; Nebraska, 101; below in all the other States, (Florida making no return.) The lowest condition is in Virginia, 47 per cent. below average. Here an unusual number of counties report late and destructive frosts. The same cause reduced the crop in North Carolina 32 per cent. below average; in Georgia, 24 per cent.; in West Virginia, 23 per cent. Indiana reports a discount of 23 per cent., mostly from insect ravages, although a few counties show very large crops. Illinois shows a decline of 20 per cent. below average; in many counties the fruit, after forming, dropped off, leaving in many cases but a small fraction of an average crop. Tennessee shows an equal decline from the same cause.

PEACHES.—The crop is above average in Nebraska, 122; Arkansas, 121; Kansas, 120; Connecticut, 115; Ohio, 112; Michigan, 110; Iowa, 110; Missouri, 106; Texas, 102. It is full average in Oregon, and below in all the other States. The greatest depreciation is found in Delaware, one county of which reports the condition 70 per cent. below average. In Virginia the loss is 63 per cent., the result of late spring frosts. The same cause in North Carolina resulted in a depreciation of 40 per cent., and in Maryland of 39 per cent. Hailstones, excessive rains, and insect ravages reduced the crop of Mississippi 35 per cent. below average. West Virginia reports an equal loss; Louisiana a depreciation of 32 per cent.; Kentucky, 26; Georgia, 24; Alabama and Indiana, 22. In many of the northwestern counties the depreciation of the peach-crop is referred to the loss of trees from the severe freezes of the last two or three winters. A tendency of the fruit to fall from the trees after blooming is extensively noted.

GRAPES.—Grapes have had fewer casualties than apples or peaches, and, consequently, present a closer approximation to a uniform average condition. The highest average, 121, is in Florida, in several counties of which grape culture is extending, and showing very satisfactory results. California reports a condition 11 per cent. above average; Missouri, 10; Maryland, 9; Arkansas, Nebraska, and Minnesota, 7; Maine and Ohio, 6; Texas and Michigan, 4; Pennsylvania, 3; Indiana and Kansas, 1. Vermont is full average, and all the other States

below. The greatest depreciation, 17 per cent., is found in Georgia. North Carolina reports 15 per cent. loss. Nearly all the other States are less than 10 per cent. below average. Frosts and insects are assigned as the causes of these losses. The general aspects of this crop, however, indicate a decided improvement.

**STRAWBERRIES.**—Strawberries are 25 per cent. above average in Connecticut, 19 per cent. in California, 10 per cent. in Massachusetts, 6 per cent. in New York, 5 per cent. in New Jersey, 2 per cent. in Texas, 1 per cent. in Florida. In all the other States the crop is below average. The drought, which was so disastrous to the summer-crops of Kentucky, reduced the strawberry-crop to 68, the lowest State average returned. Tennessee, from similar causes, is reduced to 72; Maine, to 73, tent-caterpillars being very destructive in several counties. West Virginia reports 77; Louisiana, 79; Delaware, 80; Kansas, 81; Ohio, 82; Virginia, 83; Alabama and Minnesota, 85; North Carolina and Mississippi, 86; Iowa, 87; Indiana, 89. In some quarters, where full yields were noted, it is complained that the conditions of growth were such as to precipitate the crop upon the market, glutting it for a week and then leaving it entirely destitute. In California some second crops were blasted by north winds.

**MAINE.**—*Franklin*: Tent-caterpillars injuring fruit-trees; it is stated that in Somerset County they have defoliated 1,000 acres of poplar-trees. *Androscoggin*: Apples and grape fine; strawberries light.

**NEW HAMPSHIRE.**—*Hillsborough*: Small fruit very abundant.

**VERMONT.**—*Grand Isle*: Apples and pears have just begun to grow.

**MASSACHUSETTS.**—*Plymouth*: Apples in fine condition, except a few orchards infested with canker-worms; our few peach-trees are loaded with fruit.

**CONNECTICUT.**—*Windham*: Cranberry culture extending. *New London*: Apples promise an abundant crop; peaches doing finely; grapes excellent.

**NEW YORK.**—*Steuben*: Fruit promises better than cereals, especially grapes. *Washington*: Small fruits will be light.

**NEW JERSEY.**—*Hudson*: Apple bloom copious, but much of the fruit has fallen; peaches injured by late season, as also grapes; strawberries better in quantity than quality. *Burlington*: Apples falling from early drought; cherries better than for years; the trees appear to be recovering. *Warren*: Some over-blooming apple-orchards failed. *Camden*: Strawberries unprofitable; season short and hot, throwing the whole crop into market at once.

**PENNSYLVANIA.**—*Bucks*: Apple-crop generally promising, but the "Smith's cider" will yield lightly; drought hard on our few peaches. *Washington*: Apples not a fourth of a crop; grapes and cherries better than usual. *Cameron*: Peaches destroyed to a considerable extent by the rose-bug; grapes and apples less affected. *Indiana*: Apples and peaches a half crop; fallen off from late frosts or dry weather. *Lancaster*: Apples, pears, peaches, and grapes promise abundantly, but caterpillars are very bad. *Tioga*: Apples falling off badly.

**MARYLAND.**—*Caroline*: Immense crop of strawberries; peaches an entire failure. *Baltimore*: Apples dropped exceedingly during June; grapes present a luxuriant growth; Concord the popular variety. *Dorchester*: Peaches an entire failure through late frosts; apples and grapes promise an abundant yield; strawberry-crop 50 per cent. greater than last year. *Talbot*: Peach-crop short; abundant apple-bloom, but the fruit fell off badly. *Wicomico*: Apples and peaches scarce; strawberry-crop large and profitable. *Queen Anne's*: Peaches a total failure; grapes and strawberries very abundant. *Calvert*: Peaches a failure. *Cecil*: Apples and peaches blighted and falling from the trees.

**VIRGINIA.**—*Pohatan*: All peaches and early apples destroyed by frosts. *Fluranna*: All fruit, except grapes, destroyed by frosts. *Sussex*: Peaches and most of the apples destroyed by frost. *Spotsylvania*: Apple-crop short. *Dinwiddie*: Apples and peaches mostly killed and strawberries injured by frost; grapes abundant. *Floyd*: Cranberries grow abundantly without cultivation. *Fauquier*: Apple-crop fair; no peaches, cherries, plums, or pears. *New Kent*: Fruit-crop a failure. *Charles City*: Peaches and apples frost-killed. *Elizabeth City*: All fruits frost-killed, except strawberries and grapes. *Prince George*: Apples and peaches almost complete failures. *Prince Edward*: Apples and peaches frost-killed. *Highland*: Heavy bloom, but poor crop. *Greenville*: Apples and peaches almost a failure; wild grapes abundant. *King and Queen*: But little fruit, except grapes. *Henrico*: Grapes fine, but other fruit short. *Buchanan*: Apples and peaches mostly killed in bloom by snow and frost of April 28.

**NORTH CAROLINA.**—*Haywood*: Peaches and apples almost a failure. *Madison*: Apples and peaches mostly frost-killed. *Macon*: Apples and peaches almost destroyed by frost. *Carteret*: Half the apples and peaches killed by April frosts. *Person*: General failure;

mostly frost-killed. *Tyrrell*: Apples, peaches, and grapes mostly ruined by late frosts and cold wet spring. *Chatham*: Grapes destroyed in many cases by April frosts. *Greene*: Apples and peaches almost a total failure. *Chowan*: Fruit of all kinds almost a failure. *Warren*: Fruit killed by late frosts. *Moore*: Half the fruit frost-killed in places.

**SOUTH CAROLINA.**—*Greenville*: Injured by April frosts; strawberries killed by heat and drought of May. *Lexington*: Strawberries good, but failed in the middle of June. The Seth Boyden variety, from the Department, is well suited to our climate.

**GEORGIA.**—*Montgomery*: Fruit frost-killed. *Cobb*: Fruit a half-crop. *Dooly*: All kinds of fruit damaged by late frosts and a late cold spring. *Carroll*: Killed by late frosts and wet spring.

**FLORIDA.**—*Columbia*: Not over half a crop, and that inferior and wormy from late frosts. *Jackson*: Apples and peaches injured by changes of weather during bloom. *Gadsden*: Grape-culture extending; established vineyards have produced satisfactory yields.

**ALABAMA.**—*Greene*: Not heavy, but good. *Mobile*: Ordinary varieties of grapes are 25 per cent. below average; the Scuppernong, 5 per cent. above; figs are above average; melons and pears below. *Saint Clair*: Grapes rotting. *Montgomery*: Apples and peaches rotting; grapes and strawberries very good; blackberries abundant. *Calhoun*: Nearly all fallen off.

**MISSISSIPPI.**—*Amité*: Fruit-crop greatly damaged by hail-storms. *Harrison*: Peaches demoralized by excessive rain; oranges very promising. *Grenada*: All kinds of fruit better than last year. *Tallahatchee*: Fruit-crops destroyed by caterpillars resembling the "army" worm, but smaller. *Copiah*: Cut short by rain and late frosts. *Smith*: Grapes rotted, except Scuppernong.

**TEXAS.**—*Austin*: Native grape-vines, especially Concords, are loaded with fruit; foreign grapes also beginning to ripen; several orchards of apples lately planted. *Bosque*: Peaches mostly frost-killed. *Victoria*: Peaches falling badly; trees vigorous and healthy; the most abundant grape-crop yet produced. *Bezar*: Largest grape-crop ever known. *Lamar*: Peach-crop good. *San Jacinto*: Orchards receiving more attention. *Williamson*: Peaches a full yield, but fruit small, owing to the drought; Hale's Early just ripe; three weeks later than in 1872.

**ARKANSAS.**—*Bradley*: Apples bloomed well, but the fruit dropped off. *Izard*: Grape-culture but little attended to; would be profitable; also strawberries. *Yell*: Blight or rot is destroying cultivated grapes.

**TENNESSEE.**—*Bedford*: Grapes very light. *Grainger*: Apples and peaches falling off; infested with curculio. *Lawrence*: Peaches a total failure.

**WEST VIRGINIA.**—*Preston*: Fruit injured by late frosts. *Brooke*: Apples bloomed profusely, but the fruit fell off badly. *Monroe*: Apples, half a crop; injured by insects; peaches almost a failure; grapes recovering from May frosts. *Nicholas*: Fruit-crops light, but good. *Marion*: Apples fall from the trees on account of the cold, dry May. *Jefferson*: Fruit prospects not so favorable as a month ago; grapes doing better than other kinds; pears scarce. *Pendleton*: Apples and peaches injured by late frosts. *Monongalia*: Short crop of apples and peaches. *Braxton*: Fruit injured by freezing weather of April.

**KENTUCKY.**—*Jefferson*: Fruit-crops look well. *Franklin*: Fruit greatly injured by numerous destructive insects, *Logan*: Fruit of all sorts continually dropping off.

**OHIO.**—*Trumbull*: Fruit never more promising. *Vinton*: Cold in May caused apples to drop; strawberries almost burned up; hottest June ever known here; thermometer above 90° for thirteen days, and for two days 102°. *Jackson*: Apples doing badly. *Highland*: Much damage to fruit and fruit-trees by the black measuring-worm. *Licking*: Apples falling off; strawberries very short; June 28 the hottest day—104° in the shade. *Montgomery*: Apples dropping; peaches hang better; grapes in fine condition. *Medina*: Apples and peaches never better. *Crawford*: Apples falling off considerably; curculio pest on the wane. *Hancock*: All fruit-crops superabundant. *Mahoning*: Too dry for small fruits. *Marion*: Apples poor; trees blighted; grapes never better. *Meigs*: Half the apples have fallen off. *Columbiana*: Apples and peaches almost ruined by drought.

**MICHIGAN.**—*Antrim*: Plums, cherries, and blackberries in abundance. *Hillsdale*: Apples shortened by hot weather. *Ionia*: Apples greatly injured by an unknown insect. *Van Buren*: Fruit of all kinds abundant. *Tuscola*: Apples dropping badly. Grapes and small fruit promise abundantly. *Wayne*: Fruit of all sorts abundant.

**INDIANA.**—*Elkhart*: Not the bearing-year for apples. Peach-trees full of fruit. Grapes bore heavily last year, and are consequently light. Strawberries always good. *Howard*: Peach-crop heavy; the first in seven years. Apples scarce. *Perry*: Apples damaged by insects. *Posey*: Apples, peaches, and strawberries frosted; insects injuring fruit. *Putnam*: Peaches at first promised finely, but are dropping off badly. Apples and small fruits doing well. *Ripley*: Apples and peaches have fallen badly, but will leave a fair crop. Pears and cherries good and plenty. *Shelby*: Apples have fallen badly. *Washington*: Apples light; peaches almost a failure. *Hamilton*: Apples and pears injured by some insect. *Noble*: Apples scarce. *Pike*: Apples scarce and poor; berries fair; pears scarce; grapes doing well. *Steuben*: Peaches promise well. *Switzerland*: Fruit-crops promise to be enormous. *Franklin*: Apples dropped badly. *Whiteley*: Apples dropped; peach, prospect unusually fine.

ILLINOIS.—*McLean*: Trees all bloomed, but did not set, and the fruit is falling off. *Bureau*: Apples a half-crop. Peaches few, but look well. *Hancock*: Curculio is more destructive than ever; codling-moths less numerous. *Stephenson*: A fair show of almost all sorts of fruit. *Saint Clair*: Apples almost a failure compared with their bloom. Concord grapes rotting. A new insect has appeared on the Norton. *Montgomery*: Strawberries lasted only a week, and then a luxuriant crop dried up; apples almost a failure. *Moultrie*: Apples promising. Young peach-trees will have a fair crop; old trees dead. *Putnam*: Apples dropped off to a third of a crop. *Morgan*: Fruit prospect has declined within two weeks. *Ogle*: Unpromising. *Vermillion*: Apples dropped off. *Wayne*: Apples and peaches have fallen short. *Piatt*: Apples have fallen badly.

WISCONSIN.—*Walworth*: Fruit a failure; usually precarious. *Brown*: A singular disease affecting fruit-trees; limbs dying gradually from the top. *Juneau*: Best apple-crop we have yet had. *Fond du Lac*: Copious apple-bloom, but blown off by east winds.

MINNESOTA.—*Goodhue*: Apples have not recovered from the injuries of 1873; trees still dying. *Jackson*: Nearly all the berries eaten.

IOWA.—*Marion*: Apples fallen from the trees; cherries, full crop; insects destroying plums; grapes and small fruits good. *Marion*: Apples, cherries, and small fruit grow well here. *Lee*: Peach-trees full. *Van Buren*: Small fruits abundant. *Marshall*: Apple-trees dying; raspberries winter-killed; grape-vines never before so loaded with fruit. *Des Moines*: Orchards doing nearly nothing; strawberries ruined by drought. *Harrison*: Apple-trees injured by grasshoppers; many trees set out in the spring have been killed. *Howard*: Apples have not recovered from the freeze of last year; gooseberries remarkably fine and plentiful. *Guthrie*: Copious apple-bloom, but light crop. *Hardin*: Strawberry and grape-vines largely killed by drought last fall. *Jefferson*: Good prospect of apples destroyed by worms.

MISSOURI.—*Texas*: Peaches, apples, and grapes 50 per cent. better than last year. *Platte*: Apple-bloom copious, but few trees have any fruit, and those shedding; a small worm is found in each falling apple. *Caldwell*: Prospects remarkably good. *Saint Clair*: Peaches have fallen badly. *Nodaway*: A beetle destroyed many of the apples about the middle of June. *Moniteau*: Peaches and apples dropping; leaves crisped and drying; probably the work of some insect. *Daviess*: Apples dropping; injured by worms; peaches promise a most extraordinary crop. *De Kalb*: Apples blasted, but peaches a fine yield. *Johnson*: Apples a good crop generally; peaches mostly failed; grape-culture increasing. *Marion*: Splendid bloom, but light yields. *Phelps*: Apples and peaches have fallen badly. *Adair*: Peaches and grapes abundant. *Cole*: Fruit a good average; early harvest-apples already gone. *Pike*: Fine apple-bloom, but poor yield. *Jasper*: Seedling-peaches, on prairie lands, were killed by protracted spring cold, while bedded trees are well filled, raising the crop to half average.

KANSAS.—*Leavenworth*: Immense crop of apples, peaches, and cherries; small fruits injured by fall drought and winter-freezing. *Douglas*: All varieties of cherries have produced abundantly; peaches, plums, and grapes will also yield large crops. *Nemaha*: Fruit-crops never better. *Wyandotte*: Fruit abundant. *Bourbon*: Apples abundant; peaches leaf-blighted and dropping off, but will be sufficient for home consumption; grapes look splendidly. *Doniphan*: Fruit materially injured by south winds while in bloom. *Jackson*: Fruit-crops generally fine, but strawberries poor; grapes splendid. *Montgomery*: Peaches and strawberries suffering from drought. *Washington*: Rose-bugs injured tame grapes; afterward a worm denuded the vines of leaves and fruit. Peaches and small fruits abundant. *Butler*: Peach-crop large.

CALIFORNIA.—*Napa*: Curl-leaf injured peaches; apples short; extraordinary yield of grapes. *Sacramento*: Peaches injured severely by curl-leaf; many orchards along the streams injured by seepage-waters, from overflow; second crop of strawberries destroyed by the north winds. *El Dorado*: Fruit-crops much increased; fine growing rains. *Alameda*: Grapes looking very well; promise the largest crop yet known.

UTAH.—*Box Elder*: Apricot-crop heavy; fruit generally promising. *Salt Lake*: Codling-moth as destructive as last year on apples and pears; a destructive worm attacking the grapes. *Utah*: Apple-blossoms blown off by high winds. Early peaches frost-killed.

## HAY AND PASTURES.

Timothy is in highest average condition in Connecticut, 118; and above average in New York, 106; Vermont, 104; Massachusetts, 103; and Nebraska, 101. It maintains an average in Delaware, Maryland, California, and Oregon. Its minimum condition is found in Kentucky, 55, where it was depleted by the severe drought; West Virginia stands but little higher, 62; Tennessee, 70; Ohio, 71. North of the Ohio River it is uniformly below average, reaching its highest figure, 98, in Michigan. The severe drought, as well as spring-frosts here,

injured the crop. West of the Mississippi the crop is generally better, while on the Pacific coast it attains a full average. In some of the Northern States, both east and west, the crop suffered from winter-killing.

Clover seems to have suffered somewhat less from drought and other injuries than timothy. Its highest condition, 109, is in Massachusetts; in Maryland and California it stands at 108; Oregon, 107; Connecticut 106; Pennsylvania, 105; New Jersey and Nebraska, 102; New Hampshire, 101; Delaware, 100. It is very near average in Missouri, 99; Virginia, Alabama, Illinois, and Iowa, 98. Its minimum is found in Kentucky, 60. The low averages of Tennessee, 73, and West Virginia, 75, also show that the most unfavorable conditions of growth were south of the line of the Ohio. In the Northwest the general condition is below average, but improves toward the West. The Pacific coast is above average.

Pasture shows a higher average than mown grass, indicating, on the whole, a more favorable condition of grass-growth as the season advanced. This crop suffered from severe drought in the earlier part of the season in a large number of counties. In the New England and Middle States it stands full average or above, except in Pennsylvania, 88. Seasonable showers, especially on the eastern shore, enabled Maryland to maintain her high average, 108. In the South Atlantic States drought reduced the condition below average, except in Georgia, 103. Of the Gulf States Alabama and Texas are slightly above average, the rest being below. To the northward the severe drought cut down the average to 82 in Arkansas; 76 in Tennessee; 66 in West Virginia, and 59 in Kentucky. North of the Ohio River, Ohio, 80, suffers most severely; Michigan and Wisconsin being less affected by drought, rise above average; Minnesota, on the same parallel, is also above average; while southward Indiana, Illinois, Iowa, and Missouri sink below; the trans-Missouri and Pacific regions stand above. In some parts of Oregon the rains were excessive and injurious. In California the successful growth of alfalfa is noted with an unusually luxuriant pasturage.

MAINE.—*Cumberland*: Some pieces of hay look finely; old fields badly winter-killed.

NEW HAMPSHIRE.—*Hillsborough*: Hay-crop very abundant. *Sullivan*: Good. *Rockingham*: Hay-crop promises largely; two weeks later than last year. *Belknap*: Old grasslands somewhat winter-killed; hay will be average.

VERMONT.—*Lamoille*: Hay-crop in fine condition; stock-raising and dairying the main business of the county. *Franklin*: Grass late, but doing well; pastures good. *Rutland*: Pasture and meadow good. *Grand Isle*: Grass late; timothy thin, but rank. *Chittenden*: Grass heavy on dry land. *Caledonia*: Grass badly winter-killed.

MASSACHUSETTS.—*Berkshire*: Pastures never better; white clover abundant; frequent and heavy rains and rapid drying of the surface. *Plymouth*: Hay-crop large, except on a poor, wet soil.

CONNECTICUT.—*New London*: Grass-crop very good. *Litchfield*: Frequent and heavy showers have lodged the grass and delayed cutting. *Hartford*: Grass much above average.

NEW YORK.—*Columbia*: Pastures better than for years past; rains copious; hay-crop promising. *Steuben*: June dry and cool, retarding grass-crops; clover-crop now being cut; a light crop; timothy still lighter. *Westchester*: June very seasonable; grass looking finely. *Washington*: Grass getting a good growth, but is thin in the meadows; clover largely winter-killed. *Cattaraugus*: Best hay-crop for three years. *Oneida*: Season wet; grass-crops good. *Wyoming*: Pastures uncommonly good; clover somewhat winter-killed, but has latterly done well; timothy rather short and backward. *Wayne*: June rains gave a heavy growth to grass. *Jefferson*: Grass never looked better. *Sullivan*: Pasture abundant; catle doing finely. *Otsego*: Great growth of grass.

NEW JERSEY.—*Camden*: Hay-crop gathered better than ever before; fine harvest weather; *Warren*: Pasture good; clover and timothy fine. *Burlington*: Severe drought telling on pasture. *Hudson*: Newly-sown timothy looks well; old meadows short and inferior. *Mercer*: Drought damaging timothy and pasture; clover all gathered without a drop of rain or dew; hay looks as green as when it was cut. *Sussex*: Never had such pasture for stock.

PENNSYLVANIA.—*Bucks*: Clover and mixed grasses doing well; timothy suffering for rain. *Perry*: Grass-crops injured by drought. *York*: Fine hay-harvest weather. *Phila-*

*delphia*: Hay harvested in good condition; some timothy and clover cut two tons per acre on rather dry ground. *Chester*: Clover harvested in very excellent condition. *Butler*: Grass-crops injured by the wet and cold spring, followed by a hot, dry summer. *Lehigh*: Hay-crop shortened by June drought. *Union*: Shortened by June drought and heat. *Fayette*: Hay light owing to drought in May and June. *Lancaster*: Hay-crop unusually large. *Beaver*: Clover short and cured on the stalk ready for the barn as soon as cut. *Pike*: Grass-crops never better. *Indiana*: Grass-crops superior. *Tioga*: Hot, dry June shortened timothy 10 to 20 per cent.; clover and pasture less affected. *Crawford*: Best hay-crops for several years in prospect.

MARYLAND.—*Wicomico*: Timothy and clover show most gratifying results. *Harford*: Pasture suffering from drought. *Queen Anne*: Showers have kept pastures fresh and green.

VIRGINIA.—*Fluvanna*: Clover and timothy fair. *Warwick*: Grass suffered from drought. *Pulaski*: Hay-crop light. *Fauquier*: Grass-crop good. *Augusta*: Clover and pasture improved by late rains. *Charles City*: Hay from timothy and orchard-grass, a recent introduction, has been very remunerative on good lands. *Craig*: Injured by drought. *Clarke*: Young clover will probably be killed; timothy did well when cut early. *Chesterfield*: Clover; the finest crop yet raised here. *Culpeper*: Good grass-season. *Highland*: Injured by drought. *Madison*: Clover, small; timothy, fair. *Smyth*: Grasses shortened by drought. *Henrico*: Early pastures and hay-crop good.

NORTH CAROLINA.—*Ashe*: Grass-crops shortened by drought.

GEORGIA.—*Harris*: Pastures fine. *Forsyth*: But little clover sown, but that has done finely.

FLORIDA.—*Jackson*: Injured by late rains.

ALABAMA.—*St. Clair*: Clover good; timothy injured by May drought.

MISSISSIPPI.—*Wilkinson*: Clover damaged by wind and rains.

TEXAS.—*Austin*: Improved by late showers. *Brazos*: No cultivated pastures. Wild grasses very fine. *Fayette*: Prairie-pasture excellent.

ARKANSAS.—*Fullon*: Prairie-grass fine and abundant, but imperfectly utilized.

TENNESSEE.—*Sunner*: Pastures dried up; water becoming scarce. *Carter*: Hay-crop much injured by drought. *Hickman*: Pasture fast drying up. Orchard-grass and clover cut June 1; yielded well; timothy and red-top not so well. *Bedford*: Hay, half a crop. *Blount*: Pastures drying up. *Grainger*: Clover and timothy shortened by drought. *Bradley*: Extremely difficult to get a good stand of clover of late years. *Roane*: Grass of every description nearly a failure. *Montgomery*: No clover or timothy fit to cut; pastures drying up.

WEST VIRGINIA.—*Harrison*: Drought has shortened both meadows and pastures. *Jackson*: Grass-crops greatly shortened by drought. *Monroe*: Pastures and meadows burning up. *Nicholas*: Grass-crops cut down one-half by drought. *Ritchie*: Greatly shortened by severe drought. *Marion*: Pastures fine and cattle fat. *Barbour*: Grass crops injured by drought. *Grant*: Hay almost a failure. *Brazton*: Meadows and pastures short, especially pastures. *Jefferson*: Grasshoppers destroying the young clover. *Mercer*: Grass-crops all below average, through drought. *Monongalia*: About half a crop of hay; pastures fair; cattle doing well. *Kandolph*: Pastures hardly sufficient for a goose.

KENTUCKY.—*Shelby*: Pastures drying up; stock-water becoming scarce and springs failing. *Boyle*: Very poor; hay prospect next to zero. *Adair*: Not a fourth of a hay-crop; half the meadows will not be mowed. *Hardin*: Pastures dried up. *Laurel*: Meadows and pastures burned up. *Anderson*: Ruined by drought. *Christian*: Hay and pastures dried up. *Hopkins*: Grass-crops almost a total failure. *Lincoln*: Pastures burned up. *Warren*: Drought of nine weeks has cut timothy short. *Carroll*: Timothy shortened by drought of May and June. *Butler*: Pastures dried up and eaten to the ground. *Grant*: Shortened by a terrible drought. *Greaves*: Grass-crops a failure. *Logan*: Pastures dry enough to burn; stock-water scarce; families hauling drinking-water a considerable distance; stock dying of thirst. *Russel*: Pastures dried up; meadows not worth cutting. *Edmonson*: Meadows and pastures have died out. *Nelson*: Grass-crops burning up. *Gallatin*: Clover and timothy very short.

OHIO.—*Trumbull*: Both timothy and clover abundant. *Vinton*: Meadows will scarce pay for cutting. *Jackson*: Grass-crop short; pastures drying up. *Coshocton*: Pasture, clover, and timothy seriously injured by drought. *Licking*: Clover and timothy short; little rain since May. *Perry*: Drought injuring grass-crops. *Montgomery*: Pastures short. *Monroe*: Drought hard on dairies. *Crawford*: Grass-crops light. *Mahoning*: Drought shortened meadows and pastures. *Athens*: Grass-crops not over one-fifth of an average. *Meigs*: Grass-crops light. *Columbiana*: Everything parched.

MICHIGAN.—*Lenawee*: Clover badly winter-killed on clay soils; good growing time now. *Saginaw*: New clover and timothy badly injured by spring frosts. *Menominee*: Season favorable. *Wayne*: Grass thin on the ground, but of good quality; secured in fine condition. *Culhoun*: Grass-crop looks well, though shortened by drought. *Montcalm*: A great hay-crop. *Cass*: Hay nearly all secured in superb order, though a very light crop; pastures still very short, though cattle do not fall away in flesh very seriously.

INDIANA.—*Elkhart*: Clover and timothy badly injured by two dry seasons. *Madison*: Meadows and pastures short. *Decatur*: Hay and pastures dried up. *Posey*: Pastures good,

but not large enough for the stock on them; clover generally good, but grown in small quantities, *Ripley*: Grass half a crop. *Washington*: Timothy and clover shortened by drought. *Gibson*: Pastures good. *Harrison*: Hay-crop failed; pastures burnt up. *Floyd*: Some meadows not worth cutting; clover better than timothy. *Marion*: Hay-crop shortened by drought; pastures improved by late rains. *Tippecanoe*: Fine grass-crops. *Warren*: Pastures and meadows need rain. *Whitely*: Meadows light, but hay of good quality. *Orange*: Timothy overgrown with white blossom.

ILLINOIS.—*Jersey*: Grass heavy and pastures good. *Kankakee*: Timothy shortened by drought. *Madison*: Timothy good but thin. *Tazewell*: Pastures need rain very much. *Henderson*: Pastures will soon dry up; wells and small streams failing. *Sangamon*: Pastures excellent till within two weeks past. *Grundy*: Grass withering. *Montgomery*: All grasses failed except clover, which grew luxuriantly. *Moultrie*: Timothy injured by drought.

WISCONSIN.—*Crawford*: Timothy suffered from drought earlier in the season. *Waukesha*: Badly winter-killed, but what was left is growing vigorously. *Dodge*: Pastures shortened by drought. *Calumet*: Timothy very good. *Outagamie*: Clover injured by grasshoppers.

MINNESOTA.—*Dodge*: Grass crops recovering somewhat from the previous drought. *Wabashaw*: Shortened by the May drought.

IOWA.—*Henry*: Pastures injured by drought; hay well secured. *Linn*: Grass-crops short; rain greatly needed. *Mahaska*: Too dry; hay very light. *Washington*: Pastures suffering from drought; stock-water scarce. *Lucas*: Injured by drought. *Mitchell*: Grass growing rapidly. *Greene*: Hay short. *Hardin*: Timothy thin and short on account of the dry spring.

MISSOURI.—*Cape Girardeau*: Meadows and pastures suffering from drought. *Sage*: Grass injured by drought in May and June. *Adair*: Timothy shortened by drought.

KANSAS.—*Leavenworth*: Grass-crops, except clover, shortened by drought. *Franklin*: Chinchies going for pastures.

NEBRASKA.—*Adams*: Prairie grass nearly equal to meadow in the older States.

CALIFORNIA.—*San Diego*: More pasture than for five years. *Napa*: Alfalfa a good stand and promising. *Fresno*: Mountain pastures poor.

OREGON.—*Multnomah*: Grass-crops luxuriant from the heavy rains. *Clackamas*: Clover injured by excessive rains. *Columbia*: Pastures never better.



Table showing the condition of the crops, &c., on the 1st day of July, 1874.

States.	CORN.		WHEAT.		RYE.		OATS.	BARLEY.		PAS-TULE.	CLO-VER.	TIMO-THY.	POTATOES. (Solanum Tuberosum.)		POTATOES. (Batatas edulis.) SWEET.	
	Average condition July 1.	Average condition of winter wheat July 1.	Average condition of spring wheat July 1.	Average condition of winter rye July 1.	Average condition of spring rye July 1.	Average condition July 1.	Average condition of winter barley July 1.	Average condition of spring barley July 1.	Average condition July 1.	Average condition July 1.	Average condition July 1.	Average condition July 1.	Average condition of winter last year.	Average condition of winter last year.	Average condition July 1.	Average condition of winter last year.
Maine.....	82	85	96	162	102	100	100	100	104	88	93	93	103	95	101	.....
New Hampshire.....	95	92	95	102	101	102	100	.....	89	107	101	101	99	98	101	.....
Vermont.....	86	85	87	96	101	91	98	.....	100	112	82	104	102	94	97	.....
Massachusetts.....	103	102	104	107	103	102	101	.....	100	118	109	103	111	108	.....	.....
Rhode Island.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Connecticut.....	104	98	105	103	116	105	105	.....	117	106	106	118	112	110	.....	.....
New York.....	100	97	97	98	98	105	100	.....	100	101	102	106	105	101	.....	.....
New Jersey.....	100	98	105	103	103	98	98	.....	102	105	98	106	99	98	.....	.....
Pennsylvania.....	102	100	108	97	99	100	100	.....	88	91	91	99	99	89	.....	.....
Delaware.....	100	95	110	106	102	92	100	.....	100	100	100	100	100	95	.....	.....
Maryland.....	101	104	106	101	103	102	100	.....	108	108	100	100	100	88	.....	.....
Virginia.....	101	95	105	104	104	100	100	.....	93	98	90	98	91	84	.....	.....
North Carolina.....	104	95	104	100	104	90	90	.....	90	92	87	100	100	84	.....	.....
South Carolina.....	106	101	106	101	88	93	93	.....	93	96	.....	109	105	100	.....	.....
Georgia.....	115	100	103	101	101	90	81	.....	103	100	.....	130	101	100	.....	.....
Florida.....	99	102	.....	.....	.....	.....	.....	.....	99	.....	.....	.....	.....	.....	.....	.....
Alabama.....	112	99	99	81	95	82	81	.....	101	98	.....	.....	.....	.....	.....	.....
Mississippi.....	110	93	103	101	105	102	100	.....	102	90	.....	.....	.....	.....	.....	.....
Louisiana.....	96	75	.....	.....	.....	.....	.....	.....	97	90	.....	.....	.....	.....	.....	.....
Texas.....	116	106	84	.....	89	90	90	.....	101	.....	.....	.....	.....	.....	.....	.....
Arkansas.....	112	83	144	.....	106	56	56	.....	91	82	84	86	102	78	.....	.....
Tennessee.....	88	82	119	.....	106	66	73	.....	99	70	70	70	85	65	.....	.....
West Virginia.....	89	83	118	.....	103	63	63	.....	76	73	62	89	60	71	.....	.....
Kentucky.....	97	77	117	.....	101	54	54	.....	103	59	55	89	50	81	.....	.....
Ohio.....	102	99	105	101	101	82	82	.....	80	81	71	108	91	91	.....	.....
Michigan.....	106	102	99	97	95	100	107	.....	100	102	96	98	121	103	.....	.....
Indiana.....	108	109	99	.....	98	86	86	.....	90	85	84	107	93	98	.....	.....
Illinois.....	104	105	101	99	97	101	91	.....	87	97	98	94	103	99	.....	.....
Wisconsin.....	101	100	99	91	92	97	101	.....	95	102	93	97	99	101	.....	.....
Minnesota.....	110	94	101	98	107	89	89	.....	101	86	86	100	100	96	.....	.....
Iowa.....	109	104	105	102	102	101	101	.....	97	101	92	92	106	101	.....	.....
Missouri.....	100	100	108	76	101	85	85	.....	96	97	98	95	103	102	.....	.....
Kansas.....	114	102	90	78	89	78	65	.....	100	94	94	95	106	106	.....	.....
Nebraska.....	95	109	100	103	104	100	113	.....	103	103	103	101	109	108	.....	.....
California.....	88	99	103	101	102	103	103	.....	108	108	100	100	102	99	.....	.....
Oregon.....	103	94	103	102	107	102	102	.....	115	107	107	100	100	97	.....	.....

Table showing the condition of the crops, &c.—Continued.

States.	BEANS.		SORGHUM.		SUGAR-CANE, (not sorghum.)		TOBACCO.		COTTON.	WOOL. (Amount of wool, compared with last year.)	APPLES. Average condi- tion July 1.	PEACHES. Average condi- tion July 1.	GRAPES. Average condi- tion July 1.	STRAW- BERRIES. Product com- pared with last year.
	Average com- pared with last year.	Average condi- tion July 1.	Average com- pared with last year.	Average condi- tion July 1.	Average com- pared with last year.	Average condi- tion July 1.	Average com- pared with last year.	Average condi- tion July 1.						
Maine.....	103	87												73
New Hampshire.....	100	98								94	110		106	98
Vermont.....	94	89					89	90		98	96		100	103
Massachusetts.....	100	102					50	100		103	69		93	110
Rhode Island.....	100	101					90	110		117	120			125
Connecticut.....	102	99					90	91		98	103			106
New York.....	101	97					79	95		105	105			98
Pennsylvania.....	95	96					100	100		98	95			105
Delaware.....	100	100					109	73		100	60			90
Maryland.....	101	96					79	95		99	61			80
Virginia.....	99	93					61	79	100	99	53			83
North Carolina.....	96	88					65	79	102	99	68			86
South Carolina.....	105	103							88	101	98			89
Georgia.....	97	92					93	95		93	76			94
Florida.....	100	101					101	108		100	80			101
Alabama.....	100	101					103	104		96	76			85
Mississippi.....	100	86					102	104		99	65			86
Louisiana.....	100	105					108	111		99	65			79
Texas.....	108	94					104	108		103	68			86
Arkansas.....	94	93					105	90		104	102			102
Tennessee.....	98	88					89	90		102	121			99
West Virginia.....	93	83					62	62		97	80			88
Kentucky.....	94	63					96	49		91	77			77
Ohio.....	98	89					86	48		97	65			96
Michigan.....	101	101					87	69		97	79			72
Indiana.....	102	100					87	100		97	112			68
Illinois.....	103	100					91	94		100	90			82
Wisconsin.....	102	95					87	89		103	77			99
Minnesota.....	103	94					109	83		96	80			89
Iowa.....	103	94					87	87		92	92			91
Low.....	101	94					92	99		110	90			85
Missouri.....	99	98					98	98		100	110			87
Kansas.....	98	99					101	96	100	102	106			96
Nebraska.....	109	101					122	94		97	105			120
California.....	99	99								151	101			107
Oregon.....	100	101								120	95			119
										124	93			102

## EXTRACTS FROM CORRESPONDENCE.

**ILL-TEMPERED CRITICISM.**—*Oglethorpe, Ga.*: In a late number of the *New York Financial and Commercial Chronicle* are certain comments upon the June report of the Department, which I think deserve some notice in the July report. The *Chronicle* is, in my opinion, willfully misrepresenting the condition of the growing cotton-crop. Its remarks upon the June report of the Department are in bad temper and worse manners. It comes with bad grace from a paper that in the spring stated that "cold, wet weather was favorable to the development of the young cotton-plant, causing it to take root." This nonsense appeared in the *Chronicle*, and is a fair sample of its perversions. As you are aware, cold, wet weather is the worst thing for young cotton, causing it to die faster than anything else. If such a paper is to be taken as authority, then the planters themselves are ignorant of their business. This same paper stated that an increased acreage in the Southwestern States might be expected, and at that very time the Mississippi was pouring through half a dozen crevasses.

**FARMING IN RICHMOND, N. Y.**—Market-gardening and fruit-growing are the principal features of cultivation in this county; mixed husbandry is found to pay better than special crops.

**AGRICULTURAL MACHINES.**—*Dickenson, Kansas*: A hundred reaping-machines have been sold in this town (Abilene) this season.

**IRRIGATED LAND.**—*Kern, Cal.*: This county has been grazed more than farmed, though we have about 500,000 acres of good bottom-lands. The delta of the Kern River can be easily irrigated, and will produce a crop of barley or wheat, and one of corn the same season. It will raise from 30 to 60 bushels of barley per acre, and from 20 to 40 of wheat. On 4 crops of Alfalfa 8 tons may be raised; this grass is superior to red clover for feed.

**OVERESTIMATED CROPS.**—*Stanislaus, Cal.*: The California wheat-crop, as usual, is overestimated this year by 10,000,000 bushels. A comparison of the amount shipped, as gathered from the commercial returns for several years, with the present estimates, will show that my view is correct.

**METEOROLOGICAL EXTREMES.**—*Crawford, Wis.*: The thermometer showed 100° in the shade, June 24; ranged from 85° to 94° during the four days just previous. *St. Croix, Wis.*: Thermometer 100° in the shade. *Morgan, Ohio*: In June the mercury ranged from 90° to 96° for ten days in the shade; on the 23d it stood for five hours at 98°; on the 25th a terrific wind-storm from the southeast leveled trees, un-roofed houses, blew in the gables of brick dwellings, &c. It was followed by a rain-fall of 1.2 inches within 40 minutes. *Hancock, Ill.*: During the night of June 4, 5.45 inches of rain fell—more than ever fell at one time before. *Madison, N. Y.*: A tornado, June 7, blew down buildings, demolished fences, and destroyed crops; hail-stones as large as hens' eggs. *Salt Lake, Utah*: The rain-fall has exceeded, by 40 per cent. that of any previous season.

**LABOR.**—*Schenectady, N. Y.*: Help is plenty, and can be procured at a lower price than in former years.

**WAYNE, N. C.**—This county contains 310,000 acres, or nearly five

hundred square miles. One-third is cleared land, of which one-half is laid to rest every year; about 28,000 acres are this year planted in corn and 20,000 in cotton; the remainder in wheat, rye, potatoes, &c.

**NEW FARMS.**—*Benton, Minn.*: The stagnation of business has turned attention to opening new farms and improving old ones.

**FLAX-CULTURE.**—*Stearns, Wis.*: The yield of flax promises to be enormous; it is cultivated for the seed only. *Rock, Wis.*:—About 300 acres of flax sown; condition not promising, owing to late sowing and grasshoppers. *Chippewa, Minn.*: Quite a breadth sown, but does not promise a large yield. *Marshall, Iowa*: About 4,000 acres of flax in this county, and 2,000 to 3,000 in the adjoining counties, from seed furnished mostly by the Hawkeye Oil-Mill Company, of Marshalltown; average yield, from 8 to 10 bushels per acre; price from \$1.25 to \$1.65 per bushel. *Benton, Iowa*: Flax is an important crop here; raised principally for seed; condition full average.

**JUTE.**—*Leon, Fla.*: The jute I planted as an experiment came up well, and has grown finely. It was planted as cotton and with cotton April 1 and 30, and has since been cultivated as cotton. The stalks are now from 6 to 6 feet high, and very thrifty.

**DECREASE OF LIVE-STOCK.**—*Medina, Ohio*: The diminution of stock in this county is alarming; horses are 323 less than last year; cattle, 4,480; sheep, 8,843. But once in fifteen years have we had so few—in 1865. The decrease this year is owing to the diminution of the hay and corn crop. The wool-clip is 30,000 pounds less than last year, but the fleeces average heavier.

**HOPS.**—*Sauk, Wis.*: A larger crop than at any time since the panic of 1868; acreage increased, 20 per cent.; new yards, 25 per cent. above average; old yards, 10 per cent. below.

**CASTOR-BEANS.**—*Franklin, Kans.*: Castor-beans are becoming an important crop; last year they were profitable. *Wilson, Kans.*: Castor-beans and flax taking the place of small grain till the chinchies disappear.

**ONIONS.**—*Dorchester, Md.*: The onion is fast becoming a standard crop; the soil and climate present admirable conditions of growth for this vegetable.

**WATERMELONS.**—*Wicomico, Md.*: This crop yields from \$30,000 to \$40,000 in this county.

**NEWSPAPER CROP-REPORTS.**—*Barnwell, S. C.*: The newspapers are publishing the replies of their correspondents as to condition, &c., of growing crops. These are generally local, and cannot be expected to apply to the whole country. There will be the earliest "open cotton" in this county this year ever known, from plants that escaped the frost of May 1. Were the whole crop like these favored spots, there would be the most advanced and promising fields ever seen on the 1st of July.

## ROYAL AGRICULTURAL MUSEUM AT BERLIN.

The agricultural museum of the United States Department of Agriculture has, until recently, been unique in its character. But the value and utility of such an institution are so evident that a number of attempts are now being made, both in this country and Europe, to establish collections of a similar character. Among these, that commenced at Berlin, Prussia, appears likely to assume a prominent place. Occasional notices of it have appeared in the "Annalen der Landwirthschaft," and we have recently received its catalogue and a guide to the museum, which enables us to give the following description:

The Royal Agricultural Museum was established by Minister of Agriculture von Selchow, at the instance of the royal agricultural commission, and was opened on the 4th of April, 1868, in temporary quarters, No. 24 Potsdamer strasse. Its object, as stated in the introduction to its catalogue, is to benefit agriculture "by exhibiting the best examples of every kind of product," and "by giving valuable information of all kinds."

To accomplish the first object, seeds, grains, fruits, and samples of every kind of agricultural production are exhibited; while to attain the second end, the library, models, or actual machines, and illustrations of all the different tools and processes employed in agriculture are provided. The collection occupies two stories of an irregular building, divided into seventeen apartments, of which the first contains specimens of wood, native and foreign, including very fine collections from Canada and Hindostan. The heating power of different kinds of wood is shown by Winkler's tables, as follows: Taking a cubic meter of common spruce as unity, to give the same amount of heat will require .94 white pine, .92 poplar, .91 willow, .70 beech, .69 Norway spruce, .66 birch, .65 maple, .63 elm, .59 oak. Near this collection are the seeds of the different trees, and charts showing the extent of forests in Prussia and their product. Also, here is a stem of *Lonicera periclymenum* cut so as to show that it is the descending sap-current which forms the wood.

Next, in three rooms, is the collection of wools, grouped under six heads, viz: First. Pelts, mostly of Russian breeds. Second. Commercial samples. Third. According to fabrics made from them. Fourth. General collection arranged by countries. Fifth. Showing improvement of staple. Sixth. Special German collection as it was arranged for the Paris Exposition, 1867. Of these, in the third division, the preparation of combing-wools is shown, from which ladies' cloth, thibet, lasting, &c., are made; then the short and curly, or merino wools, capable of felting and making close cloth; and, third, the wool from rags and waste, known as mungo and shoddy. The first is made from all-wool rags; and the second from mixed stuffs, from which the cotton is removed by treatment with acids. Near by are specimens of different kinds of yarn, and cloth in all its stages of manufacture.

In the machine-halls is a collection of East-Indian drills sent by the British government of Bombay. Some of these represent machines that have been in use thousands of years, and which undoubtedly gave us the first notions of drill-culture. A statement is made that the earliest European drill was invented between 1638 and 1653, by Gabriel Platte, an Englishman, and was arranged to plant in hills, but in a straight line. The invention is also ascribed to Joseph Locatelli, a nobleman of Carinthia, and to an Italian, Cavallina. Locatelli's "seed-ing-plow" went to Spain, and from thence to England in 1669, but

Jethro Tull, by the invention of the three-shared drill in 1733, first brought drill-culture into prominent notice, and after him James Cooke, a minister of Heaton-Norris, in Lancashire, made, in 1783, a six-toothed drill with cups for distributing the seed, which must be considered as the parent of those now in use. Another Englishman, Duckett, advocated the cylinder-sower already used by Tull, and introduced into Germany by Von Thaer, chiefly however for broadcast-sowers. The first broadcast-machine was made by Slight, of Edinburgh, in 1817, but was soon supplanted by the drill. The first box-drill for small round seeds, as rape, mustard, &c., was made by an English captain, T. Williamson, 1809.

The oldest mowing-machines, though very rude, were used by the Gauls. A cart, having blades arranged in front, was pushed forward into the grain by oxen hitched behind, and thus cut off the heads.

A system of six rotating scythes was made by Joseph Boyce in 1799, and an attempt to use the same principle was made by Gompertz and Mason, in 1852. In 1811-1815, Smith, of Deanstone, brought out a machine in which a short vertical revolving cylinder carried a knife on its lower end, but all these rotating machines have proved impracticable. Robert Meares, in Frome in Somersetshire, established in 1800 the shear principle as the only practical one. Salmon, in Woburn in 1807, built a machine with a row of blades and fingers moving over them, and also applied the reel. The Scotch parson, Patrick Bell, of Torfarshire, in 1826, and William Manning, of Plainfield, New Jersey, in 1832, were the founders of the present style of machines. Manning was the first to attach the draught at the side of the machine, all others previously having been pushed from behind. Obed Hussey, of Cincinnati, attached the side platform and slit finger. McCormick, then of Rockbridge, Va., now of Chicago, in 1834 improved the Manning and Hussey machine, and the appearance of these at the London Exposition, in 1851, was the signal for their introduction into general use.

The oldest thrashing machine (except the antiques) was made by Michael Menzies, in 1732, or perhaps at the same time by Tull, consisting of a rotating cylinder with flails. Several others followed shortly, some like a flour-mill, and in 1792, Willoughby, of Bedford, made one like that of Menzies, which Von Thaer brought to Germany, and which served as a model for the Mecklenburg thrasher. The machine of James Wardropp, of Amptzell, in Virginia, is on a similar principle, only the beaters are sticks moving up and down. Finally in 1785, Andrew Meikle, of Tynningham, East Lothian, laid the foundation of the present form, by using a drum with four beaters parallel to its axis, that carried the grain between itself and a concave, furnished with similar rods. An American, named Moffitt, in 1854, substituted spikes for the rods, though the Meikle machine adheres to the old system.

Next is flax machinery from various countries. There is also a working model of the different kinds of apparatus used to distribute the grain from hoppers of seed-drills, viz: a small roller with cavities sunk in it; the bucket-wheel system, where a wheel with little buckets is used; the cup system, in which cups are substituted for buckets; the brush system in several forms, and others. On the wall hangs a small Italian drill, and Cahoon's centrifugal broadcast sower from North America.

In the adjoining hall are several mowing-machines and lawn-mowers. These last are made on the plan of cloth-shearing machines. Also machines for grinding the knives; and in a niche are models of two of the French wagons used for transporting trees with frozen balls of earth.

There are food steamers, brewing apparatus, and hanging on the wall various kinds of harrows, among which the old Russian form, made of the branches of trees, is not wanting. Near by are models of elevated railways, copies of some in actual use, also cutting machines, and models of laborers' houses, root-cellars, &c.

The various systems for the improvement of swamps, reclamation of meadows, utilization of sewerage, &c., are also shown by appropriate models, including the celebrated Petersen system of drainage, and various machines for irrigation, some of which are from the East Indies, made of leather sacks on the spokes of the wheel, turned by man or bullock power. There are five models of various kinds of timber-rafts, and appliances for rafting timber down small streams.

Hall No. 7 is filled with plows of home manufacture and imported. Most of the foreign ones come from those celebrated makers, Ransome Sons, of England, and are adapted for turning the smooth furrows the Englishman loves so well. They are distinguished by long, twisted, narrow mold-boards, and narrow shares, long beams and handles, and high prices. The American plows are mostly without carriages, and are particularly noticeable for the excellence of their material. The beams and handles are of tough wood, and the share and board of so-called German steel, by which is meant not steel made in Germany, but a particular quality nearly approaching cast-steel. The first American who made a cast-iron plow was Charles Newbold, of Burlington, N. J., in 1797, who cast share and board in one piece, a plan soon superseded by Jethro Wood, who made them in two parts, and in 1819 gave them the well-known form they now bear. The American mold-boards take a medium curve between the English form and the short, stumpy plow seen in many parts of Germany. They break the ground less than this last, and are better adapted for clayey soil. Near the American collection is a plow from Mieuxmoron, of Dombasle, of Nancy, France, whose factory claims to be more than a century old. It is strongly built, like all French plows, and is evidently an improvement of the old Flandrian form. There is a large number of German plows, among which one for beet-root culture is made to run 14 inches deep. In three glass cases are 187 models, showing the complete history of plow manufacture from the earliest date to the present time, and not far off are eight cases of models of hand-tools of all nations to the present time.

In corridor No. 8 are models of milk cellars and milk apparatus of all sorts, tall vessels and flat pans, cooling and butter tubs, and cheese-presses, &c., as well as lactometers and other scientific apparatus for determining the value of milk.

Further on are shown tools for wine-making, including a small Pasteur's heater, and a collection of grape-stocks to illustrate methods of training.

The hall for seeds and grains is the finest in the museum. The samples are all arranged scientifically according to Eudlicher's system, and, so far as possible, pictures of the living plants are also at hand; the various continents are denoted by the color of the label, as Europe, white; Asia, yellow; Africa, blue; America, green; Australia, red. Case No. 5 contains a "Summary of substances used for food," and may be considered as exhibiting an abstract of the whole collection. The upper shelf contains garden-seeds and foreign spices; the next, the more important grasses and fodder plants; the third, fourth, and fifth, the grains used for human food. Besides the ordinary bread corn, we find here the doura of the Arabs and Negroes, the eleusine of the Abyssinians, the quinoa of the Peruvians, the sand halm of the Icelanders, &c.

Then there is the knackbread in flat, round cakes, the common rye bread of Sweden; the want bread (noth brot) of Lapland, with the ground reindeers' flesh, birch-bark, rye-straw, and barley-meal, from which it is made. Also, the brandy distilled from reindeers' flesh—no unimportant item of industry—is not wanting. Besides the narcotics, as coffee, tea, &c., there is a glass containing a kilogram of wheat, and near it similar glasses containing the starch, albumen, water, &c., the constituents of a similar quantity of wheat.

This system of illustration is carried out with potatoes and other foods, and their comparative value for nutrition is thus very forcibly shown, a kilogram of potatoes, for example, containing 200 grains starch, and 750 grains or two-thirds its weight of water, and on another shelf we see the elements of straw compared with those of their proper grains.

Another case shows the various processes of starch-making, the gluten being also utilized in the preparation of macaroni, &c., being added to the flour from Northern Europe, that is found very deficient in gluten as compared with that grown in South Europe. All the varieties of starch known in commerce are shown, and we observe that most of the Sago starch of commerce is potato-starch, colored with burnt sugar or iron.

Finally we have models of all parts of the flowers of cultivated plants, models of barns and farmsteads, an excellent collection of fruits, the herbarium, the cases of sugar and its manufacture, of flax in its different forms and stages, paintings of cryptogamic plants, horseshoes and methods of shoeing, bees and bee-hives, and all the miscellaneous articles necessary to complete the representation of agricultural industry here presented.

It is not intended to limit the influence of the museum to the mere exhibition of its contents to visitors, but lectures are to be given, illustrated by its collections, which the students of the agricultural college are expected to attend. Three days each week the museum is open to the public, free, and special permission for study may be obtained by students, on application. At the close of its first year the museum comprised 17,000 specimens; it now possesses 27,000; most of which have been obtained by donation. When a permanent building shall be erected, it is the intention to have workshops included, suitable for the preparation of models, &c., for which there is great need. The attention of the curator has hitherto been directed to arranging and classifying the collection, with a view to ascertaining its deficiencies, that they may receive especial attention, and it is proposed that the history of improvement in the various utensils and processes shall be as completely illustrated as possible.

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## ENTOMOLOGICAL RECORD.

BY TOWNEND GLOVER, ENTOMOLOGIST.

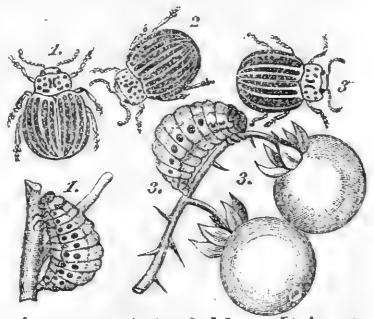
**THE COLORADO POTATO-BEETLE.**—As this insect is now so troublesome in the eastern section of the country, and many correspondents, whose farms are attacked for the first time, are asking for information as to the best means for preventing their ravages, we deem it necessary to republish what has been said in former reports regarding their natural history and habits, with the additions of the latest facts on the sub-



ject that have come under our observation. This insect has been known for over fifty years, and has been particularly injurious to the cultivated potato since about the year 1860, when it commenced its travels eastward from the base of the Rocky Mountains, and has been steadily progressing since at the rate of sixty to eighty miles a year. It is now reported as very destructive in Central New York, Pennsylvania, and New Jersey, Maryland, District of Columbia, and Eastern Virginia. It is known as the Colorado or Western Potato-Bettle, or ten-lined spearman, (*Doryphora decem-lineata*,) and its habits are as follows: The eggs are deposited by the female, to the number of about seven to twelve hundred, at intervals, during forty days, on the leaves of the potato, in somewhat regularly-arranged loose clusters. In about six days they hatch into larvæ, and feed upon the foliage of the plant from seventeen to twenty days; they then descend into the ground, and after remaining in the pupa state, to which the larva changes, for ten or twelve days, they again make their appearance as perfect beetles. In about a week the sexes pair, and in another week the females begin to lay their eggs for a second brood, thus requiring but fifty days from egg to egg again. To give some idea of their powers of reproduction the Canadian Entomologist states, that if the progeny of a single pair were allowed to increase without molestation for one season, the result would amount to over sixty millions. The insects do not die immediately after laying their eggs, as Professor Daniels, of the Wisconsin University, once kept a female alive six weeks without food, after she had laid twelve hundred eggs.

There is another insect, belonging to the same genus, which is often mistaken for the Colorado beetle. It is, however, easily distinguished from the genuine, as the second and third stripes are always united behind, giving the appearance of a heavy black stripe; and the edges of all the stripes have but a single row of punctures; the legs also have a black spot in the middle of the thighs. This insect has also been found feeding upon the horse-nettle, (*Solanum carolinense*,) in South Carolina, and has been taken upon potatoes and egg-plants in Alabama, and was particularly injurious to the latter.

In the accompanying wood-cut, Fig. 1 represents the true potato-beetle, *Doryphora decem-lineata*; Fig. 3, the *Doryphora juncta*; and Fig. 2 is an apparent cross between the two, or a variety once found in the South, in which the heavy, thick black line of the *juncta* has a very fine yellowish line running partly through it longitudinally.



The Colorado beetle has a great many foes or parasitic insect enemies that do much toward lessening their numbers and preventing still greater destruction in our potato-fields. It is attacked among the beetles by *Hippodamia maculata*, *H. convergens*, *H. quindecim punctata*, *Coccinella munda* and *C. novemnotata*, *Tetracha virginica*, *Calosoma callidum*, *Harpalus caliginosus*, *Pasymachus elongatus*, and *Lebia grandis*; among the plant bugs by *Arma spinosa*, *A. grandis*, *Harpactor cinctus*, *Euschistes punctipes*, and *Stiretrus jimbriatus*. The larva of a parasitic fly, *Tachina doryphora*, lives in the larva of the beetle, and the *Polistes rubiginosus* carries it to its nest as food for its young. *Epicauta pennsylvanica* and *Macrobasis fabricii*, both beetles that feed upon the potato, also devour this beetle.

The best remedy that can be recommended is pure Paris-green, mixed with ashes or flour, in the proportion of 1 part to 12 or 15. It should be dusted over the plants in the morning when the dew is on the foliage, and should always be repeated after rains. A convenient way of dusting the vines evenly is to prepare a dredge, on a large scale, from an old fruit-can, by puncturing the bottom full of small holes, and securing to the side a piece of broom-handle about two feet in length. This, when filled, the operator can carry in one hand as he walks down the rows, gently tapping the handle with a similar stick held in the other hand, being careful always to keep to windward. The amount can be regulated by the speed of the operator. Three pounds of Paris-green to about forty pounds of flour, ashes, or air-slacked lime, will answer for an acre of potatoes.

One of our correspondents writes that he has applied Paris-green, mixed with water, sprinkled over the plants with good effect at the rate of 1 pound to about 48 gallons, and seems to think it the best plan, as the dust then cannot be hurtful to the operator.

Mr. Saunders, of this Department, has tried brushing them off of the vines in the heat of day, and thinks that most of them were destroyed by the operation, and recommends it as the easiest way to get rid of them. We think, however, this remedy would prove of little value in localities where the heat of the sun is not as great as here. Some persons, having a prejudice against the use of Paris-green, recommend hand-picking, or collecting the insects in nets of gauze, and though this may answer in the early part of the season, and do much good by lessening the numbers of the second brood, still it is not practicable or sure later in the season when the insects are very abundant. Insects caught in this manner should never be crushed by the fingers, as they are quite poisonous. Deaths have also resulted from breathing the steam from hot water that has been used to kill them, and also from carelessly partaking of food without washing the hands after handling these insects. As the Paris-green is also poison, composed largely of arsenic, great care should be exercised in its use.

As much of the Paris-green that is sold for the purpose of destroying the potato beetle is impure, and in many instances not Paris-green at all, but chrome-green or imperial green, we give the following test for its purity from one of the Baltimore manufacturers, as follows: Place a small portion of the green in a test-tube, adding a small quantity of water and caustic potash, which will take up all the arsenic, throwing down the oxide of copper; wash this with a little water to free it from the arsenite of potash; then add nitric acid and water, which will dissolve the copper, leaving the adulteration, if any.

**INSECT INJURIES.**—Our statistical correspondents reveal an appalling visitation of insect scourges in the Northwest. The most injurious pests are of types unfortunately too well known by the American farmer. Several species unrecognizable from description are mentioned, and in a few cases correspondents have attempted to describe them. In a majority of cases, however, a person not versed in entomology will fail to detect the specific points of difference, and will consequently send a description that will suit several other forms of insect life as well as the one under consideration. A single specimen will enable the entomologist to identify the injurious insect, and to suggest such methods for its extirpation as the resources of entomological science will admit. The intelligent gentlemen who give gratuitously so much time and thought to the collection and transmission of the latest statistical facts will see at once the importance of prompt and accurate information in regard to

insect depredations. By securing specimens and transmitting them to the Department they will not only give facilities for the enlargement of entomological science, but also will confer a lasting benefit upon the farming interest, which they have so much at heart.

The following is a brief general statement from the county reports of July, 1874, showing the character of the various destructive insects, and something of the extent of their depredations.

*Chinch-bugs*, (*Micropus* [*Rhyparochromus*] *leucopterus*).—This insect, intensifying its mischievous presence in the West, is extending its ravages eastward. Last year it was heard of in only one county east of the Alleghany Mountains—Halifax, Virginia. This year it has again been quite destructive in spring-grain in this county, as well as in Nelson, Southampton, Pittsylvania, Albemarle, and Campbell; it was also mischievous in Caswell, North Carolina, in Jefferson, West Virginia, and in Livingston, Henry, and Graves, Kentucky; it is reported in Athens, Ohio. In Indiana it was mentioned in several counties as more or less injurious, viz: Pike, Crawford, Putnam, Shelby, Washington, Brown, Crawford, Jasper, Morgan, and Orange. Its ravages were more severe and wide-spread in Illinois. In some counties they appeared early enough to attack winter-wheat before harvest, and to make the wheat-stubble a point of attack upon the various spring crops. The counties complaining of their presence were Pike, Logan, Cumberland, Hancock, Macon, Marion, Pope, Mason, McHenry, Cass, Clinton, Crawford, Effingham, Jersey, Macoupin, Montgomery, Moultrie, Morgan, Richland, Vermillion, Washington, Wayne, Piatt, Perry, Schuyler, White, and Sinclair. The drought favored their operations as far north as Wisconsin. Three southern counties, Richland, Jefferson, and Green, report them as threatening spring crops. In Clarke, Iowa, timely rains largely destroyed the young insects, thus saving the crops from their ravages. They were quite injurious in Jefferson and less so in Taylor. Their most fatal ravages, however, were felt in Missouri; in Pettis they were so numerous on many farms as to swarm into houses and barns like bees; near wheat-fields the ground was a mass of crawling bugs from noon till near sundown. In Moniteau and Benton they seriously injured wheat, only on light prairie soils; wheat on timber-land measurably escaped. In Polk, corn-fields adjacent to wheat-fields seem to have specially suffered; they were particularly destructive upon grain and grass crops. They are also reported in Lawrence, Caldwell, Cass, Vernon, Saint Clair, Green, Boone, Moniteau, Barry, Barton, Carroll, Cape Girardeau, Christian, Clinton, DeKalb, Harrison, Johnson, Linn, Montgomery, Miller, Phelps, Polk, Ralls, Stone, Randolph, Reynolds, Hickory, Newton, Adair, Franklin, Dallas, Morgan, Laclede, McDonald, Crawford, Clay, Washington, and Jasper. Kansas reports greater or less injuries in Douglas, Woodson, Allen, Anderson, Barton, Bourbon, Chase, Cherokee, Franklin, Jackson, Lyon, Linn, Montgomery, Miami, Morris, Sumner, Greenwood, Marion, Osage, Wabaunsee, Wilson, Atchison, and Neosho. In Franklin, a corn-field within twenty rods of a wheat-field was considered as doomed. No efforts to resist the ravages are reported, nor does any expedient appear to have been suggested in any portion of the country for relief against this very serious and destructive enemy.

*Colorado beetles*, (*Doryphora decem-lineata*).—Colorado beetles are working eastward. They were quite severe in Wayne, New York, but were comparatively harmless in Wyoming. In Alleghany they were strenuously resisted with Paris-green; they were also noted in Cattaraugus, Delaware, Madison, and Tioga. They were also operating in Bur-

lington, New Jersey. In Butler, Pennsylvania, Paris-green is pronounced a failure; resort was here had to patent preparations, but the most effective method of resistance was to shake the bugs into a box and dispatch them. In Union Paris-green and lime were also effective. In Adams and several other counties the virtues of Paris-green were utilized by a persistent and intelligent application. In Dauphin and Forest the insects appeared to be departing, leaving no great damage behind them, especially upon late plantings. They were more or less mischievous in Armstrong, Franklin, Lycoming, Huntingdon, Chester, Philadelphia, York, Perry, Clearfield, Northampton, Washington, Indiana, Lancaster, Beaver, Elk, McKean, Luzerne, and Cameron. Maryland notes their presence in Alleghany, Frederick, Baltimore, Carroll, Prince George, Hartford, and Cecil. They were also in Culpeper, Highland, Fauquier, and Prince William, Virginia; in Harrison, Brooke, Cabell, Hardy, Hancock, Jefferson, Pendleton, and Randolph, West Virginia. In the last-named county the beetles were destroyed by an insect called the soldier-bug, of which a specimen would be very acceptable. They injured crops in Lawrence and Bradley, Tennessee, and in Rockcastle, Shelby, Jefferson, Carroll, Harrison, Taylor, Anderson, Lincoln, Grant, Scott, and Spencer, Kentucky. In Ohio they appear to have been less destructive, and more amenable to remedies, especially Paris-green. They are here reported in Trumbull, Delaware, Erie, Lucas, Athens, Licking, Meigs, Champaign, Noble, and Columbiana. They are noted in Branch, Monroe, Lenawee, Antrim, Bay, Van Buren, and Menomonee, Michigan, but appear to have been more threatening and troublesome than seriously injurious. In Cass, Indiana, they are becoming perceptibly less numerous under the influence of some insect enemy destroying them. They were also declining in Tippecanoe; they were destroyed by the persistent use of Paris-green in Marion. They are noted in Elkhart, Clay, Jasper, Harrison, Orange, Marshall, Jennings, Putnam, Wabash, and Perry. Parasites of some kind destroyed most of their eggs in Putnam, Illinois; they were also more or less destructive in Cumberland, Hancock, Kankakee, Ogle, Whiteside, Rock Island, Morgan, Marion, Ford, Grundy, Caswell, Macon, Madison, Tazewell, Carroll, Wayne, and Schuyler. A discreet and energetic use of remedies saved the crops in several counties, and limited the injuries in others. In several counties of Wisconsin they were numerous, but here, also, the value of efforts to resist the ravages of the beetle were illustrated by excellent results. The insects are noted in Pierce, Greene, Iowa, Dodge, Fond du Lac, Walworth, Clark, Columbia, Douglas, Green, Lake, Door, and Outagamie. West of the Mississippi River they were less mischievous. Minnesota reports them in four counties: Ramsey, Chisago, Steele, and Meeker; Iowa in six: Cass, Howard, Clinton, Lamar, Pottawatomie, and Louisa; Missouri in three: Nodaway, Phelps, and Reynolds. Kansas in three: Woodson, Greenwood, and Mitchell. Nebraska in two: Antelope and Thayer. In Mitchell, Kansas, the eggs were destroyed by an insect which, from the description, was probably the lady-bug, (*Coccinella*.) In Shelby County, Kentucky, a novel expedient is reported as successful; fields infested with beetles were plowed up and paddled to destroy the insects with their eggs. In Nodaway, Missouri, the insects were destroyed by a parasite resembling a pumpkin-fly.

*Grasshoppers.* One species (*Caloptenus femur-rubrum*) was somewhat demonstrative in the East; Delaware and Jefferson Counties, New York, note their presence, but with slight damage, and declining numbers. In Jefferson, West Virginia, they were destructive on young clover; in Fairfield, Ohio, their operations were merely local; they are also men-

tioned in Livingston, Kentucky. Another species (*C. spretus*) has wrought terrible havoc in many counties of the Northwest. Our correspondence last year forewarned us of a destructive visitation of this pest from the immense number of eggs deposited during the close of the last season. The severe winter, it was hoped, had mostly destroyed these eggs, but still countless millions survived in some counties, and now threaten to destroy every growing crop. Many farmers refused to put in crops in the presence of this expected nuisance. In Wisconsin, they were destructive in Brown, Clark, Door, and Outagamie. Minnesota, however, has received the most terrible visitation. In Jackson, while yet too young to fly, the insects destroy all the grain-crops and gardens. Here they rise in the air during the daytime, and settle upon the crops at night. Their movements are very erratic; they suddenly disappear, and as suddenly return. In Faribault, they began to wing about June 20, and in two or three days to fly; they always move with the wind, and not over five or eight miles per day. In Cottonwood, they have swept 95 per cent. of the grain and vegetable crops; thousands of acres of wheat are perfectly bare. They were first noted here about June 12, 1873, when they remained about two months, laying their eggs and destroying the crops generally; they began to hatch in April, 1874, and began to fly about June 20; every day the air is full of their swarming myriads, but myriads still remain. In Renville, river farms are entirely stripped of wheat; though winging fast, they seem to recruit full as many as they send away. In Martin, the crops are totally destroyed; it is stated that people must here have help or they must emigrate. They are also very bad in Lyon, Watonwan, and Rock. In Iowa they ruined the wheat-crop of Harrison as well as the corn, and the young apple-trees; in Buena Vista they had just commenced flying, and were seriously threatening the crops; in Carroll a few exhausted pioneers of the main army had fallen, but had not done any damage; they had left Cherokee after doing some injury; they were also noted in Tama, Lyons, Sioux, Hancock, Pocahontas, Emmett, Humboldt, and Webster. Within comparatively narrow range this scourge appears to have been terribly severe.

*Tent-caterpillars, (Clisio campa.)* This insect was very severe on fruit-trees in Franklin, Maine. In Somerset it destroyed 1,000 acres of poplar-trees. In Hartford, Connecticut, it depleted the apple-crop 10 per cent.; it was also destructive in Tallahatchee, Mississippi.

*Canker-worms, (Anisopteryx vernata,)* have infested a few orchards in Plymouth, Massachusetts.

*Apple-worms, (Carpocapsa pomonella.)* These insects are reported in Monroe, West Virginia; Ionia and Antrim, Michigan; Hamilton and Perry, Indiana; Hancock, Illinois; Jefferson, Iowa; Daviess, Missouri; and Salt Lake, Utah.

*Curculio, (Conotrachelus nemphar.)* Reported in Grainger, Tennessee; Crawford, Ohio; and Antrim, Michigan.

*Rosebugs, (Macroductylus subspinosus.)* Injured cultivated grapes in Washington, Kansas. After they left, a cottony substance appeared under the leaves, from which proceeded a larva that in some cases stripped the vine bare of fruit and leaves. An unknown worm destroyed the grape-vines of Salt Lake, Utah. Various fruit-insects were destructive in Franklin, Kentucky, Nodaway and Moniteau, Missouri. The plums were devoured by unknown insects in Marion, Iowa.

*Cut-worms, (Agrotis, sp.)* In Saint Mary's, Maryland; Green, North Carolina; Wayne, Georgia; Tunica, Mississippi; Tensas, Louisiana; Arkansas, Arkansas; Bay and Saginaw, Michigan; Dodge and Green Lake, Wisconsin; San Pete, Iron, and Utah, Utah.

*Measuring-worms.* Injured fruit and forest trees in Highland, Ohio.

*Boll-worms*, (*Heliothis armigera*.) Attacked cotton squares in Crittenden, Arkansas; they were not numerous.

*Cotton caterpillars*, (*Anomis xyliæ*.) Are very dubiously reported in Muscogee, Georgia; a germ of this insect was seen in Rapides, Louisiana, June 15. Cotton-flies, probably the perfected insect, appeared in great numbers in one field in Marion, Mississippi. Cotton-lice (*Aphides*) were seen in Troup, Georgia.

*Hessian-flies*, (*Cecidomyia destructor*.) Baltimore, Maryland, and Lawrence, Missouri.

*Wheat-midge*, (*Diplosis tritici*.) Tazewell, Virginia, and Bracken and Anderson, Kentucky.

*Bud-worms*. Gloucester, Virginia; Moore, North Carolina; Clarendon, South Carolina; and Conecuh, Alabama.

*Tobacco-worms*, (*Macrosila Carolina* and *M. quinque-maculata*.) Caswell, North Carolina; Cabell, West Virginia; Adair, Bracken, Grant, Edmonson, and Trimble, Kentucky; Vinton, Ohio. They also attacked potatoes in Antelope, Nebraska, and Barton, Kansas.

*Miscellaneous*.—A slender, slate-colored bug, probably a species of *Cantharis*, attacked potatoes in Greenwood, Kansas. Undescribed insects troubled the corn in Hillsborough, New Hampshire; Pitt, North Carolina; Wayne, Georgia; Harrison, Mississippi; Des Moines, Iowa. In Caroline, Maryland, innumerable green lice (*Aphis avenæ*) sucked the milk of the wheat-grains in the milky stage. Baltimore County was visited with a variety of insects troublesome to the horticulturist. In Dauphin, Pennsylvania, an undescribed insect ate the inside of the wheat-grains, leaving only the hull, which fell to the ground. Buffalognats (*Simulida*) troubled domestic animals very seriously in Powhatan, Virginia. The grass army-worm (*Leucania unipuncta*) appeared in Knox, Tennessee. In Crawford, Indiana, a yellow bug, laying a bunch of yellow eggs on the leaves, injured early potatoes.

Our correspondent in Poweshiek, Iowa, says that Paris-green, applied in the same way as to destroy Colorado beetles, will destroy the eight-spotted forester, (*Alyphia octomaculata*), so destructive to the grape-vines of the West. This remedy, however, is somewhat dangerous; it may poison the fruit. The effects of wholesale destruction of birds is now seen in the devastation of insects in different sections.

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## BOTANICAL NOTES.

BY DR. GEO. VASEY, BOTANIST.

**POISONOUS PLANTS—LOCO AND RATTLE-WEED.**—In the monthly report for October, 1873, we gave some account of a poisonous plant, called loco, which grows in California, and is sometimes destructive to sheep and cattle which feed upon it. We there stated that the plant was a species of *Astragalus*. We have recently received specimens from Mrs. J. S. Whipple, of San Luis Obispo County, of what is called loco, and also of a similar plant called rattle-weed. They are both species of *Astragalus*, but the leaves and flowers are so much broken up that the particular species cannot be accurately determined. They have smooth, inflated pods, that called rattle-weed being about an inch and a half long, thin and bladder-like. Mrs. Whipple writes:

The description of the loco-plant given in the Monthly Report was correct. It grows in abundance in several counties in Lower California, and appears to be a natural production

of the localities where found. It occurs on high and low, wet and dry lands. Animals are not fond of it at first, or don't seem to be, but, after they get accustomed to the taste, they are crazy for it, and will eat little or nothing else when the loco can be had. There seems to be little or no nutriment in it, as the animal invariably loses flesh and spirit. Even after eating of it they may live for years, if kept entirely out of its reach, but if not they almost invariably eat of it until they die. I sent to Bakersfield for the specimen of loco, as it does not grow just here. The rattle-weed, of which I send a sample, seems to be a kindred plant and of the same nature, producing nearly the same effect. It grows in this locality in abundance. This also flourishes on the mountains and in the valleys, on wet or dry land, but is confined to certain counties, or is not found in all parts of the State. If eaten freely of at first, the animals sometimes die in three days, but sometimes live two or three weeks, and, as with the loco, if but little is eaten, and the animals are kept from it, they may possibly get over its effects.

I also send you a sample of milk-weed, which grows in abundance here. Old settlers say that it is very poisonous to sheep, and when eaten produces death within two or three hours, the sheep bloating very rapidly until it dies.

The specimen sent as milk-weed does not appear to be of the *Asclepias* family, but is too young to be satisfactorily determined. It appears, however, to be one of the *Compositae*, probably a species of *Stephanome-ria*, somewhat similar to our wild lettuce (*Lactuca*.)

Subsequently to the reception of the specimens above named, the Department made application to another correspondent in Bakersfield, California, who has sent us well-prepared specimens of what is called loco and also of the rattle-weed. These specimens were submitted to Dr. Gray, who decides the former to be *Astragalus Hornii*, Gr., and the latter to be *Astragalus lentiginosus*, var. *Fremontii*. This correspondent has had practical experience with these plants, having lost by their poisonous effects a large number of horses and other stock. He entirely confirms the account of symptoms and effects previously given.

## FACTS FROM OFFICIAL SOURCES.

WHISKY FROM MOSS.—The Department of State has forwarded to this Department a communication from Mr. C. C. Andrews, representative of the United States at Stockholm, respecting the production of whisky, in Sweden, from lichen or reindeer moss. The manufacture was begun in 1863, by a process invented by a Swedish chemist, Professor Stenberg. For six years the quantities of moss used, and of whisky—50 per cent. alcohol—produced, were as follows:

Year.	Moss, pounds.	Whisky, imperial gallons.	Year.	Moss, pounds.	Whisky, imperial gallons.
1868	3,315,928	163,008	1871	1,720,141	84,672
1869	6,001,470	294,912	1872	2,149,051	105,408
1870	3,565,384	175,104	1873	704,793	34,560

Mr. Andrews states that the falling off in production is owing partly to the abundance of other materials for whisky, such as potatoes and grain, and partly to the increasing difficulty of procuring the moss.

EXPERIMENTS WITH POTATOES.—Mr. J. V. H. Scovel, of Paris, Oneida County, New York, sends the following report of his experiments with potatoes:

I send the result of some experiments in the culture of potatoes, made the past season, 1873. We are too apt to accept conclusions which appear plausible or reasonable without

taking the trouble to investigate and determine by experiment whether actual results in field practice will confirm those impressions. I have for several years flattered myself that there was something in intelligently cutting potatoes for seed, and yet, while I strongly urge the importance of selecting only good, sound, well-matured potatoes for planting, I now fear that my theory of *intelligence in the cutting* of tubers is in danger of being entirely upset when reduced to actual practice. If so, a great point is gained. It demonstrates that, without detriment, machines may be employed for cutting, dropping, and covering; thus dispensing with a large amount of hand-labor. One of the main ideas in conducting these experiments was to determine the best method of cutting and preparing seed, and its relative bearing upon the yield and value of the harvested crop.

The variety used for this purpose was the "Oneida peachblow," a seedling of the Garnet Chili; the latter having been the main variety cultivated in this locality for several years past. I prefer this peachblow to the Chili, because it is a better-looking potato, better for the table, and far more prolific. It originated in this immediate vicinity, and is well adapted to our locality, elevated about 1,500 feet above sea-level, and to our short seasons. The plot selected for experimenting was well manured the previous season with rotted barnyard manure, and planted to sowed corn. The soil would be termed a clay-loam. The plowing was done early in May. The ground was furrowed with a light plow, 3 feet apart in rows, and planted 2 feet 9 inches by 3 feet, making 5,280 hills to an acre. The planting was commenced May 21, and the potatoes were dug October 14 and 15. The result is figured out as if by the acre, and the number of bushels given in each column upon the basis of 60 pounds to the bushel.

## Season of 1873.

Kind and quantity of seed in the hill.		Seed used per acre.	Product, 60 pounds to the bushel.		
			Large.	Small.	Total.
		<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bush.</i>
No. 1.	One eye to a piece and one piece in a hill.....	2 1-3	136 1-4	7 (*)	136 1-4
No. 2.	One eye to a piece and two pieces in a hill.....	6	189	7	196
No. 3.	Two eyes to a piece and one piece in a hill.....	6	191 1-2	10	201 1-2
No. 4.	Two eyes to a piece and two pieces in a hill.....	12 1-3	257	16	273
No. 5.	Three eyes to a piece and one piece in a hill.....	8 1-5	214	7	221
No. 6.	Three eyes to a piece and two pieces in a hill.....	15 5-6	259 2-3	14	273 2-3
No. 7.	Four eyes to a piece and one piece in a hill.....	11 4-5	232 1-2	14 1-2	247
No. 8.	Four eyes to a piece and two pieces in a hill.....	21 1-6	295	17 1-2	312
No. 9.	Five eyes to a piece and one piece in a hill.....	14	258 1-2	16 1-2	275 1-2
No. 10.	One large potato.....	43 1-2	305 1-2	43 1-2	349
No. 11.	One large potato, cut in two lengthwise, one piece in a hill.....	21 1-6	263	20	283
No. 12.	One medium potato.....	25 1-4	289	18 4-5	307 4-5
No. 13.	One medium potato divided, two pieces in a hill.....	27	300	27	327
No. 14.	One medium potato, cut twice in two, and four pieces in a hill.....	28 1-5	269	33	302
No. 15.	One medium potato, cut in two, one piece in a hill.....	15 1-4	262	12	274
No. 16.	Seed end.....	10 1-2	259 1-2	10	269 1-2
No. 17.	Stem end.....	21 1-6	289	20	309
No. 18.	One small potato.....	11 5-6	250 1-4	23	273 1-4
No. 19.	One small potato, divided, two pieces in a hill.....	11 5-6	272 1-2	16 1-2	289
No. 20.	One small potato, divided, one piece in a hill.....	6 1-2	230 1-5	8 1-5	238 2-5
No. 21.	One medium potato cut to single eyes.....	30 1-2	262	70 1-2	332 1-2
No. 22.	One good-sized potato, eyes dug out, thirty hills missing.....	33	134	16 1-2	150 1-2
No. 23.	Garnet Chili, one good-sized potato, eyes dug out, 22 hills missing.....	35 1-4	155 1-2	10 1-2	166
No. 24.	Thirty-eight hills planted with the parings of single potato, pared quite thickly.†	.....	195	37 1-2	232 1-2
No. 25.	Thirty-eight hills, (Garnet Chili,) planted with the parings of single potatoes as noted above.†	.....	171 1-2	40	211 1-2
No. 26.	Seventy four hills were planted out of the 76 potatoes, thickly pared, as noted above, and of these 10 hills grew, but were late in coming up, and the crop from these 10 hills was 19 potatoes, weighing 11 pounds.	.....	.....	.....	.....

\* Only three or four small potatoes.

† These hills were throughout the season later and less vigorous in their growth than those cut in the ordinary manner.



Except as noted above, one row of each kind was planted, containing 75 hills, and the result presented as if by the acre.

The cuttings of the first nine rows were rolled in plaster, and in the remaining rows, with the exception of No. 10, about a tablespoonful of plaster was thrown upon the potato in the hill previous to covering. It was calculated to make them all about uniform in this respect. The culture was ordinary field-culture.

At harvest-time, in No. 1, planted with one eye to a piece, several hills had only one good-sized potato, several only two, and very few had three. In this row there were only three or four small potatoes. The difference in yield, as presented in Nos. 1 and 2, between one and two single eyes in a hill, is 60 bushels. Comparison between Nos. 3 and 4, having two eyes to a piece and one or two pieces in a hill, shows a difference in favor of the latter of 71½ bushels. Between Nos. 5 and 6, having three eyes to a piece and one and two pieces in a hill, the difference in favor of the stronger seeding is 53½ bushels. The difference in Nos. 7 and 8, with four eyes to a piece, is in favor of No. 8 by 65½ bushels; while between this and No. 9, with only one piece in a hill, is a falling off of 37½ bushels.

Concerning No. 9, care was taken that no piece should be planted having more than five eyes, and in my memorandum, at the time of planting, I find this note: "Requiring much care in cutting, and but few of the seed-ends left in."

The largest yield was that of No. 10, (and if I remember rightly no plaster was put in these hills,) 349 bushels requiring 43½ bushels of seed. Between Nos. 10 and 11 the potatoes were equal in size, but the latter yielded 66 bushels less per acre. Again, simply a difference in cutting seed shows between Nos. 12 and 13 an increased yield of 20 bushels in No. 13, with only an increase of 1½ bushels of seed; while too much cutting, as in No. 14, shows a diminished yield of 25 bushels as compared with No. 13.

The second largest yield, No. 21, shows an undue proportion of small potatoes, 70½ bushels. This was doubtless owing to the fact that each eye grew independently, and in many of the hills there were 18 or 20 different stalks.

Again, the difference in favor of stronger seeding is plainly marked in Nos. 19 and 20, with small undeveloped tubers cut in two and planted one and two pieces in a hill, in favor of the latter, by 50 1-5 bushels.

Is the seed-end better than the stem-end for planting? If a potato is planted whole, the eyes on the seed-end are those mainly which send forth shoots, the larger proportion remaining dormant; but cut the potato, and those eyes which in the uncut tuber do not germinate, send forth shoots, and are equally healthy and prolific. In a comparison of Nos. 16 and 17, which were the same potatoes except that the seed and stem-ends were planted in rows by themselves, the latter shows nearly double the weight of seed used, and an increased yield of 39½ bushels.

In Nos. 21 and 22, a large proportion of missing hills is shown. From each potato was cut out, with a sharp-pointed knife, every eye, or indication of an eye, which could be seen without the aid of a magnifying-glass. As a general rule, these potatoes came up slowly, some not making their appearance till the latter part of July; and, considering the disadvantages under which they grew, and the number of missing hills, the average yield is quite large. I do not pretend to affirm that this system of treatment is favorable to a prolific yield, but one of these hills contained 83 potatoes, large and small, and the largest one would weigh nearly 1½ pounds.

In seasons of great scarcity with the poor the inside of the potato may be eaten, and, if pared thickly, the parings planted. But the practice should not be commended, as the result in No. 25 evidently shows that by this process the vitality of the tuber is impaired.

My universal practice, for field-culture, has been to select medium-sized but well-developed tubers, and if not too large, plant them whole; otherwise, cut them lengthwise into two, and rarely into three pieces. The general practice in this locality is what may be termed surface-culture. The seed-bed is well prepared, the ground marked off with a horse-marker, and the potatoes pressed into the ground with the foot, and covered with the hoe. As soon as they are up sufficiently to indicate the rows, the cultivator is run between them, and they receive a slight hoeing. With the second hoeing is included the process of hilling, and the cultivation is finished.

**DIVISION OF LABOR IN AGRICULTURE.** A communication to this Department, from Mr. Daniel R. Goodloe, of Warren County, North Carolina, advocates a greater division of labor in farming. The following is a condensation of the considerations presented: All branches of mechanical industry depend largely for capital and skill in carrying them on, and for consequent profitable results, on a judicious division of labor. Were there a class of producers of wearing-apparel who undertook to manufacture all varieties of cloths, buttons, thread, leather, boots, shoes, hats, bounets, and garments of all sorts, for men women, and children, the demand for capital would be too great, and for intelligence and skill too multiform, for the capacities of any one person. Yet this is not unlike what the farmer undertakes under the

present system. In order to the highest success and profit in his business, he needs to be posted in agricultural chemistry, botany, and entomology; the nature of different soils and the best mode of treating them; the relative values and effects of all varieties of fertilizers; the best processes of tilling and culture for each kind of crop; the comparative profit in raising them; the relation of supply and demand in market for each; the adaptation of all varieties of grains, grasses, vegetables, and fruits to soil and climate; the breeds, characteristics, and relative adaptation and profits of all kinds of farm-animals; and so on, almost without limit. And then, in addition to these demands for manifold intelligence and manifold skill in applying it to departments of agriculture so distinct and varied that they are equivalent to a dozen distinct arts in mechanics, there is the further demand for sufficient capital to carry on all these branches advantageously. "Is it surprising, under such circumstances, that country-life and agriculture are so little attractive? Can we wonder that capital and population accumulate in the cities and towns out of all proportion to what they do in the country?"

Some steps have already been taken in the division of agricultural labor, greatly to the advantage of the farmer. At a remote period every farmer ground his own grain by hand; at a period comparatively recent every farmer thrashed out his own grain. Now, at much less trouble and expense to the farmer, thrashing is done very extensively by those who make that a business. Formerly, each farmer had to keep great teams and wagons, and spend a large share of time in hauling his products, it might be a hundred miles, to market, and hauling back his supplies; now this is generally done by the railroads, and "at a third or fourth of the former cost." Is it not practicable to carry this division of labor in farming still further, and thus, by a greater concentration of capital and skill employed in agriculture, to bring back to the rural districts a portion of the wealth and population which have been drawn off from them to the cities? For example, may not that fundamental branch of successful farming, plowing, be done, at least to a wide extent, much better and much cheaper than it now is, by a class who shall concentrate capital and skill on that as a distinct business?

"So long as agriculture depends on individual enterprise, steam-plowing will be regarded as impracticable. It requires too much capital, and its capabilities are too colossal for individual farmers in connection with all other farm-work. There may be a few who possess sufficient means to make the experiment on a small scale; but in order to success, it must be done on a scale sufficiently large to make that the business." Mr. Goodloe recognizes the fact that the business of plowing would not last all the year round, but thinks that the same company that should do the plowing could profitably apply the steam-power to various other uses; among which are specified thrashing and grinding grain, sawing lumber, pulling stumps, picking and packing cotton, and manufacturing sugar. He believes that such a division of labor, once introduced, would result in the formation of companies for the use of steam in agriculture, who would have the requisite capital, intelligence, and enterprise for bringing science to their aid, would make plowing by steam and improvements therein a thorough study, and consequently would effect, throughout the sphere of their operations, a large increase in the productiveness of the soil and profits of farming. "Deep plowing and subsoiling would everywhere and thoroughly be introduced," and the expenses for teams, plows, &c., would be so diminished as to enable "thousands of laboring-men to set up as farmers, who, under the present system, are unable to do so."

# MARKET-PRICES OF FARM-PRODUCTS.

*The following quotations represent the state of the market, as nearly as practicable, at the beginning of the month.*

Articles.	Prices.	Articles.	Prices.
<b>NEW YORK.</b>		<b>BOSTON—Continued.</b>	
Flour, superfine.....per bar.	\$5 00 to \$5 50	Sugar, fair to good refining...do..	\$0 7½ to \$0 8
extra State.....do..	5 85 to 6 55	Tobacco, lugs.....do..	6½ to 8
superfine western.....do..	5 00 to 5 50	common to medium	
extra to choice western,		leaf.....do..	8½ to 10
per barrel.....	5 75 to 11 00	Cotton, ordinary to good ordi-	
common to fair southern		nary.....do..	14½ to 16½
extra, per barrel.....	6 00 to 6 70	low middling to good	
good to choice southern,		middling.....do..	17 to 20
per barrel.....	6 75 to 11 00	Wool, Ohio and Pennsyl-	
Wheat, No. 1 spring.....per bush.	1 40 to 1 43½	vania.....do..	49 to 60
No. 2 spring.....do..	1 34 to 1 39	Michigan.....do..	45 to 53
winter, red, western do..	1 37 to 1 40	other western.....do..	44 to 52
winter, amber, western,		pulled.....do..	25 to 56
per bushel.....	1 40 to 1 44	combing fleece.....do..	57 to 62
winter, white, western,		California.....do..	20 to 40
per bushel.....	1 42 to 1 60	Texas.....do..	25 to 40
Rye.....per bush.	1 10 to —	<b>PHILADELPHIA.</b>	
Barley.....do..	— to —	Flour, superfine.....per bbl.	4 70 to —
Corn.....do..	74 to 87	Penn. extra.....do..	5 00 to 5 50
Oats.....do..	56 to 63	Penn. family and	
Hay, first quality.....per ton.	23 00 to 28 00	fancy.....do..	6 50 to 7 50
second quality.....do..	20 00 to 21 00	western extra.....do..	5 00 to 5 50
Beef, mess.....per bbl.	— to —	western family and	
extra mess.....do..	14 00 to 15 00	fancy.....do..	6 50 to 7 75
Pork, mess.....do..	18 50 to —	Wheat, winter, red....per bush..	1 30 to 1 40
extra prime.....do..	16 25 to —	winter, amber.....do..	1 52 to 1 58
prime mess.....do..	17 00 to —	winter, white.....do..	— to —
Lard.....per lb.	10½ to 12	spring, white.....do..	— to —
Butter, western.....do..	15 to 27	Rye.....do..	98 to 1 00
State dairy.....do..	20 to 30	Barley.....do..	— to —
Cheese, State factory.....do..	12½ to 14½	Corn.....do..	79 to 81
western factory.....do..	11½ to 13	Oats.....do..	61 to 67½
Cotton, ordinary to good ordinary,		Hay, fresh baled.....per ton	22 00 to 24 00
per pound.....	14½ to 16½	common to fair ship-	
dling, per pound.....	16½ to 19½	ping.....do..	20 00 to 22 00
Sugar, fair to good refining, per lb.	— to —	Beef, western mess.....per bbl	8 00 to 10 00
prime refining.....do..	8½ to 8½	extra mess.....do..	9 00 to 12 00
Tobacco, lugs.....do..	5½ to 7½	Warthman's city fam-	
common to medium		ily.....do..	17 00 to —
leaf, per pound.....	7½ to 10½	Pork, mess.....do..	18 25 to 18 50
Wool, American XXX and pick-		prime mess.....do..	16 50 to —
lock.....per lb.	53 to 68	prime.....do..	15 00 to —
American X and XX.....do..	47 to 55	Lard.....per lb.	11 to 15
American combing.....do..	50 to 65	Butter, choice middle State.....do..	25 to 30
pulled.....do..	46 to 52	choice western.....do..	22 to 24
California spring-clip.....do..	20 to 37	Cheese, New York factory.....do..	14 to 15
California fall-clip.....do..	17 to 28	Ohio factory.....do..	12½ to 13
<b>BOSTON.</b>		Sugar, fair to good refining.....do..	7½ to —
Flour, superfine western.....per bbl.	5 00 to 5 25	Cotton, ordinary to good ordinary,	
western extras.....do..	6 00 to 8 00	per pound.....	14 to 16
western choice.....do..	8 50 to 9 50	low middling to good mid-	
southern extras.....do..	6 00 to 6 25	dling.....per lb.	16½ to 19½
choice Baltimore.....do..	8 50 to 9 50	Wool, Ohio X and XX.....do..	53 to 56
Wheat.....per bush.	1 50 to 1 85	Ohio combing.....do..	62½ to —
Rye.....do..	1 15 to 1 20	pulled.....do..	42 to 48
Barley.....do..	— to —	unwashed, clothing and	
Corn.....do..	84 to 86	combing.....per lb.	36 to 43
Oats.....do..	61 to 69	<b>BALTIMORE.</b>	
Hay, eastern and northern.....per ton.	12 00 to 25 00	Flour, superfine.....per bbl.	4 00 to 4 75
western choice.....do..	23 00 to 24 00	extra.....do..	5 00 to 7 50
Beef, western mess.....per bbl.	13 00 to 14 00	family and fancy.....do..	8 00 to 9 50
western mess extra.....do..	15 00 to 15 50	White wheat.....per bush.	1 50 to 1 65
Pork, prime.....do..	19 00 to 19 50	amber.....do..	— to 1 62
mess.....do..	16 00 to 16 50	red.....do..	1 30 to 1 65
Lard.....per lb.	12 to 12½	Rye.....do..	90 to 95
Butter, New York and Ver-		Corn, white southern.....do..	90 to 91
mont.....do..	20 to 29	yellow southern.....do..	23 to —
western.....do..	18 to 25	Oats, southern.....do..	65 to 72
Cheese, New York and Ver-		western.....do..	65 to 68
mont.....do..	13 to 14	Hay, Pennsylvania.....per ton.	16 00 to 20 00
western factory.....do..	10 to 13½	Maryland.....do..	16 00 to 23 00

## Market-prices of farm-products—Continued.

Articles.	Prices.	Articles.	Prices.
<b>BALTIMORE—Continued.</b>		<b>CHICAGO—Continued.</b>	
Hay, western.....per ton.	\$17 00 to \$22 00	Butter, choice to fancy..per lb.	\$0 21 to \$0 24
Beef, Baltimore meses.....per bbl.	— to —	medium to good.....do.	16 to 18
extra.....do.	— to —	Cheese, New York factory...do.	11 to 12
Pork, mess.....do.	18 00 to —	Ohio and western factory,	
Lard.....per lb.	12 to 12½	per pound.....do.	10½ to 11
Butter, western.....do.	23 to 25	Sugar, New Orleans, prime to	
eastern.....do.	20 to 23	choice.....per lb.	— to —
Cheese, eastern cutting.....do.	15 to —	Sugar, New Orleans, common to	
western cutting.....do.	12½ to 13½	fair.....per lb.	— to —
Sugar, fair to good refining.....do.	7½ to 8	Wool, tub-washed.....do.	45 to 50
Tobacco, lugs.....do.	4½ to 6	fleece-washed.....do.	38 to 44
common to medium.....do.	6 to 8½	unwashed.....do.	27 to 33
Cotton, ordinary to good ordi-		pulled.....do.	— to —
nary.....per lb.	— to 15½		
low middling to middling,		<b>SAINT LOUIS.</b>	
per pound.....do.	16½ to 17½	Flour, spring.....do.	— to —
Wool, fleece-washed.....do.	— to —	winter.....do.	3 75 to 8 00
tub-washed.....do.	— to —	Wheat, red winter.....do.	1 08 to 1 30
unwashed.....do.	— to —	white winter.....do.	1 20 to 1 37½
pulled.....do.	— to —	spring.....do.	— to —
<b>CINCINNATI.</b>		Corn.....do.	58 to 75
Flour, superfine.....per bbl.	4 75 to 5 00	Rye.....do.	78 to 87½
extra.....do.	5 50 to 5 75	Oats.....do.	46½ to 53
family and fancy.....do.	5 60 to 6 00	Barley.....per bush.	— to —
Wheat, red winter.....per bush.	1 18 to 1 20	Hay, timothy.....per ton.	15 00 to 25 00
hill winter.....do.	— to —	Beef, prime mess.....per bbl.	— to —
white winter.....do.	1 20 to 1 23	mess.....do.	12 00 to —
Rye.....do.	90 to —	extra mess.....do.	14 00 to —
Barley.....do.	— to —	Lard.....per lb.	10 to 12½
Corn.....do.	55 to 71	Butter, choice.....do.	20 to 23
Oats.....do.	48 to 56	inferior grades.....do.	16 to 18
Hay, baled, No. 1.....per ton.	17 00 to 20 00	Cheese, Ohio and N. W.	
lower grades.....do.	10 00 to 14 00	factory.....do.	12 to 13½
Beef, plate.....per bbl.	13 00 to 14 50	New York factory.....do.	13 to 13½
Pork, mess.....do.	18 60 to 18 25	Sugar, New Orleans, common	
Lard.....per lb.	11½ to 12	to fair.....do.	8 to —
Butter, choice.....per lb.	18 to 20	prime to choice.....do.	— to 8½
prime.....do.	22 to 23	Cotton, ordinary to good ordi-	
Cheese, factory.....do.	12 to 12½	nary.....do.	— to —
prime apple.....do.	— to —	low middling to good	
Sugar, New Orleans, fair to good,		middling.....do.	15½ to 18½
per pound.....do.	8½ to 9½	Wool, tub-washed.....do.	46 to 51
prime to choice.....per lb.	9½ to 9¾	unwashed, combing.....do.	36 to 38
Tobacco, lugs.....do.	9 to 20	fleece-washed.....do.	— to —
leaf.....do.	12 to 34½		
Cotton, ordinary to good ordinary,		<b>NEW ORLEANS.</b>	
per pound.....do.	13½ to 15	Flour, superfine.....per bbl.	5 00 to —
low middling to good mid-		extra.....do.	5 50 to 6 50
dling.....per lb.	16 to 18½	choice to fancy.....do.	7 00 to 8 75
Wool, fleece-washed.....do.	40 to 43	Corn, yellow.....per bush.	81 to —
tub washed.....do.	44 to 46	white.....do.	82 to 85
unwashed, clothing.....do.	30 to 31	Oats.....do.	62 to 64
unwashed, combing.....do.	35 to 38	Hay, choice.....per ton.	— to —
pulled.....do.	32 to 33	prime.....do.	24 00 to 25 00
<b>CHICAGO.</b>		Beef, Texas.....per bbl.	12 00 to 12 25
Flour, white winter, fair to good,		Philadelphia.....do.	— to —
per barrel.....do.	6 00 to 6 50	Fulton market per half bbl.	11 25 to 11 50
choice.....per bbl.	7 00 to 8 00	western.....per bbl.	15 50 to 16 00
red winter.....do.	5 50 to 6 50	Pork, mess.....do.	20 00 to 21 00
medium to fancy, spring ex-		Lard.....per pound.	12 to 12½
tras.....per bbl.	5 00 to 6 50	Butter, choice Goshen.....do.	32 to 34
spring, superfine.....do.	3 50 to 4 75	western.....do.	17 to 22
Wheat, No. 1 spring.....per bush.	1 19 to 1 19½	Cheese, choice western fac-	
No. 2 spring.....do.	1 16 to 1 16½	tory.....do.	16 to —
No. 3 spring.....do.	1 09½ to 1 10	New York cream.....do.	— to —
Corn, No. 2.....do.	58½ to 59	Sugar, fair to fully fair.....do.	8 to 8½
Oats, No. 2.....do.	42 to 43½	prime to strictly	
Barley, No. 2.....do.	1 10 to 1 20	prime.....do.	9 to 9½
Rye, No. 2.....do.	83 to 86	clarified, white and	
Hay, timothy.....per ton.	11 50 to 14 00	yellow.....do.	10½ to —
prairie.....do.	7 50 to 9 00	Tobacco, lugs.....do.	5½ to 7½
Beef, mess.....per bbl.	11 00 to 11 25	low leaf to me-	
extra mess.....do.	12 00 to 12 25	dium leaf.....do.	8 to 9½
Pork, mess.....do.	17 70 to 17 75	Cotton, ordinary to good	
prime, mess.....do.	— to —	ordinary.....do.	12½ to 14½
extra prime.....do.	— to —	low middling to	
Lard.....per lb.	11-10 to 11½	good middling.....do.	15½ to 18½
		Wool, lake.....do.	34 to —

## Market-prices of farm-products—Continued.

Articles.	Prices.	Articles.	Prices.
SAN FRANCISCO.		SAN FRANCISCO—Continued.	
Flour, superfine..... per bbl.	\$4 50 to \$1 75	Beef, family mess..... half bbl.	\$10 00 to \$12 00
extra..... do.....	5 00 to 5 50	Pork, mess..... per bbl.	19 00 to 20 00
family and fancy..... do.....	5 50 to 6 00	prime mess..... do.....	16 50 to —
Wheat, California..... per cental.	1 65 to 1 85	Lard..... per lb.	12 to 13½
Oregon..... do.....	1 65 to 1 85	Butter, overland..... do.....	20 to 22
Barley..... do.....	1 00 to 1 75	California..... do.....	25 to 30
Oats..... do.....	1 50 to 1 75	Oregon..... do.....	18 to 20
Corn, yellow..... do.....	1 90 to 2 00	Cheese..... do.....	12½ to 16
white..... do.....	1 90 to 2 00	Wool, native..... do.....	17 to 19
Hay, State..... per ton.	10 00 to 14 00	California..... do.....	25 to 32
Beef, mess..... per bbl.	8 50 to 9 00	Oregon..... do.....	25 to 32

## LIVE-STOCK MARKETS.

Articles.	Value.	Articles.	Prices.
NEW YORK.		CHICAGO—Continued.	
Cattle, extra beeves... per cental	— — \$12 75	Cattle, choice beeves, 3 to 5 y. ars	
good to prime..... do.....	\$10 25 — —	old, 1,250 to 1,950 pounds,	
comon to fair..... do.....	— — — —	per cental.....	\$5 85 to \$6 10
milch-cows..... per head	40 00 to 80 00	good beeves, 1,200 to 1,300	
calves..... per cental	7 00 to 8 00	pounds..... per cental	5 50 to 5 75
Sheep, good to extra..... do.....	4 50 to 5 50	medium grades, 1,150 to	
Swine, common to fair..... do.....	— — 5 87½	1,300 pounds per cental	4 75 to 5 40
		lower grades, natives, per	
		cental.....	2 00 to 4 75
		Texans, choice corn-fed, per	
		cental.....	5 00 to 5 50
		Texans, north wintered,	
		per cental.....	3 50 to 4 25
		Texans, through-droves, per	
		cental.....	1 50 to 3 25
		milch-cows..... per head	
		veal calves..... per cental	— — — —
		Sheep, poor to medium..... do.....	2 00 to 2 50
		good to choice..... do.....	3 75 to 4 50
		Swine, good to extra..... do.....	5 85 to 6 15
		inferior to medium..... do.....	5 30 to 5 65
		SAINT LOUIS.	
		Cattle, choice native steers, 1,300	
		to 1,600 pounds, per cental	6 00 to 6 25
		prime second class, 1,150 to	
		1,400 pounds, per cental	5 00 to 5 25
		good third grade, 1,050 to	
		1,300 pounds, per cental	4 10 to 4 25
		fair butchers', 1,000 to 1,200	
		pounds, per cental.....	3 50 to 4 00
		inferior native grades, per	
		cental.....	2 00 to 3 75
		Texans and Cherokees,	
		corn-fattened, per cental.	3 00 to 3 75
		inferior..... per cental	1 25 to 2 00
		Sheep..... do.....	2 50 to 6 00
		Swine..... do.....	5 00 to 6 00
		Horses, plug..... per head	20 00 to 55 00
		street-car horses..... do.....	55 00 to 75 00
		good work-animals..... do.....	80 00 to 120 00
		driving-animals..... do.....	150 00 to 200 00
		heavy draught..... do.....	115 00 to 200 00
		Mules, 14 to 15 hands high..... do.....	70 00 to 135 00
		15 to 16 hands high..... do.....	140 00 to 170 00
		extra..... do.....	135 00 to 190 00
		NEW ORLEANS.	
		Cattle, Texas beeves, choice, per	
		head.....	40 00 to 45 00
		first quality..... do.....	35 00 to 40 00
		second quality..... do.....	20 00 to 25 00
		western beeves, per cental	— — — —
		milch-cows..... per head	35 00 to 100 00
		calves..... do.....	7 00 to 10 00
		Sheep, first quality..... do.....	4 00 to 5 00
		second quality..... do.....	3 00 to 4 00
		Swine..... per cental	7 00 to 7 50

## FOREIGN MARKETS.

WHEAT.—The forcing weather of the first part of June, in England, brought the wheat-crop into a critical state for the recurrence of wintry coldness in the middle of the month. The consequent injury to the grain and the deferring of the harvest made the lightness of the stocks of old wheat a matter of serious anxiety. Rains in France appear to have improved the prospects of the wheat-crop, depressing the markets about 1 shilling per quarter. This downward tendency, however, was by no means permanent. Contracts for the delivery of flour and wheat on the continent show a large abatement from present high rates, but such is the critical character of the times that a revulsion toward higher rates is feared. The rapid clearing out of British stores is shown in the fact that the deliveries of the third week in June are 8,805 quarters below those of the corresponding week of 1873, and the weekly imports fail to make up the deficiency. Prices continue measurably unchanged in Belgium, Holland, and Germany, but the improved prospects of the crop have depressed prices 1 shilling per quarter in the Hungarian markets.

The sales of English wheat during the week amounted to 36,002 quarters, at an average of 61s. 4d. against 44,807 quarters at 58s. 4d. during the corresponding week of 1873. The London averages were 63s. 2d. on 1,278 quarters. The imports into the United Kingdom during the week previous were 444,480 cwts. The show of fresh English samples grows more meager each week, yet millers hesitate to purchase at ruling prices. In Mark Lane, Essex and Kent, white is quoted at 53s. to 66s. per quarter; ditto red 55s. to 63s.; Norfolk, Lincolnshire, and Yorkshire red, 55s. to 61s. Of foreign wheats Dantzic mixed brings from 60s. to 68s. Königsberg, 59s. to 67s.; Rostock, 63s. to 68s.; Silesian red, 58s. to 65s.; Pomerania Mecklenburg, and Uckermark, red, 59s. to 60s.; Ghirka, 55s. to 66s.; Russian hard, 52s. to 55s.; Saxonska, 57s. to 59s.; Danish and Holstein, red, 58s. to 59s.; American, 55s. to 59s.; Chilian, white, 63s.; California, 64s.; Australian, 62s. to 65s. At Paris farmers' parcels are quoted at 71s. 6d. to 73s.; at Havre, Rouen, and Dunkirk, Oregon brings 70s.; California, 69s.; Chilian, 68s.; American spring, 62s. 6d.; Polish, 61s. 6d. At Liverpool, American white is quoted at 12s. 6d. to 13s. per cental; red winter and southern, at 11s. 9d. to 12s.; spring, No. 1, 11s. 2d. to 11s. 4d.; spring No. 2, 10s. 8d. to 11d. Canadian white, 12s. 4d. to 12s. 6d.; ditto, red, 11s. 4d. to 11s. 9d.; California, white, 12s. 6d. to 13s. 2d.; Chilian, 12s. 3d. to 12s. 4d.; Australian, 13s. 6d. to 13s. 9d.; Spanish, white, 12s. to 12s. 2d.; Danubian, 7s. 6d. to 9s. 6d.; Egyptian, 10s. 3d. to 12s.

FLOUR.—The imports of flour into the United Kingdom during the week ending June 13th amounted to 104,172 cwts. The supply of English flour at the opening of the following week, in London, was moderate, but the import was increasing. In Mark Lane the best town households brought 47s. to 54s. per sack of 280 pounds; best country households, 44s. to 47s.; Norfolk and Suffolk, 38s. to 43s.; American, per barrel of 196 pounds, 28s. to 30s.; extra and double extra, 29s. to 33s. In Paris, the rates for consumption were 52s. to 54s. per 280 pounds. The "eight-marks" for June closed at 53s. 2d.; Superior flour was weak at 52s. 4d. for June.

MAIZE.—There was a fair supply of maize in London, but a brisk inquiry soon hardened prices; in Mark Lane white was quoted at 41s. to 44s. per quarter; yellow 37s. to 39s. At Liverpool, American white brought 38s. to 38s. 6d. per 480 pounds; mixed, white and yellow, 36s. to 36s. 6d.; Galatz, 43s. 6d. to 44s.

MONTHLY REPORT

OF THE

DEPARTMENT OF AGRICULTURE

FOR

AUGUST AND SEPTEMBER, 1874.



WASHINGTON:  
GOVERNMENT PRINTING OFFICE.  
1874.

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# MONTHLY REPORT.

## REPORT OF CROP-RETURNS.

### MEANING OF THE TERM "AVERAGE."

By the term "average," as used in the reports of this Department *with respect to growing crops*, we do not indicate any definite product in bushels, pounds, tons or bales. It is an estimate not of *quantity*, but of comparative condition in reference to former years, embracing the state of development, vitality, and healthfulness of the plants at a given date. What an average crop is in quantity the Department has never determined for either county, State or nation, and never makes it an element in ascertaining the actual yield. The estimates for the latter are always based upon the yield of the previous year, and are never made till the crops have been gathered, and ample time has been afforded our correspondents to ascertain the true results.

Our correspondents are carefully instructed upon these points and fully understand them. Frequent explanations have been made in previous reports; hence the Department cannot be held responsible for misconceptions which it has made every reasonable effort to remove. If parties interested in ascertaining and publishing facts relating to our growing crops desire further explanation it will be cheerfully given. If in default of this information and in *conscious* and *confessed* ignorance of our meaning they misinterpret our results, they must bear their own responsibility to public opinion.

### CORN.

The average condition of the corn-crop on the 1st of September, as indicated by our reports of that date, was 83; the maximum, 109, was in South Carolina; the minimum, 37, in Nebraska.

The average condition, compared with the reports of September, 1873, is shown in the following table:

States.	September, 1873.	September, 1874.	States.	September, 1873.	September, 1874.
Maine .....	87	79	Louisiana .....	90	76
New Hampshire .....	100	92	Texas .....	80	91
Vermont .....	90	82	Arkansas .....	93	53
Massachusetts .....	99	83	Tennessee .....	80	66
Rhode Island .....	96	105	West Virginia .....	105	89
Connecticut .....	95	111	Kentucky .....	94	87
New York .....	90	92	Ohio .....	91	93
New Jersey .....	104	75	Michigan .....	84	76
Pennsylvania .....	87	99	Indiana .....	87	96
Delaware .....	90	90	Illinois .....	68	78
Maryland .....	94	88	Wisconsin .....	89	91
Virginia .....	99	95	Minnesota .....	100	96
North Carolina .....	99	98	Iowa .....	81	92
South Carolina .....	95	109	Missouri .....	67	53
Georgia .....	103	105	Kansas .....	63	45
Florida .....	103	102	Nebraska .....	63	37
Alabama .....	94	94	California .....	97	105
Mississippi .....	87	89	Oregon .....	102	100

None of the large corn-producing States reach average, while several of them show a decline from even last year's depressed condition. The only States that are average or above are Rhode Island, Connecticut, South Carolina, Georgia, Florida, California, and Oregon, which, together, produce less than one-twentieth of the crop.

Of 1,145 counties reporting corn-culture, 273 are above average, 240 average, and 632 below. This classification of counties in the different States is shown in the following table:

States.	Counties above average.	Counties average.	Counties below average.	Total reporting corn.	States.	Counties above average.	Counties average.	Counties below average.	Total reporting corn.
Maine			13	13	Texas	16	14	30	60
New Hampshire		1	6	7	Arkansas			34	34
Vermont	1	1	8	10	Tennessee	1	4	39	44
Massachusetts	1	1	3	5	West Virginia	1	14	18	33
Rhode Island	1	1	0	2	Kentucky	8	5	36	49
Connecticut	3	0	2	5	Ohio	16	12	25	53
New York	4	8	26	38	Michigan	8	8	20	36
New Jersey	3		2	5	Indiana	16	14	23	53
Pennsylvania	11	11	16	38	Illinois	6	9	50	65
Delaware	0	0	2	23	Wisconsin	9	8	15	32
Maryland	12	2	10	14	Minnesota	12	10	28	30
Virginia	22	14	30	66	Iowa	23	16	24	63
North Carolina	22	19	15	56	Missouri	7	3	52	62
South Carolina	12	3	4	19	Kansas			31	31
Georgia	36	19	19	74	Nebraska		1	11	12
Florida	6	6	1	13	California	7	9	2	18
Alabama	12	9	15	36	Oregon	1	4	3	8
Mississippi	5	9	19	33					
Louisiana	2	3	17	22	Total	273	240	632	1,145

The New England States, as a whole, fall about one-tenth short of an average. The plantings were generally late, and the crop is consequently backward, and has already been touched with frost in some of the more northern counties. Farmers are hoping for a warm September to enable it to mature.

The Middle States will fall about as far below average condition. They complain of the same unfavorable conditions, besides an abnormal depression of temperature at night. In some localities drought, and in others excess of rain, is stated. The greatest depression is in New Jersey; Pennsylvania is nearly average. An improvement in the conditions of growth is noted in many localities, which in another month may considerably raise the average during the current month.

The South Atlantic States, as a whole, are slightly above average, the high condition in South Carolina and Georgia compensating for the decline in Maryland, Virginia, and North Carolina, caused by drought, chinch, cool nights, &c. Late stands to some extent depressed the yield. The chronic complaint of slovenly cultivation is also received from some counties, but not so frequently as in former reports.

The Gulf States promise about nine-tenths of an average crop. Drought, extreme heat, and hot winds injured late plantings in several counties, in some cases very severely. These were felt most widely in Louisiana, where the flooding rains of spring prevented an early stand, and threw the crop mostly into the later droughts. Crops made before the drought were generally fine.

The inland Southern States will make but three-fourths of a crop, the averages being respectively as follows: Arkansas, 53; Tennessee, 66;

West Virginia, 89; Kentucky, 87. The leading cause of this low condition was drought, which was partially alleviated in the northern counties before the crop was entirely destroyed.

All the States north of the Ohio River show depressed condition, though the great corn States, Ohio, Indiana, and Illinois, are more promising than in September, 1873. Drought, heat, hot winds, and chinchés are alleged as causes of the depression. Several counties report very superior crops. This region, as a whole, will probably fall 15 per cent short of an average.

West of the Mississippi River the crop has met with terrible disasters from drought, chinchés, and grasshoppers, of which some idea may be formed from the subjoined notes of correspondence. Minnesota and Iowa seem to have nearly weathered their difficulties, but in Missouri, Kansas, and Nebraska they fell with crushing weight upon the corn crops. Our correspondence from these States reveals a wide-spread destruction in many counties, giving rise to grave apprehensions of distress among the farmers. This region will not, as a whole, make over seven-tenths of a crop.

On the Pacific coast California reports a prospect of 5 per cent. above average, and Oregon full average.

MAINE.—*Penobscot*: Season favorable. *York*: Two weeks late; weather favorable. *Oxford*: Growth good, but two weeks late; injured by frost August 3. *Androscoggin*: Backward; in danger of early frosts. *Piscataquis*: Will be poor unless frost holds off. *Franklin*: Small and late.

NEW HAMPSHIRE.—*Merrimack*: Backward; mostly in the milk; slight frost August 24. *Hillsboro'*: Backward, but looks well. *Carroll*: Backward and green; will be safe if frost holds off till October. *Sullivan*: Acreage decreased; crop late. *Cheshire*: Injured by drought, and slightly by frosts August 23 and 25. *Rockingham*: Late and backward.

VERMONT.—*Lamoille*: Season wet and cold; all crops backward. *Caledonia*: Still very late; frost in some sections did some damage. *Grand Isle*: Suffered from wet and cold. *Rutland*: Late. *Franklin*: Just fit to roast.

MASSACHUSETTS.—*Franklin*: Very backward; a warm September necessary to a sound crop. *Berkshire*: Reduced to half a crop by cool, wet weather.

CONNECTICUT.—*New London*: Kept back by rain. *Litchfield*: Large growth, but ears are not filling well; backward and in danger of frost.

NEW YORK.—*Steuben*: White frost August 3. *Allegany*: Green; cool nights. *Dutchess*: Badly injured by drought at earing time; ears not coming out well. *Erie*: Average, but late. *Franklin*: Late spring. *Otsego*: Needs a warm September to mature. *Albany*: A failure through wet, cool nights. *Columbia*: Light crop; very unfavorable season. *Rensselaer*: Poor crop; drought. *Schoharie*: Late. *Seneca*: drought threatened. *Cattaraugus*: Dryest August for seven years. *Delaware*: No rain for four weeks. *Genesee*: Suffering from drought. *Livingston*: Suffered severely from drought; many stalks have no ears on them. *Montgomery*: Backward; cool nights. *Warren*: Cool nights. *Washington*: Light; cool nights. *Jefferson*: The dry August has brought the crop to average. *Sullivan*: Injured by drought. *Monroe*: Shortened by drought.

NEW JERSEY.—*Hudson*: Wonderfully improved. *Gloucester*: Severe drought. *Salem*: Reduced to a half crop by drought. *Warren*: Promising.

PENNSYLVANIA.—*Butler*: Light crop. *Clearfield*: Late, but looks well. *Lehigh*: Grew wonderfully during August. *Northampton*: Very promising. *Perry*: Drought. *Snyder*: Never fairer or larger than this year. *Warren*: Too dry to fill well. *Lawrence*: Shortened a third by dry, cool weather. *Indiana*: Promising. *Pike*: Drought. *Tioga*: Very fine in spite of the dry, cool season. *Washington*: Early plantings ripening fast; late plantings need another good rain and good fall weather. *Bucks*: Too far matured to be injured by drought. *Westmoreland*: Looks well, but is late and in danger of frost. *Lancaster*: Less promising; drought. *Armstrong*: Injured by storms. *Beaver*: Drying up; ears small and not well filled.

DELAWARE.—*Sussex*: Greatly shortened by drought.

MARYLAND.—*Dorchester*: Shortened by drought. *Frederick*: Injured by early drought, but will compare with last year. *Worcester*: Shortened by cool weather in August. *Calvert*: Suffering from drought. *Queen Anne*: Shortened by drought one-half. *Washington*: Short in some places. *Wicomico*: Shortened by drought and the borer.

VIRGINIA.—*Alexandria*: Fodder-corn badly damaged by drought. *Bedford*: Abundant rains will raise the yield to average. *Fluvanna*: General yield 10 per cent. short, but fair on good lands. *King William*: Finest crops for years. *Middlesex*: Small, but

of average promise. *New Kent*: Late, but the best crop since the war; well-worked corn is as good as the land can make it. *Orange*: Reduced below average by cool, dry weather; injured also by chinchies. *Pittsylvania*: Greatly improved by late rains. *Princess Anne*: July rains brought the crop up to a fair average; much young corn, following potatoes, is not yet matured. *Pulaski*: Very fine corn season. *Rappahannock*: Shortened by three or four weeks' drought. *Spottsylvania*: Best crop since the war. *Stafford*: Recent rains too late to do much good. *Sussex*: Looks well. *Tazewell*: Suffering for rain. *Washington*: Looks well considering the drought. *York*: Early corn much cut up by bugs; late planted escaped; plenty of rain except early in the season. *Essex*: Bad stand, and late, but otherwise promising. *Henrico*: Still promising, though dry. *Clarke*: Half crop. *Fairfax*: Greatly injured by drought. *Henry*: Never saw so fine a crop here. *Northampton*: Improving. *James City*: Nominal price \$6 per barrel, but none for sale. *King and Queen*: Very promising. *Mecklenburg*: Fair on high lands and fine on bottoms; well worked. *Prince George*: Late corn injured by drought. *Southampton*: Greatly improved by late rains. *Charles City*: Very good on loam soil, though somewhat injured by bugs and worms. *Chesterfield*: Very good; earing finely; late plantings injured by cool weather. *Floyd*: Fine but late. *Loudoun*: Drought from May till August; rains then, but too late to save the crop. *Louisa*: Greatly reduced by drought. *Madison*: Improved with late rains to about three-fourths average; highland crops indifferent. *Augusta*: Continues to improve. *Elizabeth City*: Early plantings failed on account of worms. *Greenville*: Some crops suffering from drought; late-planted corn ears poorly. *Page*: Revived by late rains, especially well-cultivated crops. *Lunenburg*: Improved, but still short; late planted, poorly cultivated and injured.

**NORTH CAROLINA.**—*Wayne*: Good season; crop promising. *Robinson*: Will be abundant. *Pasquotank*: A little below average through drought. *Granville*: Very good where well worked. *Gaston*: Promising, except a small area visited by hail-storms. *Franklin*: Very good where well cultivated. *Chowan*: Injured by flooding rains on low lands. *Forsythe*: Good. *Cleveland*: Abundant rains have made full crops. *Beaufort*: Greatly improved by late rains. *Martin*: Splendid. *Bladen*: Inferior. *Caldwell*: Good rains will probably bring the crop to an average. *Hertford*: Full average; 10 per cent. more acreage. *Onslow*: Weather unfavorable to late crops. *Alexander*: Season fine for late crops. *Currituck*: Fair promise. *Camden*: Good. *Moore*: Finest crop since 1865. *Perquimons*: Full average. *Roucan*: Best crop for many years. *Alamance*: Fair; late rains; only half a crop planted. *Caswell*: Late; drought and imperfect cultivation. *Greene*: Good. *Person*: Very much injured by late rains. *Stanly*: More plenty than the hogs to be fattened with it. *Wilkes*: Greatly improved by late rains.

**SOUTH CAROLINA.**—*Fairfield*: Very favorable corn season. *Clarendon*: Fully 50 per cent. better than last year. *Edgefield*: Injured by drought. *Lexington*: Better than for many years past. *Marlborough*: Best crop since the war. *Georgetown*: Failed on thin lands; ears small and not well filled. *Newberry*: Drought has cut off late crops except on bottoms. *York*: Very fine.

**GEORGIA.**—*Bulloch*: Six weeks of favorable weather. *Carroll*: Best crop for six years; season favorable to both early and late plantings. *Catoosa*: Injured by drought; late reviving rains, however, on the uplands. *Clinch*: Crop made; best since the war. *Dooly*: Fine crop. *Elbert*: Late, but good; good rains. *Gordon*: Late plantings injured. *Schley*: Reviving rains making fine crops. *Stewart*: Finest crop since the war. *Sumter*: Crop made; full average; acreage insufficient. *Whitfield*: Badly injured by drought. *Wilkinson*: Large acreage; promising. *Chattooga*: Badly injured by drought. *Fulton*: Suffered from drought in some places. *Jackson*: Early crops abundant. *Lee*: Crop as fine as the land will make. *Madison*: Never better. *Cobb*: Very good. *Fayette*: Early crops good. *Floyd*: Five weeks of drought and intense heat have greatly injured the crop; very late corn improved by late rains. *Towns*: Improving rains. *Guinnett*: Good; fine rains of late. *Jefferson*: Doing finely.

**FLORIDA.**—*Jackson*: Yield will be ample for home consumption. *Levy*: Injured by alternate flood and drought.

**ALABAMA.**—*Limestone*: Prospects blasted by drought. *Wilcox*: Benefited by the drought. *Blount*: Cut off by drought from one-fourth to one-half in places. *Calhoun*: Late crops badly damaged by drought. *Lowndes*: Lack of rain for late plantings prevented this year's crop from being the best for many years. *Pike*: Late corn a failure. *Saint Clair*: Dried up; will leave enough for home consumption. *Choctaw*: Suffering from drought, especially late plantings. *Covington*: Injured by drought. *Greene*: Shortened by severe drought; young corn, late planted, is ruined. *Macon*: Late plantings ruined by drought and grass-worms. *Montgomery*: Late plantings injured by drought. *Colbert*: Injured by extreme heat. *De Kalb*: Injured by twenty days of extreme drought. *Lawrence*: Very unequal; some crops better than last year; others poor. *Calhoun*: Early crops good. *Concok*: Affected by drought. *Dallas*: Drought. *Perry*: Shortened by excessive heat and drought.

**MISSISSIPPI.**—*Lauderdale*: Shortened half by drought. *Covington*: Shortened by drought. *Grenada*: Affected by drought and hail-storms. *Pike*: Late corn injured by

drought. *Warren*: Late-planted corn irreparably injured by drought. *Holmes*: Injured by extreme drought. *Panola*: Unusually good. *Jefferson*: Fine; very improving rains in good time for late plantings. *Attala*: Late corn injured severely by drought. *Kemper*: Badly injured by drought. *Lincoln*: Bad stand and injured since by drought. *Smith*: Late crops dried up; early crops good. *Yalobusha*: Shortened by drought, grasshoppers, and worms. *De Soto*: Acreage increased and condition good. *Lee*: Acreage increased 20 per cent.; great injury from drought. *Winston*: Greatly injured by drought and hail-storms. *Rankin*: Greatly varied in character.

LOUISIANA.—*East Feliciana*: Short. *Franklin*: Late corn severely injured by cut-worms and drought. *Madison*: Greatly improved within ten days. *Moorhouse*: Disastrous five weeks' drought. *Richland*: Late corn mostly a failure through drought; heat almost unparalleled. *Carroll*: Late corn nothing; early not much. *Assumption*: Suffered from early rain, but has wonderfully recovered. *Jackson*: Late plantings injured by drought. *Claiborne*: A failure. *Concordia*: A failure. *La Fourche*: Short. *Rapides*: About average.

TEXAS.—*Shelby*: Shortened by drought. *Waller*: Severely injured by drought. *San Jacinto*: Better than for several years. *Bosque*: Shortened by drought 30 per cent. *Dallas*: Prospects for an extra crop cut off by drought; temperature over 100° Fah. in the shade for thirty days; yield will be sufficient for home consumption. *Fannin*: Light on sandy soil; fair on black land. *Goliad*: Shortened by drought on uplands; full average on bottoms. *Kendall*: Yield very large. *Liberty*: Good. *Marion*: Corn made before the drought is very heavy; freedmen's crops will not average a bushel per acre. *Palo Pinto*: Half crop. *Parker*: A little better than last year. *Titus*: Some full crops, but the general average short. *Upshur*: Better than last year, though injured by drought. *Williamson*: One-third of the crops full average; the rest half average. *Wood*: Somewhat shortened by drought, but sound. *Hunt*: No rain since May 20; half crop. *Comanche*: Cut short; no rain since July 1. *Cooke*: Ruined by drought; half a crop. *Ellis*: Not so good as was anticipated. *Grayson*: No rain in eight weeks; early corn will make thirty bushels per acre; late corn scarcely any. *Harris*: Supply abundant; selling at 50 cents per barrel in the husk. *Medina*: Dried up; late plantings failed. *Cherokee*: Drought ruined late corn; Pennsylvania White harvested a good crop. *Hood*: Enough for home consumption. *Fayette*: Drought. *Gonzales*: Crop made before the drought. *Houston*: Ruined by drought; no rain from May 1.

ARKANSAS.—*Baxter*: Cut down to a fourth of a crop by extreme drought. *Cross*: Drought. *Franklin*: Drought. *Craighead*: Drought. *Dallas*: Terrible drought; no corn or mast; many will suffer for food. *Garland*: Many farmers have not raised a single ear of corn, most having to cut down the green fodder for feed. *Hempstead*: Fields vary from full average to two bushels per acre. Last general rains May 12. *Randolph*: Destructive drought. *Crittenden*: Drought. *Independence*: Early planting will make from ten to forty bushels per acre, but three-fourths of the crop was late planted and will not average five bushels. *Izard*: Half crop; drought. *Jackson*: Drought for two and a half months; many farmers will suffer for food themselves as well as their stock. *Jefferson*: Ruined by drought. *Monroe*: Disastrous drought. *Crawford*: Tolerable in hollows; almost ruined by drought on some uplands. *La Fayette*: Half crop; drought. *Scott*: Drought. *Washington*: Upland crops failed entirely; lowlands, half a crop. *Ashley*: Terrible drought. *Arkansas*: Many fields burnt up. *Benton*: Exceedingly dry. *Pulaski*: Total failure on uplands; lowlands, a half crop. *Carroll*: Short. *Fulton*: Withering drought and hot winds. *Prairie*: Devastating drought; many will not raise their own bread. *Woodruff*: Half crop. *Sharp*: Cooked by hot winds.

TENNESSEE.—*Bledsoe*: Late corn will be full average in spite of drought. *Bradley*: Badly damaged by drought and grasshoppers. *Carter*: Injured by drought. *Greene*: Promising. *Hardin*: Suffered greatly from drought, but late corn bids fair; some early plantings will not bring a bushel per acre. *Warren*: Badly injured by a thunder-storm August 29. *Washington*: Very late, but much improved by recent rains. *Campbell*: Late plantings injured by grasshoppers. *Lawrence*: Unprecedented drought. *Cheatham*: Materially affected by drought; late plantings badly affected by army-worms. *Coffee*: Will come nearer an average than any county in Middle Tennessee. *Decatur*: Short from drought. *Dyer*: Shortened two-thirds by drought. *Lincoln*: In many places almost a total failure. *Madison*: No rain to wet the ground from April 25 to August 22; no feed for hogs. *Rhea*: Injured by grasshoppers and high winds; late corn doing well. *Macon*: Late rains brought out the corn considerably. *Grain-ger*: Mostly late planted and caught by the drought, but has greatly improved with late rains. *McMinn*: Improved by late rains, but still light. *Williamson*: Will average two and a half barrels per acre. *Dickson*: Very little rain since corn planting. *Gibson*: Late crops destroyed except on bottom lands. *Monroe*: Cut off by drought; fine rains benefiting late plantings. *Sullivan*: Greatly improved; abundant rains. *Giles*: Cut down half by drought; good only on clover lands. *Putnam*: Rescued by late rains and doing finely. *Sevier*: Improved wonderfully since the drought; a full average.

WEST VIRGINIA.—*Braxton*: Above average in quantity and quality. *Mercer*:

Greatly improved by August rains. *Monroe*: Greatly improved. *Preston*: Short. *Jefferson*: Drought has cut down the crop 40 per cent.; backward. *Grant*: Some complaints of chinchies; the crop, being late, will depend on the nearness of frosts. *Cabell*: Brought out finely by late rains. *Boone*: Fine rains have improved the crop beyond all expectations. *Harrison*: Brought out surprisingly by the late rains.

KENTUCKY.—*Shelby*: Some parts of the county have good corn weather and others very poor. *Clarke*: Suffering from drought. *Daviess*: Failed to get in crops on overflowed bottoms, yet the crop of the county will be 50 per cent. greater than last year. *Hardin*: Improved to half a crop. *Lewis*: Late rains brought the crop to full average. *Lavel*: Recent rains bringing out the crops. *Harrison*: Short through drought and ravages of the chinch-bug. *Gallatin*: Greatly improved by recent rains. *Nicholas*: Shortened by drought. *Oldham*: Poor stand and suffering for rain. *Mercer*: Late plantings filling out, bringing the crop to average. *Boyle*: Improved by late rains. *Lincoln*: Growing finely, but in danger of early frost. *McLean*: Wonderfully improved by late rains. *Taylor*: Drought from May 1 to the middle of August. *Breckenridge*: Materially improved by late rains; crop bids fair. *Grayson*: Fine season since July 15; crop has come out wonderfully. *Graves*: Greatly improved by late rains. *Logan*: Late rains too late for corn. *Russell*: August fine for corn, which, however, is fifteen days late; will make two-thirds of a crop. *Livingston*: Rains too late to save early plantings; chinchies injurious in places. *Greenup*: Seasonable rains. *Clinton*: Good crop. *Edmonson*: Improved 50 per cent. since August 1. *Ohio*: Small stalk but unexpectedly fine earing. *Owsley*: Crops greatly shortened by drought; rain too late for early plantings. *Mason*: Late plantings greatly shortened.

OHIO.—*Harrison*: Improved by late rains. *Williams*: Very good; a third more planted than usual on account of the clover freezing out. *Scioto*: Backward; injured by local storms. *Crawford*: Splendid crop for quantity and quality. *Van Wert*: Fine rains for late corn. *Ashland*: Promising, in spite of drought. *Hancock*: Largest crop we have ever had, though shortened by drought. Farmers making arrangements to winter thousands of dairy cows. *Pickaway*: Cut down half, by drought extending from April 25. *Stark*: Drought. *Ottawa*: Severe drought. *Athens*: Wonderful growth in six weeks. *Belmont*: Weather fine, and growing. *Licking*: Growing finely. *Medina*: Suffering from drought, especially late planted; ears not filling well. *Meigs*: Coming out finely from late rains. *Adams*: Shortened by drought. *Perry*: Late corn greatly improved by late showers. *Washington*: Poor stand, and may not mature before frost.

MICHIGAN.—*Charlevoix*: Drought. *Kalamazoo*: Not earing well; injured by drought. *Hillsdale*: Badly injured by drought. *Berrien*: Cut off one-fourth by drought. *Lena-see*: Much shortened by drought. *Montcalm*: Very dry. *Saint Joseph*: Injurious drought. *Branch*: Not over a third of a crop on sandy soils; on timbered land, very good. *Calhoun*: Seriously injured by drought and heat. *Wayne*: Fine, where not injured by hail. *Tuscola*: Somewhat shortened by drought. *Shiawassee*: Injured by extreme drought of six weeks. *Cass*: Poor, but improved by late rains.

INDIANA.—*Cass*: Shortened one-fourth by drought. *Clay*: Good season. *Hamilton*: Good average, in spite of drought and chinchies. *Martin*: Benefited by recent rains, especially late plantings. *Shelby*: Drought. *Washington*: Shortened by drought. *Warren*: Drought. *Kosciusko*: Cut short 30 per cent. by August drought. *Noble*: Greatly injured by drought. *Steuben*: Injured by drought; half crop. *Howard*: Never so fine; mostly out of danger. *Posey*: Greatly improved by late rains. *Madison*: Fine season. *Huntington*: Improved by late rains; some grub-worms. *Fountain*: Shortened one-fourth by drought. *Fayette*: Slightly injured by drought and chinchies. *Elkhart*: Unparalleled drought; crop shortened 30 per cent. *Decatur*: Drought and chinchies. *Perry*: Very poor. *Crawford*: Part of the county suffered from drought; the remainder reaches average. *Carroll*: Some crops injured by chinchies. *Pike*: Prospect very good; fine rain of late. *Ripley*: If frost keeps off three weeks the yield will be fair. *Wabash*: Shortened by drought and chinchies. *Fulton*: Shortened by drought. *Morgan*: Drought cut down the crop to average. *Whitley*: Good crop. *Union*: Very much shortened by drought. *Franklin*: Short in quantity and weight. *Lawrence*: Drought. *Marion*: Above average, and out of danger. *Marshall*: Shortened by drought.

ILLINOIS.—*Washington*: Badly injured by chinchies. *Johnson*: Drought. *Logan*: Rains too late to save the crop. *Livingston*: Severe drought; stock fed on corn-fodder for a month. *Sangamon*: Chinchies destructive. *Winnebago*: Half a crop; scorching south winds. *Lee*: About 92,000 acres in corn, averaging 28 bushels per acre, and aggregating 2,375,000, of which 1,887,000 will be available for export. *Alexander*: Injured by chinchies. *Henderson*: Fine prospect injured by drought within the last week. *Perry*: Ruined by drought and chinchies. *Effingham*: Half crop; drought and chinchies. *Fayette*: Hardly half a crop; drought and chinchies; late crops have fine rains. *Tazewell*: Fine growing rains. *Macon*: Better than common, excepting a few fields eaten by bugs. *Jackson*: Upland corn badly damaged by chinchies; bottoms escaped. *Clay*: Injured seriously by drought and chinchies. *Wayne*: Improved by late fine rains. *Iroquois*: Cut short one-half by drought. *Whiteside*: Somewhat fired at the roots.

*Madison*: Suffering from chinchos. *Moultrie*: Average. *Carroll*: Continued drought. *Clinton*: Taken by chinchos. *Shelby*: Materially injured by drought and chinchos; fine rains too late for corn. *Vermilion*: Shortened a third by drought. *St. Clair*: Second attack of chinchos very destructive. *White*: Crop unparalleled but for chinchos. *Henry*: Shortened greatly by drought. *Randolph*: Destroyed mostly by chinch-bugs. *Cass*: Shortened a fourth by drought and chinchos. *Ford*: Half eaten by chinchos. *Ogle*: Light through drought. *McLean*: Greatly improved, but short. *Hancock*: Some injury from chinchos; abundant rains during summer. *Mason*: Suffered severely from drought and chinchos. *Pratt*: Drought and chinchos.

WISCONSIN.—*Sauk*: Ten per cent. eaten by chinchos; injured by drought. *Fond du Lac*: Earing poorly on account of drought. *Juneau*: Good in spite of drought; no rain for two months. *Columbia*: Shortened by drought and chinchos. *Jackson*: Full average. *Pierce*: Drought. *Jefferson*: Drought and chinchos. *Richland*: Late plantings badly hurt by drought. *Outagamie*: Rains too late.

MINNESOTA.—*Mower*: Unusually good. *Nicollet*: Injured by grasshoppers. *Steele*: Fully matured. *Blue Earth*: Increased acreage, but yield reduced to average by drought and grasshoppers.

IOWA.—*Chickasaw*: Late rains may bring the crop to average. *Dallas*: Ears small, but abundant. *Des Moines*: Injured by larvae of the May beetle. *Henry*: Acreage 10 per cent. increase; average crop. Late copious rains. *Story*: Shortened by drought 20 per cent. *Polk*: Shortened by drought; favorable weather for maturing the crop. *Appanoose*: Saved by timely rains; crop ungathered selling to feeders from the grasshopper regions of Nebraska at \$10 to \$12 per acre on the stalk. *Emmet*: Destroyed by grasshoppers. *Jackson*: Shortened by drought. *Cass*: Largest crop ever raised; ten days will save it from frost. *Mitchell*: Splendid crops where well cultivated. *Montgomery*: Injured by drought. *Pocahontas*: Much improved. *Van Buren*: Fine growing rains. *Woodbury*: Shortened 20 per cent. by grasshoppers. *Washington*: Greatly affected by drought. *Howard*: Almost out of danger. *Audubon*: Plenty of rain in August; crop heavy. *Buchanan*: Fair average in spite of drought. *Decatur*: Best crop for many years. *Delaware*: Suffering. *Harrison*: Badly injured by grasshoppers. *Tama*: Driest season since the county was settled. *Pottawattomie*: Late plantings suffering from drought.

MISSOURI.—*Texas*: No rain for seven weeks; will not reach 7 bushels per acre. A hot southwest wind is doing more damage than the drought; thermometer at 107° in the shade for six days. *Baxter*: Crop worth nothing; our people must suffer terribly; nothing to feed stock with; drought terribly destructive. *Chariton*: Suffered severely from drought. *Jefferson*: No rain for five weeks. *Oregon*: Ruined by drought and chinchos; no rain for ten weeks. *Polk*: Ruined by drought and chinchos; worst outlook ever known. *Christian*: Ruined by drought. *Crawford*: Ruined by drought and chinchos. *Caldwell*: A third of a crop; much being cut for fodder. *Platte*: Crop now being cut to avoid grasshoppers; terrible drought. *Putnam*: Prospects mostly fine; drought injurious in some parts. *Saint Genevieve*: Excessive drought at last broken by abundant rains. *Clinton*: Hot southwest winds blasted some spots of corn. *Douglas*: Cut down half by drought and chinchos. *Ray*: Seriously injured by protracted drought. *Bates*: Terrible drought; ruined the crops. *Daviess*: Drought cut down the crop to 25 per cent. *De Kalb*: Injured by drought and chinchos; a third of a crop. *Moniteau*: A fourth of a crop; drought and hot winds. *Montgomery*: A few crops taken by grub-worms and a few by grasshoppers. *Newton*: Reduced to a lower figure than was ever before known by drought and chinchos. *Ralls*: Better than for many years; rain abundant and seasonable; chinchos did little damage. *Ripley*: Dried up by hot, burning atmosphere; yellow field-corn from the Department matured two or three weeks earlier than common sorts. *Vernon*: Injured severely by drought and chinchos; not half a crop. *Shelby*: Suffered from drought and chinchos. *Morgan*: Chinchos destructive. *McDonald*: An entire failure in many places. *Phelps*: Nearly ruined by six weeks of drought. *Pettis*: Reduced by drought and chinchos to an average of 4 bushels per acre. *Johnson*: Almost a total failure, through drought and chinchos. *Cass*: Will average 5 bushels, leaving out some neighborhoods favored with good rains. *Dallas*: Destroyed by drought and chinchos. *Taney*: Will not average 10 bushels per acre; late plantings scarce worth gathering. *Benton*: Drought and chinchos. *Grundy*: Nearly ruined by drought and chinchos. *Cole*: Upland crops scorched.

KANSAS.—*Jefferson*: A fourth of a crop; drought, chinchos, and grasshoppers. *Morris*: Suffered severely from grasshoppers. *Cherokee*: Short through lack of cultivation, drought, and chinchos. *Franklin*: Fearfully reduced by drought, chinchos, and grasshoppers. *Nemaha*: Nearly ruined by drought and grasshoppers; not 5 bushels per acre. *Mitchell*: Ruined by grasshoppers. *Montgomery*: Not over 15 bushels per acre. *Allen*: Materially injured by millions of grasshoppers. *Smith*: Totally destroyed by grasshoppers. *Bourbon*: Injured seriously by grasshoppers, drought, and hot winds. *Douglas*: Not over one in fifty fields made any grain at all; grasshoppers took everything. *Leavenworth*: Grasshoppers and drought. *Cowley*: Destroyed by grasshoppers. *Labette*: Destroyed by drought; used only as fodder; man and beast must live on

wheat. *Neosho* : Ruined by drought, chinch, and grasshoppers. *Woodson* : Destroyed by drought on high prairies, fair average in the valleys. Pennsylvania Feld-corn from the Department a success; matures early. *Osage* : All destroyed by drought, chinch-bugs, and grasshoppers. *Republic* : The long drought proved nearly fatal, and the grasshoppers completed the destruction of the crop. *Graham* : The grasshopper army arrived about the 14th of July, and have destroyed *all* the corn. *Crawford* : So injured by drought and chinch that it will not average more than 10 bushels per acre, and that of poor quality. *Ellsworth* : Total failure; grasshoppers took it. *Greenwood* : Injured more by drought than by grasshoppers. *Pawnee* : Eaten up by grasshoppers. *Chase* : Amounts to scarcely anything; drought, chinch, and grasshoppers.

NEBRASKA.—*Boone* : Cleaned out by grasshoppers; not a bushel left. *Dixon* : Almost totally destroyed by grasshoppers. *Pawnee* : Reduced to nothing by drought, hot winds, and grasshoppers. *Merrick* : Destroyed by grasshoppers. *Lincoln* : Destroyed by grasshoppers. *Burt* : Almost a failure in the west part of the county, owing to drought and grasshoppers. Totally destroyed by grasshoppers except a few pieces. *Gage* : Destroyed by grasshoppers. *Otoe* : Cut very short by drought.

CALIFORNIA.—*Sacramento* : Cultivated only in the bottoms; season favorable, and yield good.

### WHEAT.

The average condition of the wheat-crop of the United States, as shown by our September returns, is 93, or 2 per cent. less than the average of September, 1873. The increased acreage, however, amounting to 7 per cent., raises the prospective yield to nearly average upon last year's acreage. The September averages of the different States for 1873 and 1874 are shown in the following table :

States.	September, 1873.	September, 1874.	States.	September, 1873.	September, 1874.
Maine .....	83	100	Louisiana .....	.....	.....
New Hampshire .....	95	103	Texas .....	85	79
Vermont .....	96	106	Arkansas .....	95	120
Massachusetts .....	102	101	Tennessee .....	78	104
Rhode Island .....	.....	.....	West Virginia .....	91	111
Connecticut .....	104	103	Kentucky .....	85	112
New York .....	72	106	Ohio .....	97	109
New Jersey .....	105	101	Michigan .....	96	104
Pennsylvania .....	102	103	Indiana .....	84	104
Delaware .....	85	100	Illinois .....	93	98
Maryland .....	96	96	Wisconsin .....	107	77
Virginia .....	82	88	Minnesota .....	109	86
North Carolina .....	82	92	Iowa .....	100	96
South Carolina .....	75	83	Missouri .....	100	104
Georgia .....	75	98	Kansas .....	100	89
Florida .....	.....	.....	Nebraska .....	107	91
Alabama .....	85	101	California .....	92	104
Mississippi .....	90	94	Oregon .....	107	103

Rhode Island, Florida, and Louisiana make no return of wheat-culture, as well as a large number of counties in the Southern States. The total number of counties reporting this crop is 960; of these 383 are above average, 294 average, and 283 below average. The following table shows the number of each class of counties in each of the different sections of the Union :

States.	Counties above average.	Counties average.	Counties below average.	Total.
New England States .....	16	15	6	37
Middle States .....	33	46	9	88
South Atlantic States .....	47	44	75	166
Gulf States .....	10	15	27	52
Southern inland States .....	94	34	17	145
States north of the Ohio .....	106	70	58	234
States west of the Mississippi .....	64	59	84	207
Pacific States .....	13	11	7	31
Total .....	383	294	283	960



The New England and Middle States are all above average except Delaware, which, however, is full average. In several counties the yield is beyond any crop for twenty years. In Schuyler County, New York, the Seneca white or Clawson wheat averaged 40 bushels per acre. All of the South Atlantic and Gulf States are below average except Alabama, 101. In Maryland the crop was damaged by intense heat in some counties. One farmer in Frederick averaged 42½ bushels per acre of Fultz wheat. In Virginia the majority of the counties report unfavorable conditions of growth. Here the chinch, which for many years has not troubled the farmer, re-appeared in several counties. Parching weather in June, and subsequent rains, producing rust, are also alleged as causes of decline. The Fultz wheat is well reported in several counties. In Craig County, Touzelle yielded 29-fold, while in Powhatan it is pronounced unadapted to the soil and climate. In North Carolina, in spite of some unfavorable circumstances, the condition is 10 per cent. better than in September, 1873. The Fultz wheat here also gives satisfaction. Georgia comes nearly up to average, and is 13 per cent. better than at this time last year. Excess of rain is reported in some counties, but in others the failure may be clearly laid to improvident selection of lands and injudicious culture. The crop of Alabama is quite satisfactory; Mississippi is better than this time last year. In Texas the rust is the leading complaint. This, with other drawbacks, made the condition less promising than in September, 1873. Arkansas presents the highest condition of all the States—120. The drought, so fatal to other crops, seems to have favored the ripening and harvest of wheat. Tennessee, West Virginia, and Kentucky also present very fine crops to encourage the farmer for the great loss inflicted upon him in the other crops. In the subjoined notes will be found notices of several very successful experiments with Fultz, Tappahannock, and Touzelle wheats, some of them on a large scale.

North of the Ohio River those counties not infested with chinch generally report very superior crops. Ohio, Indiana, and Michigan, scarcely, if at all, troubled with this pest, are all above average. It cut down the crop of Illinois 2 per cent. below average. Injudicious culture is complained of in some quarters. In Wisconsin this insect enemy, together with intense heat and other causes, cut down the crop 23 per cent. below average. The Fultz and Tappahannock varieties have been satisfactorily tested in several counties of these States.

West of the Mississippi the crop is below average in all the States except Missouri. Drought, heat, grasshoppers, and chinch have not only cut down general averages, but have inflicted severe injury in numerous localities. The heaviest loss has fallen upon spring wheat. Both the Pacific States are above average. In Sutter County, California, summer fallow-wheat averaged 30 bushels per acre; some fields reaching 56. An increased use of steam thrashing-apparatus is noted. In Oregon, excessive rain and hail storms injured many fields, yet the general condition is above average.

MAINE.—*Penobscot*: Greatly improved by rains in July. *Aroostook*: Never more promising. *York*: Grain full and plump. *Oxford*: Growth good, but injured by rain in harvest.

NEW HAMPSHIRE.—*Carroll*: A failure on many farms.

NEW YORK.—*Wyoming*: Oron spring wheat from the Department a failure; but few heads matured; crop darker than the seed, which must have been bleached. *Albany*: Fair. *Genesee*: Wheat full average, and of good quality. *Schuyler*: Best crop in twenty years; Seneca white or Clawson variety has averaged 40 bushels per acre. *Tioga*: Never harvested in finer condition.

NEW JERSEY.—*Warren*: Grain plump, fine, and of good weight.

PENNSYLVANIA.—*Clearfield*: Shortened by extreme hot weather in July. *Northampton*: Yield very good; 7 bushels per 100 sheaves; grain full, sound, and heavy. *Snyder*: Very good. *York*: Injured by a worm; the second year it has infested the county. *Indiana*: Superior quality; well secured. *Bucks*: Not so heavy as was expected. *Lancaster*: Very good.

MARYLAND.—*Frederick*: Injured by extreme heat just before harvest. One farmer reports a yield of 42½ bushels of Fultz wheat per acre; no fertilizers used. *Wicomico*: Fair yield. *Baltimore*: Good; averages from 10 to 25 bushels per acre.

VIRGINIA.—*Bedford*: Not turning out as well as was expected. *Fluvanna*: Yield one-third short. *Frederick*: Two quarts of Fultz from the Department, three years ago, have this year yielded over 400 bushels of excellent grain. This variety averages from 20 to 30 bushels per acre, while other varieties only yield from 10 to 15 bushels. *Middlesex*: A failure. *Powhatan*: Tappahannock from the Department yielded 16-fold; *Touzelle* not adapted to the climate or soil. *Pulaski*: Damaged by rain in the stack. *Prince William*: Crop inferior, but well secured. *Tazewell*: Turning out well. *Essex*: Injured by rust and parched in June. *Henrico*: Turned out very badly. *King and Queen*: Badly injured by rust just before harvest. *Charles City*: Threshed out only a half crop. *Chesterfield*: Very poor; brings from 80 cents to \$1.45 per bushel. *Floyd*: Fultz wheat does finely. *Amelia*: Half average; Fultz the best of all. *Craig*: Two quarts of *Touzelle* sown on thin land with a light top-dressing of manure yielded 58 quarts, or 29-fold. *Loudoun*: Chinchies injured the crop. *Madison*: Rusted, but secured in good condition. *Augusta*: Threshed out poorly. *Lunenburg*: Below average.

NORTH CAROLINA.—*Forsyth*: Best crop in eight years. *Alamance*: Heavy strawed; grain-yield three-fourths average. *Anson*: Full average. *Greene*: Very good. *Rockingham*: A quart of white winter-wheat from the Department yielded 40-fold; a quart of winter-rye, 48-fold. *Stanly*: All crops light, except the Tappahannock and Fultz, especially the latter. Native seed contaminated with smut.

GEORGIA.—*Fannin*: More wheat raised than ever before. *Sumter*: Thrashed out poorly; slovenly culture and injudicious selection of lands. *Cobb*: Over average. *Jefferson*: Injured by excess of rain.

ALABAMA.—*Jackson*: The Tappannock wheat yielded three times as much as the common variety; *Touzelle* has done no good. *Calhoun*: Good, but damaged by rain in the stack.

MISSISSIPPI.—*Winston*: A quart of Tappahannock from the Department, in spite of rust, yielded 3 pecks of wheat.

TEXAS.—*Upshur*: Ruined by rust. *Titus*: Badly rusted. *Dallas*: Yield 15 bushels per acre, berry fine, and flour good. *Uvalde*: Talavera wheat from the Department has failed after three years' trial, through rust. It is not suited to the climate.

ARKANSAS.—*Crawford*: A quart of *Touzelle* from the Department yielded 32-fold; ordinary varieties yield but 12-fold. *Arkansas*: A good average; well secured. *Newton*: Fultz and Tappahannock just what we want.

TENNESSEE.—*Washington*: Injured by wet in the stack. *McMinn*: Will average 8 bushels per acre. *Williamson*: Harvested in fine order. *Monroe*: Fair crop. *Giles*: Extra yield and heavy grain. *Putnam*: Largest crop ever raised here.

WEST VIRGINIA.—*Braxton*: Recent rains will bring the crop up to average. *Mercer*: Above average in spite of midge and worms. *Monroe*: Crop heavier and better than ever before. *Putnam*: Damaged by rain in the shock. The Fultz from the Department has proved the most prolific in this region. One farmer, from 50 bushels of seed, obtained a crop of 1,800 bushels. *Harrison*: Thrashes out unusually well; some crops injured by rain in the stack.

KENTUCKY.—*Daviess*: Crop fine, averaging 20 bushels per acre, and ranging as high as 37½ bushels; grain good. *Hardin*: Only 85 cents per bushel. *Boone*: A farmer obtained 4 bushels of Tappahannock wheat from 4 quarts of seed sent by the Department. Another reports 80 pounds of *Touzelle* from 2 quarts of seed. Both experiments were tried on clay soil. *Nicholas*: Unusually good. *Lincoln*: Generally sound and good. *McLean*: Better than for years; Fultz did admirably. *Graves*: Good crop, but quality somewhat depreciated by the drought. *Russell*: A gallon of Fultz sent three years ago from the Department has this year resulted in 98 bushels. A gallon of Mediterranean winter produced 3 bushels; promises to be very fine.

OHIO.—*Coshocton*: Crop larger, better, and better secured than for many years. Fultz better and more abundant than any other variety. *Ashland*: Abundant and extra fine. *Morgan*: Largest and best crop for many years; Fultz from the Department is the best; Tappahannock not quite so good. *Ross*: Splendid crop. *Columbiana*: Very fine.

MICHIGAN.—*Berrien*: Fair. *Branch*: Full average and fair. *Tuscola*: Great variation of yield and quality.

INDIANA.—Never larger or finer; average from 20 to 40 bushels per acre. *Steuben*: Partly recovered from winter freezing; well secured. *Howard*: Fine yield in spite of winter-killing. *Madison*: Fine. *Fountain*: Good. *Fayette*: Good quality. *Crawford*:

Abundant and good. *Carroll*: Injured some by chinchcs. *Pike*: Quantity and quality never better.

ILLINOIS.—*Menard*: Chinchcs injurious. *Sangamon*: Excellent; yield varies from 5 to 35 bushels per acre. *Winnebago*: Half a crop; scorched by south winds. *Lee*: About 30,000 acres in wheat, averaging 13 bushels per acre, with a total yield of 390,000; of this amount 237,500 will be available for export. *Alexander*: Better than ever known; fields average from 22 to 34 bushels per acre. *Jackson*: Good average; commands 90 cents to \$1.05 per bushel. *Wabash*: Fultz wheat, from the Department, is yielding very satisfactorily. The wheat-crop generally is very large; large fields have averaged from 35 to 42 bushels per acre; county average, 20 bushels. *Cumberland*: Good. *Edwards*: Damaged by rain in the stack. *Carroll*: Yield and quality good; price 80 cents per bushel. *Saint Clair*: Splendid where well cultivated; one farmer averaged 37½ bushels per acre. *Massac*: Late wheat injured by chinchcs. *White*: Crop unparalleled but for chinchcs. *Macon*: Spring-wheat poor; fall-wheat did well; Tappahannock the best.

WISCONSIN.—*Sauk*: Reduced by intense heat and chinchcs. *Adams*: Ten per cent. short, but of good quality. *Fond du Lac*: Considerably shrunken. *Juncieu*: Yield from 3 to 6 bushels per acre. *Jackson*: Third of a crop.

MINNESOTA.—*McLeod*: Spring-wheat poorly filled on account of extreme heat following wet weather. *Mower*: Short, but of excellent quality. *Nicollet*: Injured by grasshoppers; Nicollet Township averages 10 bushels per acre. *Sibley*: Injured by drought, heat, and grasshoppers. *Winona*: Odessa wheat entirely failed. Wheat-crop averages 14 bushels per acre, ranging up to 30. *Steele*: Fine harvest weather; crop thinned by drought during stooling; berry fair size and sound; yield ranging from 14 to 30 bushels per acre. *Blue Earth*: Injured by drought and grasshoppers; quality good, except red Osaka, which rusted badly. *Pope*: Blighted by the hot sun and injured by storms. *Todd*: Seasonable rains; Oran wheat rusted. *Chippewa*: Probably injured by grasshoppers. *Stearns*: Damaged by storms in the shock. *Douglas*: Poor; unfavorable harvest-weather. *Swift*: Extreme heat prevented heads from filling. *Buchanan*: Harvested in good condition; good quality.

IOWA.—*Chickasaw*: Spring-wheat abundant and excellent. *Dallas*: Unusually good quality. *Des Moines*: Ripened too rapidly on account of the intense heat. *Lee*: Winter-wheat greatly damaged by rust and chinchcs; spring-wheat a complete failure. *Story*: Better than ever before; averages 18 bushels per acre. *Calhoun*: Would have been average but for grasshoppers. *Polk*: Both winter and spring-wheat above average. *Emmet*: Destroyed by grasshoppers. *Jackson*: Good grain but diminished yield. *Cass*: Average 20 bushels per acre; very full and plump; well secured. *Mitchell*: Fair; Odessa a failure. *Woodbury*: Shortened 25 per cent. by drought and grasshoppers. *Howard*: Averages 10 or 12 bushels per acre. *Harrison*: Half eaten by grasshoppers.

MISSOURI.—*Jefferson*: Average 15 bushels per acre on uplands and 25 bushels on lowlands. *Platte*: Sells at \$1 per bushel. *Douglas*: Wheat never better; Fultz and Tappahannock, from the Department, average about 25 bushels per acre. *Daviess*: Good and well secured. *Newton*: Twenty per cent. above average. *Vernon*: Half crop. *Douglas*: Fair crop. *Cowley*: Very good; 20 bushels per acre. *Pulaski*: Best crop for years; 12 to 30 bushels per acre.

KANSAS.—*Woodson*: Almost totally eaten by chinchcs. *Osage*: Excellent where not injured by chinch-bugs. *Republic*: Winter-wheat a good crop; early-sown spring-wheat good. *Barton*: Winter-wheat very good; spring shortened by drought.

NEBRASKA.—*Boone*: Badly swept by grasshoppers. *Dawson*: First quality.

CALIFORNIA.—*Stanislaus*: Disappoints expectations; not over 10 bushels per acre average yield. *Sutter*: Volunteer wheat averaged 8 bushels per acre; summer-fallow averaged 30 bushels and reached 56 bushels per acre. *Santa Clara*: Prices reduced about 5 per cent. *San Joaquin*: Splendid harvest; straw well developed and grain good; most of the threshing done by steam-power. *Mendocino*: Abundant; grain-hay is also abundant. *Placer*: Crop light but very good. *Sonoma*: Grain full, plump, and clean. *Alameda*: Farmers sell only as their necessities compel them at present prices.

OREGON.—*Clatsop*: Damaged by rain in the shock. *Clackamas*: Excellent everywhere. *Grant*: Badly injured by hail-storms. *Umatilla*: Averages 20 to 40 bushels per acre.

## OATS.

In New England the crop is unusually good. Maine, from which every county reports, returns an average condition of 104; New Hampshire, 105; Vermont, 110; Massachusetts and Connecticut, 103; Rhode Island, 100. Minnesota and California return 103. All other States fall

below average, ranging from 99 in Oregon to 47 in Kentucky. The reported causes of reduced condition are: New York, 88, drought and rust; New Jersey, 72, rust; Pennsylvania, 82, drought and grasshoppers. Throughout the South Atlantic and Gulf States both drought and rust have extensively prevailed. The same is true of Arkansas, Missouri, Tennessee, and Kentucky. In the other States west of the Mississippi grasshoppers have been very destructive on oats as on other crops. Chinchies have also done extensive injury in large areas of both the Mississippi and Ohio Valleys. Drought united with chinchies to reduce the crop in Wisconsin, 83. The average for the country is a condition of 86.

MAINE.—*Penobscot*: Greatly improved by rains of July. *Aroostook*: Never more promising. *Husketts*: Best crop for years. *Oxford*: Not well filled.

MASSACHUSETTS.—*Berkshire*: Heavy crop.

NEW YORK.—*Otsego*: Best crop for years. *Wyoming*: Early fallow oats later than the Brunswick, but have done well. *Albany*: Rust in some places. *Queens*: Reduced by drought. *Washington*: Growth extraordinary, but somewhat rusted. *Sullivan*: Large growth of straw, but light grain.

NEW JERSEY.—*Warren*: Light and somewhat rusted.

PENNSYLVANIA.—*Butler*: Very light; late-sown best. *Northampton*: Poor, *Indiana*: Half a crop; well secured. *Tioga*: Never harvested in finer condition. *Bedford*: Damaged by drought. *Lancaster*: Short in straw and light in grain. *Beaver*: Light, and badly eaten by grasshoppers. *Mifflin*: Very poor; some crops scarcely worth harvesting; some plowed under. *Armstrong*: Shortened by June drought.

MARYLAND.—*Wicomico*: Fair yield.

VIRGINIA.—*Prince William*: Quality inferior; secured in good condition. *Bedford*: Greatly damaged by drought. *Henrico*: Winter-oats good; spring-crops the lightest yet grown here. *Clarke*: Almost a failure. *Prince George*: Schonen, from the Department, a great success; exceeds all other spring varieties. *Chesterfield*: Winter or fall seeding excellent; spring seeding very poor. *Madison*: Grain small and inferior. *Page*: Almost a failure.

NORTH CAROLINA.—*Alamance*: Shortest crop of spring-oats for several years; winter-oats better than usual, but only a small crop sown. *Ashe*: Affected by drought. *Anson*: Full average. *Greene*: Two-thirds average.

GEORGIA.—*Fannin*: Oats almost a failure through rust. *Lumpkin*: Ruined by rust. *Walton*: Badly rusted. *Cobb*: Rusted. *Murray*: Cut off half by drought. *Jefferson*: Have done finely.

TEXAS.—*Upshur*: Ruined by drought. *Titus*: Red-rust proof did well; winter-sown oats about two-thirds of a crop; spring-sown destroyed. *Waldo*: White Schonen, from the Department, well adapted to soil and climate; potato oats improve as they become acclimated.

ARKANSAS.—*Baxter*: Shortened by drought. *Randolph*: Destructive drought. *Crawford*: Ruined by rust. *Arkansas*: Good. *Carroll*: Short. *Dorsey*: Half crop; drought of ninety days.

TENNESSEE.—*Granger*: Half crop. *Bradley*: Spring-oats an entire failure. *Williamson*: A total failure. *Monroe*: Cut off by drought and storms. *Giles*: Almost destroyed by drought. *Putnam*: Almost a failure; few sown.

WEST VIRGINIA.—*Braxton*: Short through drought. *Mercer*: Three-fourths average; Schonen the best. *Monroe*: Third of a crop. *Preston*: Short. *Doddridge*: Injured by drought. *Grant*: Injured by chinchies. *Boone*: Harvested in good condition.

KENTUCKY.—*Boone*: A farmer obtained 3 bushels of Somerset oats from 4 quarts of seed furnished by the Department; sown on clay soil. *Nicholas*: Very light. *Oldham*: Failed. *Lincoln*: Almost a failure—only half the area harvested. *McLean*: Almost a failure. *Ohio*: Injured by drought.

OHIO.—*Williams*: Very good. *Ashland*: Very poor. *Hamilton*: Partial failure; drought and chinch. *Ross*: Shortened by drought. *Columbiana*: Very short and poor. *Gauga*: Shortened by drought.

MICHIGAN.—*Shiawassee*: Yield light; quality good. *Hillsdale*: Badly injured by drought. *Livingston*: Light through drought. *Menomonee*: Some damage from grasshoppers. *Wayne*: Fine where not injured by hail.

INDIANA.—*Dearborn*: Ruined by drought. *Steuben*: Generally good. *Huntington*: Very heavy. *Decatur*: Drought and chinchies. *Pike*: Too low to be cut. *Franklin*: Very light.

ILLINOIS.—*Menard*: Injured by chinchies. *Sangamon*: Short. *Winnebago*: Scorched by south winds. *Lee*: About 30,500 acres, averaging 30 bushels per acre; total, 901,350 bushels, of which 235,350 will be available for export. *Alexander*: Injured by chinchies. *Perry*: Ruined by drought and chinchies. *De Kalb*: Below average. *Cumberland*:

Light, owing to late seeding and drought. *Massac* : Injured by drought and chinchés. *Randolph* : Short and thin ; only one-third of the crop was cut. *Cass* : Chinchés.

WISCONSIN.—*Jackson* : Half crop. *Clark* : Fast maturing ; no frost yet. *Jefferson* : Drought and chinchés. *Richland* : Light.

MINNESOTA.—*Nicollet* : Grasshoppers reduced the yield to 15 bushels per acre. *Sibley* : Destroyed by grasshoppers. *Blue Earth* : Very light ; injured by grasshoppers. *Todd* : Seasonable rains. *Jackson* : What the grasshoppers left bids fair.

IOWA.—*Chickasaw* : Splendid crop and in good condition. *Polk* : Good yield and quality. *Mitchell* : Good. *Woodbury* : Somerset oats, from Department, of light weight and poor quality ; will not weigh over 20 pounds per bushel. *Howard* : Heavy and good. *Buchanan* : Good, but short.

MISSOURI.—*Ray* : Seriously injured by protracted drought. *Newton* : Half crop and light weight. *Vernon* : Half crop. *Douglas* : Small crop saved. *Johnson* : Straw short, heads light.

KANSAS.—*Osage* : Eaten by chinchés. *Republic* : Early sown very good ; late, about one-third of a crop. *Burton* : Shortened by drought.

## RYE.

The average condition of rye is 92. It is above average in all of the New England and Middle States except Vermont and Pennsylvania. It is below average in all the Southern States except Maryland, Georgia, Florida, Tennessee, West Virginia, and Kentucky. In Ohio and California it is full average, and in all the other States below. In the Eastern States generally it appears to have enjoyed favorable conditions of growth, and also in the Southern inland States. West of the Mississippi it suffered from drought and insect-ravages. It is very little cultivated in the Gulf States.

## BARLEY.

Barley averages 92 per cent. of a full crop. Very little is raised south of Kentucky, where it is above average. In the New England and Middle States it is about average. In the Northwest it is about 90 per cent., and on the Pacific coast a little above average. The late crops in the Northwest were injured by drought and insects.

## BUCKWHEAT.

This crop is below average in all the States except Vermont, Massachusetts, and Connecticut. In New England it is about average on the whole. In the Middle States it is about 92. Considerable quantities are grown in West Virginia and Tennessee, but in the other Southern States its culture is insignificant. In the Northwest the crop has nowhere been very satisfactory. In Kansas the grasshoppers reduced the average to 39.

## TOBACCO.

Our returns foreshadow that less than half a crop of tobacco will be gathered this year. The only States presenting a condition above average are Connecticut, 107, and California, 102. Wisconsin, Iowa, and Oregon are average. These five States, however, grow less than one twenty-fifth of the whole crop. Kentucky, representing about two-fifths of the tobacco-growing interest, averages but 31, a decline of 11 since the July report. Tennessee and Nebraska make a still more unfavorable return, averaging but 24 each. Kansas strikes the base-note at 20. In the South and West the prevailing drought is sufficient to account for the generally low condition, which, in connection with the reduced acreage, will warrant the low estimates received from this part of the

country. The following extracts from correspondence will show some of the local aspects of this industry. The report from Alamance, North Carolina, will excite special attention on account of its different tenor from the general mass of our reports:

CONNECTICUT.—*Hartford*: Early planted secured in fine order; late plantings require ten to fifteen days more of good weather.

MARYLAND.—*Charles*: Not half a crop planted, and much of that injured by the cold, harsh, and dry weather. *Calvert*: Suffering from drought. *Saint Mary's*: Very poor.

VIRGINIA.—*Fluvanna*: Full half short. *Orange*: Late, and threatened by frost; only early planted and well cultivated tobacco will mature. *Patrick*: Scarcely any. *Pittsylvania*: Condition somewhat improved of late; area greatly reduced. *Spottsylvania*: Hardly a fourth of last year's acreage, and less promising. *Caroline*: Almost a failure. *Halifax*: Smallest crop for years, and badly injured by horn-worms. *Henry*: From one-fourth to one-third average; fair proportion of fine leaf if the season is good. *Mecklenburgh*: Drought and tobacco-worms injurious, the latter more numerous than for many years. *Buckingham*: With late frosts the crop may be one-third of an average. *Campbell*: Backward and unpromising. *Chesterfield*: Only a half crop planted; looks well. *Amelia*: Almost a total failure from want of plants and ravages of the fly. *Louisa*: Greatly reduced by drought and flies. *Madison*: Good when a stand was secured early; late plantings small; crop about half. *Bath*: Two-thirds of a crop.

NORTH CAROLINA.—*Alamance*: The northern portion of Alamance County is one of the finest tobacco regions in the State, though until the last few years it was not fully realized. In all the tobacco sales which have been held of late in Danville, Va., and when premiums have been offered, Alamance farmers have taken the prize. In one township, Pleasant Grove Township, which lies in the northeastern part of the county, there has been \$75,000 worth of tobacco sold of last year's crop, and some yet to sell. Some farmers have made from \$500 to \$1,000 per hand, after paying all expenses. *Caswell*: Scarce half a crop standing; with an ordinary season much of that will not mature. *Person*: Half a crop planted; unusually fine.

TEXAS.—*Titus*: Plant-beds failed.

ARKANSAS.—*Washington*: Half a crop; drought.

TENNESSEE.—*Macon*: Almost a failure. *Williamson*: A failure.

KENTUCKY.—*Daviess*: About one-tenth of a crop; looking well, but complaints of worms are numerous. *Lewis*: A third of last year's crop. *Bracken*: No improvement; almost a total failure. *McLean*: Almost a failure; about an eighth of a crop. *Grayson*: Very little planted. *Graves*: The crop will not be over a million pounds, and that inferior, against an average of six millions. *Metcalfe*: The small crop planted is poor; too late to ripen. *Mason*: A tenth of a crop.

INDIANA.—*Pike*: Looks well, but the crop will be small.

ILLINOIS.—*Massac*: Injured by drought.

MISSOURI.—*Chariton*: Suffered severely from drought. *Shelby*: Short.

## POTATOES.

The average condition reported for the entire country is 83. In New England, where the crop has suffered scarcely any drawback, full reports return an average condition of 103. Throughout the remainder of the country, except on the Pacific slope, droughts, Colorado beetles, grasshoppers, and chinchies, either singly or conjointly, have preyed on the crop to a greater or less extent. All these have combined to reduce the condition in Kansas to 20, and in Nebraska to 24. Elsewhere, the areas over which they have severally prevailed will be sufficiently indicated by the annexed notes from correspondents. The prevalence of rot is only noted in Otsego, New York. In the Middle States, except New York, ravages by the Colorados have been more extensive than heretofore.

MAINE.—*Penobscot*: Greatly improved by July rains. *Oxford*: Two weeks late. *Sagadahoc*: Rotting in some places. *Hancock*: Rotting.

NEW HAMPSHIRE.—*Hillsborough*: Yielding abundantly. *Grafton*: A good yield. *Sullivan*: Promising. *Cheshire*: Injured by drought.

VERMONT.—*Caledonia*: Some rot. *Franklin*: Have begun to rot.

CONNECTICUT.—*Windham*: Rotting. *New London*: Crop large, but commencing to

rot; late plantings badly eaten by worms and injured by late rains. *Litchfield*: Promising, but some varieties are rotting.

NEW YORK.—*Otsego*: Rot quite prevalent. *Albany*: Very poor. *Columbia*: Shortened by drought. *Rensselaer*: Poor crop; drought. *Genesee*: Suffering from drought. *Queens*: Improved; the new late Rose potato is highly spoken of. *Warren*: Suffering for rain. *Washington*: Drought. *Monroe*: Shortened by drought.

NEW JERSEY.—*Hudson*: Turning out well, especially Early Rose. *Gloucester*: Late white potatoes injured by Colorado beetles and drought. *Salem*: Colorado beetles very destructive. *Warren*: Shortened by drought.

PENNSYLVANIA.—*Butler*: Crops saved by fighting the worms. *Clearfield*: Seriously injured by bugs. *Franklin*: Almost destroyed by Colorado beetles. *Northampton*: Poor; drought and bugs. *Perry*: Destroyed largely by beetles. *Wayne*: Rotting. *Warren*: Colorado beetles successfully resisted; fine crop of potatoes, especially Early Rose. *Pike*: Drought. *Tioga*: Early plantings short; late ones look well. *Washington*: Badly injured by bugs and drought; poorest crop for many years. *Bedford*: First appearance of Colorado beetles; no great injury. *Bucks*: Notwithstanding the increased acreage, the drought will bring the yield down to less than average. *Lancaster*: Very much injured by bugs. *Luzerne*: Very serious drought. *Northumberland*: Shortened one-fifth by Colorado beetles. *Armstrong*: Very good where the bugs did not get at them.

DELAWARE.—*Sussex*: Greatly shortened by drought.

MARYLAND.—*Caroline*: Injured by Colorado beetles. *Dorchester*: Badly injured by Colorado bugs in some places. *Frederick*: The Colorado beetle is disappearing in some sections, but has done serious injury. *Queen Anne*: Badly injured by Colorado beetles. *Cecil*: Much injured by Colorado beetles. *Washington*: Nearly a failure through drought. *Baltimore*: Late crops injured by Colorado beetles.

VIRGINIA.—*Washington*: Poorest crop for many years. *Prince William*: Rain in time for late potatoes. *Loudoun*: Injured by Colorado beetles. *Page*: Injured by Colorado bugs.

NORTH CAROLINA.—*Beaufort*: Greatly improved by late rains. *Lincoln*: Almost an entire failure. *Greene*: Average.

GEORGIA.—*Carroll*: Never better. *Towns*: Improving rains.

ALABAMA.—*Choctaw*: Suffering for rain.

MISSISSIPPI.—*Kemper*: Badly injured by drought. *Madison*: The worst season for many years.

LOUISIANA.—*Franklin*: A good yield housed.

TEXAS.—*Wood*: Ruined by drought. *Red River*: Late reviving rains. *Dallas*: Quite a failure. *Austin*: Only early plantings will bring anything. *Cherokee*: Late rains saved half a crop.

ARKANSAS.—*Randolph*: Destructive drought. *Independence*: Nearly a failure. *Washington*: Almost a failure. *Arkansas*: Half crop.

TENNESSEE.—*Bledsoe*: Scarce through drought. *Bradley*: Ruined by drought. *Greene*: Very poor. *Blount*: Fine season. *Cheatham*: Almost a failure. *Dyer*: A complete failure. *Rhea*: Late plantings doing well. *Williamson*: A failure. *Monroe*: Early plantings ruined by drought; later ones improved by fine rains.

WEST VIRGINIA.—*Mercer*: Good. *Monroe*: Badly injured by insects. *Hardy*: Almost destroyed by Colorado beetles. *Lewis*: Shortened by drought. *Doddridge*: Early plantings injured by drought. *Boone*: Coming on finely.

KENTUCKY.—*Nicholas*: Nearly ruined by bugs. *Russell*: A failure. *Greenup*: Seasonable rains. *Owsley*: Greatly shortened by drought.

OHIO.—*Harrison*: Improved by late rains. *Crawford*: Much injured by long black beetles. *Van Wert*: Rains too late for early potatoes, but in time for late ones. *Ashland*: Promising; acreage far larger than ever before. *Ottawa*: Late plantings affected by drought; early kinds did well. *Medina*: Suffering for rain, especially late plantings. *Perry*: Bugs injured early crops. *Lucas*: Late potatoes not turning out well. *Geauga*: Late potatoes suffering for rain.

MICHIGAN.—*Charlevoix*: Suffering from drought. *Delta*: Late crops fine; earlier ones injured by bugs. *Kalamazoo*: Early crops injured by drought and bugs. *Hillsdale*: Injured by drought. *Bay*: Late potatoes injured by drought and bugs. *Berrien*: Much injured by drought. *Saint Joseph*: Shortened by the most severe drought and heat known in forty years. *Calhoun*: Drought. *Branch*: Very light. *Wayne*: Fine where not injured by hail. *Tuscola*: Fair in spite of bugs. *Grand Traverse*: Early crops shortened by drought; late ones promising.

INDIANA.—*Wabash*: Early potatoes good; late ones short through drought. *Whitley*: Good crop. *Marshall*: Shortened by drought. *Dearborn*: Affected seriously by drought. *Warren*: Suffering for rain. *Orange*: Tops eaten by cantharides by July 10; not enough left for seed. *Kosciusko*: Late crops suffering from drought. *Sieuben*: Injured by drought. *Posey*: Injured by Colorado beetles. *Madison*: Good. *Decatur*: Nearly a failure. *Perry*: Look bad. *Crawford*: Shortened by drought.

ILLINOIS.—*Logan*: Rains too late to save the crop. *Sangamon*: Poor; all sorts of pests.

*Alexander*: Too dry. *Cook*: Parched by summer drought. *Tazewell*: Fine growing rains. *Whiteside*: Not doing well; a new winged beetle is destroying the Colorado beetle. *Moultrie*: Early plantings injured by drought; late ones better. *Cumberland*: Almost swept by bugs. *Shelby*: Bugs of both kinds worse than ever before known. *Vermilion*: Destroyed by drought. *Massac*: Early plantings injured by bugs. *White*: Nearly destroyed by beetles. *Montgomery*: Must have rain. *Henry*: Shortened greatly by August drought.

WISCONSIN.—*Adams*: Colorado beetles less destructive than usual, but the drought very serious. *Columbia*: Early Rose, good; Peach-blows nearly ruined by drought and bugs. *Outagamie*: Late crops injured by bugs.

MINNESOTA.—*Mower*: Poor. *Sibley*: Injured by drought and bugs.

IOWA.—*Washington*: Severe drought. *Howard*: Early plantings good. *Decatur*: Not half a crop. *Dallas*: Severely injured by Colorado beetles. *Henry*: Late copious rains have greatly improved late plantings. *Muscatine*: Late heavy rains will make late potatoes a full crop. *Calhoun*: Colorado beetles and drought materially injured the crop. *Polk*: Suffered greatly from bugs and drought. *Montgomery*: Late potatoes a failure. *Van Buren*: Fine growing rains. *Woodbury*: Shortened one-half by drought, grasshoppers, and Colorado beetles.

MISSOURI.—*Crawford*: Ruined by drought. *Caldwell*: Late potatoes nothing. *Platte*: Early crop fair, and selling at 80 cents per bushel; no late crop. *Ray*: Seriously injured by protracted drought. *Shelby*: Short. *McDonald*: A failure. *Phelps*: Late plantings hardly make seed. *Johnson*: Dried up. *Grundy*: Late crops failed; Early Rose, a fair yield. *Cole*: Early crops good; late ones failed.

KANSAS.—*Mitchell*: Only a few potatoes, and those of early planting. *Bourbon*: Complete failure. *Osage*: Total failure. *Republic*: Early, a fair crop; late, an entire failure, owing to protracted drought. *Barton*: Early, half crop only, by reason of drought and large green tobacco-worm; late, entirely destroyed by grasshoppers.

NEBRASKA.—*Dawson*: Utterly destroyed by Colorado beetles. *Lincoln*: Eaten by a cantharis. *Nuckolls*: All late potatoes have failed to mature, owing to extremely hot and dry weather. *Gage*: Will be no late potatoes, owing to drought and grasshoppers. *Otoe*: Late potatoes about destroyed by drought.

OREGON.—*Clackamas*: Injured by late rains.

## SWEET-POTATOES.

As the entire sweet-potato area has been more or less affected by drought, our returns show that the condition of this crop is from 8 to 10 per cent. below average.

VIRGINIA.—*Washington*: Fair crop. *Northampton*: A very remunerative crop. *Ches-terfield*: Crop large and profitable.

NORTH CAROLINA.—*Greene*: Two-thirds of a crop.

SOUTH CAROLINA.—*Williamsburgh*: Will suffer materially from a severe drought.

GEORGIA.—*Clinch*: Very fine. *Dooly*: Badly damaged by drought. *Sumter*: Injured by drought; acreage increased. *Taylor*: Injured by drought and hot winds. *Terrell*: Injured by heat and drought.

FLORIDA.—*Columbia*: Injured by drought. *Wakulla*: Injured by drought.

ALABAMA.—*Chambers*: Crippled by drought. *Montgomery*: Injured by drought. *Conceh*: Look well, but mature slowly.

MISSISSIPPI.—*Pike*: Injured by drought. *Holmes*: Extremely shortened by drought.

LOUISIANA.—*Franklin*: Severely injured by drought. *Jackson*: A general failure.

TEXAS.—*Upshur*: Half crop. *Titus*: Drying up. *Karnes*: Drought cut down the crop 25 per cent. below last year. *Burnet*: A total failure. *Ellis*: Greatly shortened, if not ruined. *Grayson*: Shortened by drought.

ARKANSAS.—*Independence*: Nearly a failure. *Crawford*: Very short. *Arkansas*: Half crop.

TENNESSEE.—*Greene*: Look well. *Cheatham*: Look tolerably well. *Monroe*: Light.

ILLINOIS.—*Cumberland*: Good.

IOWA.—*Harrison*: Culture profitable and increasing.

NEBRASKA.—*Dixon*: Escaped the ravages of the grasshoppers.

## COTTON.

Our September returns indicate a heavy decline in the prospects of the cotton-crop in all of the States except Virginia, in which the condition remains about the same as in our August report. The crop of Virginia, however, is too small to influence the general result to any appreciable extent.



In North Carolina the leading complaint in several counties on the coast and in the northern part of the State is, cool nights, arresting vegetation, in some cases accompanied by late rains producing rust. The earlier part of the season having been favorable, the bottom crop is generally good, but the middle and top crops have in some counties been greatly injured, if not destroyed. In some cases the weed is large, but the fruit is scanty and imperfect. In several counties in the interior a damaging drought set in about the middle of August, which caused copious shedding of forms. Several counties report very fine crops, having escaped the injurious conditions of growth so serious in other parts. Moore County reports the finest crop since 1865; Pasquotank better than last year and full average; in Pamlico the drought only reduced a superabundant crop to an average. In one or two other counties the crop is promising. The State average declined 15 per cent. during August.

The same general conditions are apparent in South Carolina. Damp weather in some places has caused an excessive growth of weed with very little fruit. Rust and drought have injured many crops. Several counties report a good prospect, although the bolls were opening late. The general tone of the reports, however, is less hopeful, and the prospects of the crop declined 13 per cent. since the last report.

In Georgia a decline of 17 per cent. is noted. Protracted drought is the leading cause of this decline, but in many counties it was accompanied by extreme heat and hot, blasting winds. The destructive efficacy of the drought was not in all cases proportioned to its length. In Dooly County some promising fields were parched within half an hour. In Baker all the blooms of three weeks opening were blasted. Where drought was less severe, in some cases the weed grew at the expense of fruit. In other cases the close of the drought was marked by storms of rain and hail, doing serious injury to the remnant of the crop. In a few counties, such as Clinch, De Kalb, Elbert, and Sumter, the prospect is reported as good.

In Florida there is a decline of 25 per cent. In some counties, as Levy, alternate flood and drought ruined the crops on the best lands, causing great discouragement among farmers and a desire to emigrate. In other counties severe drought alone, and in others heavy rains, are alleged as causes of the decline.

In Alabama, though the same injurious causes have been operative, the general decline—9 per cent.—has been smaller than in any other great cotton State. In some counties it was noticed that high fertilization reinforced the injurious influence of the drought, which was more generally distributed, as there are fewer counties reporting promising crops.

Mississippi reports a decline of 15 per cent. The general cause of injury here was drought, which manifested itself more destructively upon upland than upon bottom crops. In Washington County but one rain has fallen since April.

In Louisiana the falling off amounts to 21 per cent. The drought appears to grow in virulence toward the Southwest. The intense heat and blasting, hot winds are more frequently noted. In Texas the crops having been planted mostly upon lately-overflowed lands, the drought, instead of working injury, seems to have been beneficial, especially in repressing noxious insects. All other reports, however, are of a gloomier tone.

The most marked change in the prospects of the crops is found in Texas. From an average of 105 on the 1st of August, the prospects fell to 65—a loss of 40 during August. The untoward influences

that had affected the crop in the other Gulf States here found their culmination. In some counties no rain had fallen since May. Simoom winds prevailed in numerous localities, withering all vegetation. Kendall County, however, promises an unprecedented yield. In Liberty, drought was felt but slightly. Upshur expected to equal last year's crop, but such expectations are rare.

In Arkansas and Tennessee the drought of August combined with that of the earlier season previously reported; in several localities no rain has fallen since April, and in some of these the injury was aggravated by hot winds. Arkansas has declined 40 per cent. and Tennessee 31 per cent.

Injurious insects appeared at several points in the cotton area, but their ravages were seldom such as to excite any remark. The conditions so injurious to vegetation were no less repressive of insect-life.

The State averages are as follows: Virginia, 98; North Carolina, 87; South Carolina, 86; Georgia, 77; Florida, 77; Alabama, 81; Mississippi, 74; Louisiana, 62; Texas, 65; Arkansas, 47; Tennessee, 52. The following notes of our correspondence will give some salient local features of the crop:

VIRGINIA.—*Sussex*: Looks much better than at this time last year. *Prince George*: Cool nights have caused rust; shedding forms and bolls. *Southampton*: Injured by cool nights, causing rust and premature opening. *Greenville*: Promising.

NORTH CAROLINA.—*Pimlico*: Drought has reduced cotton, but bolls enough are left for an average crop; the worm has appeared lately, but the weather is too cold for serious damage. *Beaufort*: Seriously damaged by rust; almost every crop affected. *Cleveland*: Runs too much to weed; bolls and squares dropping off. *Pitt*: Looked well till August 15, when rust came; bottom crop good, but top crop nearly ruined. *Chowan*: Seriously injured by heavy rains and cool weather; rusty; shedding leaves and bolls. *Franklin*: Cotton season very unfavorable; rust has destroyed the top crop. *Gaston*: Injured by hot days and very cool nights. *Granville*: Slightly damaged by cold nights. *Lenoir*: Suffering for rain. *Lincoln*: Materially injured by a drought of five weeks. *Mecklenburgh*: Large and tender stock full of sap, but deficient in bolls; rust in many places, and in others shedding of forms. *Pasquotank*: Better than last year; full average and forward as usual. *Wayne*: Damaging cool weather; a great failure foreshadowed. *Martin*: Two-thirds average; worst kind of season since July 20. *Bladen*: Rusted from late rains. *Hertford*: Promises a heavy yield. *Onslow*: Weather unfavorable to late crops. *Alexander*: Season fine for late crops. *Currituck*: Looks well, though injured by cool August and July. *Edgecombe*: Rust and blight injuring the crop; flooding rains. *Camden*: Good, if frost delays. *Davidson*: Two weeks late in maturing. *Moore*: Finest crop since 1865. *Perquimans*: Cold, wet weather for two weeks caused the forms and bolls to shed; suffering heavily on light lands, 33 per cent.; only 10 per cent. on clay soils. *Rowan*: Fine, but late. *Anson*: Weed large, but poorly fruited; rust in some places. *Greene*: Rust has injured the crop from one-fourth to one-third; some crops dead and dry enough to burn. *Person*: Below average. *Stanly*: Fine growth of weed, but the late cold spell has greatly injured the bolls, some of which show a rotten interior. *Wake*: General complaints of rust and scarcity of bolls, but the crop still promising.

SOUTH CAROLINA.—*Fairfield*: Crop doing well; no caterpillars; opening later than last year, but mature bolls are numerous. *Barnwell*: Fallen off 5 per cent. from drought; no worms. *Clarendon*: Large weed, but little fruit; rust becoming general. *Chesterfield*: Rusted badly. *Darlington*: Injured seriously by rust; top crop opening rapidly. *Laurens*: Larger weed than last year, but not so well fruited. *Union*: Great injury from heat, drought, and storms. *Edgefield*: Drought injuring early crops, causing young fruit to drop. *Marion*: Top crop drying up to some extent, yet the bolls were so numerous that the crop will probably be full average. *Lexington*: Not over a half crop; drought caused the bolls to fall. *Beaufort*: Rains have caused the fruit to shed; some rust and caterpillars. *Marlborough*: Early bolls have yielded well, but rust has injured later ones; rain and cold nights. *Georgetown*: Too much rain; weed copious, but fruiting unsatisfactory. *Newberry*: Fruit dropped badly; half a crop. *Richland*: Drought caused much shedding; some complaints of rust. *Spartanburgh*: Not fruiting well. *York*: No August crop; badly injured by lice, rust, and cold nights. *Williamsburgh*: Has yellow-leaf badly; leaves look as sere as they ordinarily do in November.

GEORGIA.—*Bartow*: Three weeks' drought caused copious shedding; fine rains recently. *Dodge*: Injured by rust, caterpillars, and drought. *Hart*: Plenty of weed,

but little fruit; decreased amount of fertilizers used; some fields injured by hail. *Bullock*: Opening too fast, and shedding leaves and fruit. *Carroll*: Four weeks' drought caused shedding. *Catoosa*: Drought causing squares to fall. *Clinch*: Considerably above average. *Columbia*: Unprecedented decline within a week through extreme drought and heat. *De Kalb*: Injured in a few localities by drought, but the most of the county has had abundant rain, making the cotton large and well fruited, though rather late. *Dooly*: Badly injured by drought and storms of hot wind; some promising fields were parched within half an hour. *Douglas*: A month's drought stripped off one-fourth of the forms and small bolls. *Elbert*: Two weeks late, but promising. *Effingham*: Badly rusted. *Telfair*: Backward. *Gordon*: Top forms falling. *Hall*: Fallen 1 per cent. per day for ten days. *Hancock*: Severe drought; nearly all the middle and top bolls fell; cannot make over a half crop at best. *Harris*: Caterpillars came August 5; crop later than usual; drought has caused much shedding. *Heard*: Severe hot drought materially injured the crop. *Henry*: Protracted drought has caused rapid shedding of forms. *Liberty*: Caterpillars reported, but do not cause very great alarm. *Mitchell*: Three weeks of drought and extreme heat have caused cotton to shed forms severely; there will be no top crop and a very small middle crop. *Muscogee*: Drought has injured early plantings and retarded late plantings. *Pierce*: Five weeks of drought and severe heat cut off the late crop. *Randolph*: Injured one-fourth by extreme heat. *Scriven*: Unprecedented decline in five weeks. *Stewart*: Very badly injured by protracted heat and drought; most of the later bolls have dried up; no rain for six weeks. *Sumter*: Crop average; there having been no general rain, the crop is too tough for the caterpillar. *Taylor*: Severely injured by drought and hot winds from the northwest; top crop destroyed and middle crop greatly reduced. *Terrell*: Greatly injured by drought. *Troup*: Severe damage from drought and shedding of large bolls. *Walton*: Badly injured by drought and extreme heat. *Whitfield*: Badly injured by drought. *Taliaferro*: Hot winds have cut the crop down to nearly half average. *Wilkinson*: No late crop can be made; rust in spots; bolls small; but little over a half crop can be made. *Chattooga*: Badly injured by drought. *Fulton*: Shortened 20 per cent. by drought. *Morgan*: Early cotton shed profusely from heat, and opened prematurely; rain injured the open bolls; fertilized cotton shed most freely; late crop doing well. This year we used 769 tons of fertilizers and expect 7,000 bales. *Baker*: Damaged by drought of four weeks; blooms of three weeks past all blasted. *Jackson*: Badly injured by drought. *Lee*: Serious injury from drought. *Macon*: Shortened by drought 25 per cent. *Madison*: Late; poorly fruited. *Marion*: Shortened 25 per cent. by August drought. *Twiggs*: Three weeks of heat and drought, unequalled in thirty years, have done incalculable injury; not over two-thirds of a crop. *Wayne*: Drought. *Banks*: Late reviving rains. *Brooks*: Drought caused rust and shedding of bolls. *Cobb*: Two weeks late; drought caused shedding of small bolls and forms. *Fayette*: Plenty of rain, benefiting cotton greatly. *Floyd*: Greatly injured by five weeks of drought and intense heat. *Murray*: Very injurious drought. *Gwinnett*: Nearly average; slightly injured by two weeks' drought in August; shedding late forms; acreage decreased 1,000 acres. *Jefferson*: Badly injured by rain; more rain fallen than for twenty years; rust. *Putnam*: Shedding forms and bolls. *Wilkes*: Suffered from extreme heat; bolls falling badly.

FLORIDA.—*Hamilton*: Injured 10 per cent. by drought. *Jackson*: Sporadic boll-worms and rust, but probably a larger crop than last year. *Jefferson*: Injured by drought. *Madison*: Drought has caused fruit-shedding and rust. *Wakulla*: Damaged by heat and drought. *Columbia*: Caterpillars plenty, but doing less damage than usual. *Leon*: Boll-worm did much damage; caterpillars increasing, but slowly. *Levy*: Injured by alternate floods and drought; crops on the best lands ruined, causing people to desire to emigrate. *Taylor*: Ruined in places by heavy rains.

ALABAMA.—*Henry*: Severely injured by the hottest short drought—three weeks in August—ever known here; boll-worm injurious. *Lowndes*: Cut down half by the unprecedented heat. *Russell*: Four weeks of hot, dry weather have caused cotton to shed forms badly; caterpillars cut down late cotton one-half; Paris-green used but little. *Chambers*: Shed heavily under a three weeks' drought. *Pike*: Hopelessly gone; not over a half crop. *Saint Clair*: Shedding through drought; hottest August ever known here. *Choctaw*: Suffered from drought. *Corington*: Drought beneficial, keeping back the caterpillars. *Greene*: Drought disastrous. *Hale*: Crop shortened on uplands by six weeks' drought; has sustained itself on rich slough and bottom land. *Lee*: Stand late and bad, but was doing well till the drought, commencing August 1, when it was shortened one-third; especially injuring matured fields. *Macon*: Shed most of the squares and small bolls; some damage by boll-worm. *Montgomery*: Considerably injured by drought. *Dale*: Destructive drought; no top crop. *Colbert*: Little over half crop; extreme heat. *De Kalb*: Extreme heat and high fertilization injured the crop very seriously. *Marion*: Late and shortened by drought. *Franklin*: Drought caused the bolls and squares to fall to some extent. *Lawrence*: Very unequal; some crops injured by drought; others better than last year. *Limestone*: Prospect blasted by drought. *Wilcox*: Shortened by extreme heat, especially on light uplands. *Autauga*:

Seriously injured by drought in many places; blooms and small bolls falling. *Blount*: Extreme heat and scorching winds ruined the growing bolls and squares, reducing the crop to half average. *Concub*: Doing well till drought caused shedding. *Dallas*: Shortened 25 per cent. by drought and intense heat; bottom crops injured by caterpillars. *Perry*: Shortened by excessive heat and drought.

MISSISSIPPI.—*Lauderdale*: Shortened half by drought. *Couchoma*: Crop late and drought disastrous. *Noxubee*: Upland ruined by drought; bottoms not so seriously affected. *Amite*: Over average promise, though suffering some from drought. *Covington*: Shortened by drought. *Grenada*: Suffered from drought and hail-storms. *Jasper*: Injured by drought and worms; bolls falling. *Pike*: Injured by drought; forms and young bolls shedding badly. *Warren*: Crops on light lands shedding badly; weather unfavorable to worms. *Hinds*: Ruined by late drought. *Holmes*: Severe drought has caused copious shedding. *Penola*: Ruined by drought almost. *Jefferson*: Shed very rapidly; rust very injurious. *Attala*: Drought caused rapid shedding and premature opening. *Kemper*: Badly injured by drought. *Lincoln*: Early plantings promising; later ones seriously affected by drought. *Smith*: Half average. *Yalabusha*: Shortened one-half by drought; shedding badly. *De Soto*: Greatly injured by nine weeks' drought, with cool, drying winds. *Madison*: Seriously injured by long drought; middle crop lost, and top crop poor. *Wilkinson*: Some injury from caterpillars; some shedding, but the crop on the whole is a fair average. *Lee*: Great injury from drought. *Tishamingo*: Long drought. *Washington*: But one rain since April; cotton shedding and turning yellow. *Adams*: Uplands shedding badly from drought; bottoms doing better. *Marion*: Drought. *Rankin*: Decline of 30 per cent. from drought.

LOUISIANA.—*Bienville*: Materially damaged by protracted drought. *Union*: Reduced one-half by drought and hot, dry winds; thermometer at 104° in the shade. *Caddo*: Shortened one-half by drought. *East Baton Rouge*: Fine till it commenced shedding two weeks ago; prospect reduced 5 or 10 per cent. *East Feliciana*: Six weeks' drought very destructive. *Franklin*: Damaged by drought; in some places nearly all the forms have fallen; on land recently overflowed cut-worms have swept the crops. *Iberia*: Weather remarkably favorable for the maturing of cotton. *Madison*: Greatly improved within thirty days. *Moorehouse*: Disastrous five weeks' drought; bolls falling to an alarming extent. *Richland*: Shedding forms and blooms very copiously. *Washington*: Not over two-thirds of a crop at best. *Carroll*: Long-continued drought caused copious shedding. *Jackson*: Drought has caused shedding and premature opening; half a crop. *Claiborne*: Nearly dried up the top crop. *Tensas*: Most of the cotton being planted on overflowed land, the drought is very favorable; blooming finely and bolls swelling rapidly; too dry and hot for worms. *Concordia*: Shedding badly on sandy soils; doing well on black soils. *Rapides*: Growth checked by drought; bolls and leaves shedding copiously. *West Feliciana*: Injured by six weeks' drought; early planted shed very copiously; late planted not so bad.

TEXAS.—*Austin*: Badly injured by drought, especially on sandy uplands; plants have stopped growing; blooms and bolls dropping; not over a half crop. *Bandera*: Shedding. *Shelby*: Half crop on uplands; bottoms better. *Waller*: Shortened by excessive heat and drought; fallen squares and forms covered the ground like a carpet. *San Jacinto*: Drought injured upland cotton, but benefited the bottom crops; worms on hand, but doing little damage. *Bosque*: Early cotton beyond redemption; late reduced 50 per cent. by drought. *Caldwell*: Eight weeks' drought. *Colorado*: Prospects for a heavy yield cut off by drought and worms, but the yield will be greater than last year. *Dallas*: A third of a crop. *Fannin*: Light on sandy soil; on black land two-thirds of a crop. *Goliad*: Suffering from drought. *Kaufman*: Shortened by drought; shedding badly; not over 300 pounds seed-cotton per acre. *Kendall*: Promises an unprecedented yield. *Liberty*: Affected but slightly by drought. *Marion*: Not over a third of a crop. *Milam*: Shedding badly; reduced a third within a month. *Palo Pinto*: Half crop. *Parker*: Not 100 pounds to the acre; some fields will not be picked at all. *Polk*: Far ahead of last year. *Rusk*: Half a crop; shedding and drying up. *Titus*: Stand late and poor; damaged by drought and boll-worms. *Upshur*: Will be equal to last year. *Wood*: Ruined by drought. *Karnes*: Drought cut down the crop to 10 per cent. below last year. *Matagorda*: Materially injured by drought. *Hunt*: Half crop; no rain since May 20. *Lavaca*: Drought of seven weeks; worms active in spite of heat, and would be very destructive but for Paris-green. *Anderson*: Drought withering everything; simoon winds; half the springs and wells and all the streams dry. *Burnet*: Extreme drought; will not get 200 pounds seed-cotton per acre. *Comanche*: No rain since July; cut short. *Cooke*: Succumbing to drought; probably a fourth of a crop. *Ellis*: Ruined; a bale from four to six acres. *Fort Bend*: Shedding forms fast; half a crop. *Grayson*: Shortened by drought. *Harris*: Upper forms dropping, but still the crop promises above average. Paris-green effectively applied to the destruction of worms. *Medina*: Suffering from drought. *Falls*: Ruined by excessive drought and heat. *Hood*: The early promise of a bale per acre was blasted by the severe drought; no rain since July 3; intense heat. *Fayette*: Shortened by the severe drought. *Gillespie*: Destructive drought. *Washington*: Severe drought. *Gonzales*:

Drought causing profuse shedding. *Houston*: Being late planted the crop was destroyed by drought.

ARKANSAS.—*Franklin*: Will average 200 or 250 pounds per acre seed-cotton. *Hempstead*: Rapidly failed in two weeks past; drought and hot winds. *Randolph*: Destructive drought. *Independence*: Cotton which in July promised a bale per acre will not yield a third of it; uplands will make a bale to ten acres. *Izard*: Half crop; drought. *Jefferson*: Hundreds of acres never came up. *Monroe*: Disastrous drought; half a crop. *Crawford*: Bottom crops splendid; uplands almost a complete failure. *Lafayette*: Quarter crop; no rain since May. *Scott*: Drought. *Ashley*: Terrible drought. *Bradley*: Disastrous drought. *Cathoun*: Entire failure; no rain since May. *Pulaski*: Only one rain since April 20; dead as a November frost could make it. *Fulton*: Withering drought and hot winds. It will be a benefit if it teaches farmers to diversify their crops. *Prairie*: Devastating drought. *Woodruff*: Excessive drought, extreme heat, and hot winds have cut off the crop one-half. *Sharp*: Cooked by hot winds. *Dorsey*: Disastrous drought of ninety days; a third of last year's crop. *Drew*: Destroyed by drought, heat, and parching winds. *Newton*: Burned up. No rain since June 1.

TENNESSEE.—*Hardin*: Suffered greatly from drought. *Loudoun*: Two-thirds of a crop. *Dyer*: Shortened two-thirds by drought. *Madison*: Not a third of a crop.

### HAY AND PASTURES.

The product of hay, compared with last year, is, in Maine, 83 per cent.; Pennsylvania, 95. The remaining New England and Middle States range from 110 in New Hampshire and Vermont to 134 in New York and New Jersey; Virginia, 105; North Carolina, 102. The other South Atlantic and the Gulf States range from 98 in South Carolina to 67 in Louisiana; Arkansas, 62; Tennessee, 76; West Virginia, 67; Kentucky, 54. In the Northwest States the extremes are: Ohio, 72, and Minnesota, 99; Missouri, 91; Kansas, 85; Nebraska, 87; California, 122; Oregon, 106.

In the production of timothy, compared with last year, the New England and Middle States range, taken together, considerably higher. The highest are, Vermont, 114, and New York, 126. Only two fall below—Maine, 87, and Pennsylvania, 93. The product equals that of last year in Nebraska. In Oregon it is 2 per cent. above. The Gulf States and California do not report any timothy worth mentioning. In the remaining States the product, compared with 1873, ranges between 49 in Kentucky and 96 in Virginia and North Carolina. Our returns indicate that this crop, on the whole, was secured in excellent condition. Among the States in which it is an important product the figures are: Wisconsin, 100; Maine, Massachusetts, Pennsylvania, Illinois, and Minnesota, 101; Vermont, 102; New Hampshire and New Jersey, 103; New York and Nebraska, 107; Rhode Island, 108; Connecticut, 109. South Carolina returns 100; Mississippi, 105; Virginia and Iowa, 97; Maryland and Oregon, 98; Michigan and Missouri, 99. Other States range between 82 in Tennessee and 95 in Indiana.

The following facts of local interest are noted:

Alleghany, N. Y., reports millet sown in large acreage, unusually good, "and the best kind of hay in the county." *Franklin*: The largest hay-crop for twenty years. *Henrico, Va.*: A finer crop of clover than ever before. *Chesterfield*: A yield of 4 tons of clover to the acre. *Mecklenburgh*: Increased attention to grasses, and encouraging results from trials of timothy. *Parker, Texas*: That while prairie-grass dried up, Hungarian turned out well. In *Lawrence, Tenn.*, German millet stood the drought well. It also yielded well in *Dickson*, but was injured by the army-worm. In *Cheatham*, grass-crops were badly injured by the army-worm. In *Grant, W. Va.*, timothy was injured by chinchies. In *Republic, Kansas*, more hay was put up than in any previous year; also in *Barton*, in spite of the drought, where the buffalo-grass is giving way to

larger kinds of prairie-grass. In Crawford, where little hay except from prairie-grass is produced, there is a fair crop of that, since chinchies do not attack it. In Otoe, Neb., more wild hay than usual was put up, owing to the shortness of crops.

**PASTURES.**—Reports from New England concur in representing the condition of pastures and the prospects for fall feed as unusually good.

From the Pacific slope there is no complaint, and very little from Missouri. With rare exceptions, reports are favorable from West Virginia and Kentucky, the South Atlantic and Gulf States, and from the Western Territories. In the remaining parts of the country pastures have been reduced considerably below average condition by the prevailing summer drought. Yet, very generally, recent rains are rapidly changing the aspect for the better. This is especially true in the Ohio Valley. Among counties reporting pastures dried up to such a degree as to necessitate the feeding of stock, are Camden, N. J.; Luzerne, Pa.; Trumbull, Ohio; Montcalm, Mich.; and Putnam, Ill.

**MAINE.**—*Aroostook*: Hay-crop light. *Sagadahoc*: Fall-feed abundant. *Piscataquis*: Deficiency of hay made up by cutting swale and other grasses.

**NEW HAMPSHIRE.**—*Hillsborough*: Hay above average. *Carroll*: Fall-feed abundant. *Rockingham*: Hay-crop large and well secured.

**VERMONT.**—*Caledonia*: Hay did well; second crop unusually large. *Rutland*: Hay-crop excellent in quality and condition. *Orleans*: Large crops of timothy and natural grasses, but little clover.

**MASSACHUSETTS.**—*Berkshire*: Increased bulk, but diminished weight; selling at the low prices of \$12 to \$12.50 per ton.

**CONNECTICUT.**—*Hartford*: Grass as green and fresh as in June.

**NEW YORK.**—*Steuben*: Fall pasture improving. *Allegany*: Millet unusually good and sown in larger acreage; best kind of hay in the county. *Erie*: Drought injuring pastures. *Franklin*: Largest hay-crop in twenty years. *Otsego*: Hay-crop unusually heavy; after-feed shortened by drought. *Albany*: Hay a splendid crop, and generally well secured. *Washington*: Pasturage abundant. *Broome*: Extreme drought; no aftermath; all crops reduced. *Rockland*: No rain in August; pastures drying up. *Sullivan*: A very large crop, gathered in excellent condition.

**NEW JERSEY.**—*Hudson*: Hay-crop large and secured in fine order; largest yield for two years. *Warren*: Hay-crop good and well secured. *Monmouth*: Drought shortening pastures; if rain does not come soon we will find a home-market for our large hay-crop. *Camden*: Pastures short; many farmers feeding stock; no rain since August 8.

**PENNSYLVANIA.**—*Butler*: Very light. *Philadelphia*: Late pastures have suffered severely from drought. *Lawrence*: Pastures burned up; stock suffering for want of feed and water. *Pike*: Drought. *Tioga*: Hay never secured in better order. *Washington*: Fall pastures excellent. *Bedford*: Hay damaged by drought. *Beaver*: Greatly shortened by drought. *Cambria*: Drought destroyed the hay-crop. Pastures burned up for want of rain.

**MARYLAND.**—*Queen Anne*: Pastures burned up. *Saint Mary's*: Pastures dried up.

**VIRGINIA.**—*Pulaski*: Very fine grass season. *Tazewell*: Pastures good. *Henrico*: Timothy light, but clover finer than ever before. *Fairfax*: Pastures greatly improved by late rains. *Mecklenburgh*: Trial with timothy encouraging; increased attention to grasses. *Chesterfield*: Clover yields 4 tons per acre; hay-crop large. *Craig*: Fall pastures above average. *Loudoun*: Successive years of drought have caused the old turf to be broken up; chinchies injured grass. *Louisa*: Pastures better than might have been expected from the drought. *Madison*: Saved in excellent condition.

**NORTH CAROLINA.**—*Beaufort*: Greatly improved by late rains. *Alexander*: Season fine for late pastures. *Ashe*: Grass-crops affected severely by drought.

**SOUTH CAROLINA.**—*Chesterfield*: Good season for grass, but hay-crop small. *Newberry*: Drought favorable for curing hay. *Richland*: Hay-crop shortened by grass army-worms.

**FLORIDA.**—*Jackson*: Pasturage of native grasses in good condition. *Orange*: Guinea grass very successful.

**ALABAMA.**—*Montgomery*: Native grasses abundant; large yield of hay. *Calhoun*: Early hay-crop good.

**MISSISSIPPI.**—*Holmes*: Too dry for even crab grass. *Kemper*: Hay-crop badly injured by drought.

**TEXAS.**—*Williamson*: Hay-crop short. *Parker*: Prairie-hay dried up, but Hungarian grass turned out well. *Austin*: Very light. *Goliad*: Range good. *Comanche*: Pasture failing. *Medina*: Pasture suffering from drought.

ARKANSAS.—*Carroll*: Hay-crop all dried up.

TENNESSEE.—*Bledsoe*: Hay very short. *Lawrence*: German millet stood the drought well; hay-crop good. *Loudon*: Pastures burned up or eaten by grasshoppers. *Cheat-ham*: Grass-crops badly injured by army-worms. *Dyer*: Large quantities of rye and wheat are being sown for winter pasture, and large crops of turnip-seed sown; with all possible economy many will suffer for food. *Lincoln*: Grass-crops failed, but as the rain is falling freely we hope for good fall pastures. *Macon*: Pastures very good. *Obion*: Pastures burned up; no rain to wet the ground three inches since April. *Grain-ger*: Timothy injured after cutting; clover saved in good condition. *Williamson*: Timothy a complete failure; millet will help out very much; pastures short. *Dickson*: German millet good, but injured by grass army-worms. *Monroe*: Hay harvested in fine order, but light.

WEST VIRGINIA.—*Braxton*: Hay falls much below average, but late rains have greatly improved pastures. *Mercer*: Hay-crop cut down one-third by drought. *Monroe*: Hay a third of a crop, but of good quality. *Morgan*: Pastures growing finely. *Preston*: Hay short, but good. *Ritchie*: Pastures unusually good. *Grant*: Timothy injured by chinchcs. *Boone*: Pastures good. *Harrison*: Fall pastures good.

KENTUCKY.—*Daviess*: Three-fourths of the land intended for tobacco was sown in Hungarian grass or millet. *Hardin*: Pastures coming up through late rains, and stock looks well. *Jefferson*: Drought still continues; pastures drying up; water for stock becoming scarce. *Laurel*: Fall pastures promise to be very good. *Jessamine*: Prospect of fine fall and winter pasture. *Nicholas*: Exceedingly light crops. *Oldham*: Hay-crop failed. *Mercer*: Fall grass coming up. *Spencer*: Shortened by drought, lasting from May 1 to August 29. *Taylor*: Fall pastures benefited by late rains. *Grayson*: Pastures fine from late rains. *Logan*: Rains have started fall pastures. *Metcalfe*: Never better pasturage.

OHIO.—*Harrison*: Injured by late rains. *Logan*: Injured by winter-freezing and summer-drought; hay well saved. *Trumbull*: Pastures failing fast; dairymen feeding largely with bran and shorts. *Hocking*: Fine pastures; good rains. *Athens*: Fall pastures more abundant than for years. *Medina*: Pastures and meadows suffering for rain. *Meigs*: Pastures fine; cows cheap and hay dear. *Perry*: Drought killed most of the young timothy and clover. *Columbiana*: Pasture dying. *Geauga*: Fall-feed shortened by drought.

MICHIGAN.—*Lenawee*: Hay shortened by winter-killing and drought. *Menomonee*: Good hay-crop, well secured. *Montcalm*: Very dry; some farmers feeding cows. *Cal-houn*: Grass seriously injured by drought. *Shiawassee*: Hay well secured and fine.

INDIANA.—*Cass*: Clover-seed yield light. *Dearborn*: Hay ruined by drought. *Martin*: Recent rains fine for pastures. *Warren*: Pastures suffering for rain. *Orange*: Blue-grass growing fast. *Steuben*: Clover light; timothy good; late pasture dried up. *Fountain*: Pastures burned out and cattle suffering for grass and water. *Crawford*: Greatly shortened by drought. *Franklin*: Shortened by drought. *Spencer*: Pastures very good.

ILLINOIS.—*Logan*: Pastures improved by late rains. *Winnebago*: Pastures dried up by scorching south winds. *Alexander*: Too dry. *Cook*: Parched. *Putnam*: Late rains started the grasses, but many are feeding stock. *Tazewell*: Fine growing rains. *Wayne*: Fall pastures growing under fine rains. *Macoupin*: Fall pastures extra fine; in thirty-six years' residence I have never known such heavy rains as within the last two weeks. *Marshall*: Pastures improved by late rains. *De Kalb*: Improved by late rains. *Iroquois*: Pastures improved by recent rains. *Whiteside*: Pastures short. *Madison*: Grasses thin. *Carroll*: No second crop of hay. *Shelby*: Fine rains, bringing out pasture. *Vermillion*: Pastures burned up, but revived by late rains. *McHenry*: Pastures short; severe drought. *Piatt*: Pastures improving.

WISCONSIN.—*Fond du Lac*: Pastures short from drought. *Columbia*: Pastures dried up; wells and springs failing. *Green*: Half eaten by chinchcs. *Pierce*: Hay materially shortened. *Clark*: Early mowings above average. *Jefferson*: Meadows suffered from drought. *Richland*: Fall feed badly dried up.

MINNESOTA.—*Steele*: Soaking rains bringing out grass. *Green*: Pastures dried up.

IOWA.—*Floyd*: More wells dry than ever before known; pastures bare. *Henry*: Fall pasture abundant; late copious rains. *Lee*: Timothy abundant. *Louisa*: Abundant fall pasture; excellent rains. *Appanoose*: Fall pasture better than for years; fine rains. *Fremont*: Pastures killed by drought. *Van Buren*: Fine growing rains for pasture. *Bremer*: Pasture benefitted by heavy rains. *Howard*: Timothy and clover hay good; prairie shortened by drought. *Buchanan*: Hay light.

MISSOURI.—*Platte*: Injured by grasshoppers. *Clinton*: Hot southwest winds blasted grass in spots. *Newton*: Hay light. *Schuyler*: Fall pastures extra fine. *Knox*: Hay short. *Clay*: Pastures dry as cured grass; stock water scarce.

KANSAS.—*Cherokee*: Much hay being cured; quality good. *Nemaha*: Farmers are putting up plenty of hay to supply the losses inflicted by grasshoppers. *Mitchell*: Hay-crop shortened by drought. *Neosho*: Much hay secured; stock will winter well. *Osage*: Hay shortened by drought. *Republic*: Prairie hay short. More put up than in any previous year. *Burton*: The buffalo-grass of the plains is giving way to the larger

kinds of prairie-grass, and in spite of the drought there is more hay in the county than ever before. *Crawford*: Have but little hay except from prairie-grass, which is fair. The chinchos do not injure that. *Miami*: Prairie-hay generally fair; a plenty of fodder.

NEBRASKA.—*Otoe*: More wild hay put up than usual, owing to the short crops.

OREGON.—*Clatsop*: Grass crops heavy and well secured.

## STOCK HOGS.

The apprehended scarcity of feed in all quarters of the Union has caused a general reduction in the numbers kept for fattening. Delaware, Georgia, and Texas are the only States in which the number retained is equal to last year. The condition is above average only in Vermont, Massachusetts, Connecticut, Delaware, Texas, Minnesota, California, and Oregon.

VIRGINIA.—*Bland*: Hogs scarce. *Bedford*: Stock of hogs depleted by cholera. *Chesterfield*: Fewer than since 1866; good mast and corn crop. *Madison*: Hogs scarce and small. *Elizabeth City*: Stock increasing.

NORTH CAROLINA.—*Granville*: Many died from eating mushrooms. *Caldwell*: Increasing, but not in remarkably good condition.

GEORGIA.—*Dooly*: Dying fast from cholera; no remedy. *Laurens*: Dying fast from cholera.

ALABAMA.—*Covington*: Cholera very fatal. *Winston*: Hogs nearly all died of cholera.

MISSISSIPPI.—*Marion*: Cholera destroyed 85 per cent. of the hogs.

ARKANSAS.—*Crittenden*: Hog-raising ceased. *Woodruff*: Three-fourths died of cholera. *Sharp*: Hogs unusually healthy.

WEST VIRGINIA.—*Braxton*: No mast; number and condition of hogs must consequently decline. *Kanawha*: Many hogs have died of a new and peculiar disease.

KENTUCKY.—*Warren*: Half the stock-hogs sold for export, fearing a scarcity of corn. *Boyle*: Hog-cholera destructive; the bulk of the stock-hogs have been shipped to Indiana and Illinois for fattening. *Russell*: Many hogs died for lack of corn.

OHIO.—*Crawford*: Few; many killed last winter from lack of feed. *Hancock*: Hogs scarce.

TENNESSEE.—*Cannon*: Hogs sold to be fed elsewhere. *Williamson*: Driven north of the Ohio to fatten.

INDIANA.—*Clay*: Hogs, \$5 per 100 pounds gross. *Hamilton*: Scarce and high priced. *Washington*: Fewer than usual, and decreased 20 per cent. in average weight. *Fayette*: Poor on account of short pasture and scarcity of corn. *Elkhart*: Stock reduced by scarcity of corn.

ILLINOIS.—*Madison*: As many raised as last year, but rapidly disposed of in view of scarce corn-crop. *Edwards*: Cholera destructive, especially to white hogs. *Macon*: Unusually scarce.

IOWA.—*Lucas*: Many hogs will be received for fattening from Kansas and Nebraska. *Montgomery*: Stock increased by shipments from the grasshopper districts of Kansas and Nebraska. *Woodbury*: Stock light.

MISSOURI.—*Caldwell*: Stock-hogs shipped away on account of lack of corn. *Monteau*: Selling our hogs to counties that have corn.

KANSAS.—*Marshall*: Hogs generally shipped away on account of lack of corn. *Franklin*: Within ten days every salable hog has been shipped. *Nemaha*: Nearly all shipped away. *Jackson*: Almost all the hogs in the county bought and shipped; about 7,000 have been shipped. *Crawford*: Poor, and, in consequence of a short corn-crop, a great many sold and shipped.

NEBRASKA.—*Pawnee*: All sold out of the county. *Cass*: In very bad condition; all that would possibly do have been shipped to market. *Gage*: Corn being destroyed by grasshoppers, pork has to be fattened on wheat. All the hogs that could be spared have been sold and shipped east.

OHIO.—*Ross*: Hogs short.

MICHIGAN.—*Cass*: Selling off hogs on account of scarce feed.

INDIANA.—*Marion*: Driven away to feed.

ILLINOIS.—*Randolph*: Will be driven away to feed.

## FRUIT.

The large promise of fruit in the early spring, if not nipped in the bud, was extensively nipped, soon after the abundant bloom, by late frosts. Since then various insects and wide-spread and protracted



drougths have conspired to still farther disappoint early expectations. In Kansas and Nebraska the grasshoppers were very destructive on fruit. They not only stripped the trees and vines of leaves, leaving the fruit to wither for want of sustenance and from exposure to the scorching sun, but in many cases attacked and devoured the fruit itself.

**APPLES.**—The only States reporting the condition of apples above an annual average are: Rhode Island, 113; Connecticut, 106; and New Jersey, 115. The next in order are—Pennsylvania, 99; California, 98; Oregon, 97; New York, 96; South Carolina, 94; Texas, 93; Minnesota, 91. The lowest are: Vermont, 44; Virginia, 50; Mississippi, 57; Kansas, 65.

In Maine, Oxford reports three-fourths of the orchards ruined by caterpillars; Franklin, the fruit injured by insects. While Grafton, in northern New Hampshire, reports the crop almost a failure, Rockingham, in the southern part, reports the largest for several years, and the fruit excellent. In Frederick, Md., the apple-worms threaten to cut down the crop one-half; it was injured by the curculio in Clarke, Va.; by insects in Monroe, W. Va.; by codling-moth in Moultrie, Ill.; by grasshoppers in Platte, and fly-sting in Jefferson, Mo.; falling off badly in Berkshire, Mass.; Adams, Crawford, Lucas, and Van Wert, Ohio; Kalamazoo, Lenawee, and Livingston, Mich.; Crawford, Ind., and Texas, Mo.; rotting in Carroll, Ga.; Arkansas, Ark., and Granger, Tenn. In Harrison, Ohio, the pear-blight is prevalent, and extending to the apple-trees. In Sonoma, Cal., "apples are rotting on the ground by thousands of tons, the supply being so greatly in excess of the demand."

**PEACHES.**—Ohio returns an average condition of 119, Michigan of 109; Connecticut, 104, (in which but few peaches are produced,) is the only other State which does not fall below average. Delaware, the great peach State, is the lowest, Kent County returning 20, and Sussex only 10; Maryland, 40; Virginia, 24; North Carolina, 49; Mississippi, 47; Louisiana, 50. California returns 99; Nebraska, 97; Pennsylvania and Iowa, 95; Oregon, 94; New Jersey, 92; New York, 86. The remaining States, producing peaches, range between 85 in Illinois and 71 in Alabama and Arkansas.

In Prince William, Va., while budded peaches are an entire failure, unbudded yield "reasonably well." In Sonoma, Cal., the crop was shortened by "curled leaf." In De Kalb, Mo., the pulp was eaten from the stones by grasshoppers. In Kentucky, Lewis reports the largest crop ever raised. In Ohio, Crawford, the best crop in twenty years; Columbiana, "five times the average crop for the past twenty years;" Hancock, "trees breaking under their loads of fruit." Fountain, Ind., the best crop in ten years; Lee, Iowa, the largest crop ever known.

**GRAPES.**—The returns for grapes make a better show than those for apples and peaches. The New England and Middle States are above average except Rhode Island, average; Maine, 91; Vermont, 86; Massachusetts, 92; and Delaware, 98. Connecticut returns 119; New Jersey, 105. The other States making returns above an annual average are—West Virginia, 101; Kentucky, 114; Ohio, 108; Indiana, 103; Illinois, 102; California, 109. The next highest, in order are, South Carolina, Texas, and Missouri, 99; Michigan, 98; Iowa, 97. Louisiana, 73; Mississippi, 79; Kansas and Georgia, 82; North Carolina, 83; Tennessee, 86, and Wisconsin, 88; these are the only States falling below 90.

Mildew is noted in Hancock, Me., Grand Isle, Vt., Berkshire, Mass., and Luzerne, Pa.; rot in Dorchester, Md., Spottsylvania, Va., Doddridge, W. Va., and Osage, Kans. Ashland, Ohio, and Sonoma and Alameda, Cal., report the largest crop yet grown.

MAINE.—*Androscoggin*: Apples, a light crop. *Hancock*: Grapes, badly mildewed.

NEW HAMPSHIRE.—*Hillsborough*: Small apple-crop. *Carroll*: Apple-crop good.

VERMONT.—*Grand Isle*: Grapes, badly mildewed. *Rutland*: Apples, almost a failure. *Franklin*: Apples, almost a failure.

MASSACHUSETTS.—*Berkshire*: Grapes, late and mildewed.

CONNECTICUT.—*Windham*: Apples badly damaged by worms. *Litchfield*: Endangered by early frosts.

NEW YORK.—*Albany*: Apples very poor, both in quantity and quality. *Columbia*: Apples failed in the north part of the county. *Rensselaer*: Apples, few and falling off; no peaches; few plums. *Queens*: Grapes improved. *Washington*: Apples a half crop and inferior. *Warren*: Good apple and peach crops; grapes well filled.

PENNSYLVANIA.—*Tioga*: Apples and pears half average; no peaches; grapes abundant. *Washington*: Fruit crops larger, but not all of good quality. *Bucks*: Early apples an increased yield; peaches well grown and promise a full crop. *Luzerne*: Grapes wilting. *Armstrong*: Fruit injured by storms.

MARYLAND.—*Caroline*: Peaches a failure. *Dorchester*: Peaches an entire failure; some rot in grapes, reducing the yield 30 per cent. *Frederick*: Peaches rotting; grapes average. *Worcester*: Injured in quantity and quality by spring frosts. *Wicomico*: Peaches scarce.

VIRGINIA.—*Bland*: Fruit greatly damaged by late frosts in the spring. *Patrick*: No peaches. *Pittsylvania*: Grape yield immense, but injured by the rot. *Prince William*: Budded peaches an entire failure; unbudded yield reasonably. *Rappahannock*: Grapes promising. *Sussex*: Very few apples or peaches; grapes fine and thrifty. *Washington*: Apples and peaches very scarce. *Essex*: All fruit crops failed except grapes. *Henrico*: Apples and peaches scarce and poor; grapes a half crop. *Caroline*: Few apples or peaches. *Campbell*: Fruit scarce and indifferent. *Chesterfield*: Very few good apples; peaches a failure; grapes plenty and fine. *Louisa*: No fruit of any consequence. *Madison*: No peaches and few apples. *Augusta*: Apples dropping badly. *Page*: Apples and peaches almost a failure.

NORTH CAROLINA.—*Gaston*: Fruit of all kinds abundant; grapes especially fine. *Granville*: No fruit. *Lenoir*: Fruit nearly all frost killed. *Wilkes*: Peach crop a failure except on the mountains; apples inferior.

GEORGIA.—*Carroll*: Apples rotting; peaches wormy. *Laurens*: Fruit almost a failure. *Jackson*: Peaches scarce and indifferent. *Towns*: Fruit almost a failure. *Wilkes*: Fruit inferior.

FLORIDA.—*Jackson*: Apples a partial failure; peaches, average; grapes, below average.

ALABAMA.—*Calhoun*: Fruit crop generally a failure.

MISSISSIPPI.—*Holmes*: Fruit an entire failure; *Madison*: Fruit a failure.

TEXAS.—*Williamson*: A large crop of small peaches. *Marion*: Fruit crop destroyed by drought. *Kendall*: Wild fruits abundant. *Dallas*: Early peaches very fine; late, quite a failure. *Bandera*: Grapes drying up on the vines. *Karnes*: Peaches 10 per cent. below last year. *Cooke*: Peaches withering on the trees. *Medina*: Peaches small.

ARKANSAS.—*Franklin*: All kinds badly injured by drought. *Izard*: Grapes did finely; the only good fruit-crop. *Arkansas*: Apples, rotting; peaches, better. *Carroll*: No peaches.

TENNESSEE.—*Bradley*: Nearly all kinds abundant and good; grapes better than ever before. *Greene*: Apples light; peaches plenty, in some neighborhoods. *Granger*: Half crop of apples; rotting. *Cabell*: Apples a full average.

WEST VIRGINIA.—*Monroe*: Grapes superb. *Barbour*: Peaches almost a failure; apples indifferent. *Doddridge*: Peaches have failed for several years; grapes rotting, on account of late heavy rains.

KENTUCKY.—*Lewis*: Largest peach crop ever raised here. *Warren*: Fruit exceedingly fine.

OHIO.—*Harrison*: Improved by late rains. *Williams*: Fifty per cent. above average; the first season in five years in which we have had over a half crop. *Crawford*: Peaches, the best crop in twenty years. *Ashland*: Apples faulty; grapes, the best crop yet known; average rapidly increasing. *Hancock*: Peach trees breaking under their loads of fruit. *Ottawa*: Apples a half crop. *Athens*: Apples, peaches, and grapes abundant and fine. *Adams*: Late peaches withering on the trees. *Columbiana*: More peaches than ever before; five times the average of twenty years past.

MICHIGAN.—*Kalamazoo*: Apples small, wormy, and dropping. *Hillsdale*: Apples blighted; peaches plenty, but small and poor. *Berrien*: Apples and peaches shortened by drought. *Livingston*: Apples dropping; Rhode Island Greenings about the only winter apples left. *Calhoun*: Seriously injured by drought. *Wayne*: Apples below average; peaches and grapes abundant. *Shiawassee*: Apples injured by drought.

INDIANA.—*Hamilton*: Winter apples scarce and poor. *Posey*: Apples and peaches scarce and poor. *Fountain*: Peaches fine; best for ten years; apples almost a failure. *Pike*: Fruit generally poor, but grapes are plenty and good. *Whitley*: Good crop of peaches. *Franklin*: Apples and peaches ruined by drought; grapes fine.

ILLINOIS.—*Montgomery*: Winter apples almost a failure. *Sangamon*: Early apples good; later ones scarce. Concord grapes looking badly since late rains. *De Kalb*: Apples blown from the trees. *Madison*: Few bearing trees, but they are thrifty and full of fruit. *Moultrie*: Young peach trees loaded with fruit. *Carroll*: Apples and grapes injured by hail.

WISCONSIN.—*Fond du Lac*: Apples wormy and inferior; crop short.

IOWA.—*Lee*: Largest peach crop ever known; every tree full.

MISSOURI.—*Caldwell*: Apples and peaches plenty, but small. *Platte*: Fruit injured by grasshoppers. *Clinton*: Southwest winds roasted the apples under the trees, and some wild plums on the trees. *Daviess*: Apples few, but good; peaches plenty, but shriveled by drought. *De Kalb*: Peaches eaten from the stones by grasshoppers. *Monteau*: Apples scarce; peaches a failure.

KANSAS.—*Jefferson*: Ripened prematurely by hot winds. *Franklin*: Peaches plentiful, but small; grapes considerably destroyed by grasshoppers. *Nemaha*: Fruit swept by grasshoppers. *Mitchell*: Swept by grasshoppers. *Montgomery*: Peaches and apples shortened by drought. *Allen*: Peaches and apples taken by grasshoppers; trees stripped of foliage. *Douglas*: Trees stripped of fruit and foliage. *Osage*: Apples and peaches nearly ruined by grasshoppers; grapes rotted badly. *Republic*: Peach-trees stripped of their foliage and fruit. *Jackson*: Apple and peach trees stripped of foliage, and the fruit dried up in the scorching sun. *Shawnee*: Grasshoppers stripped all fruit-trees.

NEBRASKA.—*Pawnee*: Trees swept by grasshoppers. *Otoe*: Grasshoppers have reduced the yield and quantity of apples and grapes by consuming the foliage. They are also devouring the peaches.

CALIFORNIA.—*Stanislaus*: Grapes injured by the fly fully 20 per cent. *El Dorado*: Fruit very fair; peaches smaller than usual, on account of the great number on the trees. *Sutter*: Only a few apples on the trees, but they are large and fine. *Mendocino*: Fruit-trees and vines all young; crops abundant. *Sonoma*: Peach-crop shortened by curled leaf. Grapes promise the largest crop yet raised in the State, yielding, probably, 1,500,000 gallons of wine. *Alameda*: Largest and finest grape-crop yet grown. *Butte*: Fruit crops copious, but stunted by overbearing. *Nevada*: Fruits of all kinds abundant, but late. *Amador*: Season remarkably favorable for all kinds of fruit.

OREGON.—*Clatsop*: Damaged greatly by blight; early apples mostly lost and late ones damaged. *Clackamas*: Yield declined, but quality excellent. *Grant*: Fruit-crops injured by hail-storms.

Table showing the condition of the crops, &c., on the 1st day of August, 1874

States.	Corn—Average condition August 1.	Spring wheat—Average condition August 1.	Spring rye—Average condition August 1.	Oats—Average condition August 1.	Barley—Average condition August 1.	Buckwheat—Average condition August 1.	Buckwheat—Average condition August 1.	Potatoes, ( <i>Solanum tuberosum</i> )—Average condition August 1.	Potatoes, ( <i>Batatas edulis</i> )—Average condition August 1.	Tobacco—Average condition August 1.	Hay—Average condition August 1.	Hay—Product of clover compared with last year.	Hay—Average condition of clover when harvested.	Pasture—Average condition August 1.	Legums—Average condition August 1.	Cotton—Average condition August 1.	Sorghum—Average condition August 1.	Sugar cane, (not sorghum)—Average condition August 1.	Apples—Average condition August 1.	Peaches—Average condition August 1.	Grapes—Average condition August 1.
Maine.....	92	101	101	102	95	104	97	99	101	100	94	89	101	104	97	100	98	107	104	98	89
New Hampshire.....	98	100	104	106	102	100	101	103	101	106	105	101	111	111	116	100	103	98	105	92	105
Vermont.....	97	108	106	106	104	100	101	110	102	104	108	83	104	116	96	100	103	98	114	70	106
Massachusetts.....	101	108	97	109	101	98	102	104	87	87	110	114	108	115	92	83	80	102	114	112	103
Rhode Island.....	100	105	94	97	101	102	102	108	102	104	107	114	102	112	102	95	96	113	57	102	102
Connecticut.....	108	95	102	103	102	107	112	116	104	104	106	112	114	130	103	99	99	125	113	119	119
New York.....	94	94	100	101	102	93	98	102	100	97	106	112	102	106	98	100	100	92	107	89	104
New Jersey.....	91	101	95	101	88	98	97	88	91	101	137	107	106	100	100	100	88	107	88	88	104
Pennsylvania.....	101	101	95	101	88	91	97	89	101	100	100	113	107	107	100	100	98	93	93	103	103
Delaware.....	101	101	95	101	88	91	97	89	101	100	100	113	107	107	100	100	98	93	93	103	103
Maryland.....	96	90	90	92	85	102	97	75	100	72	97	112	97	91	95	100	95	76	42	103	103
Virginia.....	94	90	92	93	87	120	91	67	94	73	95	102	101	91	95	98	98	49	32	88	88
North Carolina.....	94	90	92	93	87	103	93	87	93	73	95	102	101	91	95	98	98	49	32	88	88
South Carolina.....	110	92	92	92	86	100	93	93	99	100	102	85	97	90	95	98	77	58	46	91	81
Georgia.....	110	92	92	92	86	100	93	93	99	100	102	85	97	90	95	98	77	58	46	91	81
Florida.....	102	102	102	102	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Alabama.....	107	95	95	95	88	100	103	97	100	85	96	98	93	101	96	90	103	106	80	88	99
Mississippi.....	95	95	95	95	88	100	103	97	100	85	96	98	93	101	96	90	103	106	80	88	99
Louisiana.....	102	95	95	95	88	100	103	97	100	85	96	98	93	101	96	90	103	106	80	88	99
Texas.....	85	85	85	85	85	108	97	90	99	97	104	111	111	105	95	105	96	100	96	107	104
Arkansas.....	70	70	70	70	70	94	96	65	76	78	91	93	99	73	74	87	76	97	81	75	88
Tennessee.....	82	82	82	82	82	130	85	46	80	31	61	63	67	65	81	72	73	73	58	124	88
West Virginia.....	82	82	82	82	82	130	85	46	80	31	61	63	67	65	81	72	73	73	58	124	88
Kentucky.....	93	106	96	96	96	92	94	90	84	91	62	75	74	64	61	61	86	76	112	108	100
Ohio.....	93	106	96	96	96	92	94	90	84	91	62	75	74	64	61	61	86	76	112	108	100
Michigan.....	106	96	96	96	96	92	94	90	84	91	62	75	74	64	61	61	86	76	112	108	100
Indiana.....	96	96	96	96	96	92	94	90	84	91	62	75	74	64	61	61	86	76	112	108	100
Illinois.....	96	96	96	96	96	92	94	90	84	91	62	75	74	64	61	61	86	76	112	108	100
Wisconsin.....	98	98	98	98	98	92	94	90	84	91	62	75	74	64	61	61	86	76	112	108	100
Minnesota.....	100	84	90	93	93	104	93	79	90	95	93	93	100	102	76	82	85	74	86	100	100
Iowa.....	102	90	93	93	93	96	89	93	90	77	87	86	96	90	92	93	101	93	108	100	100
Missouri.....	70	80	91	73	73	92	81	35	78	77	93	97	99	74	80	81	81	85	108	100	100
Kansas.....	42	85	100	100	101	95	78	35	78	77	93	97	99	74	80	81	81	85	108	100	100
Nebraska.....	103	105	98	100	99	102	96	96	93	103	102	110	99	102	91	85	85	109	89	99	102
California.....	103	105	98	100	99	102	96	96	93	103	102	110	99	102	91	85	85	109	89	99	102
Oregon.....	100	96	96	100	95	102	103	97	100	100	101	101	101	101	96	94	94	104	100	100	94

Table showing the condition of the crops, &c., on the 1st day of September, 1874.

States.	Corn—Average condition September 1.	Wheat—Average condition when harvested.	Rye—Average condition when harvested.	Oats—Average condition when harvested.	Barley—Average condition when harvested.	Buckwheat—Average condition September 1.	Potatoes, ( <i>Solanum tuberosum</i> )—Average condition September 1.	Potatoes, ( <i>Batatas edulis</i> ), sweet—Average condition September 1.	Tobacco—Average condition September 1.	Cotton—Average condition September 1.	Hay—Product of time last year, compared with this year.	Hay—Average condition of timothy when harvested.	Hay—Product of hay of all kinds compared with last year.	Beans—Average condition September 1.	Sorghum—Average condition September 1.	Sugar-cane (not sorghum)—Average condition September 1.	Hops—Average condition September 1.	Stock hogs—Number for fattening compared with last year. (Answer in hundredths as with other questions.)	Stock hogs—Average condition as to weight and size. (Answer in hundredths as with other questions.)	Wool—Weight of fleece compared with an average clip. (Answer in hundredths as with other questions.)	Apples—Average condition September 1.	Peaches—Product compared with an average. (Answer in hundredths as with other questions.)	Grapes—Average condition September 1.
Maine	79	100	100	104	102	97	101	.....	107	.....	101	101	83	95	.....	.....	112	95	97	98	83	.....	15
New Hampshire	92	103	106	105	102	96	105	.....	75	.....	107	103	110	72	.....	.....	100	99	98	.....	85	.....	101
Vermont	82	106	99	110	102	101	105	.....	.....	.....	114	102	110	68	.....	.....	80	91	103	.....	44	.....	86
Massachusetts	83	107	103	101	100	100	92	.....	80	.....	109	101	112	70	.....	.....	.....	97	100	.....	45	.....	92
Rhode Island	105	105	100	90	100	100	93	.....	103	.....	100	103	113	100	.....	.....	.....	88	95	.....	77	.....	100
Connecticut	111	103	101	103	104	111	110	.....	107	.....	100	100	130	103	.....	.....	.....	89	102	.....	100	.....	119
New York	72	106	102	107	101	93	89	.....	92	.....	136	107	134	101	.....	.....	.....	94	102	.....	100	.....	119
New Jersey	95	101	100	88	81	90	76	.....	.....	.....	104	103	134	95	.....	.....	.....	94	98	.....	101	.....	105
Pennsylvania	99	103	96	72	81	90	76	.....	51	.....	93	101	95	95	.....	.....	.....	97	98	.....	100	.....	105
Delaware	90	100	100	82	81	95	79	.....	62	.....	110	90	113	100	.....	.....	.....	92	100	.....	105	.....	102
Maryland	88	96	101	71	.....	.....	61	.....	.....	.....	103	98	112	87	.....	.....	.....	94	98	.....	100	.....	102
Virginia	95	88	94	63	.....	.....	73	.....	55	.....	96	97	105	96	.....	.....	.....	89	97	.....	101	.....	94
North Carolina	98	92	96	76	.....	.....	53	.....	77	.....	87	96	102	100	.....	.....	.....	95	98	.....	102	.....	83
South Carolina	109	83	76	82	100	.....	100	.....	91	.....	86	93	100	92	.....	.....	.....	95	98	.....	103	.....	63
Georgia	105	98	100	88	94	.....	91	.....	94	.....	87	91	96	92	.....	.....	.....	99	96	.....	99	.....	63
Florida	102	100	100	88	94	.....	107	.....	107	.....	77	90	.....	.....	.....	.....	.....	101	98	.....	98	.....	62
Alabama	94	101	95	81	.....	.....	91	.....	75	.....	.....	.....	82	83	.....	.....	.....	98	98	.....	90	.....	62
Mississippi	89	94	90	95	.....	.....	92	.....	83	.....	.....	.....	86	85	.....	.....	.....	97	98	.....	91	.....	62
Louisiana	76	.....	.....	60	.....	.....	83	.....	58	.....	105	.....	77	67	.....	.....	.....	95	98	.....	90	.....	71
Texas	91	79	80	92	83	.....	83	.....	70	.....	.....	.....	86	85	.....	.....	.....	87	80	.....	97	.....	69
Arkansas	53	120	80	57	.....	.....	40	.....	70	.....	72	.....	55	62	.....	.....	.....	100	102	.....	63	.....	69
Tennessee	66	104	102	49	.....	.....	99	.....	47	.....	75	.....	62	66	.....	.....	.....	82	90	.....	67	.....	69
West Virginia	89	111	101	69	.....	.....	98	.....	54	.....	63	.....	76	73	.....	.....	.....	82	90	.....	67	.....	69
Kentucky	87	112	100	47	103	.....	78	.....	78	.....	49	.....	67	64	.....	.....	.....	82	90	.....	63	.....	69
Ohio	93	109	100	75	93	.....	43	.....	25	.....	42	.....	67	64	.....	.....	.....	82	90	.....	63	.....	69
Michigan	76	104	98	93	95	90	81	.....	31	.....	49	.....	73	54	.....	.....	.....	82	90	.....	63	.....	69
Indiana	96	104	98	89	101	83	79	.....	62	.....	92	.....	89	94	.....	.....	.....	82	90	.....	63	.....	69
Illinois	78	98	94	87	88	79	63	.....	70	.....	93	.....	89	94	.....	.....	.....	82	90	.....	63	.....	69
Wisconsin	91	77	89	83	81	95	88	.....	100	.....	95	.....	95	83	.....	.....	.....	82	90	.....	63	.....	69
Minnesota	96	96	99	103	96	99	76	.....	100	.....	95	.....	89	90	.....	.....	.....	82	90	.....	63	.....	69
Iowa	92	96	96	92	95	84	75	.....	100	.....	95	.....	94	91	.....	.....	.....	82	90	.....	63	.....	69
Missouri	53	104	93	79	95	69	54	.....	49	.....	76	.....	92	99	.....	.....	.....	82	90	.....	63	.....	69
Kansas	45	89	89	61	80	39	20	.....	36	.....	66	.....	85	65	.....	.....	.....	82	90	.....	63	.....	69
Nebraska	37	91	93	76	91	.....	53	.....	32	.....	100	.....	87	84	.....	.....	.....	82	90	.....	63	.....	69
California	105	104	100	103	101	96	93	.....	102	.....	123	.....	132	100	.....	.....	.....	82	90	.....	63	.....	69
Oregon	100	103	97	93	96	99	100	.....	100	.....	102	.....	106	99	.....	.....	.....	82	90	.....	63	.....	69

## EXTRACTS FROM CORRESPONDENCE.

**WHEAT-CULTURE.**—*Bradley, Tenn.*—I sowed eleven varieties, all but three of which rusted. Fultz, Arnold's Canada Hybrid, and Burk's Golden Straw did not rust, because they ripened from nine to fourteen days earlier than our common wheats. Burk's Golden Straw was fourteen days earlier, and weighed 70 pounds to the bushel. It makes as much flour from 4.72 bushels as can be made from 5 bushels of any other variety. The Fultz yields more than any other. From one quart sowed last year, and the proceeds resowed this year, I have received 83 bushels by weight. It produced, on my farm, 36 measured bushels per acre, weighing 64 pounds per bushel.

*Jersey, Ill.*—If we could get wheat that would ripen about June 10, of short growth and fair heads, it would be a great thing for this section. A number of years ago we had wheat of this description, which suited the soil and climate so well that we got the reputation of being the best wheat-growing section of the State, and our wheat brought the highest price in the market. I think the seed came from France, and was first sown in Virginia, whence it was distributed over the country, being known as the May wheat. Wheat ripening after June 25 is of no use to us, as the rust always strikes it.

*Walla-Walla, Wash.*—Inadequate transportation allows us only 40 cents per bushel. Farmers say they cannot raise it at that price.

*Morgan, Utah.*—Excelsior wheat from the Department preferred to Tappahannock, Fultz, or any other kind. It stands drought, yields well, and bears a long straw.

*Coffee, Tenn.*—A neighbor thrashed 90 bushels of Fultz from 2 bushels sown on  $3\frac{1}{2}$  acres. From 3 quarts received from the Department, and distributed by me, thousands of bushels have been grown in three years.

*Alexander, N. C.*—Two quarts of Touzelle wheat, from the Department, sown in October and harvested in June, made two bushels of fine large grain. It will do well in this section.

*Uvalde, Tex.*—The Falcon wheat does not make as good a yield as our native wheat.

*Fannin, Tex.*—From extreme scarcity of money, many are selling their wheat to Saint Louis merchants at \$1 per bushel, and will probably buy flour at high prices next spring. This is a long distance to send to mill.

*Guthrie, Iowa.*—On old land poorly put-in, wheat was cut short by dry weather. Fortunately we have less of such farming than usual, and I think this year will "play out" a few more slovenly theories.

*Lincoln, Mo.*—Touzelle wheat kept green until a few days ago. None of it matured.

*Marion, Mo.*—Fall-wheat crop the finest ever raised. Tappahannock from the Department preferred; grain large, more transparent and heavier than any other; weighs as much as 72 pounds per bushel.

*Wood, Ohio.*—The Fultz wheat you sent me two years ago has proved a perfect success. From the 12 quarts received I had 12 bushels of nice wheat. It is almost identical with the old blue-stem wheat raised in Eastern Ohio thirty-five years ago. Its superiority is seen most strikingly when threshed; it will yield from the dozen sheaves a larger amount than any other variety.

*Spottsylvania, Va.*—A farmer in this county has made good crops for three years by late seeding. He sows from October 25 to November 16. His land being poor, he treats it with 200 pounds of guano per acre. This year the seed yielded nineteen-fold.

**CORN-CULTURE.**—*Carroll, Mo.*—The necessity for thorough cultivation as well as the evil consequences of cultivating the soil too wet has never been more thoroughly demonstrated than this season. Corn in some fields looks green and promising, while in adjoining fields, broken up too wet, it is "fired" up to the shoot, and will not make even good fodder.

**RICE-CROPS.**—*La Fourche, La.*—The rice-crop looks well; March plantings will shortly be harvested. I am satisfied that the material regeneration of Louisiana will be effected by means of the rice-crop. It is of quick growth—only five months from seeding to harvest; it is easily cultivated; allows a large acreage per hand; yields well, and commands high prices. It is easily cultivated by white labor; and in Louisiana, unlike South Carolina, it does not cause sickness, as the land is high, formerly cultivated in sugar-cane.

**POULTRY-DISEASE.**—*Woodson, Kans.*—Chicken-cholera has swept the entire stock of poultry from scores of our farm-yards—turkeys, geese, ducks, and Guineas, as well as Brahmans and Shanghais. The Houdans are the only fowls exempt; they appear to be the hardiest of the new varieties, and the best layers.

**TOBACCO-CULTURE.**—*Hampden, Mass.*—The tobacco-crop is somewhat backward, but looks unusually healthy and strong. Considerable of Spanish leaf is being raised

in this vicinity, which gives a much finer leaf than the old Connecticut seed, and is more forward, some pieces being already topped and of heavy growth.

**GRAPE-CROPS.**—*Monroe, W. Va.*—A few small vineyards promise immense crops of grapes; at least 5,000 pounds per acre.

*Salt Lake, Utah.*—Grapes mildew before ripening; no remedy found. It is estimated, that 70 per cent. of the crop will be thus ruined.

*New London, Conn.*—Grape-vines are loaded with fruit, and the indications are that the yield will be nearly as large again as ever before.

**DAIRY-PRODUCTS.**—*Orleans, Vt.*—Our specialty is butter-making. Yield up to average with fair prices—25 to 30 cents per pound.

*Washington, N. Y.*—Dairying unusually prosperous and on the increase.

**FRUIT-CULTURE.**—*Pulaski, Ill.*—Bitter-rot alarmingly on the increase. There is good reason to believe that it spreads from tree to tree, as it certainly increases most rapidly in the vicinity of kinds first affected by it. A still more fatal malady is a form of blight known as root-rot, which destroys a large percentage of our trees, giving no outward sign until the trees are ready to be pushed over with a slight push.

**AVERAGE YIELD OF WOOL.**—*Sangamon, Ill.*—Five different flocks yielded as follows: No. 1, 111 head, 420 pounds; No. 2, 35 head, 150 pounds; No. 3, 22 head of high grade Cotswold yearlings, 176 pounds; No. 4, 110 head of common sheep, (corn-fed during the winter,) 660 pounds; No. 5, 74 head good merinos, 592 pounds. Total, 347 sheep, yielding 1,998 pounds of wool, and averaging 5.75 pounds per head. The average of the county is about 5 pounds.

**HEAVY HAIL-STORMS.**—*Hart, Ga.*—A remarkable hail-storm passed over a portion of this county August 14, covering a streak about three miles wide and fifteen or twenty miles long. In some places it completely stripped all vegetation of fruit and foliage. The hail lay on the ground three inches deep.

*Grant, Oreg.*—The most destructive rain and hail storm ever witnessed in this county occurred on the 9th instant. A dark cloud appeared in the southwest, while at the same time a heavy storm seemed approaching from the northeast. Carried by two opposite currents of air, they drifted together immediately over a portion of the settlements. Considerable wheat and barley was ready for the sickle, and where this was the case the grain was as completely threshed as if passed through a thresher. Only four or five farms received the full force of the hail-storm, but these suffered severely. Apples, plums, and pears were almost entirely ruined; even the new fruit-buds forming were materially injured. Had the hail-storm been general throughout the valley, not enough grain would have been left for seed and bread. As it is, there will be quite a large surplus.

**EXCESSIVE RAIN-FALL.**—*Chowan, N. C.*—Rained six hours July 29, filling wash-tubs a foot deep.

*Morgan, Ohio.*—July very hot and dry till the 11th, when it rained 1.2 inches; 12th, 0.3 inches; 21st, 0.5 inches; 24th, 0.7 inches; 26th, 0.8 inches, with a heavy storm; total, 3½ inches.

*Washington, Ill.*—Six inches within twenty days.

*Lewis, N. Y.*—From 8 p. m. August 1 to 9 a. m. August 2, 7.8 inches.

*Wasatch, Utah.*—More rain than ever before.

*Summit, Utah.*—Heavy and frequent rain-storms to an extent never before known, causing heavy floods and much damage to hay.

*Des Moines, Iowa.*—Drought broken by a rain-fall of 12 inches.

**PRICES OF PRODUCE.**—*Macon, Ill.*—Wheat, 85 cents to \$1.05; corn, 55; oats, 35; live hogs, \$6 per cental.

**AGRICULTURAL PROSPERITY.**—*Crawford, Pa.*—No season has been so prosperous for twenty years.

*Van Buren, Iowa.*—I am running a small farm of 40 acres, with 20 under cultivation in fruit, nursery, vegetables, and some grain. My income varies from \$1,500 to \$2,000 per annum.

**RYE-CULTURE.**—*Osage, Kans.*—The white rye sent me by the Department last fall has produced a splendid crop of fine, well-filled grain, ripening ten days earlier than the black rye, sown beside it the same day.

*Dickson, Tenn.*—A neighbor raised 3½ bushels of winter rye from 4 quarts received from the Department, although the chickens had destroyed at least one-fourth of the sowing.

**DROUGHT.**—*Hood, Tex.*—The Brazos River in hundreds of places is as dry as the public road. The Palaxy Creek at this point is still running. Wild animals are coming long distances for water, and hogs by hundreds are seeking the Palaxy. The oldest citizens have never seen such a drought. Thousands of trees are dead, or their leaves are as dead as ordinarily in the month of December.

*Independence, Ark.*—The drought which had begun to affect crops in July continued till August 20. This was attended with a degree of heat never before experienced. With this heat there was an almost constant wind coming in gusts and heated so as to raise the thermometer to 106° and sometimes to 110° in the shade.

*La Fayette, Ark.*—No rain since May.

*Bradley, Ark.*—No rain since April 19.

*Pulaski, Ark.*—On July 8 the only rain fell since April 20; thermometer, from July 15 to August 25, ranged from 92° to 106°, with extremely hot winds; cotton is as dead as a November frost could make it; one-twentieth of the oak timber in the hills dead.

*Prairie, Ark.*—On the 10th August the thermometer was 108½° in the shade.

*Sevier, Ark.*—No rain since May.

## RICE.

In reply to letters of inquiry concerning the cultivation of rice, as to its extent and increase, the Department has received several interesting statements from leading fields of production.

**SOUTH CAROLINA.**—Dr. J. A. R. Sparkman writes from Georgetown County, South Carolina: The tide-lands of this county, so particularly adapted to the culture of rice, border several rivers—the Waccamaw, Pee Dee, Black, and Sampit, (which unite to form Winyaw Bay,) and the two Santees, which empty into the ocean about twelve miles south of Winyaw Bay. Up to the year 1860, there were about 46,000 acres under regular cultivation, and, according to the census returns of that decade, the crop of 1859, the largest ever grown, yielded 95,127 tierces of clean marketable rice. Estimated at 600 pounds to the tierce, the product was 57,076,200 pounds, or upward of 1,200 pounds per acre. From 1860 to 1868, no records of acreage or product have been preserved. The area of cultivation for 1868 and 1869, but not the product, has been ascertained. During the four years succeeding, both product and acreage are known, as shown in the following statement, viz:

Year.	Acreage.	No. of tierces.	Pounds per acre.
1868 .....	12, 143		
1869 .....	16, 100		
1870 .....	15, 133	13, 636	540
1871 .....	17, 439	13, 500	464
1872 .....	16, 900	15, 175	562
1873 .....	17, 100	13, 126	490
1874 .....	16, 232		

It will be seen that the area of cultivation in 1871 was greater than in any one of the seven years cited, and 1,207 acres in excess of the present year. Dr. Sparkman says:

The diminished product of 1871 resulted from an almost unprecedented wet harvest, by reason of continued rains when the crop was on the stubble. The rice was seriously damaged in quality, wasted in the fields, and made a very unsatisfactory turn-out in the mills. So in 1873, a heavy and protracted freshet, from August to the middle of October, proved most disastrous as to quality and quantity of rice, and the crop, considered the best grown since 1865, sold at non-remunerative prices, causing heavy disappointment and embarrassment, peculiarly, throughout our entire district, not 5 per cent. of the rice-estates paying expenses of cultivation. Most of the planters had to give liens upon the present growing crop to cover deficiencies of the last year, and the usurious rates of interest demanded by money-lenders, and by those who furnish advances in the shape of plantation-supplies, leaves so small a margin of profit for the producer that no wonder need be expressed that the area of cultivation has decreased. The additional cumulating difficulties in the management and control of labor renders it highly improbable that an improved condition of things may be looked for until the political and monetary affairs of the commonwealth assume a sounder and healthier tone.

As to the prospects of the crop for the present year, (1874,) we may now speak understandingly. The winter and spring months devoted to the preparation of the soil were unusually wet and unfavorable. A series of freshets, up to the middle of April, retarded field-work until beyond the usual time for seeding, and the preparations of three to four months had to be hurried through in as many weeks, late in the season, when imperfect drainage and the heat of spring rendered the use of machinery with



animal-power less available than usual; consequently the work was slovenly done and the crop badly set. Upwards of one-third of the 16,232 acres planted were seeded late in May, and up to the 20th of June, the usual time for sowing being from the 25th of March to the last of April. The water-grasses, started by the condition of the lands under a very low subsidence of the freshets, were well rooted when the rice was put in; and high up the rivers, where the drainage is still deficient, these grasses have never been eradicated or controlled. The almost universal report, therefore, is that the crop is "grassy"—which means unsatisfactory cultivation. Under these circumstances the growth has not been vigorous, and the product cannot possibly exceed the average of the past four years. The crop is assuredly not as promising as the growth of last year, and the harvest has not yet commenced. That portion of the crop planted in May will inevitably be seriously damaged by birds, (a terrible pest with us,) and it has yet to be seen whether the June rice will mature so as to be out of the way of harm in the contingency of an early frost. All things fairly considered, there is no ground for calculating upon anything more than an average, which has not, since 1863, reached higher than 560 pounds of clean rice to the acre, this being 55 per cent. less than the maximum of 1,207 pounds in 1859.

GEORGIA.—The following account of the rice-fields in McIntosh County, Georgia, has been received :

Year.	Acreage.	Yield per acre.	Total yield.
		<i>Bushels.</i>	<i>Bushels.</i>
1870 .....	3,300	32	105,600
1871 .....	2,460	20	49,200
1872 .....	2,020	30	60,600
1873 .....	2,430	31	75,361

In the year 1871 two-fifths of the entire crop was destroyed by a heavy storm and continued freshets after it was cut and stacked in the fields. In 1872 the acreage was greatly diminished by an excessive freshet of long duration, which occurred during the planting-season. In the present year nineteen hundred acres have been planted up to September. The heavy and continued freshets, together with a cold spring, retarded planting operations. Planters, however, are still at work, and there will probably be as much planted as in former years. Upon a review of the acreage planted, it is ascertained that only one-third of the land "under bank," and which was planted prior to the war, is now under cultivation. The fact that all the lands have to be kept in good order to insure the safety of the crop, and the additional facts of limited resources in money and a failing supply of labor, account for the reduced acreage in the county, and for the reduced average per acre.

LOUISIANA.—A correspondent writing from Point à la Hache, says :

Of the yield of our rice-crop in 1873, we can estimate with certainty that the yield was about 240,000 barrels of rough rice, or 120,000 bushels of hulled and polished. Notwithstanding the many difficulties planters had to contend with in the beginning, their success was very encouraging, for the crop of 1873 was in proportion doubled to that of any preceding year. The condition and prospects for this year (1874) are wholly changed on account of a wet and late season for planting. It may be estimated that the crop will reach 180,000 bushels of rough, or 90,000 bushels of rice hulled and polished.

## ENTOMOLOGICAL RECORD.

By TOWNEND GLOVER, ENTOMOLOGIST.

INSECT INJURIES.—*Cotton-caterpillars* (*Anomis xylinæ*).—This insect appeared at different points in the cotton States, but their injuries were scarcely appreciable except at a very few points. In Pamlico, North Carolina, the weather was too cool for them, but generally the extreme heat was unfavorable to their propagation. In Russell, Alabama, and a few other counties, they were somewhat destructive to late crops; but elsewhere they were either of very little force, or were easily destroyed by Paris-green. The planters of Harris, Texas, are hopeful of finally exterminating them.

*Cotton-lice* (*Aphis* sp.,) were quite injurious to cotton in York, South Carolina.

*Boll-worms* (*Heliothis armigera*,) were more or less injurious to cotton in Jackson and Leon, Florida, Henry and Macon, Alabama, and Titus, Texas.

*Chinch-bugs* (*Micropus Rhyparochromus leucopterus*).—This insect, a former visitant of the Atlantic coast States, appears inclined to renew its old acquaintanceship in that quarter. In Orange, Virginia, it cut down a superior corn-crop to an average; in York it affected early corn, but did not molest late plantings. It was injurious to grain-crops generally in Prince William, and in Loudoun ravaged wheat and grass. In Harrison and Livingston, Kentucky, it damaged corn. In Hamilton, Ohio, it attacked oats. It was somewhat troublesome in Tuscola, Michigan, and injured corn and wheat in Sauk and Columbia, Wisconsin, but these counties were too far north for a severe visitation. It inflicted greater or less injuries in several counties of Indiana upon different crops, viz., Hamilton, Fayette, Carroll, and Washington. In Illinois its destructive sweep was still wider, embracing Menard, Sangamon, Perry, Effingham, Fayette, Jackson, Clay, Madison, Clinton, Saint Clair, Massac, White, Randolph, Cass, and Ford counties. In Missouri it is reported in Ralls, DeKalb, Callaway, Carroll, Morgan, Pettis, Johnson, Dallas, Pulaski, Benton, and Grundy. It was also injurious in Franklin, Osage, Linn, Miami, and Crawford, Kansas.

*Colorado beetles* (*Doryphora decem-lineata*).—This pest is making its presence painfully felt in some new localities on the Atlantic coast. In Salem, New Jersey, it injured late crops very seriously, and did considerable damage in Gloucester. In Pennsylvania they are noted in Butler, Clearfield, Franklin, Northampton, Perry, Bedford, Huntington, and Cambria; in Northumberland they abandoned the vines and were observed crawling over the pavements and streets of the villages. In Caroline, Dorchester, Frederick, Queen Anne, Cecil, and Baltimore, Maryland, they have been more or less destructive. In Prince William, Virginia, wasps have been observed destroying them very rapidly. They were quite injurious in Page. They were at work in Monroe, Preston, Hardy, and Jefferson, West Virginia; in Nicholas, Kentucky, they nearly ruined the crop. In Ohio they are noted in Perry and Washington, but no serious injury is stated. In Charlevoix, Delta, Kalamazoo, and Bay, Michigan, their presence was felt in greater or less devastations, but Paris-green was found to be a very effective antidote. In Indiana their ravages were not serious; they are reported only in Clay, Posey, and Decatur counties. In White, Cumberland, and Shelby, Illinois, they inflicted more or less injury, as also in Adams, Columbia, and Outagamie, Wisconsin, and in Sibley, Minnesota. They were injurious in Calhoun and Woodbury, Iowa, but in Howard they were extensively destroyed by parasites. They are also reported in Shelby, Missouri, and Dawson, Nebraska.

*Grass army-worms* (*Leucania unipuncta*,) shortened hay-crops in Richland, South Carolina, and Heard, Georgia; in Macon, Alabama, they injured late corn; in Cheatham and Dickson, Tennessee, they were destructive on grass-crops, especially German millet. They appeared in Putnam, but did little damage.

Old potato-bugs (*Cantharis* sp.,) were noted in Decatur and Orange, Indiana, and Shelby, Illinois.

*Grasshoppers*, (*Caloptenus* sp.)—The *C. femur-rubrum* is reported in several localities in the Middle States, and between the Alleghanies and the Mississippi, but its injuries do not appear very formidable. The *C. spretus*, the formidable grasshopper of the plains, sometimes erro

neously termed "locust," has inflicted terrible ravages in the Northwest, of which the following specimen is presented in the language of our correspondent:

*Doniphan, Kansas.*—The late summer and fall crops have been almost entirely destroyed by grasshoppers. The common jumping grasshopper did much damage through the early part of the season, but about the middle of August clouds of the flying ones made their appearance over the county, devouring and destroying vast quantities of vegetation. Gardens were quickly eaten up, corn-fields were stripped of leaves, and in many cases the corn was entirely eaten off; fruit-trees are left with naked branches, and in many cases the half-ripened fruit is left hanging on the trees, presenting a sickening sight of death and destruction.

In addition to the actual loss by devastation, the loss caused by discouragement will be greater. Years of patient waiting, hard work, and self-sacrifice have been destroyed in a few days, with no known remedy for protection—just as the fruits of labor were beginning to be realized, destruction came—and the question with many is, "Is it of any use to try again?"

Here is a field for the Department of Agriculture. Some method of protection or relief must be had against the destruction of this insect, or an immense tract of magnificent country will never be what it would without this curse. I am one of those who believe all such things may be controlled by some practical method; it only requires study, enterprise, and means to learn how. This county (Doniphan) could well afford to pay \$100,000 for a guarantee that no grasshoppers should ever trouble it again. I have learned that vegetation highly cultivated and growing vigorously is less liable to be destroyed than when on the decline or growing feebly. Thus it is we often see a single tree in an orchard eaten even to the bark, while others of the same variety are not damaged so much; and upon examination it will be invariably found that those mostly eaten were diseased, or had their vitality in some way impaired. This thing was noticeable when the same kind of insects were here six or seven years ago. Of all fruit-trees, apple and pear trees suffer the most, while peaches, plums, and cherries suffer the least. They eat the leaves off the apples and leave most of the apples on, but the peaches they will eat the fruit and leave the foliage; but, in many instances, when vegetation is not plenty, I understand they clean all as they go, and I have seen instances of this kind. The damage to vineyards in this county is not so great. They do not seem to relish grapes, and are satisfied by eating off the stems and leaving the bunches fall to the ground. There will not be enough corn in this county to feed what stock there is in the county as it should be fed.

This plague is reported in Brown and Broome, Wisconsin; Nicollet, Sibley, Blue Earth, Faribault, Jackson, Douglas, and Wright, Minnesota; Sioux, Emmett, Harrison, Calhoun, and Woodbury, Iowa; Platte, Shelby, Daviess, and DeKalb, Missouri; Jefferson, Morris, Cherokee, Franklin, Nemaha, Mitchell, Montgomery, Allen, Smith, Bourbon, Douglas, Leavenworth, Cowley, Labette, Osage, Rice, Neosho, Graham, Cloud, Crawford, Ellsworth, Greenwood, Jackson, Butler, Miami, Linn, Pawnee, Chase, Sedgwick, and Shawnee, Kansas; Pawnee, Cass, Nuckolls, Furness, Dawson, Madison, and Gage, Nebraska. In some localities the hot winds, so destructive to vegetation, with the parched earth, addled their eggs. The wide-spread destruction which they have caused in the Northwest has not been adequately described. In many places large masses of people will probably suffer during the coming winter for the necessities of life, their crops having been swept by this remorseless enemy.

MISCELLANEOUS.—Cut-worms (*Agrotis sp.*) injured corn and cotton in Franklin, Louisiana. Fruit-caterpillars (*Clisio campa*) infested three-fourths of the apple-orchards of Oxford, Maine, and were seen in Clay, Indiana. Coddling-moths (*Carpocapsa pomonella*) injured apples in Moultrie, Illinois. Horn-worms (*Macrosila carolina*) were destructive of tobacco in Halifax, Virginia, and Pope, Illinois. A species of *Aphis* destroyed buckwheat in Luzerne, Pennsylvania. Grub-worms (*Lachnosterna sp.*) infested corn-crops in Huntington, Indiana, and in Montgomery, Missouri. May beetles (*Lachnosterna sp.*) were found in corn-fields in Des Moines, Iowa. In Whiteside, Illinois, a new beetle, undescribed, was observed destroying the larvæ of the Colorado beetle, thrusting it through the body with its beak, and killing it instantly. The

tobacco fly (*Macrosila carolina*,) was injurious in Amelia, Virginia. The curculio (*Conotrachelus nenuphar*,) injured fruit-crops in Clarke, Virginia. Late wheat in Piscataquis, Maine, was infested with the weevil (*Diplosis tritici*.) The "borer" was observed in the corn-fields of Wicomico, Maryland. In Lunenburg, Virginia, an undescribed insect attacked growing corn, boring its roots, and causing it to fall.

## CHEMICAL MEMORANDA.

By WM. McMURTRIE, CHEMIST.

CASTOR PLANT.—Mr. J. P. Lawrence, of Dallas, Texas, sent to this Department a sample of seed of castor plant, (*Ricinus communis*,) that the quantity of oil contained therein might be determined, and in order to compare their value in this particular with that of foreign varieties. We have also made similar determinations with samples of the varieties *R. minor* and *R. sanguinarius* from France. The beans from Texas seem to belong to the variety *R. sanguinarius*, and, as will be seen from the analyses given below, compare very favorably with those grown in France.

The analyses resulted as follows:

	I.	II.	III.
Moisture .....	4.40	4.35	4.10
Oil .....	46.95	47.78	45.55
Matter extracted by alcohol and water .....	6.35	4.20	4.40
Starch .....	8.875	9.81	12.50
Albuminoids .....	3.788	3.10	2.40
Cellulose .....	25.50	27.22	27.70
Inorganic matter .....	2.90	2.90	2.94
	98.763	99.36	99.59

No. I represents the composition of the sample of *Ricinus sanguinarius*, grown in Texas; No. II the same variety, grown in France; while No. III represents that of a sample of *Ricinus Minor* grown in France.

The following are the results of an analysis of the mineral matter contained in the beans of *Ricinus sanguinarius*:

Lime .....	11.31
Magnesia .....	7.33
Peroxide of iron .....	0.89
Phosphoric acid .....	33.657
Sulphuric acid .....	2.218
Chlorine .....	0.89
Potassa .....	29.52
Soda .....	8.75
	99.565

ARTIFICIAL PRODUCTION OF INDIGO.—The discovery and application of a practical method for the artificial production of alizarin bids fair to be followed by one somewhat similar for the production of indigo. T. L. Phipson has succeeded in obtaining a purple-black product in small quantity showing considerable resemblance to the black product resulting from the unfavorable fermentation of the leaves of *Indigofera*. It is insoluble in water and alcohol, but is soluble in sulphuric acid, and is obtained in the following manner: Phenoleyanin is melted with sodium acetate or with nitro-naphthalin, and the product dissolved in oil of vitriol. On addition of water a sulpho-acid is precipitated, which, when treated with excess of ammonia, yields a small quantity of the purple-black product in question.

**USE OF PARIS-GREEN.**—Reports from different localities seem to indicate that farmers are afraid to make use of Paris-green (arsenite of copper,) for the destruction of the Colorado potato-beetle, thinking it possible that the arsenic may be taken up by the tubers in sufficient quantity to become injurious to the health of consumers; and the question has arisen, “Is there any ground for this supposition.” It is true that arsenic has been taken up by cabbage in notable quantities, but the conditions were highly favorable. It is also reasonable to suppose that it would be assimilated by plants, from the fact that arsenic acid is included in the same chemical classification as phosphoric acid, the two compounds having many similar properties. But whether the former may be substituted for the latter in the economy of plant-growth is a point which has not yet, to our knowledge, been determined. We hope to settle this point by the results of an investigation lately instituted in our laboratory, which shall be published as soon as complete. In the mean time, however, we think it will be safe to make applications of Paris-green in the small quantities usually recommended, since the danger to the consumer from the small amount that can be taken up will undoubtedly be very slight.

**SUGAR CONTAINED IN VINE LEAVES.**—Some time ago M. Petit published the fact that grape-vine leaves contain from 20 to 30 grams of glucose and 13 to 16 grams of acid, consisting principally of tartaric acid in combination with potassa, per kilogram of leaves, and it appeared to him that the sugar present was inverted sugar alone, without admixture of cane sugar, but subsequent examination, by tests with Fehling’s liquor, both before and after treatment with acid, and by means of polarimetric tests, showed that cane sugar was present also. He made two determinations of the amounts of each kind of sugar present after treatment with animal charcoal to remove the coloring matter and tannin.

In the first, one kilogram of leaves gave—

Cane sugar .....	9.20 grams.
Glucose .....	26.55 grams

In the second, operating more rapidly, he obtained—

Cane sugar .....	15.80 grams.
Glucose.....	17.49 grams.

He also found a mixture of cane sugar and glucose in the leaves of cherry and peach. One determination gave, per kilogram of leaves—

Cane sugar.....	33 grams.
Glucose.....	12 grams.

**A SOLUBLE MODIFICATION OF STARCH.**—After a series of experiments with this regard, M. Musculus has succeeded in obtaining a modification of starch, said to be soluble, and preserving at the same time all the other properties common to this substance. In order to obtain this product, common starch is treated with strong acid, which is subsequently removed by repeated washings with cold water. A granular body is left behind, which is insoluble in cold water, but completely soluble in water heated to 50° C., and seems to be starch not aggregated in grains or feculæ, possessing all the other properties, especially the same rotatory power.

The following table, prepared by Professor Freytag, showing the proportions of proximate organic principles, as well as the percentages of inorganic principles found in the ashes of several feeding-materials, has been published in the general catalogue of the Royal Agricultural Museum in Berlin. The table will explain itself:

## One kilogram (1,000 grams) of the following materials contains in grams—

Materials.	Water.	Albumen, (crude protein.)	Starch, (non-nitrogenous extract.)	Cellulose, (crude fiber.)	Fat.	Potassic hydrate.	Sodic chloride.	Magnesia.	Lime.	Ferric oxide.	Phosphoric acid.	Sulphuric acid.	Silicic acid.	Sulphur from the organic substances, principally albuminoids.	Ammonium nitrate, 33 percent. N, equivalent to the amount of nitrogen necessary to the formation of the albuminoids.	Alcohol which may be produced from the starch present.
<b>I.—Seeds:</b>																
1. Wheat .....	143	131.1	663	30	15	6.6	0.9	2.2	0.6	0.06	9.24	0.49	0.3	1.5	60	376
2. Oats .....	140	113.6	560	100	60	5	1.2	1.8	1	0.8	6.19	0.49	12.22	1.7	52	318
3. Peas .....	138	233	495	88	20	11.50	1.5	1.9	1.2	0.08	9.97	0.98	0.22	2.4	107.5	281.2
4. Rape .....	130	170	.....	172	500	10.48	0.6	4.6	5.2	0.01	18.48	1.59	0.4	2.2	77.2	.....
<b>II.—Roots:</b>																
5. Potatoes .....	750	23.6	200	11	3	6.67	0.4	0.4	0.5	0.05	2.02	0.73	0.3	0.2	10.3	113.6
6. Sugar-beets .....	815	8	*130	37	1	4.70	1.0	0.7	0.5	0.03	0.1	0.4	0.3	0.1	3.6	70
<b>III.—Straw and stalks:</b>																
7. Wheat-straw .....	141	22	200.4	450	15	5.84	2.3	1.1	2.6	0.09	2.6	1.47	23.2	1.6	10	.....
8. Oat-straw .....	141	25.6	369.4	400	20	11.54	3.8	1.8	3.6	0.11	2.03	1.84	21.2	1.7	11.7	.....
9. Pea-stalks .....	143	70	323	380	25	12.75	4.9	3.6	18.6	0.13	4.28	3.43	21.8	0.7	32	.....
10. Rape-stalks .....	170	35	326	415	16	11.54	7.7	2.1	10.1	0.12	3.07	3.31	21.6	1.4	16	.....
11. Potato-stalks .....	770	35.2	70	80	7	0.84	0.62	2.7	5.5	0.1	0.67	0.73	0.5	0.5	16.1	.....
12. Beet-leaves .....	597	19.5	39.5	21	5	4.64	1.92	3.3	3.6	0.08	1.46	1.72	0.6	0.8	9	.....
13. Meadow hay .....	144	62	393	294.6	60	30.37	8.24	3.3	7.7	0.15	4.56	4.25	9.7	1.7	37.5	.....

\* Sugar.

PRODUCTION OF OZONE BY OXIDATION OF VOLATILE HYDROCARBONS.—It has for a long time been a generally accepted fact that ozone is produced in the absorption of oxygen by essential oils, and in 1863, in a paper read before the Chemical Society of London, Lawes, Gilbert, and Pugh stated their belief “that the ozone said to be observed in the vicinity of vegetation is due rather to the intense action of the oxygen of the air upon minute quantities of volatile hydrocarbons evolved by the plants, than to any action within the cells.” These views seem to have been proved fallacious from the results of certain investigations embodied in a paper lately read before the same society by Mr. Charles T. Kinzett. He has experimented with a large number of the volatile hydrocarbons, and finds that the reactions heretofore believed to indicate the presence of ozone, are due merely to the presence of easily-reducible oxidized products of the hydrocarbons themselves. His experiments have been of a very thorough and exhaustive character, and the conclusions he has arrived at are doubtless correct. Experiments made in the laboratory of this Department, with the oil of *Eucalyptus globulus*, though not as extensive, have furnished results tending to confirm his conclusions.

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## BOTANICAL NOTES.

By DR. GEORGE VASEY.

GRASSES FOR THE SOUTH.—The question of what grasses are best adapted to the wants of the Southern States is one which is receiving deserved attention at the present time. A correspondent in Brazil has sent us some specimens of three kinds of grasses which are most esteemed for cultivation in that country, and his account of them may have some value with reference to our own country.

No. 1 is the *Eleusine Indica*. He says:

This is the grass with which the pastures are made in this province, generally on bottom lands, and it is considered that cattle and horses become as strong on this grass as when fed on corn. The Brazilians call it *graminea*; but it is not the *gramma* of Europe, and I think it is native. It runs on the ground, and takes root at the joints, and is extremely hard to eradicate on good ground. It forms a very heavy sod. The Americans say that it is the Bermuda grass, but I think it impossible. It is the most valuable grass here.

In botanical works the common or vulgar name given for this grass is dog's tail, or wire grass. It is much like the *Cynodon dactylon*, or Bermuda grass, but coarser and heavier.

No. 2 is a species of *Rottbællia*, of which he says:

No. 2, *Gramma roxa*.—This, I think, is a species of *Rottbællia*, of which we have several in the United States. It is not many years since it was introduced into Brazil, and it has the advantage of the *graminea* in that it grows on poorer ground and stands the frost better. It is more hardy in habit. I think it is not a native, although we have native species. A Brazilian told me that he saw this grass in England. The Brazilians have cultivated it only a few years, but it promises to be a very valuable grass.

Although we have several species of this genus in the Southern States, it has not, so far as we are aware, attracted any attention as a valuable grass.

No. 3 is a species of *Panicum*, of which our correspondent says:

*Capim de Angola*.—This grass, as its name imports, probably comes from Africa, and in rich, moist ground will produce on the same ground probably more vegetable matter than any other grass in the world. It grows in favorable places 30 feet in height, and

is edible for cattle. There are two kinds, which I cannot distinguish apart. This is called "*Capim de Angola*," and the other "*Capim fina*," which latter is cultivated in large pastures in the provinces of Mines Geraes, and the cattle taken to Rio are fattened on it principally. It bears burning well, whereas the *Capim de Angola* does not. It is said that the *Capim fina* does not flower. I think this would be a very valuable grass in the glades of Florida.

We have not the means of accurately determining the species of this panicum, but it is probably the *P. jumentorum*, Salz., and is probably the same as the Guinea grass, or at least it is one of the grasses so called, for unfortunately the common names given to grasses, and often to other plants, are very uncertain and unsatisfactory.

JOHNSON GRASS.—Some account was given of this grass in the monthly report for last December. We have recently received specimens from Mr. John Haralson, Selma, Ala., requesting an analysis and name. He says:

I beg to call your attention to a grass that is grown in this section, and is known here as the Johnson grass. It propagates from the seed and roots. It sends up a tall stem, very tender till after seeding-time, with long and luxuriant blades, resembling the blades of Chinese sugar-cane or chicken-corn. It puts out among the earliest vegetation in spring, and soon yields a crop for mowing. On good land it may be mown half a dozen times in the year. It succeeds very well on any kind of soil, on ridge or bottom lands, and, in the very fertile black or bottom lands, yields a rank and unsurpassed crop in abundance. Stock of all kinds love it, and, where it grows, give the preference to it over any other growth. There is a divided sentiment in reference to it in this section, where people think of growing nothing else but cotton and corn; but all are agreed, so far as I know, that for a stock-growing country it is the best grass known. Many persons here object to it because of its great tenacity of life, matting the soil with deep and spreading roots, like the cane-root, and the rapidity with which it spreads itself over a farm when once set, and the difficulty of eradication, in case one desired to subdue it for some other crop. This class of persons admit its virtues as a forage-crop, such as I have mentioned. Others, again, contend that it may be confined to one field, if it is fenced and not allowed to go to seed, and that by constant pasturage and mowing, and turning the soil over in winter, to expose the roots to frost, it may be subdued. Experiments in this direction have not reached satisfactory results as yet. It is proper to add that the name given it here is from the man who brought it to this country many years ago, whose name was Johnson, and it is said to be what is known as the Guinea grass. An examination of the books in reference to that grass, however, does not convince me of its identity, or else that very little is known by the writers on grasses of the Guinea grass. The seeds are abundant, somewhat like the chicken corn, but not so abundant on the stalk, and weigh about 35 pounds to the bushel.

I have thought that the above statements in reference to this grass might prove of interest to you.

This grass, upon investigation, proves to be *sorghum halapense*, closely related to *sorghum vulgare*, which includes the broom-corn, Guinea corn, &c. This is a perennial with strong, vigorous roots, and an abundance of long and tolerably broad leaves. Dr. Chapman, in his "*Botany of the Southern States*," mentions this species of sorghum as being sometimes cultivated under the name of Cuba grass. It is possible that it is also called Guinea grass, but incorrectly, as that name belongs to the Panicum before mentioned.

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## THE OATS-CROP IN THE SOUTH.

Reports to this Department make the impression that in most, if not all, of the Southern States the oats-crop is wholly unprofitable. The best seed sent there greatly degenerates, the complaint being that it is more subject to mildew than any other crop. And while there is found



there a red oats, for which it is claimed that it is proof against mildew, at its best it is so inferior in quality as scarcely to be entitled to the character of oats. It has been pressed upon the Department, by southern farmers, that it should be procured for distribution, in consequence of which the best sample of it was sought for and purchased from near Selma, Ala., and after subjecting it to an additional winnowing it weighed but 28 pounds to the bushel. Unless it be upon some of the highlands of North Carolina or Georgia, it is not worth while to waste time and labor upon the effort to procure a paying crop of oats in the Southern States. Although the Department has distributed among southern farmers the red oats procured at Selma, its use is not recommended.

## THE SELECTION AND PLANTING OF SEED.

This Department has taken much pains to impress upon the farmers of the country the great value of a careful selection of seed. In England experiments have been made in the cultivation of wheat which have produced the most remarkable and, indeed, almost incredible results, from selections for a series of years. These experiments have been conducted by Maj. F. F. Hallett at his Manor Farm, Kemp Town. On the 4th of June, 1874, Major Hallett read a paper before the Midland Farmers' Club at Birmingham, expounding his "pedigree system" as applied to cereal crops, which created a wide and deep interest in agricultural and other circles, and has since been a prolific topic of discussion. The author of this system says:

The plan of selection which I pursue is as follows: A grain produces a plant, consisting of many ears. I plant the grains from these ears in such a manner that each ear occupies a row by itself, each of its grains occupying a hole in this row; the holes being twelve inches apart every way. At harvest, after the most careful study and comparison of the plants from all these grains, I select the finest one, which I accept as a proof that its parent grain was the best of all, under the peculiar circumstances of that season. This process is repeated annually, starting every year with the proved best grain, although the verification of this superiority is not obtained until the following harvest.

In illustration of these principles of selection, I now give the following results, due to their influence alone—as the kind of seed, the land, and the system of culture employed were precisely the same for every plant for four consecutive years; neither was any manure used, nor any artificial means of fostering the plants resorted to.

*Table showing the importance of each additional generation of selection.*

Year.		Length.		Containing.	No. of ears on finest stool.
		Inches.	Grains.		
1837	Original ear .....	4 $\frac{1}{2}$	47		
1853	Finest ear .....	6 $\frac{1}{2}$	79		10
1859	Finest ear .....	7 $\frac{1}{2}$	91		22
1860	Ears imperfect from wet season.....				39
1861	Finest ear .....	8 $\frac{1}{2}$	123		52

Thus, by means of repeated selection alone, the length of the ears has been doubled, their contents nearly trebled, and the "tillering" power of the seed increased five-fold.

The following table gives similar increased contents of ear obtained in three other varieties of wheat :

	Grains in original ear.	Grains in improved ear.
Original red, commenced 1857 .....	45	123
Hunter's white, commenced 1861 .....	60	124
Victoria white, commenced 1862 .....	60	114
Golden drop, commenced 1864 .....	32	96

It was supposed by the ancient writers that the powers of grains differed in relation to their positions in the ear. This I investigated in 1858 by planting the grains of ten ears on a plan showing their several positions in the ear. The only general result, among most conflicting ones, was that the smallest corns, those most remote from the center of growth, exhibited throughout, most unexpectedly, a vigor equal to that of the largest; and that the remarked worst grains, in one or two instances, did not by any means fall so far short of the good ones as had been expected. I have also made frequent trials of the comparative power of large and small, plump and thin grains—and, in the case of oats, which produce a small grain attached to a large one, trials as to their respective powers—with uniformly the same result, viz., that in good grains of the same pedigree neither mere size nor situation in the ear supplies any indication of the superior grain.

Very close observation during many years has led me to the discovery that the variations in the cereals which nature presents to us are not only hereditary but that they proceed upon a fixed principle, and from them I have deduced the following law of development of cereals:

1. Every fully developed plant, whether of wheat, oats, or barley, presents an ear superior in productive power to any of the rest on that plant.
2. Every such plant contains one grain, which upon trial proves more productive than any other.
3. The best grain in a given plant is found in its best ear.
4. The superior vigor of this grain is transmissible in different degrees to its progeny.
5. By repeated careful selection the superiority is accumulated.
6. The improvement, which is at first rapid, gradually, after a long series of years, is diminished in amount, and eventually so far arrested that, practically speaking, a limit to improvement in the desired quality is reached.
7. By still continuing to select, the improvement is maintained, and practically a fixed type is the result.

Thick and thin sowing has always been a mooted point among farmers. Major Hallett's experience for a series of years proves most conclusively that thick sowing of wheat is not only wasteful, but pernicious. What is called stooling in this country, is known in England and called tillering, and he advocates the doctrine that tillered wheat is far preferable to that which grows from the germ of the seed; the advantage is twofold, saving the expense of seed and the superior quality of tillered plants. His reasoning upon the subject marks the consideration which he has given to it. He says:

We find then that a perfect plant of wheat consists of three principal parts, viz., the roots, the stems, and the ears. When a grain is planted in a proper manner, these are produced as follows: shortly after the plant appears above ground it commences to throw out new and distinct stems, upon the first appearance of each of which a corresponding root-bud is developed for its support; and while the new stems grow out flat over the surface of the soil, their respective roots assume a corresponding development beneath it.

This process, called "tillering," will continue until the season arrives for the stems to assume an upright growth, when tillering ceases, and the whole vital power of the plant is concentrated upon the production of the ears. These will be the finest it is capable of producing, unless the growth of its roots has been in any way interfered with, as, for instance, by having been crowded by those of other plants, when the size of the ears will be proportionately diminished.

This tillering is the great characteristic of all the cereals, and as an instance of the extent to which it may attain, I have known a plant of wheat grown from a single grain to cover in May a circle 5 feet 6 inches in diameter, measuring from the extremities of the opposite leaves as they lay tillered out flat upon the surface.

At the Exeter meeting of the British Association I exhibited three plants of wheat, barley, and oats, each from a single grain, with the following :

	Stems.
Wheat.....	94
Barley.....	110
Oats.....	87

The fact then at once stands out that a plant of wheat requires space for full development, and, therefore, time to fill that space. It is evident that the proper space and time to allow to each grain are those which, while sufficient for full development, leave no ground unoccupied at harvest. Such proper time must, it is plain, be much earlier than when wheat is planted so thickly that "tillering" cannot take place.

In reference to this point of time of sowing we must consider the rate of wheat growth during the different months, and the best measure we can have of this is the time which it takes to come up. Thus wheat sown—

1st of September comes up in.....	7 days.
In a mild autumn—1st of October comes up in.....	14 days.
1st of November comes up in.....	21 days.
1st of December comes up in.....	28 days.

And assuming, as we may fairly do, this as the relative rate of wheat growth when it is up, then wheat which is up on the 1st of September makes in the first fifteen days of that month a growth equal to that of the whole month of October; in the next ten days a growth equal to that of the whole of November; and in the last five days of September a growth equal to that of the first twenty days of December; or in other words, wheat up on the 1st September, compared with that up on the 1st October, has exactly a double autumn for growth before the winter sets in; and, indeed, the case is in reality much stronger than this, for if winter were to set in early there would be for wheat sown at the end of October little or no autumn growth above ground.

The importance of every day (especially the earlier days) of September growth cannot be overrated.

It must be borne in mind always that it is a matter for the maturest study and judgment to correctly apportion the quantity of seed to the time of sowing and to all the existing surrounding circumstances.

A large quantity of seed sown early is just as much opposed to reason as the late sowing of a small quantity of seed, and, indeed, more so, for the first must become winter-proud and cannot succeed, while the season may be of such a character as to enable the last to do so.

As a general basis I would suggest on a large scale the drilling of wheat as follows: End of August to 10th September, 2 to 3 gallons per acre; for each week later, to the end of September, an additional gallon per acre.

When opportunity is afforded for observing the unimpeded growth of the cereals there is seen to exist a striking variation in their mode of growth and powers of production.

The superiority of some individuals over others is so marked in various ways as to lead irresistibly to the inference that it must be hereditary, and the desire to prove this brings us to the consideration of the selection of seed.

In reference to the animals of the farm, whether horses, cattle, sheep, or pigs, the importance of a good pedigree is fully recognized, as also with regard to some of our agricultural plants; for if a farmer wants a good cabbage, mangold, turnip, or carrot, he selects the seed from a good parent, but the moment he deals with the cereals he altogether ignores the great principle of like producing like.

Upon this great principle, running throughout all nature, I base my system of selection.

The results of selection in many agricultural plants, such as the parsnip, cabbage, turnip, potato, hop, &c., are well known; and there has recently been published in France a report showing how my principle of selection, applied to the beet cultivated for sugar, has resulted in an increase of 5 per cent. of sugar.

In the case of the vine, too, I may cite an instance:

Some eight years since I communicated to an Italian friend my views as to the selection of the vines. These he carried back with him to his relative in Piedmont, and two years ago he informed me that the produce in wine from his relative's estate had been trebled by adopting the principle of selection.

No one can go into a hop garden in this country without being struck with the contrast between some of the poles covered with hops, and other poles having scarcely any at all upon them, the season of course having been the same for all.

The science of horticulture, too, presents innumerable proofs of, and, indeed, may be said to owe its very existence to, the principle of plant selection.

Now that some, at least, of the variations of cereals are heritable is obvious from the existence of the numerous distinct varieties.

The transmission of minute characteristics is evidenced in the variety of wheat known as "Grace's White." There is in every grain a kind of indentation across the back, as if when still soft a thread had been tied tightly round it; this mark is more or less distinct, but never entirely absent. It even has a practical bearing upon its market value, the grains occupying as much room in the measure as if no such indentation existed.

In fact close observation shows that in the cereals, as throughout nature, no two plants or grains are precisely alike in productive power, and hence that of any two or greater number of grains or plants one is always superior to all the others, although that superiority can be discovered only by actual trial.

This superiority may consist in various particular characteristics, as power to withstand frost; prolificness; size and character of ear; size, form, and quality, and weight of grain; length or stiffness of straw; powers of tillering; rapidity of growth; and many others.

Now, while our farmers and planters will not, each for himself, pursue this system for a series of years, of procuring "pedigree seed," one or more in a vicinity may do it, for the benefit of others and his own profit. The manifestly successful results of Major Hallett's planting has so convinced the people of England, that his "pedigree wheat," to the extent of all he can raise, is now sold at a price three times as great as any other wheat. This Department has procured some of this wheat, and will have its merits fairly tested in this country.

Such is the interest taken in this subject in England that the Midland Farmers' Club, at Birmingham, appointed a deputation of its most distinguished members to visit the farm of Major Hallett for the purpose of making a personal inspection of his growing crops, his "pedigree barley" and oats as well as his wheat. This examination was made on the 10th July, 1874, and the report of this deputation to their society was highly satisfactory. It seems to have been established beyond any reasonable doubt that a "pedigree," in its capacity to transmit powers of production, is as certain as that of a horse for swiftness of speed, or that of a cow for her quantity and quality of milk. While all farmers are choice in their selection of a profitable breeding stock, it is only because the results are palpable to the eye; those of the careful selection and care of seed are not so immediately seen, but they are even more certain and profitable in their consequences.

The bushel of ordinary wheat contains 700,000 grains and upwards; and taking 2 bushels per acre as the seed sown, we have, speaking roughly,  $1\frac{1}{2}$  millions of grains per acre put into the ground.

I have counted at harvest the number of ears upon a quarter of an acre of wheat (drilled 20th November, with  $1\frac{1}{2}$  bushels per acre, and which proved an exceptionally heavy crop of nearly 7 quarters per acre,) and I found the number of ears per acre to be 934,120, or not so many ears as the grains sown. Here it is clear from the number of grains sown that either the natural powers of tillering could not have been exercised, or that the greater part of the seed must have been sown uselessly. Doubtless some of the grains did produce more than one ear, but this only makes the case still worse for the remainder.

Not only was the number of ears below that of the grain sown, but each ear was but the stunted survivor of a struggle for existence.

Indeed, it has been stated by Jethro Tull, that if a square yard of thickly-sown wheat be counted in the spring, and the supposed number of ears then recorded, it would be found that 90 per cent of them would be missing at harvest. Beyond all question, in thickly-sown wheat a very large proportion of what appear as stems in the spring die away before harvest, and have thus grown not only uselessly, but in the struggle for existence have starved and stunted those which ultimately came to ears.

In ordinary crops the number of ears produced per acre being taken as about one million, and the crop as 34 bushels, we have at 700,000 grains to the bushel, 23,800,000 grains per acre, or an average per ear of only 23 to 24 grains; and if more than one million ears per acre be claimed, it must be at the expense of their contents.

Five pints of wheat per acre planted in September, 12 inches by 12 inches, gave 1,001,880 ears per acre, or 67,760 ears in excess of those produced on the other side of the hedge from 6 pecks, or more than twenty-one times the seed.

Again, 5 pints planted 12 inches by 12 inches October 17, gave 953,320 ears per

acre; and planted similarly October 4,\* 966,762 per acre; while 1 bushel planted October 15, gave only 812,160.

Two plants of 24 ears each gave 1,911 and 1,878 grains, or 79 per ear. 20 ears per foot, at 48 grains only per ear, would produce 11 quarters per acre.

All the conditions of time and space being fulfilled, we can obtain from a single parent grain as many ears as are ordinarily obtained from twenty grains, with this most important advantage, viz: these ears being produced from plants which have attained (or nearly so) perfect development of their growth, contain more than double the common number of grains, and their contents may be largely increased by the continued annual selection of the most vigorous parent grains.

These small quantities may in the following manner be drilled on a large scale without additional expense:

My principal object is to insure perfect singleness and regularity of plant with uniformity of depth. The two latter may be attained by the drill, as may the former also by adopting the following plan: The seed-cups ordinarily used in drilling wheat are so large that they deliver bunches of grains, consisting of six or seven, which fall together within a very small area, from which a less produce will be obtained than if it had been occupied by a single grain. The additional grains are thus not only wasted, but are positively injurious. By using seed-cups, however, which are only sufficiently large to contain one grain at a time, a stream of single grains is delivered, and the desired object, viz., the depositing of grains singly, at once attained. The intervals in the rows will not be exactly uniform, but they will be sufficiently so for all practical purposes. The width of these intervals will of course depend upon the velocity with which the seed-barrel revolves, which can be regulated at pleasure by a proper arrangement of the cog-wheels which drive it. By drilling thus we obtain the advantage of the "broad-cast" system also, equal distribution, as we can have the rows as close together, and the grains as thin in the rows as we please.

The crop should be hoed as soon and as frequently as practicable, with Garrett's horse-hoe. If the seed has been sown early this should be done in the autumn, as it causes the plants to tiller and occupy the whole ground before the winter sets in. It is essential to the success of thin sowing to keep the land perfectly free from weeds during the growth of the crop.

We will now consider a few facts as to what may be produced under my system.

And first I would draw attention to the effect upon the crop of the mere increased size of the grain produced.

A bushel of pedigree wheat, (original red,) produced from single grains, planted 12 by 12, contains about 460,000 grains, while a bushel of ordinary wheat contains 700,000 grains and upwards. Therefore, in two crops consisting of precisely the same number of grains, the crop from the thin seeding would be upwards of 70 bushels against 46 bushels, or 9 quarters against 6 quarters, per acre.

Again, a bushel of pedigree barley, produced from grains planted singly 12 inches by 12 inches, contains 390,400 grains, while a bushel of ordinary barley contains upwards of 550,000, or in two crops of equal numbers of grains the one would be 55 bushels, the other 39, or 7 quarters against 5 quarters per acre.

Thus in the increased size alone of the grains produced we obtain an increase of crop of from 40 to 50 per cent.

The following are some of the advantages which, apart from the increase of crop obtained, would attend the adoption of the August and early September sowing of a proper quantity of seed:

1. *The saving of seed.*—Although this is no main object of my plan, but only, as it were, a necessity arising out of it, this single one of its features is in itself of national importance, resulting in a saving of nearly one million quarters of wheat alone.

2. *Power of withstanding frost and insects.*—The roots of wheat sown in August become by the middle of October so developed as to render it quite safe from lifting by the frost, and attacks of wire-worm, &c., would be almost entirely unknown.

3. *Forwarding of the work of the farm.*—If the wheat were practically all drilled by

* Rows (3 outside)													
Planted.	Missed.	=		=		Gave ears.						Per foot.	
87	— 5	=	82	—	—	2184	—	—	—	—	—	26½	
74	— 6	=	68	—	—	1832	—	—	—	—	—	27	
14	— 0	=	14	—	—	420	—	—	—	—	—	30	
7 inside rows.													
12	— 1	=	11	—	—	282	—	—	—	—	—	25 1-7	
17	— 0	=	17	—	—	395	—	—	—	—	—	23½	
14	— 0	=	14	—	—	322	—	—	—	—	—	23	
14	— 0	=	14	—	—	276	—	—	—	—	—	20	
14	— 0	=	14	—	—	303	—	—	—	—	—	21½	
14	— 2	=	12	—	—	317	—	—	—	—	—	26½	
14	— 1	=	13	—	—	304	—	—	—	—	—	23	
—	—	=	—	—	—	—	—	—	—	—	—	—	
59		=	95			2199						23 1-7	

\* 2199, (22½ including misses,) or 966,792 per acre.

the 10th September, the whole autumn would be at the farmer's disposal for clearing the land and getting ready for the autumn and very early spring sowing of barley and oats, beans, and peas; the root-crops would not require to be hurriedly removed; and, in fact, the farmer would be always well ahead of all his work throughout the year.

4. The crop would never become "winter proud" even in the mildest seasons, or laid by heavy summer rains.

5. The harvest would be from two to three weeks earlier. Thus, notwithstanding the cold spring, I had (May 26) August-sown wheat just bursting into ear, and August-sown barley, which was quite out in ear and in full bloom more than a week before. The harvest being over at least a fortnight sooner would be of immense advantage in the cleaning of the land.

6. Whereas seasons are frequently most unfavorable to late-sown cereals, they are scarcely ever so to early-sown ones.

There is no real ground whatever for assuming our present amount of produce per acre to be final and unalterable. One hundred years ago the produce per acre probably was, and certainly might with equal reason have been, deemed so; and yet it has now been nearly doubled.

We have seen that the present average contents of our ears of wheat must be from 20 to 30. Were it grown as I propose, the average contents of the ears would be at the very least from 40 to 60—far more probably from 60 to 90; for under such a system so small an ear as one of 40 grains is quite the exception. And this increase of the contents of the ears would be obtained without any diminution of their number; in other words, the crop would thus at least be doubled. This is no mere speculation, as I have had 27 quarters of wheat grown upon 3 acres of land from 1 bushel of seed upon the whole 3 acres; and I have grown over a whole field 82 bushels per acre of barley, weighing 57 pounds per bushel, from only one peck of seed per acre. And this was only an approximation to the system which I advocate before you to-day.

It may very fairly be asked me: Is your crop of wheat at present growing sown in August and the early days of September; and if not, why not? I answer at once that it is not so, I am sorry to say, although a good deal of it was got in at the end of September.

I have been foolish enough to try and combine the old practice with the new, and to hope by an approximation to August-sowing practically to reap all its advantages. The success which has attended this earlier sowing has been most remarkable, as the crops at this moment growing upon my poor land will abundantly show; but such approximation is at the most but a half-way house to the greatest possible improvement, as may be seen by comparing these crops with those I have which were sown in August.

I have become, by these gradual steps, convinced of the absolute necessity of abandoning entirely our ordinary practice of sowing wheat after mangolds, carrots, cabbage, rape, &c., and have arranged to have very nearly, if not quite, all my wheat drilled this year in August and the early days of September; and my crops are and will be at all times open to the inspection of every member of this club.

There may be seen upon my farm now, wheat sown in single grains, in August, one foot apart each way; and some sown early in September, 15 inches apart each way; also about 30 acres drilled at end of September and the beginning of October with  $5\frac{1}{2}$  gallons per acre. Barley sown in August, single grains, 18 inches apart each way, side by side with some planted April 1st, 9 inches apart each way; also a field of barley drilled with 2 gallons per acre, and 48 acres drilled with  $3\frac{1}{2}$  gallons per acre.

I counted (May 26th) the stems upon a plant from a single grain of wheat, of barley, and of white Canadian oats, all sown in August, as follows:

A plant of wheat.....	84 stems.
A plant of barley.....	87 stems.
A plant of oats.....	36 stems.

I will now show how the  $3\frac{1}{2}$  millions of acres of wheat sown in England could be drilled in August and the early days of September.

Taking the crops of England as given in the agricultural returns for 1872, at the end of this paper:

First, there are 585,000 acres of bare fallow. Next, there are 496,000 acres of beans, and 353,000 acres of pease. And these beans and pease should be sown in the autumn and come sooner to harvest. Then there are 420,000 acres of vetches, lucerne, &c. And of clover and grasses under rotation, 2,822,000 acres. In all 4,676,000, out of which to obtain 3,337,000 acres of wheat.

To the extent of about one-half of the clover and grasses under rotation, whether for hay or not, it would doubtless be necessary to sacrifice all the growth at present obtained after about midsummer or the middle of July.

In the Standard of December 10, 1873, in an account of the annual dinner of the Central Farmers' Club, an honorable agricultural member is thus reported: "He was astonished, therefore, to hear so painstaking, careful, and thoughtful a statesman as

the Earl of Derby saying that it was his deliberate opinion that the land of England might be made to double its present produce, and still more that Lord Leicester should back up that opinion."

Now, I do not hesitate to say that with regard to corn the noble lords were strictly right, and their honorable critic egregiously in the wrong.

By the adoption of my system this could be done, and the whole of the breadstuffs which we purchase each year at the enormous sum of forty millions sterling might be produced upon our own land at home, enriching the proprietors and cultivators of England, and annually adding these forty millions to the wealth of the entire nation.

## CROP EXPERIMENTS.

**FULTZ WHEAT.**—A correspondent writing from Lauderdale County, Alabama, gives the following as his experience with one quart of this wheat received from the Department in 1872:

This is my third crop from the one quart of wheat received. The amount of land employed was four and one-half acres, from which I have just threshed ninety bushels of splendid wheat, or twenty bushels to the acre. It was sown in a field by the side of eleven acres of Reed-straw wheat, which yielded nine bushels to the acre. The season was very unfavorable on account of heavy and continued rains throughout March and April. About the 1st of May the Fultz was badly scalded, or blighted; in fact looked as if it would not make half a crop. With a favorable season, I am confident it would have made thirty or more bushels per acre. I think it will prove the best wheat yet introduced into this part of the South. Our average yield of wheat for the last five years has been about ten bushels.

Hon. W. E. Niblack, of Indiana, incloses to the Department the statement of a farmer in his district in which it appears that a sowing of one quart of Fultz, November 6, 1871, yielded thirty pounds. This product was sown in September, 1872, and yielded ten bushels. In turn, this was sown in September, 1873, and produced 300 bushels. Two acres, sown after tobacco, yielded 104 bushels, or 50 bushels per acre. The entire crop was grown on clay soil.

The Frederick County (Md.) Examiner, of recent date, records a yield of Fultz wheat in that county of 42 bushels per acre on 42 $\frac{1}{4}$  acres, "a result which, as far as we have heard, has nowhere been equaled."

The results for three years on the experimental farm of the University of Wisconsin are given, as follows:

Sown.	Rate per acre.	Harvested.	Yield.
September 18, 1871.....	1 $\frac{1}{4}$ bushel .....	July 12.....	33 bushels.
September 10, 1872.....	1 $\frac{1}{4}$ bushel .....	July 11.....	20 bushels.
September 5, 1873.....	1 $\frac{1}{4}$ bushel .....	July 1.....	34 bushels, 55 pounds.

The yield in each case is given by weight, 60 pounds to the bushel; the grain has weighed 60 to 62 pounds to the measured bushel. The crop of 1872-'73 was on new and partly low ground. The ice in early spring killed a part of the crop. This year (1874) a lot on old ground, following oats, and on side-hill facing south, yielded 29 bushels 26 $\frac{1}{2}$  pounds per acre.

Fultz wheat was first distributed by the Department in 1871. A historical note of its origin was given in the Annual Report for that year.

**JENNINGS WHEAT.**—Dr. H. M. Price, of Fluvanna County, Virginia, reports the results of a {comparison} between the Jennings wheat (re-

ceived from this Department) and two varieties, the Clawson and Tappahannock. He sowed the Jennings October 9, on one-twelfth of an acre, which before had been planted in cabbage. Soil, a dry, stiff clay, which was fallowed and harrowed, and the seed turned under with a shovel-plow. No fertilizer used. On the same amount of land equal quantities of the Clawson and Tappahannock, respectively, were sown.

The following is a tabulated statement of results:

	Weight of straw.	Weight of grain.	Yield per acre.	When ripe.
	<i>Pounds.</i>	<i>Pounds.</i>	<i>Bushels.</i>	
Jennings .....	485	165	33	June 16.
Clawson .....	461	183	36 3-5	June 20.
Tappahannock .....	401	122	24 2-5	June 14.

The straw was weighed June 30.

BRUNSWICK CABBAGE AND THE NOCERA ONION.—While the Department aims at all times to introduce superior varieties of vegetable-seeds, very great importance attaches to careful and methodical cultivation. It is clearly the duty, as it is the interest, of recipients of varieties of pronounced excellence to care for them with scrupulous regard. In a statement of Mr. Cook, of Baldwin County, Georgia, recently made to this Department, there is evidence of such regard worthy of especial commendation. His experiment was confined to the Brunswick cabbage and the extra early Nocera onion. He says that it is a very prevalent notion among the farmers in that part of Georgia that cabbage cannot be grown successfully, believing which the majority continue to grow calewort, and look upon an eight-pound cabbage, if home-grown, (referring to his own success,) as something almost wonderful. "Let them procure seed of the Brunswick, and raise strong, healthy plants by thinning out liberally; make their land rich, and plow deep. Set out up to the first leaf, (very important,) and cultivate carefully, and they will soon discover that they have been laboring under a mistake," is the advice and prediction of Mr. Cook.

Mr. C.'s method with his cabbage was as follows:

Planted the seed in a cold frame February 10; transplanted to soil of medium fertility March 20. The land had been deeply plowed and manured a month before; raw cotton-seed applied broadcast before plowing, at the rate of 100 bushels to the acre; when the plants were ready, the soil was freshened by a shovel-plow, dispensing with the harrow. The plants were set out 3 by 3 feet apart, during a light rain. Two days after two tablespoonfuls of superphosphate was applied to each plant by sprinkling on the surface and slightly raking in. The cultivation consisted of two plowings and three hoeings. Four applications of land-plaster were made, following as many rains. The first head was cut May 26, and nine-tenths of the product were marketed by July 10, the heads ranging from 4 to 8 pounds in weight. Comparatively few plants failed to head; but for the cabbage-worm, 99 per cent. would have headed. These insects were unusually destructive, and would not yield to plaster alone. In brief, Mr. C. says that, after having tried all the leading varieties of cabbage except the Early Wyman, he is decidedly in favor of the Brunswick.

In regard to the Nocera onion his praise is unqualified. Seeds for "sets" and for large onions were planted February 16, and on June 15 both were harvested. The average diameter of the onions was three inches, and the sets were very fine, and yielded well.



## JUTE IN LOUISIANA.

Mr. Emile Lefranc, president of the Southern Ramie Association, at New Orleans, as is known, has been for a considerable period very actively engaged in the culture of jute, as well as in perfecting a decorticating machine for cleaning and preparing the fiber for the market and for manufacturing. His experiments, which have been conducted on an adequate scale, have confirmed the impression that the cultivation of this valuable fibrous plant will eventually become a very profitable industry, especially in the southern portion of this country.

In a recent letter to the Commissioner, Mr. Lefranc states that, in spite of the difficulties and drawbacks which he has had to encounter the present season from diluvial rains, overflows, and droughts, he will have 150 acres of jute to harvest, if the weather be not too unfavorable, in September. Some of the fields he describes as splendid, growing 8 feet high, and as thick as wheat.

Mr. Lefranc's jute-cleaning machine, a description of which, with illustrative drawings, may be found in the forthcoming Annual Report of the Department, for 1873, has been improved, as he states, by unceasing researches and numerous applications, from which the best have been selected. It is said to work well, and to produce over a ton of clean fiber per day, with four attendants only. It cleans jute, ramie, and okra radically and without waste, and it is believed that hemp and flax may be as well treated by it. Mr. Lefranc says: "We treat jute without leaving butts or refuse, and we can treat hemp and flax without having the loss of tow." If this be so, the machine will effect an important reform in our textile trade, and exert an influential agency in developing our hemp and flax production.

Mr. Lefranc mentions a curious fact in connection with his experience in the culture of jute. A piece of land that produced jute-seed last year is now in full growth of jute again, though none was planted there this year. The seed which dropped last year was sufficient for a new crop.

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## AGRICULTURE IN INDIA.

C. Samba Siva, secretary of the Native Association of Mayaveram, Madras, furnishes this Department with a very interesting account of the state of agriculture in the rice-producing district of Tanjore, and of improvements about to be set on foot. He says:

There has been formed an association in Mayaveram, a town in the district of Tanjore, in the Madras Presidency, the chief object of which is the introduction of improvements in the art of agriculture. Mayaveram is situated on the banks of the Cavery, and from its position it will be seen that it occupies the center of the delta of the Cavery, which has, not inaptly, been called "the Eden of Southern India." The population almost entirely subsists by agriculture; and here, as in many other parts of this large country, the art, though practiced perhaps from the very origin of civilized life, remains in the same state. The cultivator depends entirely on the fertility of the soil, which is every year renewed by the Cavery. The government has done much to economize the supply of water, and a large extent of land has been brought

under cultivation since the commencement of the British administration in the country. The agriculturist enjoyed many advantages here, but the times are changed so much that it will not do for him to remain in ignorance. The labor-market now presents difficulties which did not exist before. Taxation has increased. The increase in the price of articles of consumption is great. In the midst of these altered circumstances, the agriculturist begins to see that only by improving his art can he cope with the difficulties.

A brief sketch of the present state of agriculture in this district may not be out of place. The Cavery begins to flow in June, and continues to supply the fields with water till October. Cultivation commences soon after the southwest monsoon sets in, and ends when the northeastern monsoon ceases to bring down rain. Rice only is cultivated. In some places two crops are raised, but only one crop is raised in the greater part of the delta. The great body of land-owners possess no capital, and the few who save do not invest their savings in the improvement of their lands. The consequence is, the agriculture of the district is left in the hands of a laboring class called "Pura Kudi," who generally own a pair or two of plowing cattle, and till, on an average, not more than six or seven acres. The understanding between the Pura Kudi and the landlord is by no means satisfactory, and the art of tilling is therefore neglected, each being satisfied with what little can be scraped, and neither willing to employ skill nor capital. There is a total want of improvement in the implements made use of by the farmer, and the condition of the cattle is truly deplorable. These, added to the subsiding of the river floods at irregular times, render agriculture very unsafe for the small and moneyless farmers in many places.

This is the chief cause why only one crop is raised in the greater part of this district. The raising of water two feet higher is never thought of, and whole tracts are left waste, though, during the season of cultivation, water is never two feet below the surface. Many an improvement might be made in the art of agriculture that is at present carried on in the district, and the association has this in view. A model farm will be established this year, with a view to show practically what improvements can be effected in the art. Experiments in the use of manure and in the culture of various grains and plants will be undertaken, and the results carefully recorded. In its endeavors the association has received much help and encouragement from the superintendent of the Government Experimental Farm at Madras.

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## FACTS FROM OFFICIAL SOURCES.

**THE PHYLLOXERA IN FRANCE.**—The Prefect of the Department of the Rhone has published a decree directing the mayor of each Commune within his jurisdiction, upon the indication of the presence of the phylloxera, to proceed at once to determine the limits of each local district infected by the insect. Every vine affected and all the roots within 5 meters are to be dug up and burned. This decisive measure has not escaped sharp criticism. To save the vine lands of the Rhone from destruction by this pest, it is now proposed to secure winter irrigation by a grand canal connected with that river. M. Dumont, *Ingénieur en chef des ponts et des chaussées*, has developed, before a governmental commission, a scheme for the construction of such a canal, within four years, at a cost of 102,000,000 francs. This, it is supposed, will rescue from destruction over 60,000 acres of vine lands, yielding products worth 200,000,000 francs per annum and taxes amounting to 20,000,000 francs.

**THE GULF REGION AS A FIELD FOR EMIGRATION.**—The American Patron, a journal published at Finley, Ohio, having addressed a series of inquiries to intelligent parties residing in different parts of the Gulf Coast, in regard to the eligibility of that section as a field for northern immigration, received an official reply from Citronelle Council No. 7, Order of Progressive Farmers, Mobile County, Alabama, to the following effect:

1. The salubrity of the Gulf Coast, east of Louisiana, is fully equal to that of any section of the Union. Miasmatic diseases prevail during certain seasons on the river-bottoms, but of a less malignant type than is found in similar localities of the North. The yellow fever is expected in the cities about every five years, but it never troubles the rural districts. The whole region is almost totally exempt from Asiatic cholera.

2. The climate of the South is destitute of the extremes of both heat and cold found in the North. A summer temperature of 90° F. is unusual, while the Gulf breezes render the air very delightful.

3. Most of the crops grown in the North can be successfully grown on the coast, with a great variety of tropical and semi-tropical products, giving scope for an exceedingly varied culture. An acre of corn there represents a greater money value than at the North.

4. Markets are fair and constantly improving. An increased production would call forth increased facilities for transportation. The early spring products are shipped North at a period when they find no competition.

5. Southern pine lands are worth more per acre than the best uplands of the Northwest. In the South an immense area of wild lands of the best quality, belonging to the Government, are open to homestead settlers. For improved lands \$4 per acre is a high average price. The peculiar advantage of southern products enables the judicious cultivator to realize a much larger value per acre than at the North.

6. The surface of the country is generally high, but rolling and well watered. Abundance of water-power is found in the streams. The swamp area, contrary to general impression, is very small.

7. Educational facilities are very good in the cities, and becoming more extended in the country. Church privileges are very good.

8. People from the North who come to engage in regular business and to identify themselves with the country will be kindly received.

**ABANDONMENT OF HOMESTEAD-CLAIMS.**—Many homestead-settlers on the public lands in Western Kansas are unwisely leaving their farms and allowing their claims to go by default. The reason is, discouragement growing out of poor results of poor and unintelligent farming. Many of them make it a secondary business.

**ABANDONMENT OF SHEEP-RAISING IN THE SOUTH.**—At various points in the South our correspondents speak of the destruction of sheep by that chronic nuisance, worthless dogs, as increasing to such an extent that sheep-raising has been measurably abandoned. Our correspondent in Elizabeth City, Va., especially deplores this destruction, as that section of the country can hardly be excelled either in the weight of fleece or quality of mutton produced.

**SORGHUM AND MAPLE-SUGAR.**—In Monroe County, Ohio, in 1873, 437 acres of sorghum were planted. The product embraced 29,466 gallons of sirup and 15 pounds of sugar. The maple-sugar industry yielded 3,495 pounds of sugar and 226 gallons of sirup.

**IMPROVED FARMING PROSPECTS.**—*Albany, Wyoming*: The Daily Independent, of Laramie City, states that the soil of Wyoming is developing greater productive power as the farmers become acquainted with its peculiarities. Timothy and blue-grass can be successfully raised. Many new stock-farms have been started, and thousands of cattle have been brought from Colorado and Montana. The Laramie Plains afford a constant supply of grass, but in some other regions graziers have had annually to shift their pastures.

*Robeson, N. C.*—For the first time our farmers have felt fully rewarded for their labors. The only fear now is that market-products will not command remunerative prices.

**PLUNDERING FROM GOVERNMENT.**—Our correspondent in Escambia County, Alabama, represents that in that section agricultural improvement is greatly hindered by the fact that Government timber is suffered to be cut and carried off to market without limit or restraint. He thinks that if an agent were appointed to see that the provisions of the homestead-law were enforced, and no one permitted to cut timber until he had a legal right to, one good result would be that "the people would go to work, cultivate farms, and improve homesteads."

**REFLUX EMIGRATION.**—Our correspondent in Ellsworth, Kansas, reports: "Many farmers are disheartened, and leaving for the older States. Potato-beetles, chinch-bugs, grasshoppers, drought, and fire will turn the tide of emigration eastward."

**NEW PEACH.**—Our correspondent in Jasper County, Missouri, sends us an account of a new peach, which the Horticultural Society in that county has named "Amsden's June." It is a seedling, planted in 1858 by Mr. L. C. Amsden. The tree first fruited in 1872, bearing nine peaches, "which began to ripen the last of June," and the last specimen of which was "the perfection of ripeness" on the 7th of July. The original tree, as well as thirty or forty budded from it, fruited again this season. It is claimed that it is hardy, productive, and entirely free from the "curled leaf," which has been very destructive to the peach-crop in that locality; that the fruit is very juicy, melting, and well-flavored, and that it is fully four weeks earlier than Hale's Early.

**SUCCESSFUL PEAR-CULTURE.**—L. & A. B. Rathbone, of Oakfield, Genesee County, New York, have furnished for this Department the following facts relative to their experiment in cultivating pears: In the spring of 1864 they set out 4,000 dwarf pear-trees, 3,000 Duchesne, 500 L. Bonne de Jersey, 400 Beurre de Anjou, and 100 Vicar of Wakefield. The trees are 10 feet apart, each way, occupying 10 acres. The soil is "a gravelly loam, mixed with sand, with clay subsoil." For five years the trees were severely pruned. The orchard has received medium cultivation, but no fertilizer, except that in June, 1873, it was dressed with about 80 bushels per acre of slaked lime and unleached wood-ashes. Delivered in barrels at Batavia, and beginning with 1868, the several amounts received for annual sales for six successive years were as follows, and in the order named: \$100, \$230, \$110, \$1,338, \$2,250, \$5,530—total, \$9,558. It will be noticed that in the last-named year, 1873, the gross sales reached \$553 per acre.

**BEET-SUGAR IN ENGLAND.**—The culture of the sugar-beet is enlarging in England, not only as a forage-plant but also for the production of sugar. The commissioners of the revenue in 1873 report the establishment of a distillery for the production of alcoholic liquor from beet-juice, and that it consumes the produce of 730 acres of beets raised in the neighborhood. The sugar-mill at Lavenham absorbs the product of 450 to 570 acres, averaging about 14 tons per acre. The sugar-product of the country for 1872 was 5,890 quintals; for 1873, 7,560 quintals, of 112 pounds each. These aggregates represent mostly raw sugars, but the refining process is being introduced more extensively.

**STEAM FARM-MACHINERY IN SCOTLAND.**—The labor difficulties of the United Kingdom have compelled farmers to rely to a greater extent

than formerly upon machinery. To secure the benefit of the latest improvements, a large capital is necessary, and to accumulate this farmers are forming associations. An association of this character in Scotland, according to a late official report, during 1873, worked some 16,000 acres with steam and other elaborate machinery, performing all heavy operations at a greatly diminished cost to the farmer, and paying a dividend of 5 per cent. upon the capital invested. The large amount of capital necessary to such improvements is, then, no bar to their use, as farmers can either combine for the common ownership and working of elaborate and high-priced machinery, or they can employ capitalists who make such operations their specialty, and who will plow the ground or gather the crops for a specific remuneration.

**FRENCH ARMY-HORSES.**—*Le Journal d'Agriculture Pratique* states that the French army, of all arms, now requires, annually, 81,000 horses, of which the cavalry alone absorbs 70,000. The projected reorganization of the latter branch of the service will raise its annual demand to 90,000, and that of the whole peace establishment to over 100,000. On a war-footing this annual consumption of horses would be raised to 250,000. The census of 1866 returned 3,313,000 horses of all ages and grades. During the late Prussian war 419,000 were lost or rendered unserviceable. With the subsequent increase, the present total can scarcely be equal to 3,000,000, of which not over ten per cent., or 300,000, between the ages of four and fourteen, may be regarded as available for military service. This leaves but a small margin of effective horses for the wants of the community. To guard against the difficulties which threaten the nation in case of war, the government has, by a late law, reorganized the “*administration of studs*,” and re-established the “*school of studs*” at Pin. Commencing with 1875, the number of stallions maintained at public expense is to be augmented 200 each year until the total number shall have reached 2,500. These stallions are to be chosen from the best blood of the different races. An increasing schedule of prizes is to be annually awarded for the production of stallions, mares, colts, and fillies. The “*jumenterie*” of Pompadour is to be re-established, and to be constituted of 60 mares, exclusively devoted to the production of horses of Arab and Anglo-Arab blood. The most scientific and skillful practitioners are to be employed in this effort to enlarge the studs of France, and to guard against the exigencies of a state of war with its extraordinary demand for horses.

**CHARBON.**—Our regular correspondent in East Feliciana, La., states that 500 plow-animals have died of charbon in that parish, not including oxen. This loss has severely crippled the working of the cotton-crop. A correspondent residing in New Orleans states that the charbon destroyed live-stock by wholesale in Point Coupee and Concordia Parishes, Louisiana. In some localities it seriously crippled the working of the crops. In Avoyelles Parish it destroyed 50 per cent. of the mules and 25 per cent. of horses, besides 15 per cent. of cattle. It was quite virulent also in Hardin County, Texas.

**ENGLISH ALMONDS.**—Our chief correspondent in Williamson County, Texas, raised this year 230 pounds of English almonds upon six grafted trees, five years old.

## MARKET-PRICES OF FARM-PRODUCTS.

*The following quotations represent, as nearly as practicable, the state of the market at the beginning of each month.*

Articles.	August.	September.
<b>NEW YORK.</b>		
Flour, superfine .....	\$4 40 to \$5 00	\$4 45 to \$5 00
extra State .....	5 25 to 6 10	5 15 to 5 75
superfine western .....	4 40 to 5 00	4 45 to 4 95
extra to choice western .....	5 15 to 11 00	5 05 to 9 00
common to fair southern extras .....	5 50 to 6 15	5 25 to 6 10
good to choice southern .....	6 20 to 11 00	6 15 to 9 00
Wheat, No. 1 spring .....	1 30 to 1 36	1 20 to 1 23½
No. 2 spring .....	1 23 to 1 30	1 13 to 1 20
winter, red, western .....	1 27 to 1 30	1 08 to 1 27
winter, amber, western .....	1 30 to 1 32	1 22 to 1 27
winter, white, western .....	1 35 to 1 55	1 25 to 1 45
Rye .....	96 to 1 05	_____ to _____
Barley .....	_____ to _____	1 90 to _____
Corn .....	77 to 88	82 to 83½
Oats .....	75 to 1 00	47 to 56
Hay, first quality .....	22 00 to 27 00	19 00 to 21 00
second quality .....	18 00 to 19 00	12 00 to 15 00
Beef, mess .....	_____ to _____	_____ to _____
extra mess .....	_____ to _____	_____ to _____
Pork, mess .....	22 50 to _____	22 75 to 22 87½
extra prime .....	20 00 to _____	22 00 to _____
prime mess .....	19 50 to _____	_____ to _____
Lard .....	13¼ to 13¾	14¾ to 15½
Butter, western .....	17 to 30	22 to 35
State dairy .....	24 to 32	27 to 28
Cheese, State factory .....	10½ to 13¼	11¾ to 14
western factory .....	9 to 12	10 to 12½
Cotton, ordinary to good ordinary .....	13½ to 15½	13½ to 15½
low middling to good middling .....	15½ to 18½	15½ to 18½
Sugar, fair to good refining .....	7½ to 8½	8½ to 8½
prime refining .....	8½ to 8½	8½ to _____
Tobacco, lugs .....	6½ to 9½	6½ to 9½
common to medium leaf .....	9 to 12½	9 to 11½
Wool, American XXX and picklock .....	55 to 60	53 to 65
American XX and X .....	47 to 56	47 to 55
American, combing .....	51 to 65	51 to 65
pulled .....	33 to 53	33 to 53
California, spring-clip .....	23 to 35	23 to 37
California, fall-clip .....	17 to 25	17 to 27
<b>PHILADELPHIA.</b>		
Flour, superfine .....	3 50 to 4 25	3 50 to 3 62½
Pennsylvania extra .....	4 50 to 5 75	_____ to _____
Pennsylvania family .....	6 00 to 7 75	6 00 to 6 25
western extra .....	4 50 to 5 75	_____ to _____
western family and fancy .....	6 00 to 9 25	5 75 to 7 25
Wheat, winter, red .....	1 28 to 1 32	1 18 to 1 23
winter, amber .....	1 34 to 1 38	1 27 to 1 29
winter, white .....	1 33 to 1 50	1 35 to 1 38
spring .....	1 20 to 1 23	1 13 to _____
Rye .....	91 to 93	88 to 92
Barley .....	Nominal.	_____ to _____
Corn .....	82 to 84	85 to 87
Oats .....	55 to 80	49 to 55

## Market-prices of farm-products—Continued.

Articles.	August.	September.
PHILADELPHIA—Continued.		
Hay, fresh, baled.....per ton..	\$20 00 to \$22 00	\$20 00 to \$22 00
common to fair shipping.....do.....	19 00 to 21 00	19 00 to 21 00
Beef, western mess.....per barrel..	8 00 to 10 00	8 00 to 10 00
extra mess.....do.....	9 00 to 12 00	9 00 to 12 00
Warthman's city family.....do.....	17 00 to ———	17 00 to ———
Pork, mess.....do.....	23 75 to 24 00	24 00 to 24 50
prime mess.....do.....	23 00 to ———	23 00 to ———
prime.....do.....	22 00 to ———	22 00 to ———
Lard.....per pound..	13 $\frac{3}{4}$ to 16 $\frac{1}{2}$	14 $\frac{1}{2}$ to 15 $\frac{1}{2}$
Butter, choice Middle State.....do.....	30 to 33	33 to 34
choice western.....do.....	24 to 28	26 to 30
Cheese, New York factory.....do.....	12 $\frac{1}{2}$ to 13 $\frac{1}{2}$	13 $\frac{1}{2}$ to 14 $\frac{1}{2}$
Ohio factory.....do.....	12 to 12 $\frac{1}{2}$	12 $\frac{1}{2}$ to 13
Sugar, fair to good refining.....do.....	7 $\frac{7}{8}$ to 8 $\frac{1}{8}$	8 $\frac{3}{8}$ to 8 $\frac{5}{8}$
Cotton, ordinary to good ordinary.....do.....	13 $\frac{3}{4}$ to 16	13 $\frac{1}{2}$ to 16 $\frac{1}{4}$
low middling to good middling.....do.....	16 $\frac{3}{8}$ to 18 $\frac{3}{4}$	16 $\frac{3}{4}$ to 18 $\frac{1}{2}$
Wool, Ohio X and XX.....do.....	53 to 57 $\frac{1}{2}$	— to 55
Ohio combing.....do.....	58 to 63	60 to 64
pulled.....do.....	45 to 52	27 to 49
unwashed, cloth'g and comb'g.....do.....	23 to 42	42 to 45
BALTIMORE.		
Flour, superfine.....per barrel..	4 25 to 4 75	4 25 to 4 75
extra.....do.....	5 00 to 6 00	4 75 to 6 25
family and fancy.....do.....	6 00 to 8 00	6 00 to 8 00
Wheat, white.....per bushel..	1 25 to 1 45	1 10 to 1 25
amber.....do.....	1 42 to 1 45	1 30 to 1 35
red.....do.....	1 20 to 1 30	1 10 to 1 28
Rye.....do.....	80 to 85	85 to 90
Corn, white, southern.....do.....	90 to 92	93 to 94
yellow, southern.....do.....	83 to 84	81 to 82
Oats, southern.....do.....	60 to 65	52 to 55
western.....do.....	60 to 63	51 to 55
Hay, Pennsylvania.....per ton..	20 00 to 21 00	18 00 to 19 00
Maryland.....do.....	22 00 to 23 00	20 00 to 22 00
western.....do.....	— to —	— to —
Beef, Baltimore mess.....per barrel..	— to —	— to —
extra.....do.....	— to —	— to —
Pork, mess.....do.....	24 00 to 25 00	24 00 to —
Lard.....per pound..	14 to —	15 to —
Butter, western.....do.....	24 to 25	23 to 28
eastern.....do.....	— to —	— to —
Cheese, eastern cutting.....do.....	14 to —	14 $\frac{1}{2}$ to 15
western cutting.....do.....	12 $\frac{1}{2}$ to 13	13 to 13 $\frac{1}{4}$
Sugar, fair to good refining.....do.....	7 $\frac{3}{4}$ to 8	7 $\frac{7}{8}$ to 8 $\frac{1}{4}$
Tobacco, lugs.....do.....	— to —	— to —
common to medium, leaf.....do.....	— to —	— to —
Cotton, ordinary to good ordinary.....do.....	14 $\frac{1}{2}$ to 15 $\frac{1}{2}$	14 $\frac{3}{8}$ to 15 $\frac{1}{2}$
low middling to middling.....do.....	15 $\frac{3}{4}$ to 16 $\frac{3}{4}$	15 $\frac{3}{8}$ to 16 $\frac{3}{4}$
Wool, fleece-washed.....do.....	— to —	— to —
tub-washed.....do.....	— to —	— to —
unwashed.....do.....	— to —	— to —
pulled.....do.....	— to —	— to —
CINCINNATI.		
Flour, superfine.....per barrel..	4 25 to 4 50	3 75 to 4 25
extra.....do.....	— to —	— to —
family and fancy.....do.....	5 25 to 6 75	5 15 to 6 50

## Market-prices of farm-products—Continued.

Articles.	August.	September.
CINCINNATI—Continued.		
Wheat, red winter .....	per bushel.. \$1 04 to \$1 07	\$1 03 to —
Hill winter .....	do..... 1 08 to 1 12	1 05 to \$1 10
white winter .....	do..... 1 18 to 1 23	1 10 to 1 12
Rye .....	do..... 90 to 92	82 to 83
Barley .....	do..... — to —	1 00 to 1 05
Corn .....	do..... 66 to 71	70 to 75
Oats .....	do..... 48 to 50	46 to 48
Hay, baled, No. 1 .....	per ton... 20 00 to 25 00	20 00 to 22 00
lower grades .....	do..... 15 00 to 17 00	16 00 to 19 00
Beef, plate .....	per barrel.. 14 00 to 15 00	13 50 to 15 00
Pork, mess .....	do..... 23 75 to 24 00	23 00 to —
Lard .....	per pound.. 14 to 14½	16½ to —
Butter, choice .....	do..... 23 to 25	25 to 28
prime .....	do..... 19 to 20	23 to 25
Cheese, factory .....	do..... 12 to 12½	12½ to 13
pine-apple .....	do..... — to —	— to —
Sugar, New Orleans, fair to good .....	do..... — to —	— to —
prime to choice .....	do..... 9¾ to 10	9¾ to 10
Tobacco, lugs .....	do..... 15 to 22½	15 to 22½
leaf .....	do..... 22½ to 37¼	22½ to 37¼
Cotton, ordinary to good ordinary .....	do..... 13 to 14½	12¾ to 14½
low middl'g to good middl'g .....	do..... 15½ to 17½	15½ to 17½
Wool, fleece-washed .....	do..... 42 to 45	42 to 45
tub-washed .....	do..... 45 to 48	45 to 50
unwashed, clothing .....	do..... 30 to 31	30 to 31
unwashed, combing .....	do..... 35 to 38	35 to 38
pulled .....	do..... 32 to 35	32 to 35
CHICAGO.		
Flour, white winter extras, fair to good .....	per barrel.. 5 75 to 6 50	5 50 to 6 50
white winter extras, choice .....	do..... 6 75 to 7 75	6 50 to 7 50
red winter extras .....	do..... 5 50 to 6 50	4 75 to 6 50
medium to choice spring extras .....	do..... 5 00 to 5 75	5 12½ to 5 50
spring, superfine .....	do..... 3 50 to 4 75	3 50 to 4 50
Wheat, No. 1 spring .....	per bushel.. 1 03 to —	97 to —
No. 2 spring .....	do..... — to —	93½ to 93½
No. 3 spring .....	do..... — to 97	90 to —
Corn, No. 2 .....	do..... 63 to 90	66¾ to 67½
Oats, No. 2 .....	do..... 43 to 71	40 to 41½
Barley, No. 2 .....	do..... 1 03 to 1 05	93 to —
Rye, No. 2 .....	do..... 73 to 76	75 to 75½
Hay, timothy .....	per ton... 17 50 to 18 00	11 50 to 15 50
prairie .....	do..... 5 00 to 10 00	8 00 to 10 00
Beef, mess .....	per barrel.. 11 25 to 11 50	11 25 to 11 50
extra mess .....	do..... 12 25 to 12 50	12 25 to 12 50
Pork, mess .....	do..... 23 25 to 23 30	23 00 to —
prime mess .....	do..... — to —	— to —
extra prime .....	do..... — to —	— to —
Lard .....	per pound.. 12½ to 12½	15 to 12½
Butter, choice to fancy .....	do..... 25 to 28	23 to 33
medium to good .....	do..... 20 to 23	22 to 25
Cheese, New York factory .....	do..... 11 to 12	12½ to 13
Ohio and western factory .....	do..... 10 to 11	11½ to 12½
Sugar, New Orleans, prime to choice .....	do..... — to —	— to —
common to fair .....	do..... — to —	— to —
Wool, tub-washed .....	do..... 45 to 53	45 to 55
fleece-washed .....	do..... 38 to 44	40 to 47
unwashed .....	do..... 27 to 33	27 to 34
pulled .....	do..... — to —	— to —



## Market-prices of farm-products—Continued.

Articles.	August.	September.	
SAINT LOUIS.			
Flour, winter .....	per barrel..	\$3 25 to \$7 50	\$3 75 to \$7 00
Wheat, red winter .....	per bushel..	97 to 1 10	95 to 1 15
white winter .....	do.....	1 00 to 1 10	1 15 to 1 18
spring .....	do.....	— to —	70 to 90
Corn .....	do.....	55 to 78	77 to 80
Rye .....	do.....	— to 80	80 to 90
Oats .....	do.....	42 to 55	42½ to 44½
Barley .....	do.....	— to —	91½ to 1 15
Hay, timothy .....	per ton...	17 00 to 20 00	17 50 to 20 00
Beef, family .....	per barrel..	13 00 to 14 50	— to —
extra mess .....	do.....	— to —	14 00 to 16 00
Lard .....	per pound..	13 to 14	13¾ to 16¼
Butter, choice .....	do.....	26 to 28	27 to 32
inferior grades .....	do.....	15 to 25	20 to 25
Cheese, Ohio and N. W. factory .....	do.....	12 to 12½	12½ to 13
New York factory .....	do.....	12½ to 13	13 to 13½
Sugar, New Orleans, common to fair .....	do.....	— to —	— to —
prime to choice .....	do.....	— to —	— to —
Cotton, ordinary to good ordinary .....	do.....	12½ to 14¼	12½ to 14¼
low middling to good middl'g. do.....	do.....	15¼ to 17½	15¼ to 17½
Wool, tub-washed .....	do.....	49 to 53	49 to 54
unwashed, combing .....	do.....	32 to 39	32 to 39
fleece-washed .....	do.....	42 to 52	42 to 52
NEW ORLEANS.			
Flour, superfine .....	per barrel..	— to 4 50	— to 4 00
extra .....	do.....	— to 4 75	4 25 to 5 25
choice to fancy .....	do.....	7 75 to 8 50	6 25 to 7 00
Corn, white .....	per bushel..	90 to 92½	90 to 92
yellow .....	do.....	77 to 78	— to 80
Oats .....	do.....	75 to 80	56 to 60
Hay, choice .....	per ton...	26 50 to 27 00	— to 26 00
prime .....	do.....	25 00 to 25 50	23 00 to 24 00
Beef, Texas .....	per barrel..	12 00 to 12 25	12 00 to 12 25
Philadelphia .....	do.....	— to —	— to —
Fulton Market .....	do.....	11 25 to 11 50	11 25 to 11 50
western .....	do.....	15 00 to 16 00	15 00 to 16 00
Pork, mess .....	do.....	25 50 to —	— to 24 50
Lard .....	per pound..	— to 15	— to 15¾
Butter, choice southern .....	do.....	— to —	23 to 30
western .....	do.....	20 to 25	20 to 22
Cheese, choice western factory .....	do.....	— to 14	— to 13
New York cream .....	do.....	— to 19	— to 19
Sugar, fair to fully fair .....	do.....	9¾ to 9½	9¾ to 9½
prime to strictly prime .....	do.....	— to —	9¾ to 9½
clarified, white and yellow .....	do.....	— to —	10¾ to 11¾
Tobacco, lugs .....	do.....	7½ to 9	7½ to 9
low leaf to medium leaf .....	do.....	9½ to 11½	9½ to 12
Cotton, ordinary to good ordinary .....	do.....	11¾ to 14¼	11¾ to 14¾
low middling to good middling .....	do.....	15¾ to 16¾	16 to 17
Wool, lake .....	do.....	— to 34	— to 34
SAN FRANCISCO.			
Flour, superfine .....	per barrel..	4 00 to 4 50	4 25 to 4 50
extra .....	do.....	— to 4 75	— to 4 75
family and fancy .....	do.....	5 00 to 6 00	5 00 to 5 25
Wheat, California .....	per bushel..	1 50 to 1 65	1 45 to 1 60
Oregon .....	do.....	1 50 to 1 60	1 50 to 1 60
Barley .....	do.....	1 12½ to 1 40	1 05 to 1 75
Oats .....	do.....	1 40 to 1 75	1 45 to 1 65

## Market-prices of farm-products—Continued.

Articles.	August.	September.
SAN FRANCISCO—Continued.		
Corn, white..... per bushel..	———— to ———	\$1 80 to \$1 85
yellow..... do.....	———— to ———	1 80 to 1 85
Hay, State..... per ton..	\$11 00 to \$14 50	8 00 to 13 50
Beef, mess..... per barrel..	8 50 to 10 00	8 50 to 10 00
family mess..... per half barrel..	6 50 to 8 00	6 50 to 8 00
Pork, mess..... per barrel..	19 00 to 20 00	22 00 to 24 00
prime mess..... do.....	17 50 to 18 00	17 50 to 18 50
Lard..... per pound..	13 to 14	15 to 16
Butter, overland..... do.....	20 to 22	20 to 25
California..... do.....	25 to 35	25 to 40
Oregon..... do.....	18 to 20	18 to 20
Cheese..... do.....	12½ to 16	12½ to 16
Wool, native..... do.....	17 to 19	17 to 19
California..... do.....	25 to 32	25 to 32
Oregon..... do.....	25 to 33	25 to 32

## LIVE-STOCK MARKETS.

NEW YORK.		
Cattle, extra beeves..... per cental..	\$13 00 to ———	\$13 00 to \$13 25
good to prime..... do.....	———— to \$12 75	12 00 to 12 75
common to fair..... do.....	10 50 to ———	10 00 to 11 75
milk-cows..... per head..	40 00 to 80 00	45 00 to 85 00
calves..... per cental..	4 00 to 9 50	4 00 to 10 00
Sheep, good to extra..... do.....	———— to 6 50	4 00 to 7 50
Swine, common to fair..... do.....	———— to ———	7 00 to ———
PHILADELPHIA.		
Cattle, beeves..... per cental..	5 50 to 7 50	———— to ———
Sheep..... do.....	4 50 to 5 75	———— to ———
Swine, corn-fed..... do.....	10 00 to 10 75	———— to ———
BALTIMORE.		
Cattle, best beeves..... per cental..	5 50 to 6 62	5 25 to 6 87
first quality..... do.....	4 37 to 5 50	4 00 to 5 25
medium..... do.....	3 75 to 4 37	3 25 to 4 00
ordinary..... do.....	3 25 to 3 75	3 00 to 3 25
general average of market..... do.....	———— to 4 50	———— to 4 25
most of the sales between..... do.....	4 00 to 5 25	3 75 to 5 00
Sheep..... do.....	2 00 to 2 50	2 00 to 3 50
Swine, corn-fed..... do.....	9 50 to 10 00	10 00 to 10 25
SAINT LOUIS.		
Cattle, choice native steers, 1,300 to 1,600 pounds..... per cental..	5 75 to 6 00	5 50 to 5 75
prime second class, 1,150 to 1,400 pounds..... do.....	4 75 to 5 00	4 75 to 5 25
good third-grades, 1,050 to 1,300 pounds..... do.....	3 85 to 4 00	3 85 to 4 00
fair butchers', 1,000 to 1,200 pounds..... do.....	3 25 to 3 75	3 25 to 3 75
inferior native grades..... do.....	2 00 to 2 50	2 25 to 2 50
Texans and Cherokees, corn-fattened..... do.....	3 12½ to 3 62	3 00 to 3 50
inferior..... do.....	2 12½ to 2 37	1 90 to 2 20
Sheep..... do.....	2 50 to 6 00	2 00 to 4 25
Swine..... do.....	5 50 to 7 25	4 00 to 7 50

## Live-stock markets—Continued.

Articles.	August.	September.
NEW ORLEANS.		
Cattle, Texas beeves, choice.....per head..	_____ to \$40 00	_____ to \$40 00
first quality.....do.....	\$30 00 to 35 00	\$30 00 to 35 00
second quality.....do.....	20 00 to 25 00	20 00 to 25 00
western beeves.....per cental..	_____ to _____	_____ to _____
milch-cows.....per head..	35 00 to 100 00	35 00 to 100 00
calves.....do.....	8 00 to 9 00	7 00 to 9 00
Sheep, first quality.....do.....	4 00 to 5 00	4 00 to 5 00
second quality.....do.....	3 00 to 4 00	3 00 to 4 00
Swine.....per cental..	5 00 to 8 00	5 00 to 8 00
CINCINNATI.		
Cattle, good to prime butchers'		
steers.....per cental..	_____ to _____	_____ to _____
common to good medium.....do.....	2 00 to 5 00	2 00 to 5 50
milch-cows.....per head..	25 00 to 40 00	25 00 to 50 00
Sheep, common.....do.....	3 00 to _____	3 25 to _____
good to prime butchers'.....do.....	4 25 to _____	4 25 to _____
Swine, shipping grades.....do.....	6 40 to 6 95	6 00 to 6 75
good to prime butchers'.....do.....	7 10 to 7 25	7 00 to 7 80
CHICAGO.		
Cattle, extra-graded steers, 1,400		
to 1,500 pounds each...per cental..	6 10 to 6 50	6 40 to 7 00
choice beeves, 3 to 5 years		
old, 1,250 to 1,450 pounds...do.....	5 75 to 6 00	6 00 to 6 25
good beeves, 1,200 to 1,300		
pounds.....do.....	5 25 to 5 50	5 25 to 5 75
medium grades, 1,150 to		
1,300 pounds.....do.....	4 75 to 5 00	4 25 to 5 00
lower grades, natives.....do.....	2 00 to 4 50	1 75 to 4 00
Texans, choice corn-fed.....do.....	5 00 to 5 25	4 50 to 5 25
Texans, north-wintered.....do.....	3 00 to 4 25	2 50 to 4 00
Texans, through droves.....do.....	2 00 to 4 25	1 50 to 3 75
milch-cows.....per head..	_____ to _____	_____ to _____
veal calves.....per cental..	_____ to _____	3 50 to 5 50
Sheep, poor to medium.....do.....	3 00 to 4 00	3 00 to 4 00
good to choice.....do.....	4 25 to 5 00	4 50 to 4 75
Swine, good to extra.....do.....	6 35 to 6 65	7 00 to 8 40
inferior to medium.....do.....	6 70 to 6 85	6 70 to 6 90

## FOREIGN MARKETS.

WHEAT.—The season for breadstuffs in Europe is in marked contrast to the last two seasons. In England, August closed with a long stretch of beautiful weather, which put the year's gathering entirely out of harm's way, the bulk having been harvested in the finest condition. This change in the condition of production could not fail to produce a rapid fall in prices. The markets for new wheat suddenly came down from 5s. to 10s. per quarter. In several county markets the best white did not command more than 50s. This movement, however, has probably reached its minimum, and may be expected to be followed by some reaction. The complete exhaustion of stocks in England will necessitate a steady demand for at least a portion of our surplus. France

exhibits the same plenteous promise of home production. The weather has been charming, and just suited to the growing crops. The best white wheat at Paris ranges from 40s. to 50s. per 480 pounds. American spring-wheat has been offered in London at 42s. 6*d.* per 480 pounds, including cost and freight. The other countries of Europe have likewise been generally favored with good growing and harvest weather. Declining markets are reported in Holland, Belgium, Germany, and Hungary. The new wheat at Hamburg weighed from 61 to 64 pounds per bushel. It had not, at the close of August, arrived in large quantities, yet its promise was such that old American wheat, though offered at a decline of 4s. or 5s. per quarter, found few buyers. Reports from Odessa showed a large crop in Southern Russia, while samples received indicated good quality. A great decline of prices was the result. In Algiers holders were regretting their refusal to accept former prices.

The sales of English wheat during the last week in August amounted to 28,087 quarters, at 57s. 2*d.*, against 23,079 quarters, at 60s. 3*d.* during the corresponding week of 1873. The London averages were 53s. 4*d.* on 4,039 quarters. The imports into the United Kingdom for the previous week were 781,939 cwt. In Mark Lane, Essex, and Kent, new white was quoted at 47s. to 52s. per quarter; ditto, new red, 44s. to 48s.; Norfolk, Lincolnshire, and Yorkshire, 41s. to 48s.; Dantzic, mixed, 53s. to 62s.; Königsberg, 50s. to 63s.; Rostock, 50s. to 52s.; Silesian, red, 49s. to 51s.; ditto, white, 54s. to 58s.; Pomerania, Mecklenberg, and Uckermark, red, 50s. to 51s.; Ghirka, 43s. to 44s.; Russian, hard, 43s. to 47s.; Saxonska, 40s. to 50s.; Danish and Holstein, red, 50s. to 52s.; American, red, 46s. to 49s.; Chilian, white, 55s.; Californian, 56s.; Australian, 54s. to 57s. In Liverpool, American red winter, 9s. 3*d.* to 10s. per cental; No. 1 spring, 9s. 3*d.* to 9s. 6*d.*; No. 2 spring, 8s. 9*d.* to 9s.; Bombay, 9s. 6*d.* to 10s. 6*d.*; Egyptian, 8s. to 10s.; Californian, 10s. 1*d.* to 10s. 3*d.*; Oregon, 11s. 3*d.* to 11s. 6*d.*; Chilian, 9s. 6*d.* to 9s. 9*d.*; Australian, 11s. 3*d.* to 11s. 6*d.*

FLOUR.—At the opening of the last week in August there was a moderate supply of country flour in London and a very small stock of foreign, and the trade in both was by no means brisk during the week. In Paris the market ruled low, but with evident signs of a reaction, the closing prices being 35s. 3*d.* to 37s. 11*d.* per 280 pounds. In Mark Lane the best town households brought 43s. to 47s. per sack of 280 pounds; best country households, 40s. to 42s.; Norfolk and Suffolk, 38s. to 39s.; American, 25s. to 30s. per barrel. In Liverpool, English and Irish superfines brought 38s. to 40s. 3*d.* per 280 pounds; extra, 43s. to 47s.; Trieste, 55s. to 65s.; Spanish, 41s. 3*d.* to 43s.; American, western and extra State, 23s. to 25s. per barrel; Baltimore and Philadelphia, 23s. to 27s.; Ohio and extra, 25s. to 27s.; Canadian, 26s. 6*d.* to 28s.

MAIZE.—Toward the close of August a great falling off in the arrivals of maize was noted in the Mark Lane Express; prices for white, 36s. to 38s. per quarter; yellow, 32s. to 34s. In Liverpool there was but limited inquiry, and a fall of 6*d.* per quarter; American, mixed, closed at 32s. 6*d.*

MONTHLY REPORT

OF THE

DEPARTMENT OF AGRICULTURE

FOR

OCTOBER, 1874.



WASHINGTON:  
GOVERNMENT PRINTING OFFICE.  
1874.

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# MONTHLY REPORT.

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## REPORT OF CROP-RETURNS.

### COTTON.

Our October returns show a slight improvement in the condition of the cotton-crop during September, but a marked decline since August 1.

The averages of the whole country for the past three months were as follows: August 92, September 70½, October 72. These reports date from the first of each month. During September North Carolina, South Carolina, and Alabama showed a decline; Mississippi and Louisiana remained stationary; Georgia, Florida, Texas, Arkansas, and Tennessee raised their averages.

September is generally the trying month upon this crop, witnessing its greatest reduction of condition. In 1873 the figures fell from 89 to 78½. This year the crisis came in August, the prevailing causes of decline being different from those of the last few years. Insect injuries, usually a prominent complaint among planters, are seldom heard of this year; the conditions of growth so unfavorable to the crop were likewise destructive of its insect enemies. But any lack of mischievous agency of this kind was more than compensated by the drought, extreme heat, hot withering winds, cool nights, and excessive rains which prevailed in different portions of the cotton area.

In regard to the ultimate yield of the cotton-crop we may, if we think best, amuse ourselves with a variety of speculations. The chronic anxiety to discount the future and appropriate its assets to present profit has become a serious public evil, leading as it does to reckless theorizing. The continuance of a specific class of conditions of growth is assumed without any apparent suspicion that Providence may possibly have some other purpose than the production of a cotton or a corn crop. Notwithstanding the known instability of these conditions, impatient statistics would figure up assured results. A fall favorable for the opening and picking of cotton would add a million of bales to the aggregate yield, even if the condition of the crop was very unsatisfactory. On the other hand, a very promising condition might be counterbalanced by early frosts, or by a bad picking season. Who is to forecast these elements of production?

If the cotton-crop could weather opposing influences, so as to maintain its average summer vitality during its whole season of growth, its annual yield would be immensely greater than it is. What is actually gathered is the residuum after depletion by various destructive influences, which, as above stated, generally operate most seriously in September. The following figures show the condition of the crop as averaged from the October returns of the last four years:

Cotton States.	1871.	1872.	1873.	1874.
North Carolina.....	80	90	88	85
South Carolina.....	75	86	80	82
Georgia.....	72	88	82	80
Florida.....	73	75	76	81
Alabama.....	75	82	78	75
Mississippi.....	76	78	75	74
Louisiana.....	73	72	72	62
Texas.....	70	85	80	70
Arkansas.....	82	75	83	55
Tennessee.....	94	90	90	56
Average of the ten States.....	75½	78	79	72

For reasons before stated, it would not be safe to deduce from the October condition any positive and dogmatic results in regard to the final yield of a crop ungathered and still liable to vicissitudes. In the monthly reports of the Department occasional conjectures have been hazarded as to the ultimate product from known data, and on the supposition that the conditions of growth and harvesting undergo no marked change. Sometimes alternative suppositions are made as to probable yield under varied classes of conditions. But in all such cases we have clearly intimated that nothing in the science or art of statistics enables us to forecast future contingencies which affect the final result. The public press has not always been careful to indicate the hypothetical character of such conjectures, and has in some cases represented the Department as pronouncing oracularly upon the yield of crops ungathered.

The Department has not yet hazarded a conjecture in regard to the ultimate yield of the crop of 1874. It differs in several important characteristics from preceding crops to an extent which suggests extra caution in theorizing. The annual crisis came earlier than usual, giving to injurious influences a wider scope of operation, while the recuperation of September was scarcely perceptible. Yet the months of October and November may develop important modifications in the final figures. An unfavorable closing season would reduce the aggregate yield to 3,000,000 bales or lower; the season must be remarkably favorable to raise the aggregate yield above 3,500,000 bales.

VIRGINIA.—*Greenville*: Cool weather injurious. *Sussex*: Five per cent. better than usual; no rust or worms. *Dinwiddie*: Seriously injured by drought; top crop mostly destroyed. *Southampton*: Below expectations.

NORTH CAROLINA.—*Wilson*: Greatly shortened by rust. *Franklin*: Suffered from cold and rust. *Anson*: Rust general and destructive; top crop lost; some farms will not average 125 pounds of seed-cotton per acre. *Cumberland*: Drought and rust. *Pasquotank*: Acreage reduced one-half; condition greatly depressed by cool weather. *Mecklenburgh*: Twenty per cent. short of August figures; rust, drought, and heat; an early frost will cut it short 20 per cent. more. *Robeson*: Sudden and unexpected depression since last report; rust or blight cut down the crop one-fourth. *Beaufort*: Serious decline since September report; weather unusually cool; rust especially destructive; picking weather unfavorable. *Columbus*: Very fine; no worms or other disaster. *Gaston*: Cool nights more injurious than drought. *Goldsborough*: Fields well manured with composts did well; the fertilizers used by many only stimulated the crop to premature growth, which it could not maintain when the stimulant was exhausted. *Bladen*: Cold nights have caused a destructive rusting of the crop. *Camden*: Cool weather has caused farms to shed very badly, reducing the crop fully 33 per cent. *Cleveland*: Most of the August bolls dropped off; the yield depends on the delay of frost. *Granville*: Shortened 10 per cent. by drought. *Greene*: No top crop. *Chowan*: Heavy rains and cool nights have caused the shedding of leaves and bolls. *Edgecombe*: Unusual amount of cotton open; early-matured bolls are yielding heavily. *Perquimans*: Still greater decline than last reported; loss 25 per cent.; rust. *Moore*: Not so badly rusted as it is farther south.

SOUTH CAROLINA.—*Union*: Prospect greatly declined since September 1; excessive rain and cool weather, with heavy dews, restrain the opening of the bolls; early frosts cared. *Beaufort*: Injured by rust and caterpillars. *Newberry*: Drought caused the



bolts to cease growing on sandy soils; all had opened by September 10. *Pamlico*: Cut down 20 per cent. by rust. *Polk*: Not so good as last year. *Stanly*: Opens slowly, and locks hang but sparely out of the bolls. *Marion*: Late storms have injured the crop; there will be very little late cotton. *Darlington*: Never more promising till the rains ceased, in August; since then it has shed all the fruit taken on since July; staple injured by late heavy rains beating it on the ground. *Georgetown*: Greatly injured by storms. *Marlborough*: Storms and bad picking weather; much open cotton beaten out. *Richland*: Caterpillars damaged some crops. *Orangeburgh*: Weed good, but fruitage scanty and nearly all open; no blooms for a month; rust very bad. *Lexington*: Not yet recovered from August droughts; yield light. *Laurens*: Two weeks of drought caused great shedding of forms and young bolls.

GEORGIA.—*Pierce*: Drought and rust. *Schley*: Drought in September caused still further decline; some worms, but too late to do any harm. *Dooly*: Ruined by drought from August 2 to September 22. *Douglass*: Never recovered from the August drought; opening very fast; the drying of wild vegetation indicates an early frost. *Muscogee*: Continued drought, with rust. *Catoosa*: Squares dropping. *De Kalb*: Drought. *Early*: Unprecedented drought of September; worms injured the top crop. *Elbert*: Rust. *Marion*: Uplands not so good as last year; bottom crops better. *Sumter*: Drought and caterpillars; very poor prospect. *Henry*: Rust and August drought. *Banks*: Good picking weather; but little middle crop. *Montgomery*: Poor stand and injured by rust. *Spalding*: Quality middling, and good middling. *Harris*: Opening very rapidly; occasional rains during the drought prevented injurious shedding. *Terrell*: Drought through September broken by a few showers; crop a third less than last year; good picking season. *Jackson*: Weed small and damaged by late storms; blooms scarce. *Laurens*: Cut down half by drought; picking season never better. *Lincoln*: Rust on gray lands. *Oglethorpe*: No top crop; middle crop short; drought. *Walton*: Coming in slowly; picking retarded by storms, which have also injured the crop; 66 bales came in during September against 325 bales last year. *Brooks*: Good gathering season. *Macon*: Picking forward; drought in August made the crop open prematurely. *Morgan*: Injured by heat of August; opening fast; bolls small; lint short and light; later plantings did not suffer so much; bolls of better size; some rot among bottom bolls; receipts to date only half of last year's. *Upson*: Still further decline. *Jefferson*: Rust. *Baldwin*: Coming to market freely; staple of excellent quality; yield shortened by drought. *Madison*: Rust; two weeks late. *Carroll*: All the August cotton shed through drought; no rain for six weeks. *Twiggs*: Will be all gathered by November 1. *Wilkes*: Opening finely; very unequal in condition. *Pulaski*: Acreage decreased 20 per cent.; nearly all open, and will be picked within thirty days; the prospective yield has declined 25 per cent., but the staple remaining is of excellent quality on account of the absence of rain and storms to blow it out and stain it.

FLORIDA.—*Columbia*: Shortened 10 per cent. by rust within thirty days; unusual drought. *Wakulla*: Hot dry weather killed the caterpillars, but also injured the crop; bolls mostly open. *Jackson*: Forward but short; mostly secured in good order. *Leon*: Injurious drought in August and September. *Jefferson*: Weather fine for opening and picking. The rapidity with which the crop is marketed may induce people to think the crop is larger than it is. *Madison*: Some very fine crops, but the general condition is very unsatisfactory. *Gadsden*: Many fields denuded by the third brood of caterpillars; crop injured also by drought; many young bolls perished and others are yielding but scantily. *Levy*: Rust.

ALABAMA.—*Dale*: No rain for two months; squares and grown bolls falling; half crop. *Greene*: Drought. *Russell*: Top crop shedding. *Mobile*: Drought; squares falling. *Coffee*: Some worms, but the drought was too much for them. *Concuh*: Prospect improved. *Montgomery*: Nearly average in spite of drought. *Pike*: No rain for eleven weeks; upland cotton all open. *Shelby*: Drought. *Calvert*: More than was expected, but staple not so good; will be picked early. *Dallas*: Shortened a fourth by protracted drought. *DeKalb*: Bolls opening well, but smaller than last year and lint shorter. *Marshall*: Will yield not over half average; staple short and inferior; slight frost September 23, but no damage. *Calhoun*: Poorly fruited; drought and late stand. *Chotaw*: Shortened by long drought. *Hale*: Ruined by drought and caterpillars. *Jackson*: Drought and rust. *Macon*: Drought caused the crop to shed badly and to open prematurely. *Lawrence*: Half crop. *Autauga*: Drought for three months; no top crop. *Henry*: Drought through August and September. *Clarke*: Shortened one-half by drought and caterpillars. *Limestone*: Very poor; not over a bale for six acres. *Franklin*: Poor crop. *Monroe*: Drought since July 20. *Winston*: Top bolls falling; crop opening freely.

MISSISSIPPI.—*Lauderdale*: Half average; in some places no rain has fallen since June. *Grenada*: Drought; bolls opening immaturity; lint and seed frequently very imperfect. *Yalabusha*: Not over two-thirds average. *Lee*: Drying up; almost the last boll is open; no rain of any consequence since May 3. *Wayne*: Small crop. *Attala*: Cut of a third by drought. *Kemper*: Drought cut off both the crop and the worms. *Noxubee*: Black and slough lands will double last year's yield; sandy upland not so good; good picking season. *Rankin*: Crop made; rains too late to save it; half picked

already. *Tishemingo*: Opened earlier than last year; quality inferior; good picking time. *Amite*: Injured by drought; good picking season. *Hancock*: Suffered severely from worms; heretofore it was thought that worms would not injure cotton on the sea-shore, but this hope has proved fallacious. *Winston*: Drought. *Loundes*: Worms have stripped the leaves; light lands suffered from drought and heat. *Carroll*: Extreme heat caused forms to drop, materially reducing the yield. *Lincoln*: Opening rapidly; picking well advanced. *Jefferson*: Seed sprouted by heavy rains following the late drought. *Clark*: Very little rain since July 1. *Adams*: Good picking weather.

LOUISIANA.—*Iberia*: Caterpillars have done but little damage. *East Baton Rouge*: Caterpillars in large numbers; uplands only half average. *Iberia*: Worms appeared in September, too late for damage. *East Feliciana*: Cut down one-half since August 1 by drought and heat; staple inferior and seed immature. *Caddo*: Damaged 10 per cent. by September rains; picking slow; crop gathered after September 5 will be inferior in quality. *Claiborne*: Heavy and driving rains in September injured the quality of cotton to the extent of 2 cents per pound. *Franklin*: Greatly damaged by recent driving rains. *Rapides*: Staple good, but the crop only half average. *Madison*: Fell off 10 per cent. in September through drought. *Concordia*: Opening slowly; but little yet shipped. *Union*: Quality good, but yield short. *Cameron*: Worms in many places; injury serious. *Jackson*: Picking going forward rapidly, but staple inferior owing to premature opening of bolls brought on by excessive heat; top crop growing rapidly, with abundant forms and bolls; this, if the frost holds off, will materially increase the yield.

TEXAS.—*Bosque*: Long drought; half a crop. *Dallas*: A third of a crop; staple inferior to last year. *Llano*: Unprecedented drought. *Palo Pinto*: Drought. *Red River*: Drought. *Washington*: Condition improved; first picking of superior quality; the quality will be 10 or 12 per cent. in advance of last year. *Austin*: Caterpillars destroyed the top crop; late heavy rains caused a serious loss by washing and blowing out the seeds; much inferior cotton. *Collin*: Excessive drought and heat caused cotton to throw off its forms. *Falls*: Injured by heavy rains in September. *Waller*: Continued rains caused the seed to sprout in the boll; condition still further reduced. *Bell*: Cut short by drought. *Bandera*: Greatly damaged by late rains; top crop destroyed by worms; a bale to 3 or 4 acres. *Cherokee*: Injured by wet, cloudy weather. *Fannin*: Injured by recent rains; seeds, in some cases, have sprouted in the boll. *Harrison*: Injured by drought. *Henderson*: No rain in September; crop very short. *Kaufman*: Half crop; drought. *Medina*: Drought; rain comes too late to save it. *Hood*: Fallen off beyond precedent; seed small and light; staple short. *Nacarro*: Two months drought cut down the crop fearfully. *San Jacinto*: Half short and a month late. *Williamson*: Slightly improved by late rains. *Harris*: Excessive rains have sprouted the seed in the bolls; picking brisk. *Cooke*: Short; no rain from June 15 to September 7; August extremely hot. *Freestone*: Severe drought; crop shortened; *Wharton*: Prospect of a heavy yield cut down by excessive rains. *Montgomery*: Seed sprouted in the bolls from excessive rains. *Rusk*: Has taken a second growth, and is now filled with small bolls and blooms, few of which can mature. *Matagorda*: The whole coast visited by heavy rains after a long drought; very bad for cotton. *Lvaca*: Excessive rains and heavy storms have beaten out the cotton, reducing the condition 20 per cent. *Caldwell*: About 4 acres to a bale; excessive rains and floods. *Uvalde*: Badly blown down. *Comanche*: Failure through drought. *Lamar*: Good picking weather; staple good, rich cream-color, and of medium length. *Fayette*: Shortened by drought and injured by subsequent storms; will average a half bale per acre on the bottoms and a bale to 4 or 5 acres on the uplands. *Travis*: Drought from the middle of July to the middle of September, causing the plants to shed forms and bolls very freely. *Upshur*: Early crop matured before the drought; fields clean. *Victoria*: Badly blown out by a storm of fifty-six hours, commencing September 5. *Kames*: Damaged by late heavy rains; will average about a bale to 4 acres. *Kendall*: Seriously injured by fourteen days of continuous rain. *Robertson*: Rain causing considerable seed to sprout in the boll. *Blanco*: Injured by late rains.

ARKANSAS.—*Pulaski*: Premature opening; picking costs 75 cents per 100 pounds, hands boarding themselves. *Boone*: Drought. *Crawford*: Opening better than usual. *Dallas*: Short. *Franklin*: Cut off one-fourth by drought; late heavy rains have caused it to stain and rot in the boll. The little cotton there is is near the ground, and the continued rainy and cloudy weather has greatly damaged it. *Garland*: Almost a failure. *Prairie*: Picked as rapidly as possible and thrown on the market. *Yell*: Almost a failure; drought, with scorching winds in the summer. *Craighead*: Early frosts would finish what is left of the crop. *Cross*: A great failure. *Hempstead*: In many parts of the county there was no rain from May 10 to September 16; intense heat. *Ouachita*: Opening rapidly; shortest crop ever raised here; poor quality, short lint; bad color. *Monroe*: Half crop. *Stone*: Twelve weeks' drought. *Independence*: Nearly all open; picking will be completed forty days earlier than usual.

TENNESSEE.—*Gibson*: Almost a failure; quality inferior. *Henry*: Short; drought. *Hardin*: Seriously damaged by drought. *Giles*: Injured by fall rains; not over 400 pounds seed-cotton per acre. *Obion*: Half a crop. *Lauderdale*: Half a crop.

## WHEAT.

Our October returns indicate a yield of wheat both larger in quantity and better in quality than last year, nearly, if not quite, equaling the splendid crop of the census year, which aggregated 287,745,626 bushels.

The New England States, (Rhode Island not growing enough to report,) have reached nearly a million of bushels, Maine increasing 33 per cent.; New Hampshire, 3 per cent.; Vermont, 5 per cent.; Massachusetts, 13 per cent.; Connecticut equaling last year's crop. In quality Massachusetts is fully equal to last year, and all the others above, the improvement in Maine being 12 per cent.

The Middle States have increased their aggregate yield, the crop, compared with last year, ranging from 100 per cent. in Delaware to 116 per cent. in New York. The average quality is considerably better than last year.

Of the South Atlantic States, Maryland falls 1 per cent. and Virginia 6 per cent. below last year, and both are somewhat inferior in quality. On the other hand South Carolina is fully equal to last year; North Carolina increases 3 per cent. and Georgia 21 per cent. The last three States also show improved quality.

Of the Gulf States, the crops of Florida and Louisiana are too inconsiderable for notice. Alabama enlarges her yield 23 per cent. and improves its quality 29 per cent. In Mississippi the crop is 2 per cent. larger, but 9 per cent. lower in quality. Texas is about 6 per cent. lower than last year in both quantity and quality.

Of the four inland Southern States, Arkansas raises her product 50 per cent.; Tennessee, 29 per cent.; West Virginia, 23 per cent.; Kentucky declines 5 per cent. All these States have improved their quality; Tennessee, 17 per cent. Their aggregate yield will be about a third greater than that of the census year.

North of the Ohio River the ravages of insects and atmospheric injuries have reduced the crop of Wisconsin 35 per cent. below last year, a loss which more than counterbalances the increase in the other States of this section. Illinois equals last year's yield; Indiana increases hers 9 per cent.; Ohio, 16 per cent.; Michigan, 22 per cent. All present a considerably improved quality except Wisconsin. This section will produce about a million bushels less than last year.

West of the Mississippi River, Minnesota decreases her yield 16 per cent.; Iowa, 2 per cent.; Kansas, 5 per cent.; Missouri increases 29 per cent., and Nebraska 1 per cent. The quality is depreciated from 2 to 5 per cent. in all except Missouri, which has improved 27 per cent. Atmospheric and insect injuries were here more generally diffused. The aggregate yield of these States will be nearly 2,000,000 bushels less than last year.

On the Pacific coast, California increases her yield 10 per cent. and Oregon 21 per cent. Oregon equals last year in quality, and California improves 3 per cent. The increased yield of this section more than compensates for the decline of the northwest.

There is a smaller amount than last year of old wheat remaining on hand in all the States except Connecticut, Delaware, South Carolina, Alabama, Arkansas, and California. The greatest exhaustion of old stocks is found in Wisconsin, Nebraska, Kansas, Michigan, Tennessee, and Virginia.

MAINE.—*Oxford*: Best crop in ten years.

VERMONT.—*Orleans*: Generally well secured, though some pieces lodged; others troubled by the midge, here called the weevil. *Caledonia*: Good.

MASSACHUSETTS.—*Berkshire*: Did not thrash out as well as it promised at harvesting.

NEW YORK.—*Genesee*: Great increase on last year. *Wyoming*: Tappahannock for two years has done well; Touzelle not suited to the climate. *Franklin*: Best for many years.

PENNSYLVANIA.—*Clearfield*: Prematurely ripened by drought and extreme heat. *Northampton*: Thrashing out 7 bushels per 100 sheaves; a good yield; grain full and of good weight. *Lycoming*: Shortened by drought, but of good quality. *Berks*: Excellent quality.

MARYLAND.—*Montgomery*: Not yielding so well as last year. *Baltimore*: Slightly below last year; good quality; Fultz the most satisfactory.

VIRGINIA.—*Greenville*: Rust. *Gloucester*: Much rust on blades and some on stalks; good culture and free manuring make no difference. *Dinwiddie*: Yield only four-fold and of poor quality; smut and cockle. *Essex*: Fultz did best, much being sown. *King George*: Not so good quality as last year. *Albemarle*: Chinch. *Fluvanna*: Grain light; in proportion to straw. *Henrico*: Fine promise ruined by subsequent drought and heat. *Louisa*: Quality fair, but yield disappointing. *King William*: Fultz from the Department surpassed every other variety.

NORTH CAROLINA.—*Haywood*: Very good, especially Fultz, from seed furnished by the Department. One farmer raised 2½ bushels from a quart of seed; another thrashed 3 bushels from seven dozen sheaves. *Buncombe*: Best crop, in quantity and quality, for many years.

TEXAS.—*Wood*: Crop larger than last year from increased acreage; average yield not so great. *Dallas*: Yield 15 bushels per acre; increased acreage will bring the crop up to last year. *Kaufman*: Mediterranean wheat from the Department averaged 20 bushels per acre, weighing 65 pounds per bushel.

ARKANSAS.—*Independence*: Better wheat and more of it than any year since the war, but less than three per cent. of the crop acreage in this grain. Supply of bread will be very short.

TENNESSEE.—*Blount*: Wheat the only crop that reached an average. *Carter*: Touzelle failed; Tappahannock did well. *Grainger*: Large breadth sown, but did not all fill perfectly; condition good. *Knox*: Black weevil injured the crop. *Grundy*: A fair agricultural fair Tappahannock wheat, from seed originally furnished by the Department, took the first premiums. *Sevier*: Touzelle from the Department did no good. Fultz very fine yields; better than any other except the Tappahannock. A farmer, from two quarts of Tappahannock, made 3½ bushels. *Robertson*: Tappahannock did well. *Washington*: Not thrashing out as well as was expected. *Obion*: good. *Junderdale*: Better than for years.

WEST VIRGINIA.—*Mercer*: Good quality. *Monongalia*: Generally thrashed; tons out largely, and weighs 64 pounds to the bushel. *Tyler*: Crop better than for several years. *Fayette*: Thrashed out better than expected, and the quality good. *Mome*: Excellent and heavy yield.

KENTUCKY.—*Graves*: Below average in quality. *Anderson*: Affected by the drought and the midge. The Fultz wheat is anxiously sought after for seed.

OHIO.—*Hancock*: Of very fine quality. *Noble*: The best for years. *Athens*: Excellent crop. The Fultz, hardy and prolific; has proved a valuable acquisition.

MICHIGAN.—*Branch*: The best crop ever raised in the county. *Oakland*: Harvested in very good condition and has yielded largely. *Charlevoix*: Winter-wheat is considerably shrunk, owing to the dry weather in July. Spring-wheat is plump and good.

INDIANA.—*Harrison*: Quality good. *Tippecanoe*: The crop is thrashed and proves a full average in quantity and quality. *Whitley*: About two-thirds of a crop; good quality.

ILLINOIS.—*Moultrie*: Almost a failure, and quality bad. *Mason*: Thrashing out well in quantity and quality. *Douglas*: In some localities seriously damaged by chinch. *Lee*: About all thrashed; quality good. *Madison*: The average per acre is 75, but the area is at least 10 per cent. larger than in 1873.

WISCONSIN.—*Door*: Upon thrashing it proves very light; not more than three-fourths of a crop. *Richland*: Nearly all shrunk some. *Saint Croix*: Injured in stack by wet weather.

MINNESOTA.—*Sibley*: Spoiled by the locusts and hot weather. *Blue Earth*: Rice Osaka not over 5 per cent. of an average crop owing to rust, and a large surface of it sown; this greatly reduces the general average. *Nicollet*: Reported by thrasher as averaging about 11 bushels per acre. *Wright*: Mostly number 2. *Goodhue*: Shortened by drought. *Houston*: Considerably injured in stack by heavy rains. *Rock*: Equal to last year's crop in quantity and quality, but suffered from grasshoppers both years. *Waseca*: Never better.

IOWA.—*Cass*: Very considerably damaged in the stack by long continued rains. *Woodbury*: Being injured in the stack by excessive rain. No old wheat in the county to speak of. *Madison*: More rain fell in September than in the same month for ten years past, and a large amount of wheat in stack is damaged. *Chickasaw*: From the report of thrashers the yield is better than was anticipated. *Cherokee*: Some damaged

both in stack and shock by excessive rains. *Harrison*: The crop was destroyed except in spots. *Howard*: That thrashed early is in good order; but the recent rains have damaged that in stack. *Mitchell*: Very much injured in the stack by heavy rains. *Audubon*: Badly damaged by rains since harvest. *Henry*: Damaged in stack by heavy rains.

MISSOURI.—*Caldwell*: Has not yielded in thrashing as well as was expected. *Greene*: The largest and finest crop ever raised in the county. *Stone*: The yield per acre is fully 100 per cent. above last year. The Fultz and Tappahannock yielded splendidly, and the quality is extra good. The Touzelle did nothing; too late for this climate. *Jasper*: Thrashing out better than expected, 30 bushels per acre being a common average. *Pemiscot*: Not enough for home consumption; drought.

KANSAS.—*Jefferson*: Raised no number 1; dry weather and chinchies shrunk the berry. *Republic*: Winter-wheat yields 400 per cent. more than last year, with a corresponding increase in quality. Wheat in the stack much injured by the September rains. *Montgomery*: The product last year 200,000 bushels; this year from 300,000 to 350,000; quality good, averaging 62 pounds to the bushel. Tappahannock has excelled all other varieties in quantity and quality, and was less damaged by the chinchies. *Labette*: Product, compared with last year, 135. We claim to be the banner county in the State in the raising of wheat. *Nemaha*: Light, and much of it lost in screenings. *Jackson*: Light, but good berry. *Ottawa*: The acreage was unusually large, but the yield reduced by drought, and the grain materially injured in stack by rains. *Woodson*: Mostly destroyed by the winter and the chinchies.

NEBRASKA.—*Antelope*: With twice last year's acreage we only get last year's total of wheat, pinched by hot weather and cut by "the red-legs." *Dixon*: Has suffered greatly in the shock from wet weather.

CALIFORNIA.—*Del Norte*: Excellent. *Sonoma*: All thrashed; a very satisfactory yield, and a very superior quality.

COLORADO.—*Rio Grande*: Has done better than ever before, yielding 62½ bushels per acre on a three-acre field. *Morgan*: Injured by rust. *San Pete*: Turned out better than was expected; quality good. *Box Elder*: A shrinkage from rust. *Salt Lake*: Unprecedented rains caused rust and shrinkage.

## RYE.

The New England States equal or improve last year's crop, both in quantity and quality, Maine showing an increased product of 26 per cent. The Middle States are a little below last year in quantity, and a little above in quality. The South Atlantic States show a small reduction in both. The reduction in the Gulf States is still more marked, on account of the low figures of Texas, which reports but two-thirds of last year's crop. The inland Southern States, as a whole, show an increased yield and an improved quality. The States north of the Ohio show a slight increase in quantity and quality. The States west of the Mississippi and on the Pacific coast are about equal to last year in both quantity and quality.

## OATS.

The product of the oat-crop in the New England States shows, on the whole, a considerable increase. Maine increases her yield 27 per cent.; New Hampshire, 3 per cent.; Vermont, 16 per cent.; Massachusetts, 13 per cent. On the other hand, Rhode Island decreases her small crop 18 per cent.; Connecticut, 4 per cent. The quality, compared with last year, ranges from 100 in Rhode Island to 107 in Maine.

Pennsylvania reduces her crop 18 per cent. Complaints of drought in some quarters and of excess of rain in others, indicate the leading causes of this decline. The other Middle States, however, show an enlargement; New York, 7 per cent.; New Jersey, 1 per cent.; Delaware, 10 per cent. The quality on the whole is considerably depreciated.

Along the South Atlantic and Gulf coasts both quantity and quality show a decline, except that the yield of Georgia is 8 per cent. and Alabama 5 per cent. larger than last year. In all other sections of the Union, except the Pacific coast, both quantity and quality have declined.

the greatest loss being in Kentucky, which reports only 43 per cent. of last year's crop. Tennessee averages 46 per cent.; Louisiana and West Virginia, 61 per cent.; Arkansas, 62 per cent.; Kansas, 68 per cent. On the Pacific coast the quality is equal to last year. California enlarges her yield 8 per cent. Oregon declines 1 per cent.

MAINE.—*Oxford*: Poorly filled; quality inferior. *Androscoggin*: Heavy yield.

VERMONT.—*Orleans*: Good, though somewhat rusted. *Caledonia*: Seldom better.

MASSACHUSETTS.—*Berkshire*: Heavy strawed, and well headed.

NEW YORK.—*Franklin*: Some rust, but crop better than last year.

PENNSYLVANIA.—*Clearfield*: Lightest crop for years. *Elk*: Badly rusted. *Columbia*: Drought. *McKean*: Season too wet.

VIRGINIA.—*Caroline*: Almost a failure. *Greenville*: Rust. *Dinwiddie*: Rust. *Essex*: Worse than last year's bad crop. *Clarke*: Almost a complete failure. *Highland*: Latter part of the season brought the crop to an average. *Albemarle*: Chinchies. *Henrico*: Winter oats good; spring poor. *Louisa*: Chinchies. *King and Queen*: Very good.

NORTH CAROLINA.—*Buncombe*: Poor in quantity and quality.

SOUTH CAROLINA.—*Chesterfield*: Spring oats a failure; winter very good.

MISSISSIPPI.—*Lincoln*: Increased acreage, but not an increased yield per acre.

TEXAS.—*Austin*: Red oats (rust-proof) the only variety fit to grow here. *Cooke*: Somerset oats too tall and too late for the climate. *Uvalde*: Somerset oats a success. *Upshur*: Better crop than last year, especially rust-proof.

TENNESSEE.—*Carter*: Somerset from the Department yielded exceedingly well. *Lincoln*: Shortened by drought. *Grundy*: Hopetown oats, from seeds originally furnished by the Department, took the premiums at our county fair. *Trousdale*: An entire failure. *Washington*: Winter oats a fine crop; spring oats poor.

WEST VIRGINIA.—*Grant*: A failure. *Braxton*: Far below last year in quantity and quality. *Mercer*: Inferior in quality, greatly damaged by drought. *Monroe*: Very poor; not over one-third of a crop.

KENTUCKY.—*Oldham*: A failure, owing to drought. *Clarke*: Seriously injured by drought. *Gallatin*: A very short crop, owing to excessive drought. *Lincoln*: Almost a failure, owing to drought. *Graves*: Almost an entire failure; drought. *Anderson*: Almost a complete failure; drought.

OHIO.—*Medina*: Shortened by drought. *Morrow*: Early sown gave a fair average. Late sown did not give half a crop and were of poor quality. *Vinton*: Nearly ruined by drought. *Athens*: Almost an entire failure; drought. *Delaware*: Early varieties very good; late affected by drought.

MICHIGAN.—*Lake*: Injured by drought. *Branch*: Light from drought. *Montcalm*: Injured by dry weather.

ILLINOIS.—*Moultrie*: Poor. *Douglas*: Seriously damaged by chinchies. *Lee*: Not good in quantity or quality.

WISCONSIN.—*Juneau*: Poor.

MINNESOTA.—*Sibley*: Spoiled by the locusts. *Blue Earth*: Greatly injured by drought. *Wright*: Very light. *Mower*: Very good. *Goodhue*: Shortened by drought. *Rock*: Suffered from grasshoppers much more than last year. *Waseca*: Never better; every farmer has an abundant crop.

IOWA.—*Chickasaw*: A fine crop. *Decatur*: A very large crop. Those thrashed all right, but those in stack (probably one-third) nearly all lost by excessive rains. *Howard*: No complaint of yield or quality, and the price better than for years.

MISSOURI.—*Caldwell*: Secured in the best condition, but a little light in weight. *Greene*: Injured by drought. *Laclede*: Not half a crop—drought. *Platte*: Not more than half a crop.

KANSAS.—*Jefferson*: Not well filled; drought. *Montgomery*: Not over half a crop; drought and chinchies. *Pawnee*: Matured before the drought and grasshoppers came. *Labette*: Shortened by drought. *Jackson*: Rather light.

NEBRASKA.—*Antelope*: Badly used by the "red-legs."

CALIFORNIA.—*Del Norte*: Excellent.

## BARLEY.

In the New England States, except Rhode Island and New York, the product of the barley-crop is greater than last year, the excess in Vermont being 16 per cent. In all these States the quality is equal to last year or superior. Pennsylvania declines 2 per cent. in quantity and 4 per cent. in quality. Georgia and Texas are nearly equal to last year in both quantity and quality. Tennessee equals its previous crop, and Kentucky exceeds by 18 per cent., the quality in both being superior.

North of the Ohio River the crop has declined both in quality and quantity. West of the Mississippi River, Iowa, Kansas, and Nebraska have increased, while Minnesota and Missouri have decreased. Missouri and Kansas have declined in quality; Minnesota, Iowa, and Nebraska have improved. On the Pacific coast the crop is equal to last year, except a decline of 3 per cent. in quality in California.

#### BUCKWHEAT.

The condition of the buckwheat-crop is above average in Vermont, 103; Connecticut, 108; North Carolina, 101; Tennessee, 103, and Minnesota, 102; it is full average in Delaware, Mississippi, Indiana, Wisconsin, and Oregon; in all the other States it is below average. In the Middle and Southern States it has been injured by drought, and in the Northwest by insects. Several counties in different parts of the country report extra yields. The Silver-hull from the Department is showing good results.

#### CORN.

Returns indicate an average condition, throughout the country, of 86. This is an improvement of 3 per cent. since the 1st of September, and 2 per cent. above the average for October 1, 1873. This general average is made up from returns of average condition for each county in the several States, which indicate the promised rate of yield and quality, but not the quantity of the crop, the acreage not being taken into account. The returns for acreage in July showed a breadth planted fully 2,000,000 acres greater than in 1873. The highest per cent. of increase was in the South, but the greatest absolute increase was in the West, while New England indicated a slight decrease. The enlarged acreage and the slightly improved condition give promise of an increase in product over last year of something over 60,000,000 bushels, but the returns for November, which report, not condition, but product, compared with last year, may considerably modify this estimate. Among the greater corn-producing States, lowest in condition, are Kansas, 51; Missouri, 59; Tennessee, 70; Illinois, 78; Michigan, 84; Wisconsin, 85; Kentucky, 86. The highest among these States are Indiana, 102; Ohio, 99; Pennsylvania, 97; Iowa, 96; Texas, 95; New York, 90. All of the above States reported, in July, an increase in acreage, except Kentucky, 97; Tennessee, 98, and New York, 100. Texas reported an increase of 16 per cent.; Kansas, 14; Missouri, 10; Iowa, 9; Indiana, 8; Illinois, 4; Ohio, 2. Ranging highest in average condition among the States producing a less amount, are California, 109; South Carolina, 108; Rhode Island and Connecticut, 106; Minnesota, 104; Georgia, 103; North Carolina and Florida, 102. Lowest, Arkansas, 53; Nebraska, 63; New Jersey and Louisiana, 69; Maine, 78; Delaware, 85; Vermont and Maryland, 88. Between these extremes are Oregon, 100; New Hampshire, 96; Virginia, 93; West Virginia, 95; Alabama, 94; Mississippi, 90; and Massachusetts, 89.

Up to the first of November frosts had done very little damage. The principal cause of low condition has been droughts prevailing to an almost unprecedented extent at the most unpropitious seasons for corn. To this must be added the very great ravages by grasshoppers in Kansas and Nebraska, and in parts of Missouri, Iowa, and Minnesota; also extensive injuries by chinchies in these States, except Iowa, and in Ohio, Indiana, and Illinois, and to a less extent in Wisconsin. In California and Colorado Territory ravages by grasshoppers are also noted. In-

teresting particulars of local variations in condition and their causes will be found in the notes from correspondents which follow:

MAINE.—*Oxford*: Growth good; two or three weeks late. *Sagadahoc*: Late. *Androscoggin*: Very backward and light.

NEW HAMPSHIRE.—*Carroll*: Remarkably green and backward.

VERMONT.—*Orleans*: Crop good and ripening well. *Washington*: Harvested in good order; no frost yet. *Rutland*: Severe drought for two months.

MASSACHUSETTS.—*Berkshire*: Injured by the early cold season.

CONNECTICUT.—*New London*: Very promising.

NEW YORK.—*Columbia*: Very light. *Queens*: Shortened by drought; not generally well filled. *Tioga*: Recent rains. *Genesee*: Prematurely ripened by drought in August and September. *Sullivan*: Light but good. *Franklin*: Late and small. *Hudson*: Injured by drought.

NEW JERSEY.—*Gloucester*: Shortened by extreme drought.

PENNSYLVANIA.—*Northampton*: Planted on old corn-stubble without manure; crops are very poor. *Clearfield*: Some good pieces, but late planting causes much soft corn. *Indiana*: Sound and safe from frost. *Columbia*: Suffered from drought. *Westmoreland*: Corn still needs fine weather for ripening, *Erie*: Has done well. *Armstrong*: Good season. *Lycoming*: Average in quantity and quality. *Beaver*: Damaged by drought. *Butler*: Injured and retarded by cool nights.

DELAWARE.—*Kent*: Shortened by late drought.

MARYLAND.—*Dorchester*: Shortened 30 per cent. by drought; fodder good. *Baltimore*: Average, and of good quality.

VIRGINIA.—*Greenville*: Injured by worms. *Lunenburg*: Shortest crop ever made. *Madison*: Maturing and very sound; upland poor; bottoms good where well worked. *Middlesex*: Injured by bud-worms; season good. *Gloucester*: Injured by drought and worms. *Shenandoah*: Drought. *Stafford*: Half crop. *Charles City*: Still green. *Dinwiddie*: Yield large but of inferior quality; late planting, poor culture, and drought. Fodder well secured. *Essex*: Best crop for five years in spite of bad stand. *King George*: Too dry and cold. *Nelson*: Good, but late. *Clarke*: Some improvement. *Elizabeth City*: Improved of late. *Highland*: Unusually good. *Loudoun*: Improved by late rains; a fine prospect. *Mathews*: Fine quality, shortened by bud-worms. *Mecklenburgh*: Drought and storms. *Nansemond*: A late cold season gave a poor stand, but a fine summer has greatly improved the crop. *Pulaski*: Nearly out of danger. *Albemarle*: Late rains have raised the crops to average. *Fluvanna*: Tolerable. *Louisa*: Partial drought. *King William*: Best crop for years. *Orange*: Benefited by late rains; chinchies. *King and Queen*: Will make 50 per cent. more than last year. *Buchanan*: Drought and leveling winds. *Chesterfield*: Fine yield and quality if frost delays.

NORTH CAROLINA.—*Franklin*: Lack of cultivation. *Cumberland*: Drought. *Pasquotank*: Short, but better than last year. *Beaufort*: Unusually well saved and sound. *Gaston*: Shortened by drought. *Cleveland*: Short. *Camden*: Good. *Greene*: Nearly average, but not enough for home use. *Perquimans*: Fully a third better than last year. *Chowan*: Good. *Haywood*: Late and of low growth on account of drought, but the ears are long and well filled. *Moore*: Early crops fine, later plantings injured by drought.

SOUTH CAROLINA.—*Orangeburgh*: Crop fine. *Lexington*: Late corn has held its own.

GEORGIA.—*Schley*: Good, and enough for home consumption. *Muscogee*: Short, cotton-seed fertilizer not applied. *Catoosa*: Injured worse by drought than ever before. *DeKalb*: Good. *Sumter*: Crop made; 15 per cent. better than last year, but not enough planted. *Columbia*: Fine; enough for home use. *Harris*: Better than last year. *Oglethorpe*: Turning out well in spite of a cool summer. *Upson*: As good as the land will bring where well cultivated, but a large proportion is not well cultivated. *Jefferson*: Better than usual. *Carroll*: Fine where well worked; fodder largely saved in good order. *Pulaski*: Increased acreage and yield.

FLORIDA.—*Madison*: Good, as usual. *Gadsden*: Yield satisfactory.

ALABAMA.—Late corn injured by drought. *Greene*: Crop turning out well. *Coffee*: Late corn almost cut off by drought. *Conecuh*: Drought. *Montgomery*: Fine; the late plantings injured by drought were few; full ears and good grain. *Colbert*: Half a crop and of poor quality; selling at \$1 per bushel; usual price 40 to 50 cents. *Dallas*: Late plantings curtailed by drought. *Calhoun*: Early plantings good; late, injured by drought. *Lawrence*: Half crop. *Clarke*: Early-planted upland crop very good; river-bottom crops mostly ruined by drought. *Limestone*: Very poor. *Franklin*: Distressingly short in some localities. *Monroe*: Drought since July 20.

MISSISSIPPI.—*Attala*: Late plantings ruined. *Kemper*: Destructive drought. *Randolph*: Some excellent; some very poor. *Amite*: Late plantings injured by drought. *Winston*: Shortened by drought.

LOUISIANA.—*Iberia*: Selling at 50 cents to 75 cents per barrel. *Franklin*: Damaged



by rot. *Rapides*: Quality, average; quantity, one-fourth short. *Madison*: Late plantings damaged by drought.

TEXAS.—*Wood*: Sound and in good order. *Aranzas*: Shortened by drought. *Bosque*: Drought. *Dallas*: Injured by drought; will yield 30 bushels per acre. *Palo Pinto*: Drought. *Austin*: Light. *Collin*: Short. *Fannin*: Pennsylvania field-corn matures about twenty days earlier than any other variety. *Harrison*: Drought. *Medina*: Injured by storms. *Hood*: Brings 50 cents per bushel; supply supposed to be ample for home demand. *Freestone*: Injured by heavy rains. *Uvalde*: Greatly injured by excessive rain. *Fayette*: Shortened by drought, but of good quality. *Upshur*: The product will be twice as great as last year. *Victoria*: Injured by heavy rain-storms. *Karnes*: Heavy rains have caused some ungathered corn to sprout on the stalk. *Kendall*: Seriously injured by rains.

ARKANSAS.—*Pulaski*: Light and chaffy. *Boone*: Continued drought since June. *Fulton*: Drought. *Garland*: Drought. *Prairie*: Very light. *Yell*: Almost a failure. *Cross*: General failure of all sorts of crops; not over a fourth of a crop of corn. *Washington*: Somewhat injured by chinchies; well matured. *Stone*: Twelve weeks' drought. *Independence*: Very short.

TENNESSEE.—*Jackson*: Better than last year, but not so good as usual. It will sell high. *Johnson*: Recent rains have brought up corn above average. *Gibson*: More generally cut for forage than usual; crop will average 10 bushels per acre; last year 25. *Grainger*: Very much improved by rains since July 11; nearly safe from frost. *Henry*: Drought. *Knox*: Seriously injured by grasshoppers. *Monroe*: Late corn had seasonable rains, but is in danger from early frost; fodder still green, and the grain still in the roasting-ear stage. The farmers are saving fodder, and it is hoped will be able to winter their stock. *Wilson*: Very light. *Grundy*: A fine growing summer. *Trousdale*: Late, but will yet come out if the fall be favorable. *McMinn*: Drought. *Robertson*: Late and damaged by worms. *Bedford*: Drought. *Washington*: Runners' white corn makes the neatest of roasting-ears; yields well. *Cheatham*: Improved by late rains, but late. *Obion*: Somewhat improved.

WEST VIRGINIA.—*Raleigh*: Turning out finely; some farmers average 50 bushels per acre. *Tyler*: Much injured by drought. *Monroe*: Much better than expected.

KENTUCKY.—*Anderson*: Cut short by drought. *Butler*: One-half the crop yet very green; a part just silking out. *Mason*: Not over three-fourths of a crop, but has matured well. *Adair*: Has improved greatly since the rains. *Bracken*: Cut short one-third by drought. *Grayson*: Has come out remarkably well. *Logan*: Materially injured by drought and army-worm. *Spencer*: Cut down by drought.

OHIO.—*Morrow*: Planted early, on good soil and well tilled, it gave a very fair crop; planted late and poorly cultivated, it is unremunerative. *Warren*: Shortened by drought, but the acreage, greater than ever before, will make the product average. *Geauga*: Injured by drought. *Hancock*: The largest crop ever grown in the county, but somewhat shortened by drought. *Noble*: Large area planted; injured some by drought, but shall have the largest crop for years. *Adams*: Shortened by drought. *Athens*: Injured by drought. *Delaware*: Full average in spite of extensive drought; growth of stalk small, but heavy and well-ripened ears.

MICHIGAN.—*Wexford*: The best crop ever grown here. *Hillsdale*: Being harvested four to six weeks earlier than ever known. *Oakland*: Will be a large yield. *Saginaw*: More smut than common. *Cass*: Better than expected a month ago.

INDIANA.—*Noble*: Will not exceed half a crop. *Switzerland*: Rather short; drought. *Tippecanoe*: Truly a splendid crop, and unusually forward. *Whitley*: A fine crop, of good quality. *Hamilton*: Fine; fully two weeks earlier than common; number one in quality. *Huntington*: Injured by drought. *Madison*: For about one hundred square miles in this section corn is an excellent crop, but in surrounding regions the crop is poor on account of drought. *Boone*: Drying out finely.

ILLINOIS.—*Fayette*: A failure; drought. *Mason*: Light and of poor quality. *Cumberland*: Light but well ripened. *Douglas*: Fine, and now ripe. *Macoupin*: Injured 20 per cent. by chinchies. *Madison*: A short crop of very light corn. The poorest fields have generally been cut for fodder to save something from the chinchies. *Montgomery*: Excellent on the bottoms, but on the prairies injured, and in some places entirely destroyed by the chinchies. *Washington*: Shortened one-half by chinchies. *McLean*: Although averaging not more than half a crop, some have fair corn in almost every part of the county, owing to thorough preparation of the soil before and after plowing and frequent plowing and harrowing till June.

WISCONSIN.—*Ozaukee*: The best crop for the last twenty years. *Green*: A greater amount has been cut than ever before.

MINNESOTA.—*Sibley*: Very good. *Isanti*: Ripened in good condition, but less in quantity than usual. *Wright*: Good. *Goodhue*: All varieties well ripened. *Waseca*: Never better.

IOWA.—*Bremer*: Many ears not well filled for want of rain. *Chickasaw*: Not a full crop, but better than last year. *Clinton*: Dead ripe from old age. *Decatur*: A very large crop; the best in twenty years. *Des Moines*: Ripe before frost, but only three

quarters of a crop. Not less than 20 inches of water have fallen within the past month and corn is growing in the shock. *Harrison*: A greater acreage than ever before; early planted, very good, but late, inferior. *Howard*: Ripened before frost. More cut up for fodder than ever before. *Mitchell*: All matured. *Plymouth*: In some townships almost totally destroyed by the grasshoppers; in others, an abundant yield. *Washington*: Will be ripe enough to crib by the 20th of October; one-fourth short.

MISSOURI.—*Gasconade*: Almost an entire failure; drought and chinchés. *Greene*: Many pieces will not have a bushel of good corn per acre. *Cass*: Entire failure in parts of the county; half-crop in other parts, owing to seasonable showers. *Laclede*: Not half a crop, owing to severe drought and chinchés. *Moniteau*: All cut up to "rough" stock through the winter. *Wayne*: Cut short by drought. *Dent*: On upland suffered severely from chinchés and drought; some very fine crops on very low valleyland. *Platte*: Damaged by the grasshoppers and recent rains. *Montgomery*: Quite inferior in the south part of the county; in the north, extra good. *Newton*: The poorest yield ever known, owing to drought and chinchés. *Perry*: Almost a failure in about half the county, owing to drought and chinchés. *Reynolds*: In many fields will not make one bushel to the acre, being entirely burned. *Stoddard*: About two-thirds of a crop, but sound and good in quality; drought and chinchés cut it short. *Shelby*: Better than last year 120 per cent., and would have been much better if we had not had any chinch-bugs. We suffer more from them than from drought. *Jasper*: Will not average 5 bushels to the acre, owing more to chinchés than drought. *Maries*: Severe drought and the chinchés caused almost an entire failure of corn on uplands, and badly injured it on bottoms. *Peniscot*: Not enough for home consumption; drought.

KANSAS.—*Woodson*: Many fields destroyed by drought and chinchés, but an average crop will be harvested. *Ottawa*: Utterly ruined by grasshoppers. *Ellsworth*: The grasshoppers destroyed all the corn. *Marshall*: About an entire failure. *Mitchell*: No corn, and very little hay, owing to drought. *Shawnee*: One-fourth of a crop; poor in quality. *Butler*: About half a crop, and worth \$1. *Clay*: A total failure; grasshoppers and drought. *Republic*: A failure. *Montgomery*: Less than half a crop; drought and chinchés, and want of thorough cultivation. Farmers who plowed deep, planted early, and cultivated thoroughly, report from 40 to 60 bushels per acre. *Neosho*: Hardly worth harvesting. *Labette*: On the streams, about three-quarters of a crop; on the prairies, not one-sixth; drought and chinchés. *Nemaha*: Only one-tenth of a crop, and very poor in quality. *Brown*: Only about 15 per cent. of a crop; drought, chinchés, and grasshoppers. *Douglas*: Nearly a universal failure; grasshoppers and drought.

NEBRASKA.—*Antelope*: But little left. *Richardson*: Almost a failure; chinchés and drought. *Lincoln*: Destroyed by the grasshoppers. *Adams*: Entirely destroyed by grasshoppers. *Cass*: Nearly a failure, owing to drought and grasshoppers.

CALIFORNIA.—*Del Norte*: Late. *San Luis Obispo*: Backward, as it was replanted, owing to ravages by grasshoppers, but a fine crop is anticipated.

UTAH.—*Kane*: Promises well.

## POTATOES.

The only States which report the average condition above an annual average are Maine 101, and Florida 119; Rhode Island returns 100; all other States fall below, ranging from 98 in Wisconsin down to 26 in Kansas. Among the States which produce potatoes on a large scale, the returns of condition for October 1, this year and last, respectively, averaged in New York 94 and 107; Pennsylvania, 87 and 100; Ohio, 84 and 89; Michigan, 87 and 89; Indiana, 85 and 77; Illinois, 77 and 59; Iowa, 81 and 51; Missouri, 55 and 61; Maine, 101 and 98; New Hampshire, 97 and 98; Vermont, 94 and 108; New Jersey, 86 and 101. Lowest in condition, next to Kansas, are Nebraska, 43; Arkansas, 46; Kentucky, 51; Mississippi, 54; Maryland and Tennessee, 58; West Virginia, 69. The average condition for the whole country is 86, against 89 one year ago. The acreage reported in July was about 2 per cent. greater than in 1873. These figures indicate that the crop will fall somewhat below that of 1873, though no definite estimate can be made before the November returns, which report actual production compared with the previous year.

In localities in Maine, New Hampshire, Vermont, and Connecticut, rotting to some extent is noted; also in Maryland, Michigan, and Kau-

sas. The Colorado beetle is mentioned among the causes of low condition in New Jersey, Pennsylvania, Delaware, Maryland, West Virginia, Kentucky, Indiana, Illinois, Wisconsin, Minnesota, Iowa, and Nebraska. Grasshoppers in Iowa, Minnesota, Kansas, Nebraska, California, and Colorado Territory, but wide-spread droughts have been by far the greatest cause.

### SWEET-POTATOES.

Among the States producing this crop, Delaware and California report an average condition; all other States fall below. Kansas, only 51; Arkansas, 59; Nebraska, 67. Except Indiana, 99, which produces comparatively few, the range of the remaining States is between 78 in Alabama and Louisiana, and 98 in Georgia and Pennsylvania. The general average condition is somewhat lower than in October, 1873. Further particulars respecting local exigencies affecting potatoes and sweet-potatoes will be found in the notes below.

MAINE.—*Oxford*: Yield and quality good. *Sagadahoc*: Some varieties rotting. *Androscoggin*: Generally fair, but rotting in some localities.

NEW HAMPSHIRE.—*Carroll*: Tops look well. *Hillsborough*: Some rot.

VERMONT.—*Caledonia*: Crop light; some rot.

MASSACHUSETTS.—*Berkshire*: Potatoes short and undersized.

CONNECTICUT.—*New London*: Early varieties rotting to some extent. *Windham*: Drought saved the crop from rotting. *Hartford*: Some rot.

NEW YORK.—*Queens*: Yield less than last year but quality superior. *Tioga*: Drought. *Columbia*: Drought affected late potatoes. *Erie*: Early Rose did well; other varieties injured by drought and bugs.

NEW JERSEY.—*Gloucester*: Colorado beetles.

PENNSYLVANIA.—*Clearfield*: Injured by Colorado beetles. *Northampton*: Vines injured by common corn grub. *Indiana*: Excellent quality and fair crop. *Columbia*: Some Colorado beetles. *Elk*: Nearly destroyed by Colorado beetles. *Erie*: Colorado beetles. *Berks*: Peerless the leading variety.

DELAWARE.—*Kent*: Colorado beetles shortened late crops.

MARYLAND.—*Baltimore*: Drought and bugs. *Dorchester*: Colorado beetles and rot. *Cecil*: Injured by drought and Colorado beetles.

VIRGINIA.—*Spottsylvania*: Promising. *King George*: Early crops good; late not so good. *Nansemond*: Second crop very fine. *Henrico*: Fine where they came up. *Fairfax*: Benefited by late rains. *King and Queen*: Very good. *Chesterfield*: Yield large; quality indifferent.

NORTH CAROLINA.—*Wilson*: Drought. *Cumberland*: Drought. *Beaufort*: Look fine. *Prince William*: Late rains will bring them to average if frost delays. *Haywood*: Drought.

GEORGIA.—*Pierce*: Drought.

FLORIDA.—*Leon*: Drought. *Madison*: Better than last year.

ALABAMA.—*Dallas*: Drought. *Marshall*: Drought. *Choctaw*: Drought.

MISSISSIPPI.—*Winston*: Shortened by drought. *Amite*: Drought. *Hancock*: Promising.

TEXAS.—*Aransas*: Early plantings injured by the recent rains, causing them to rot; late crops promising. *Bosque*: Shortened by drought. *San Jacinto*: Have kept better than usual. *Henderson*: Drought.

TENNESSEE.—*Lincoln*: Almost a failure. *Grainger*: Very short; early plantings nearly a failure; later are good. *Henry*: Drought. *Wilson*: Almost a failure. *Washington*: A failure. *Lauderdale*: Ruined by drought.

WEST VIRGINIA.—*Jefferson*: Much injury by the Colorado beetle.

KENTUCKY.—*Oldham*: A failure; prolonged drought. *Clarke*: Almost a total failure; drought and the Colorado beetle. *Grayson*: Late, both Irish and sweet, are fine. *Spencer*: Short, more from drought than the Colorados. *Anderson*: Irish, ruined by drought and the bug; sweet, nearly an average crop. *Butler*: Irish, almost a failure.

OHIO.—*Butler*: Seriously injured by drought. *Medina*: Shortened by drought. *Washington*: Few were planted for fear of bugs. Both the early and the late crops suffered from drought. *Morrow*: Early potatoes have done much better. *Vinton*: Early, injured by drought. *Geauga*: Late, injured by drought. *Delaware*: Very poor yield, but excellent in quality.

MICHIGAN.—*Delta*: Early Rose, hitherto the most profitable variety, are being injured by rot. *Surry*: Great injury by drought and bugs. *Hillsdale*: Light, from extreme drought. *Saginaw*: Scabbed with worms and inclined to rot. *Cass*: Late, have done well.

INDIANA.—*Floyd*: Early, an entire failure. We raise no late potatoes. *Madison*: Much damaged by the Colorado beetle. *Brown*: Shortened one-half by drought. *Tipppecanoe*: Splendid in quantity and quality. *Whitley*: Above an average crop, of good quality.

ILLINOIS.—*Fayette*: Irish, nearly a failure; sweet, a fair crop. *Wabash*: Early, 60 per cent. of an average; rotted badly after they were dug. Late, promising. *Lee*: A light crop.

WISCONSIN.—*Door*: Good, except the very early planted. *Douglas*: Yield pretty well in spite of the bugs. *Juneau*: Fair. *Green*: Much better than usual.

MINNESOTA.—*Sibley*: Injured by the locust, potato-bug, and dry weather. *Houston*: Injured by drought.

IOWA.—*Woodbury*: A poor crop, though better than last year. *Chickasaw*: Shortened by drought. *Harrison*: Irish, injured by grasshoppers, bugs, and drought; sweet, good, and an increased acreage. *Howard*: Light. *Linn*: The late crop much shortened by drought.

MISSOURI.—*Caldwell*: Late, nearly a failure. *Platte*: No late Irish potatoes in the county; a fair yield of early, but they soon rot if left together in large quantities. *Adair*: The largest crop of sweet-potatoes ever known. *Perry*: Nearly failed from drought. *Pemiscot*: Did not return the seed planted; drought.

KANSAS.—*Douglas*: Late potatoes a failure; sweet, one-fourth to one-sixth of a crop. *Jackson*: Irish, about a failure, except Early Rose; sweet, poor but rather better than Irish. *Ottawa*: Nearly ruined by grasshoppers. *Crawford*: An entire failure. *Labette*: Irish, nearly a failure. *Neosho*: Almost an entire failure. *Marshall*: About an entire failure. *Mitchell*: Early varieties, half crop; late, an entire failure except where mulched very deep with old straw; dry weather. *Franklin*: The crop improving, as the late rains have helped it. *Butler*: We have no potatoes except a few early ones, and they are rotting considerably. *Clay*: A total failure; grasshoppers and drought. *Republic*: Late, failure. *Montgomery*: Early Rose did well; late crop entire failure, drought.

NEBRASKA.—*Antelope*: Very poor yield; whole settlements without a bushel. *Richardson*: Late; not worth digging. *Lincoln*: Destroyed by the bugs.

CALIFORNIA.—*Del Norte*: Very poor crop. *San Luis Obispo*: Ravages by grasshoppers necessitated replanting, but a fine crop is anticipated.

COLORADO.—*Weld*: Seriously injured by grasshoppers. *Costilla*: An entire failure.

UTAH.—*Kane*: In parts of the county almost a failure; the vines turning yellow and dying.

## TOBACCO.

The condition of the tobacco-crop is somewhat higher than was foreshadowed by the September returns, though still the promise is for less than two-thirds of a crop; the average of all the States reporting this crop is 61. Only two States, Connecticut 109 and Georgia 101, are above average; Massachusetts, Florida, and Oregon are full average. These five States, however, represent less than 6 per cent. of the entire crop. Kentucky, which produces about two-fifths of the entire crop of the country, averages but 44. Virginia, the next largest tobacco-growing State, averages but 65; Tennessee, the third in rank, 44; Ohio, the fourth, 40; Maryland, the fifth, 78; Missouri, the sixth, 65. All the other States are below average.

MASSACHUSETTS.—*Hampden*: Early-cut tobacco is curing remarkably well, of good colors and without any white streaks; only half the crop is of this character; the rest is badly rusted in the field and will be of bad color.

CONNECTICUT.—*Hartford*: A third less acreage planted than the average of past years; product per acre and quality above average.

MARYLAND.—*Montgomery*: Very green and late; an early frost would destroy nine-tenths of the crop; late rains beneficial. *Calvert*: Improved a little from late rains, but they did not come in time to save the crop. *Prince George*: Shortened by drought.

VIRGINIA.—*Caroline*: Smallest crop planted in twenty years; it looks well. *Lunenburg*: Shortest crop ever made; failure of setting plants and drought. *Madison*: Early stands good; late, small and light. *Spottsylvania*: Small acreage; small and poor crop; a few fine pieces ready to cut. *Pittsylvania*: Small acreage; late and in danger from early frosts. *Buckingham*: Storm September 28, injured late crops, which had been improving very rapidly. *Dinwiddie*: Badly fired by dry, hot winds. *Halifax*: Crop small and green; much injured by late storms. *Nelson*: Late and poor. *Mecklenburgh*: Injured by a drought, and then by a storm. *Albemarle*: Late rains have raised the crop above

average. *Fluvanna*: Half crop. *Montgomery*: In danger of frost. *Amelia*: Reduced 5 per cent. by equinoctial gales. *Louisa*: Much must be cut green. *Orange*: Injured by storms. *Chesterfield*: Half crop planted; quality average.

NORTH CAROLINA.—*Greenville*: Injured by storms; about half the crop is above average. *Alamance*: Half crop; injured in quality by storms. *Caswell*: Greatly damaged by storms. *Haywood*: Drought. *Buncombe*: Not a fourth of last year's acreage planted.

MISSISSIPPI.—*Hancock*: Not turning out well.

ARKANSAS.—*Washington*: Greatly benefited by September rains. *Stone*: Twelve weeks' drought.

TENNESSEE.—*Henry*: Very short. *Smith*: One-fifth of an average crop. *Trousdale*: Pretty much a failure; usually there are about 2,000 hogsheads shipped out of the county; this year there will not be 20. *Robertson*: Almost an entire failure.

WEST VIRGINIA.—*Mercer*: Late; about two-thirds of a crop.

KENTUCKY.—*Adair*: Almost a failure. Only a small amount planted; most of that very late, and in danger from frost. *Edmondson*: Small quantity growing and that late. *Grayson*: This, our principal export crop, is almost a failure. Very little was planted, and that is still standing. *Graves*: Not over one-fourth of a crop, and a great part of that will have to be cut green. *Butler*: Yet very green, and a very small quantity of it. *Owen*: This crop, our great staple, will not exceed one-fourth of an average. *Cumberland*: Our leading staple for money, and is a failure; dry weather.

OHIO.—*Vinton*: Not more than one-eighth of a crop; eaten by bugs, and injured by drought. *Noble*: Almost a failure.

MISSOURI.—*Adair*: Looks well; a good crop. *Pemiscot*: Almost an entire failure.

KANSAS.—*Clay*: A total failure; grasshoppers and drought.

## SUGAR-CANE.

Georgia and the Gulf States report a considerable growth of sugar-cane. In Georgia, twenty-eight counties report an average condition of 95. In Alabama, fifteen counties average 78, the lowest being in Pike, and the highest in Escambia. Eight counties of Mississippi report a condition largely above average; a specially favorable showing is made in Smith County. Eight parishes in Louisiana average 94; seventeen counties in Texas reach only 87.

GEORGIA.—*Pierce*: Drought. *Early*: Doing nothing; drought. *Sumter*: Drought. *Terrell*: Badly injured by drought.

FLORIDA.—*Wakulla*: Terribly shortened by drought. *Hamilton*: Drought. *Leon*: Drought. *Gadsden*: Ten per cent. above average.

ALABAMA.—*Dale*: A failure. *Coffee*: Cut off by drought. *Conecuh*: Drought. *Pike*: Dried up. *Choctaw*: Seriously damaged by drought.

MISSISSIPPI.—*Hancock*: Turning out poorly. *Jackson*: Increased attention to cane; climate and soil very favorable.

LOUISIANA.—*Saint Mary's*: Greatly shortened by drought. *Iberia*: Stunted by protracted drought. *Rapides*: Greatly thrown back by the drought.

## FATTENING-CATTLE.

The number of fattening-cattle is equal to or above last year in Maine, Massachusetts, Connecticut, Delaware, South Carolina, Florida, Alabama, Minnesota, and the Pacific States; in all the others the number has decreased. The condition is above average in the New England States, New York, Delaware, Virginia, North Carolina, South Carolina, Florida, Alabama, Texas, Iowa, and the Pacific States; in all the others it is below.





## EXTRACTS FROM CORRESPONDENCE.

AGRICULTURAL PROSPECTS.—*Russell, Ala.*—The low price of cotton has caused many farmers to abandon the use of bacon entirely, it being so much higher than usual. They find milk and butter very good substitutes. There is more economy practiced, with less inclination to go in debt than in any year since the war.

*Harris, Ga.*—Corn is better than last year, yet the people seem to be hard run to live, money being scarcer than at any time before the war.

*Yell, Ark.*—In some parts of the county there will not be enough corn for bread, and should we have a hard winter the stock will starve. In many parts the farmers are moving to sections where there is a good supply of breadstuffs.

*Craighead, Ark.*—Sharp times here; but there is this consolation, that it is the same thing everywhere.

*Hempstead, Ark.*—It seems that many of the poorer and more improvident class of persons must suffer during the coming year. Farmers are concluding that no money can be made by employing them, and they provide nothing except finery to wear to big meetings.

*Jefferson, Ark.*—The lower class of laborers are suffering from scarcity of provisions, with very little cotton for them to pick, and, consequently, very little hiring to be done.

*Stone, Ark.*: Taken as a whole, we have had an unusually hard season.

*Grundy, Tenn.*—A fine growing summer-season to make up for late planting on account of heavy floods. Cattle doing remarkably well; pasture good, and more fodder than usual, laid by.

*Montgomery, Tenn.*—Our people dread the coming winter and spring.

*Berkshire, Mass.*—With all deficiencies, the amount of crops is encouraging to the farmer, and, as a whole, the products of the year ought to be satisfactory.

*Northampton, Va.*—We can compare with any section in regard to sweet potatoes, in yield, quality, and remuneration.

*Greene, N. C.*—With the decreased yield and low prices of cotton I feel safe to say there will be more broken farmers than in 1867.

*Gadsden, Fla.*—The cotton-crop has been made at less expense than any since the war. But little money was expended for commercial fertilizers, and economy is now the order of the day, partly forced by the impracticability of obtaining the usual advances from factors and merchants, and partly voluntary, from the conviction that a reform in that particular has become an absolute necessity.

*Henry, Ala.*—A tendency is manifest among our people to adopt more judicious rules of economy, and among farmers a determination to raise their own supplies.

*Louises, Miss.*—The year will be remembered as one of unusual anxiety and solicitude. The low prices of cotton and the high prices of provisions will cause a contraction in cotton-culture. There is a disposition to diversify crops.

*Fairfax, Va.*—Less than usual of any kind of wheat will be sown this fall, on account of a growing disposition to go into something that promises larger and more certain results.

*King and Queen, Va.*—For the last five years previous to the present,



we have had continual drought, but this year has been most favorable to the farmer. Its effects are felt already in increased prosperity.

*Clay, Ala.*—Taken altogether, this has been a most unfavorable year for the farmer; nothing we planted has realized expectation; heavy rains in the spring filled the growing plants with sap, and a short drought in June nearly ruined us. The fall has been favorable for cotton; what little we made will soon be gathered in fine condition, but the price will not remunerate us for labor and manure. Cotton is ruining us; our people *must* try mixed husbandry, or all go into bankruptcy.

*Independence, Ark.*—Stock-hogs have died off, leaving 20 per cent. of the people literally without meat for a year to come.

*Washington, Kans.*—The trees which the grasshoppers denuded of leaves, have put out again their spring foliage. In some instances peaches and blossoms are to be found on the same tree. Lettuce, spring radishes, water-cress, and onions are ready for the table, being the growth of only a few weeks. The late potatoes, the vines of which were green, will make a crop if the frost holds off a little, and the same may be said of turnips, which are widely sown. Pastures for stock are better now than at any time all summer, and farmers are still making hay. Kansas can beat the world in redeeming itself.

*Merced, Cal.*: The wheat-market in the interior is in a deplorable condition. There is no remuneration to farmers at present prices unless conveniently situated for shipping. Many farmers are drawing money on grain in store and holding for better prices—paying 1½ per cent. per month, which I think a ruinous policy.

*Brown, Kans.*: We have had very small crops of small grain, but the drought, chinchies, and grasshoppers have ruined the corn to such an extent that we shall get only about 15 per cent. of a usual crop. It is generally believed here that the chinchies did four times the damage done by both the drought and grasshoppers.

*Crawford*: Dry weather, chinchies, and grasshoppers have about ruined the corn and potatoes; beans and buckwheat are failures; will not return the seed.

*Osage, Nebr.*: Drought, chinchies, and grasshoppers were the cause of our failure in crops.

*Trimble, Ky.*: The best season for a long time. Crops are plentiful.

*Putnam, Mo.*: Altogether we have had one of the most favorable seasons for many years, for which we should be thankful to the great Giver of every good and perfect gift.

*Jasper, Ind.*: In my opinion we have more grain of all kinds in this county than ever before.

*San Bernardino, Cal.*: The cereals have done remarkably well this year. Wheat is not always a safe crop, owing to rust, supposed to be occasioned by sea-fog. Our great drawback has been the want of a market, being so far inland; but the discovery of rich mines in our neighborhood, which are being rapidly developed, will make a market for all our surplus produce, and for more than we can spare.

*Cherokee, Kans.*: Most of the farmers obtain credit on their growing wheat-crop, generally to be paid from the first of August to the middle of October. The unusually low price of wheat, 65 to 85 cents, has taught them a very necessary lesson—buy less and pay when you buy.

*Pike, Ind.*: If hogs or cattle are not driven here to be wintered or fattened, we will have to boat our corn to the lower country.

OPIUM POPPY VERSUS TURNIPS.—*Stanley, N. C.*: The opium poppy did not turn out well this year. It stood the winter well, grew tall

plants with large capsules, but little opium in them. It is remarkable that turnips, sown where the poppy grew, came up, but would not get beyond the seed-leaf. Repeated sowings on the same lot had the same result. Turnips sown in spots not far removed from the opium-patch are doing very well, and are less annoyed by bugs than ever before. Can it be that the opium poppy leaves in the ground elements incompatible with the life of a turnip?

**WHEAT-CULTURE.**—*Snyder, Pa.* : Much "Shoemaker" wheat raised here last year. Millers would not pay as much for it as for other wheat, alleging that it does not make good flour.

*Madison, Va.* : Large quantity of Fultz wheat sown this fall; very popular.

*Stafford, Va.* : Low prices and poor yield; more discouragement than at any time since the war.

*Charles City, Va.* : No old wheat left, on account of repeated failures of the crop.

*Mitchell, N. C.* : Touzelle, not adapted to this climate; Tappahannock, the best.

*Nicholas, Ky.* : Fultz wheat, from the Department, does finely. I raised about 24 bushels per acre.

*Boone, Mo.* : I raised 35 bushels of Fultz on seven-eighths of an acre; Tappahannock, 21 bushels per acre.

*San Luis Obispo, Cal.* : Touzelle, from the Department, yields remarkably. One field of 12 acres averaged 58 bushels per acre. It suits this section; is free from smut, and sets well against our summer winds.

**SEED-WHEAT FOR EGYPT.**—*Sonoma, Cal.* : That the excellence of our wheat is attracting the attention of foreign agriculturists is proved by the fact that the government of Egypt has ordered a large quantity of our best wheat for seed in that country.

**ANTIDOTE FOR SMUT IN WHEAT.**—*Sonoma, Cal.* : We have neither rust nor smut in any of our wheat-fields. I beg leave respectfully to differ from the advice given on page 467 of the monthly report of the Department for November and December, 1871, wherein farmers are advised to "discard all idea of mixing ingredients with it (seed-wheat) to destroy smut." This question has been so well and thoroughly tested in our State as to be no longer even a matter of doubt. All our seed-wheat is soaked from eight to twelve hours in a solution of bluestone, (sulphate of copper,) in the proportion of six ounces to every 100 pounds of wheat. Smut being a fungoid growth, resulting from diseased grains, the germ or vitality of these diseased grains is killed by the solution of vitriol, and thus prevented from growing and contaminating the sound grains. A farmer here would be thought crazy were he to sow his wheat without subjecting it to the above process.

**WHITE WINTER-RYE.**—*Pettis, Mo.* : From 4 quarts of white winter-rye I harvested  $2\frac{1}{2}$  bushels—twenty-fold—the best in quality I ever saw. Sown on the 5th of November, broadcast, on new white-oak land. It was injured to some extent by chinch-bugs.

*Stone, Mo.* : The white winter-rye sent me from the Department yielded a splendid crop both in quantity and quality. It is decidedly the finest rye I ever saw.

*Pemiscot, Mo.* : The white rye sent me from the Department yielded one bushel from two quarts, notwithstanding the driest season for many years.

*Thayer, Nebr.* : The white rye received from the Department does splendidly here.

**CORN-CULTURE.**—*Mitchell, N. C.*: Runners' white corn takes the lead here; it is large and early enough to mature finely.

*Des Moines, Iowa*: The surplus of corn in this county is being fed to stock brought in from the West. The year 1875 will see corn higher than for a number of years past. This county is drained of old corn, and nearly every body is feeding new.

**TREE-CULTURE.**—*Iberia, La.*: I obtained a few seeds of the *Eucalyptus globulus*, and succeeded in raising one of those beautiful trees. It is now 5 feet high and seventeen months old. Other parties have had excellent success in raising these trees.

**COTTON-CULTURE.**—*Beaufort, N. C.*: Much disappointment at the yield; the only consolation is, that there are no bills for fertilizers to pay this year.

*Dooly, Ga.*: Drought from August 2 to September 22 ruined the crop. The planters are in a desperate condition; short crops; heavy liens; cotton worth only 13 to 13½ cents per pound, and bacon 16 to 17. When, O when, will they learn to plant less cotton and more corn and wheat? Not till starvation stares them in the face.

*Washington, Miss.*: Rained April 27, the cotton coming up, and ceased suddenly. First rain on cotton and corn, July 11; second, September 24, of no benefit to the crop. The July rain caused about a third of the crop to come up, the seed previously failing to germinate for lack of moisture. The crops that came up by reason of the July rain are perhaps better than those that came up in April, and have been made without any rain at all. Nearly all vegetation, except cotton and Bermuda grass, was burned up by drought.

**GRASS AND PASTURES.**—*Troup, Ga.*: There was a good crop of brush peas, but owing to the drought of August and September running peas did not make a full crop. We rely upon them for fall pasturage, and curing the vines for hay, which we consider equal to the best clover hay; it has no equal for milch cows.

*Wilkes, Ga.*: German millet has been grown successfully as a forage crop. It requires rich land, but yields immensely of forage and seed.

**FRUIT-CULTURE.**—*Burlington, N. J.*: Considerable blight in apple and pear trees. In some orchards the ends of limbs have died.

*Allegany, Md.*: For years my pear-trees were blighted with a prevalent disease. I planted them twenty years ago, but they never matured a pear. In the spring of 1873 I commenced using soap-suds around the roots, and last fall I had some pears. I then mulched the ground around the trees with manure, and this spring scattered a peck of ashes around each tree, again using soap-suds. This summer and fall, all my trees bear full crops of sound fruit.

*Grant, W. Va.*: A good beginning has been made in grape-culture, but of late years the dry-rot has greatly reduced the yield, and has discouraged growers. Is there no reliable remedy?

*Pulaski, Ill.*: The scab or spot is increasing from year to year to such an extent as to make it nearly impossible to have any winter apples. This disease, with a disease known here as "root-rot," seems to increase with time in spots after it once makes its appearance. If the latter disease kills one tree in a locality, other trees near it die out, and it is almost impossible to get trees set out in the vacancies to grow.

**WEATHER.**—*Wyoming, Pa.*: Most severe drought ever known in the county.

*Columbia, Fla.* : More hail fell September 10, than for many years together.

*Wakulla, Fla.* : Little rain since August 1.

*Aransas, Tex.* : We have had the heaviest rain-fall and the highest salt-water tide known for years. The heaviest part of the storm was during the night of September 5. It raged still more severely to the west of us.

*Sagadahoc, Me.* ; Three light frosts in September, but not enough to kill pumpkin-vines.

*Indiana, Pa.* : First frost September 22; no damage.

*Westmoreland, Pa.* : Slight frosts in some localities.

*Elk, Pa.* : The crops of Fox Township, except wheat, were almost entirely destroyed by successive hail-storms.

*Mecklenburgh, Va.* : Terrific storm September 28; great damage to corn and tobacco.

*Hempstead, Ark.* : No rain from May 12 to September 16, in many parts of the county; heat intense.

*Ontario, N. Y.* : First frost October 2.

*Hudson, N. J.* : No rain from August 9 till September 12; then it came in torrents.

*Victoria, Tex.* : Heavy rains daily up to September 27; all our streams are out of their banks, causing total destruction of bottom crops.

*Stone, Ark.* : Drought of twelve weeks cut off cane and cotton and dried up pastures.

*Oldham, Ky.* : Drought from the latter part of April till the present time; the driest year since 1854; streams and springs have failed.

*Williams, Ohio* : We are still suffering from a very severe drought. In many localities there has not been a thorough drenching rain this summer.

*Decatur, Ind.* : The season has been peculiarly unfavorable to crops; scarcely enough rain to keep life in vegetation. There will be a smaller amount of wheat sown this fall than usual; the ground is too dry and hard for breaking. There has not been much sown up to this date.

*Ripley, Ind.* : A four-weeks' drought until Saturday, when we had a good rain; but pastures are dried up, and in many localities water has to be hauled two or three miles for family use, and cattle driven to water the same distance.

*Jennings, Ind.* : We are having the severest drought we have ever experienced at this time of the year; wells and cisterns nearly all dry.

*Butler, Mo.* : Dry weather is the cause of the failure of crops here.

*Vernon, Mo.* : But one light shower, last week, since the middle of July.

*Grundy, Ill.* : A severe drought, which has prevailed for three months, still continues. It cuts short all late-growing crops. Stock-water is scarce, and farmers have been feeding their cattle since the 20th of July.

*Lucas, Ohio* : Have lived here thirty-six years, and never before saw the wells and streams so low.

*Phelps, Mo.* : From the 9th of July to the 24th of September we had no rain.

*Boone, Mo.* : Not since 1854 have we had any drought to compare with the one we are still afflicted with. In the north and interior of this county nearly all the stock-water is exhausted.

*Perry, Mo.* : Everything that grows has nearly failed from the severe drought—unprecedented in this county—which has lasted from the 2d of May until September.

*Pettis, Mo.* : Stock-water very scarce. The old citizens say the creeks here are lower than ever before.

*Pemiscot, Mo.* : The dryest season for many years; no rain to break ground for wheat until the 25th of September.

*Pawnee, Kans.* : Drought and grasshoppers entirely destroyed our crops, except oats, sorghum, and castor beans. The oats had matured before the grasshoppers came, and the sorghum and castor beans they would not eat.

*Riley, Kans.* : If we except a moderate crop of wheat and oats, this county is nearly cleaned out by drought and grasshoppers.

LOCAL PRICES.—*Pike, Ind.* : We are hauling our wheat to Vincennes and other points at \$1 per bushel. Oats are selling at Vincennes at 40 cents. Sweet potatoes are selling here at 65 to 75 cents—less than the price of Irish potatoes.

*Switzerland, Ind.* : Fat hogs are scarce, and prices rule high; stock hogs scarce and in demand.

*Tippecanoe, Ind.* : Potatoes, splendid in quantity and quality, are bringing \$1 at Lafayette on account of the great failure in parts of Illinois. For corn 50 cents is freely offered; wheat, \$1.

*Moultrie, Ill.* : Corn from 35 to 50 cents in the field; hay, \$10 per ton at stack, heretofore generally from \$5 to \$5.

*Carroll, Ill.* : Price of wheat 80 cents; rye, 90; oats, 42; old corn, 70; new, 50.

*Richland, Wis.* : Hops all sold by growers at 30 to 33 cents. Fat cattle very low—only 2 cents per pound for cows; fat hogs are selling alive for 5 cents per pound.

*Mower, Minn.* : No. 1 wheat selling at 71 cents along the line of the Southern Minnesota Railroad. Potatoes, 50; oats, 30; timothy seed, (half crop, but good quality,) \$2.50.

*Madison, Iowa* : New corn is selling at 33 $\frac{1}{3}$  cents per bushel.

*Appanoose, Iowa* : Feeders of cattle and hogs (from Kansas and Nebraska) have overrun the State, and corn is selling at \$10 to \$20 per acre.

*Platte, Mo.* : The wheat crop is now fully in market, selling at from 85 cents to \$1, according to quality. Rye, 80 cents; oats scarce, selling at 50 cents; corn, 50 cents.

*Jasper, Mo.* : Apples, 25 cents per bushel in the orchard.

*Chase, Kans.* : Fall wheat, 85 to 90 cents; spring, 50 to 70; corn, 80 cents to \$1; potatoes, \$1 to \$1.50; hay, \$2 to \$4 per ton.

*Butler, Kans.* : Corn, about half a crop, is worth \$1.

*Douglas, Kans.* : The price of a poor article of corn is 65 cents per bushel, against 20 cents last year. Old corn is shipped from Iowa, and sells at 85 cents.

*Thayer, Nebr.* : Corn sells in this county at 75 cents, and wheat, at only 60 cents cash.

*Adams, Nebr.* : Plenty of wheat at 65 cents.

*Rio Grande, Col.* : Potatoes are scarce, and worth 5 cents per pound.

FLAX-CULTURE IN MINNESOTA.—*McLeod* : The culture of flax for the seed has been introduced during the season. The result has been satisfactory. The flax-crop this year has been 50 per cent. more profitable than that of wheat.

*Stearns* : Flaxseed will undoubtedly supersede the wheat-crop, except for home consumption. It is now ascertained, from two years' raising, that it pays much better than wheat, the average per acre being nearly the same, while the selling price is more than double. The cost of raising is the same. Another advantage of raising flax is, that on ground sown with it the previous year one-third more wheat per acre can be

raised. From the book of the flax agent I learn that fifteen times the amount of last year's production in the county will be marketed this year—65,000 bushels against 4,000—which, at \$1.30 per bushel, will bring to the farmers \$84,500.

**BEET-SUGAR.**—*Santa Cruz, Cal.*: A beet-sugar factory, built in this county the past season, will commence operations this October. There are 1,200 acres of sugar beets now in fine condition for its use.

**HEMP IN CALIFORNIA.**—*Alameda*: The cultivation of hemp is attracting some attention in California. That planted in this county the past season has done extremely well; some small fields have grown to the height of 8 or 10 feet, and the fiber is pronounced equal to the imported. It is conceded by those acquainted with the growing of hemp that there is much land in this county and throughout the State well adapted to its production.

**BURNING OUT CHINCHES.**—*Stoddard, Mo.*: One of our farmers found after his wheat harvest that the chinch-bugs were swarming into his corn, whereupon he strewed dry straw among it and burned it. This, with slight injury to the crop, killed nearly every bug.

**CASTOR-BEANS.**—*Pawnee, Kans.*: The grasshoppers, which destroyed other crops, would not eat the castor-bean. Even this dry season the plant is thrifty and full of blooms; no insect meddles with it at any stage of its growth.

**LIVE STOCK.**—*Madison, Va.*: Increased attention to stock of all kinds.

*Dale, Ala.*: Our hogs have the cholera and our cattle the black tongue.

*Greene, Ala.*: So much land is lying out that the cattle have better pasturage than heretofore.

*York, Pa.*: Very few cattle yet brought into the county for fattening, on account of the malignant disease among the herds of our most extensive buyers.

*Elizabeth City, Va.*: In the item of "fattening cattle" it is difficult to get a correct estimate. *Dwarf, scrawny, lean*, is the general rule here, and "fat" is the exception. A good yoke of working oxen is an uncommon sight; our farmers prefer mules for heavy work.

*James City, Va.*: Heavy mast of chincapins; will give fattening hogs a fine start.

*Beaufort, S. C.*: The range for stock in the middle and lower portion of the county is equal to any pasturage in the world. Cattle are in good condition the year through, requiring no other feed than grass; they are as fat as Tennessee stall-fed beef from May 1 to January 1.

*Gibson, Tenn.*: Farmers generally are herding their surplus horses, mules, and cattle, and driving them to the Mississippi bottoms to be pastured upon the cane during the winter. Herders are employed at so much per head to watch over them and return them in the spring. The herders salt and feed them to corn twice a week, and charge from \$1 to \$2 per month per head. By this means large numbers are provided for during the winter and corn saved for fattening pork.

*Monroe, Ala.*: No cattle fattened in this county except those pastured on the public domain.

*Marion, Ind.*: A largely increased number of hogs will be fed this season in consequence of a good crop of corn and the failure of that crop in other States. A large number has been brought from Kansas, Missouri, and Kentucky. This applies to the State at large rather than to

this county, as the home market for corn is better in this than in adjoining counties, or in others still more remote from large markets.

*Leavenworth, Kans.:* Farmers are selling their hogs to drovers in Iowa and Illinois, as corn is 70 cents per bushel, and they cannot feed, to any profit.

*Scott, Ill.:* Large numbers of hogs are coming in here from Missouri to be fed.

*Douglas, Kans.:* Fully one-half of our hogs have been sold and shipped away to fatten; the remainder will be butchered early.

*Posey, Ind.:* Our farmers are introducing improved varieties of cattle, sheep, and hogs.

*Pawnee, Kans.:* Cattle are looking better than usual at this time of the year. The drought has not been severe enough to damage the grass much, and it seems to have more nutriment in it than in a wet season. This county is peculiarly fitted for the raising of cattle and sheep. The short nutritious grass, called "buffalo-grass," upon the high grounds, and the ranker growth of blue straw upon the bottoms for hay, seem to meet all the wants of the stock-raiser. Short, mild winters, with good winter feed, render it possible to bring cattle through without any feed, as has often been done here successfully.

*Mitchell, Kans.:* Sheep are doing exceedingly well, looking robust and healthy, no disease prevailing, and everything encouraging to the sheep-raisers, except a near market for wool. This might be had, as we have abundant water-power on the Solomon River, and produce sufficient wool to keep a large factory in operation throughout the year.

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## NEWSPAPER CROP-REPORTS.

The newspaper crop-report is an individual expression, oftener than otherwise, of a villager rather than a farmer, in form as variable as the individuality of reporters, without reference to any standard of comparison, one with another, and without any certain means of exact interpretation. Thus, if one is indefinite in quantity and proportion, one hundred equally indefinite only make a chaotic aggregate. For example, from a long list of such reports, which cost heavily in "enterprise" and money, I try to calculate the acreage of a crop from its details of comparative area. "The number of acres is small," but the percentage of decrease may be 10, 30, or 50. "There is a great deal of corn planted," yet I must have a new "deal" before the winning card of ascertained acreage is secured. There has been "an increase in the number of acres," but no one can say whether it is large or small. "More than usual has been sown," however much "more" may mean. "Farmers have put all in the ground they can possibly manage," which is the record of each recurring year, though circumstances greatly modify the mathematical import of "all." Some make exact comparisons; one returns one-half more than last year, another one-third, another still, a quarter, but rarely is the comparison more closely drawn; it appears not to be worth while, if 33 per cent. shall seem a unit too low, to split the difference between that and 50; or if the increase is evidently a few acres, it might be undignified to say less than a quarter, or at least 10 per cent. There are others who scorn to accept an increase less than

the Dutchman's 1 per cent.; so if the area is not "thrice" the former figure, it certainly must be "double."

If the present condition of a crop is sought, the information conveyed by these random reports is equally indefinite. I quote from models: "Farmers think they will have a good crop;" "splendid prospects for corn;" "wheat on dry land will exceed the average, on clays will be short;" "rains are bringing corn along very fast." The reporter fails to indicate the amazing rate of speed at which the rains are leading the maize; and when he tells us that "the corn-crop will be heavy," we fail to see whether he expects it to weigh 70 pounds to the bushel, or yield 100 bushels to the acre. And if a full average is not expected, of course it is "half a crop," or if unwonted nicety of comparison is attempted, three-fourths of a crop. The exaggerated and slipshod expressions of conversation are carelessly penciled, and the precious information probably sent by telegraph. And this is enterprise and a model crop-report.

This use of language, which has no common measure of value, and may mean one thing to the writer and another to the reader, is not the only difficulty with these unsystematic reports. The ground covered by the report is equally indefinite; usually a township, often a county, sometimes a wide district is ambitiously included when any territory whatever is indicated. If a township, the increase stated at 50 per cent. may be correct, and yet the whole county have actually no increase, as has been tested in our recent experience. Then a third difficulty occurs in the different production of different counties, some of which produce a crop by millions of bushels, while others in the same State fail to yield as many hundreds of thousands. Thus, with no definite expression of acreage in the separate reports, and these reports covering unknown areas of territory, or widely different in size, and differing quite as widely in amount of production, it is simply impossible to calculate or formulate an expression of the average meaning of the sum of such reports. It is the sheerest guess-work to indicate from such data whether there is more or less than usual of a crop, unless the unanimity in one direction is almost absolute. The only thing to be done—the only thing that is done—is to read the whole jumble of conflicting matter, and leap rashly to a conclusion which shall embody the general expression made upon the mind. It is a blind trust in intuition—often so blind as to overbear the result of mathematical demonstration, which fails to establish its conclusions.

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## ENTOMOLOGICAL RECORD.

BY TOWNEND GLOVER, ENTOMOLOGIST.

EXPERIMENTS WITH PHYLLOXERA.—During the past season an experiment has been instituted in order to prove the identity of the *Pemphygus vitifolia* or leaf-gall-louse, of Fitch, with the *Phylloxera vastatrix*, or root-gall-louse, so injurious at present to the vineyards in France, and in parts of this country also. In March, the Department wrote to Mr. George W. Campbell, of Delaware, Ohio, for specimens of vines infested with the root-gall-louse, *Phylloxera vastratrix*, which he kindly forwarded to the Department in most excellent condition for the experiment—the roots being literally a series of galls or knobs caused by the root-lice themselves living on the roots. These were carefully put



in flower-pots and placed in a large closed case, in a leafless condition, so that no other insects could intrude. Three other perfectly healthy vines from our own greenhouses were then planted, on which there were neither leaves nor root-gall-lice, and placed in juxtaposition with the unhealthy vines. These were tended carefully during the summer, put out foliage, and finally all died, with the exception of one vine, apparently from the *Phylloxera*. During all the time the experiment was carried on, the foliage was examined day by day to see if any leaf-gall-lice made their appearance on the foliage, but not the least sign of a gall could be found, even with a magnifier, on any of the vines, which grew finely until late in summer or early autumn, and put out abundant foliage.

The present month, (October,) the vines having lost their foliage, the whole six were examined, and the roots were found swollen, as if from the effects of the root-lice, but not a single leaf-gall had been produced on any of the leaves. We cannot give the names of the vines, as accidentally the labels were thrown away by the laborer when he removed the dead vines in order to have them and the earth in which they were grown thrown into the furnace, as is always done when noxious insects are discovered, for fear of dissemination of new injurious insects.

It is also to be remarked that the grape-vines in the immediate neighborhood of the infested plants, in the Department graperie, which were mentioned in a previous report, do not show the least symptom of disease, and appear in a perfectly healthy condition.

As, although this experiment was carefully conducted, there may have been some climatic or other cause which prevented the leaf-galls from making their appearance, from the root gall-lice known to be there, as it is stated they are identical, we shall repeat the experiment next year on a larger scale and make the results known to the public.

**THE COTTON-WORM.**—A question having arisen as to whether the cotton army-worm, *Anomis xylinæ*, (*Aletia Argillasea*, of Hübner,) passes the winter in the egg, caterpillar, chrysalis, or moth state, Prof. A. R. Grote, of Buffalo, at the meeting of the American Association for the Advancement of Science, held at Hartford, in August last, read a very able essay on the subject, in which he stated that he had observed the cotton-worm during five seasons in Central Alabama, and on many different plantations. He states that the earliest period at which he had observed the young worms was the last week in June, and that their appearance was always heralded by the perfect fly, the latter coming to lights in houses at least a week before the worm appeared in the fields; and that the worm is always heard of first to the southward of any given locality. It comes as an army from the south, and the broods arrive consecutively, as long as the season lasts, and that this southern army is killed by the advancing winter and the death of the food-plant—the cotton-plant—on which it feeds exclusively, refusing to eat anything else; and that the specimens of the fly taken in the Northern States have merely followed the water-courses, as the moths are capable of extended flights; and that it originates at the south, and its appearance is due in every instance to a fresh immigration (of the moths) from more southern regions, nay, even farther. Professor Grote concludes that “the insect is not indigenous with us, but is an annual; not a denizen, but a visitant, unable to contend with the variations of our climate; and he believes that the process of artificial extermination may be simplified by limiting the period of successful attack, and doing away with certain proposed remedies. The agent of destruction must be directed against

the first brood in each locality, and concerted action on the part of the planters where the remedy is to be applied will be necessary."

**INSECT-INJURIES.**—*Cotton-caterpillars*, (*Anomis xylinæ*.)—The influences so injurious to the cotton-crop were likewise destructive of its insect-enemies. More or less annoyance is reported in Beaufort and Richland, South Carolina; in Gadsden, Florida; in Coffee, Hale, and Clarke, Alabama; in Cameron and East Baton Rouge, Louisiana. In Hancock, Mississippi, they visited sea-shore fields which have hitherto escaped their ravages. In Bandera, Texas, they ate the top crop.

*Bud-worms*.—An insect designated by this popular name injured corn in Greenville, Middlesex, Gloucester, and Matthews, Virginia.

*Tent-caterpillars*, (*Clisiocampa*.)—This insect was injurious to fruit and forest trees in Jefferson, Mississippi.

*Tree-caterpillars*, (*Hyphantria textor*.<sup>(?)</sup>)—The insect designated as a tree-caterpillar denuded trees of their foliage in Saint Mary's, Louisiana.

*Cut worms*, (*Agrotis* sp.)—Some fields of wheat were ruined by this insect in Washington, Illinois. A worm which from description appears to be of this genus, injured grass-crops in Grayson, Kentucky.

*Chinch-bugs*, (*Micropus* [*Rhyparochromus*] *leucopterus*.)—These insects injured different crops in Pittsylvania, Gloucester, Albemarle, Louisa, and Orange, Virginia. They made their first appearance in the corn-fields of Washington, Arkansas. They are also reported in Medina, Ohio; in Gibson, Grant, Huntington, Madison, Scott, Decatur, Jennings, Wells, Clay, Fulton, Switzerland, Wabash, and Warren, Indiana; in Marion, Cumberland, Douglas, Macoupin, Madison, Washington, Edwards, Piatt, and Shelby, Illinois; in Walworth, Wisconsin; in Gasconade, Cass, Chariton, Laclede, Linn, Vernon, Phelps, Nodaway, Dent, Newton, Perry, Stoddard, Missouri; in Jefferson, Franklin, Anderson, Coffee, Tennessee; in Shelby, Jasper, and Marion, Iowa; in Montgomery, Neosho, Labette, Brown, Crawford, and Woodson, Kansas; in Osage and Richardson, Nebraska. In some of the above localities they were very destructive.

*Cabbage-worms* (*Pieris rapæ*) destroyed the cabbage-crop of Medina and Fairfield, Ohio. A worm not recognizable from description injured the cabbage-crop of Marion, West Virginia.

*Wheat-midge*, (*Diplosis tritici*.)—This pest was confounded with the weevil, in Orleans, Vermont. It was also noted in Anderson, Kentucky.

*Colorado beetles* (*Doryphora decem-lineata*) are demonstrating still farther eastward. They have been heard from in Erie, New York; in Gloucester, New Jersey; in Clearfield, Northampton, Columbia, and Erie, Pennsylvania; in Kent, Delaware; in Baltimore, Dorchester, and Cecil, Maryland; in Greenville, Virginia; in Jefferson, West Virginia; in Clarke, Kentucky; in Barry, Michigan; in Switzerland, Madison, and Decatur, Indiana; in Lincoln, Nebraska.

*White grubs* (*Lachnosterna fusca*) injured corn in New London, Connecticut, and Grayson, Virginia. In the last-named county as many as 110 worms were counted in a single hill; they also injured grass-crops; they were more numerous than ever before.

*Grass army worms* (*Leucania unipuncta*) were more or less destructive in Adair, McLean, Livingston, Breckinridge, Taylor, and Ohio, Kentucky; in Marion, Jackson, Edmonds, and Montgomery, Illinois; in Saint Genevieve and Logan, Missouri. In some of these localities their ravages were very severe. Another grass army-worm, probably *Laphygma* sp., was very destructive in several counties of Tennessee, being

reported in Lincoln, Montgomery, Warren, Wilson, Giles, Dickson, and Cheatham.

*Grasshoppers (Caloptenus spretus)* still continue their ravages west of the Mississippi River. They are reported in Palo Pinto, Cooke, and Gillespie, Texas; in Wright, Sibley, Rock, and Watonwan, Minnesota; in Lyon and Plymouth, Iowa; in Cass, Lawrence, Platte, Pettis, and Jasper, Missouri; in Leavenworth, Clay, Pawnee, Neosho, Allen, Bourbon, Brown, Crawford, Douglas, Ellsworth, Jackson, Ottawa, and Woodson, Kansas; in Webster, Thayer, Osage, Lincoln, and Cass, Nebraska; in San Luis Obispo, California; in El Paso and Weld, Colorado.

The following from Labette County, Kansas, will give some idea of its ravages:

The farmers in my county had their land for wheat prepared in good time, and in a better condition than I ever saw. On the 6th of September the grasshoppers made their appearance all over the county. Farmers became alarmed and did not sow any wheat. About the 18th to the 20th they appeared to go away. Farmers commenced sowing, and got in about two-thirds of their crop. On the 28th and 29th they came the second time, filling the air, reminding one of a snow-storm in December. Some who had sown early had wheat up nice, but you cannot find a spear in any place. Wheat which was sown before the grasshoppers came the first time has been eaten down, until the grain has finally ceased to grow. I am candidly of the opinion that every acre which is sown to-day in this county will have to be sown again. There is no other chance for it, and the great trouble will be that so many of our farmers have sown all their seed and are not able to buy again. And what will they do? Some who have not been two years on their claims are leaving them and going over into Missouri and Arkansas to winter—to find something to live upon.

## CHEMICAL MEMORANDA.

BY WM. McMURTRIE, CHEMIST.

**CURIOUS DEPOSIT OF PHOSPHATIC MATERIAL.**—Some months ago Judge W. Schley, of Savannah, Ga., sent to this Department a sample of material with a statement to the effect that it had been discovered in considerable quantity in a cave near the city above mentioned. He gave no further description of its location or surroundings, but the sample sent was nearly white, pulverulent, becoming lumpy upon compression, and appeared to be the result of deposition. Preliminary tests led to the conclusion that it was of considerable agricultural value, and we consequently made a complete analysis, which determined the following composition:

Insoluble silica, sand, &c.....	6.20	Chlorine.....	Trace.
Soluble silica.....	0.60	Nitric acid.....	Trace.
Lime.....	14.32	Carbonic acid.....	Trace.
Magnesia.....	3.43	Moisture.....	16.10
Alumina.....	13.53	Organic matter, {	containing 0.119
Peroxide of iron.....	7.34		per cent. nitro-
Soluble phosphoric acid.....	8.40		gen, equivalent
Insoluble phosphoric acid.....	6.10		to 0.1445 per
Potassa.....	2.53		cent. ammonia, 16.25
Soda.....	0.375		
Sulphuric acid.....	3.87		99.045

The high percentage of soluble phosphoric acid in this material is somewhat surprising, yet this, together with the fair percentage of nitrogen and potassa it contains, and its very favorable mechanical condition, renders it immediately available for application to the soil for almost any kind of crops. The planters of the section may consider themselves fortunate in having in their midst so valuable a source of fertilizing material, if, indeed, development shows that it exists in large quantity.

INFLUENCE OF FORESTS UPON RAIN-FALL.—In a note upon this subject presented to the French Academy of Sciences \* by MM. L. Faurat and A. Sartiaux, they give the results of some interesting observations made in the forest domain of Hallette and upon a neighboring cultivated section of country. Becquerel declares that forests increase the amount of rain-fall, while Vaillant insists that they diminish it, and Mathieu concludes from his researches that the amount of rain-water received by forests is equal to or even greater than that received by the open country. Dausse states that rain is formed when warm and moist winds encounter cold strata of air; the air of forests being cooler and more humid than that of uncovered soil, a greater quantity of rain should fall in such localities. In order if possible to settle the point thus disputed, the authors have made observations: first, above a wooded section; and, second, at the same elevation at a distance from this section so slight that the differences observed can be due to the influence of the forest alone. In order to carry out these observations they placed, at an elevation of about 6 meters above a collection of oaks and elms which were of about twenty years' growth and about 8 or 9 meters high, a pluviometer, a psychrometer, an evaporimeter, and maximum and minimum thermometers, to determine the quantity of rain-fall, the amount of moisture in the air, and the variations of temperature and evaporation. At a distance of 300 meters from the forest, at the same elevation, the same instruments were placed under the same conditions over an open country.

The following table shows the results of their observations:

*Quantity of rain-fall.*

Date.	Above wooded section.	300 meters from wooded section.
	<i>Millimeters.</i>	<i>Millimeters.</i>
1874—February .....	18.75	18.00
March .....	15.00	11.75
April .....	27.50	25.75
May .....	39.25	35.50
June .....	51.25	48.25
July .....	40.75	37.75
Total .....	192.50	177.00

Difference in favor of forest, 15.50 millimeters.

*Degree of saturation of the air.*

Date.	Above the wooded section.	300 meters from wooded section.
	<i>Centimes.</i>	<i>Centimes.</i>
1874—March .....	71.1	70.0
April .....	64.3	64.2
May .....	64.1	60.4
June .....	60.9	60.1
July .....	54.6	53.8
Total .....	315.0	308.5
Average .....	63.0	61.7

Difference in favor of forest, 1.3 centimes.

\* Comptes rendus, t. lxxix, 409.

From the results of these observations the authors conclude that if they were carried out during the entire year, and yielded proportionally similar results, there is proof sufficient that forests possess an advantage over cultivated country in the influence exerted upon rain-fall.

PETERSON'S METHOD OF MEADOW-CULTURE.\*—In May of last year such a lively discussion was aroused and so many different opinions expressed with regard to the value of the Peterson method of meadow culture, at the congress of meadow culturists, in Wittkiel, (Schleswig,) that Dr. Oemler and E. Fuchs were induced to undertake an investigation, botanically and by means of analytical chemistry, to determine the differences in the growth of grasses upon meadows treated according to the Peterson system and upon those left in the natural condition. In their work they have noted the character of the soil, the different species and the number growing on a given space, the length of the taller and shorter specimens, the total weight and the general composition of the mixed grasses. They also determine the difference between the actual amount of nutriment produced from a given area when crops almost purely of grasses are grown, and when mixtures of grasses with lucerne or with Swedish clover are grown.

The first observations were made upon an area containing nearly pure grass. The soil was a humus loam, with a subsoil of tolerably fatty clay. Eighteen square feet produced 10 pounds, the average number of plants for this space being about 431, per square foot. The following table represents the number of each variety present, with their greatest and least lengths :

	Number of plants.	Length of plants.	
		Longest.	Shortest.
		<i>Centimeters.</i>	<i>Centimeters.</i>
<i>Festuca pratensis</i> .....	100	98.5	85.0
<i>Holcus lunatus</i> .....	66	105.5	40.0
<i>Poa pratensis</i> .....	64	98.0	50.5
<i>Phleum pratense</i> .....	59	81.2	43.5
<i>Arrhenatherum elatius</i> .....	41	106.0	98.0
<i>Dactylus glomerata</i> .....	32	88.0	51.0
<i>Lolium perenne, fine</i> .....	24	91.0	71.0
<i>Lolium perenne</i> .....	22	92.5	15.0
<i>Alopecurus pratense</i> .....	14	.....	.....
<i>Rumex acetosa</i> .....	4	.....	.....
<i>Ranunculus repens</i> .....	3	.....	.....
<i>Poa annua</i> .....	2	.....	.....
	431		

\* Die landwirth. Versuch. Stat. Bd. xvii, 211.

## One hundred parts of this mixture of grasses contain—

	In fresh condition.	Dried.
Water .....	75.99	12.62
Raw fiber .....	6.84	24.80
Ash .....	1.55	5.64
Nitrogenous matter .....	2.58	9.37
Fat .....	1.04	3.80
Non-nitrogenous matter .....	12.09	43.77

Nitrogenous matter : non-nitrogenous matter :: 1 : 5.0.  
Raw fiber : entire nutriment :: 1 : 23..

In the first test the plot selected was in the lowest portion of the meadow, but in the second test the plot was selected in the highest portion, the grass in this case being mixed with lucerne.

The soil of this plot is dry loam, with a subsoil of stiff red loam ; 18 square feet produced  $11\frac{1}{2}$  pounds of material, with an average of 390 plants per square foot.

The observations resulted as follows :

	Number of plants per squarefoot.	Longest plants.	Shortest plants.
		<i>Centimeters.</i>	<i>Centimeters.</i>
Lolium perenne, (rye grass) .....	167	94.2	16.4
Lolium perenne, fine .....	92	70.5	19.3
Arrhenatherum elatius .....	79	112.5	72.0
Festuca pratensis .....	17	85.7	63.5
Poa pratensis, (blue-grass) .....	8	.....	.....
Bromus mollis, (cheat) .....	8	.....	.....
Medicago sativa, (lucerne) .....	5	.....	.....
Dactylus glomerata, (orchard-grass) .....	4	.....	.....
Stellaria holostea .....	4	.....	.....
Alopecurus pratense .....	2	.....	.....
Phleum pratense, (timothy) .....	1	.....	.....
Holcus lunatus .....	1	.....	.....
Crepeanthemum Lucanthemum, (daisy) .....	1	.....	.....
Taraxacum officinale, (dandelion) .....	1	.....	.....

## One hundred parts of this mixture contain—

	Fresh condition.	Dried condition.
Water .....	79.24	9.06
Raw fiber .....	5.91	25.88
Ash .....	1.26	5.53
Nitrogenous matter .....	2.99	13.12
Fat .....	0.82	3.60
Non-nitrogenous matter .....	9.78	42.81

Nitrogenous matter : non-nitrogenous matter :: 1 : 3.6.  
Raw fiber : entire nutriment :: 1 : 2.3.

In the third test a plot of average elevation was chosen, this being covered with grass with admixture of Swedish clover. The soil was somewhat humous, but otherwise the same as that of the other plots. The product amounted to  $12\frac{1}{2}$  pounds per 18 square feet, with 320 plants per square foot, the latter being distributed as follows :

	Number of plants per square foot.	Length of plants.	
		Longest.	Shortest.
<i>Arrhenatherum elatius</i> .....	103	92.5	40.4
<i>Lolium perenne</i> .....	42	92.3	17.5
<i>Phleum pratense</i> .....	40	65.0	49.3
<i>Lolium perenne, fine</i> .....	40	65.6	23.5
<i>Festuca pratensis</i> .....	29	86.0	52.0
<i>Poa pratensis</i> .....	21	98.5	62.0
<i>Holcus lunatus</i> .....	19	103.0	36.0
<i>Dactylus glomerata</i> .....	9	68.5	19.0
<i>Alopecurus gericulatus</i> .....	7	84.0	52.0
<i>Alopecurus pratensis</i> .....	5	-----	-----
<i>Trefolium hybridum</i> .....	5	-----	-----

One hundred parts of this mixture contain—

	Fresh.	Dried.
Water .....	76.02	10.00
Raw fiber .....	7.72	28.92
Ash .....	2.27	8.53
Nitrogenous matter .....	3.20	12.02
Fat .....	0.97	3.65
Non-nitrogenous extractive matter .....	9.82	36.88

Nitrogenous matter : non-nitrogenous matter :: 1 : 3.4.

Raw fiber : entire nutriment :: 1 : 1.81.

The number of plants, in case of grasses, is naturally greater for a given area than in case of fodder-plants, since the latter require more space for their growth; but upon comparison of the analyses accompanying the different tests, it will be found that the percentage of nitrogenous nutriment is not only higher, but that the ratio between the nitrogenous and non-nitrogenous material is lower and more favorable. From a Prussian acre (0.6 acre) was produced, in test I, about 14,400 pounds of grass, containing 371.5 pounds nitrogenous matter; while in tests II and III were collected 16,200 pounds, containing 484.38 pounds nitrogenous matter, and 18,000 pounds containing 576 pounds nitrogenous matter. The authors are in favor, also, of cultivation of lucerne and clover, since their exhaustive effects are overbalanced by other effects more favorable.

The meadow which had been left in the natural condition was adjacent to that to which the Peterson method had been applied, and although the grass was overripe, which favored to a certain extent the method in question, yet the differences are quite marked. The soil in the latter case is a heavy loam, with a somewhat loose subsoil. The vegetation con-

sisted in part of good grasses, with admixture of carices, juncaceæ, and dicotyledonous swamp-grasses, especially *Caltha palustris*. Unfortunately, late mowing prevented as extensive investigations in this as in previous cases.

The matter collected in three tests contained, in the fresh and the air-dried condition, the following constituents:

One hundred parts of this mixture contain—

	Fresh.	Air-dried.
Water.....	59.73	6.61
Raw fiber.....	12.34	28.60
Ash.....	2.46	5.71
Nitrogenous nutriment.....	3.84	8.90
Fat.....	1.16	2.70
Non-nitrogenous extractive matter.....	20.47	47.48

Nitrogenous matter : non-nitrogenous matter :: 1:563.

Raw fiber : entire nutriment :: 1:206.

The low percentage of water in this sample was due partly to its being too ripe, and partly to the fact that it had been mowed for some time.

The plants collected from the natural meadow were *Ranunculus Flammula*, *Senecio aquaticus*, *Spiraea ulmaria*, *Caltha palustris*, *Lychnis flos cuculi*, *Lysimachia nummularia*, *Galium palustre*, *Equisetum palustre*, *Juncus compressus*, *Carex glauca*, *Briza media*, *Aira caespitosa*, *Holcus lanatus*.

The chemical composition of this mixture was—

	I.	II.	III.
Water.....	78.22—7.83	79.82—6.42	81.56—6.95
Raw fiber.....	6.33—26.80	5.23—24.29	5.49—27.75
Ash.....	1.71—7.25	2.05—9.40	1.32—6.63
Nitrogenous nutriment.....	1.21—5.16	1.46—6.81	1.46—7.37
Fat.....	0.82—3.48	0.75—3.50	0.73—3.62
Non-nitrogenous extractive matter.....	11.71—49.48	10.69—49.58	9.44—47.68

Nitrogenous matter : non-nitrogenous matter :: 1 : 10.4 : 1 : 7.83 : 1 : 6.96.

Raw fiber : entire nutriment :: 1 : 2.17 : 1 : 2.46 : 1 : 2.11.

The comparison of these tables with the preceding, by means of the ratios given in the lower portion, is easily made. A fact which seems worthy of notice is that in all of the six analyses the figures representing the entire nourishment in the ratios are included within the limits 1.8 and 2.4, and these limits will be observed in the following analyses.

The following tables are the results of analyses of materials collected from a meadow, cultivated according to the Peterson method, and an adjoining one in the natural condition, near Cappeln. In the first lot, collected the following plants—

<i>Arrhenatherum elatius</i> .....	105 centimeters high.
<i>Lolium perenne</i> .....	90 centimeters high.
<i>Phleum pratense</i> .....	84 centimeters high.
<i>Holcus lanatus</i> .....	102 centimeters high.
<i>Tripolium hybridum</i> .....	—

	Fresh.	Air-dried.
Water.....	79.71	8.91
Raw fiber.....	4.77	21.40
Ash.....	1.65	7.43
Nitrogenous nutriment.....	1.58	7.12
Fat.....	0.89	4.60
Non-nitrogenous extractive matter.....	11.40	5.14

Nitrogenous matter : non-nitrogenous matter :: 1 : 7.77

Raw fiber : entire nutriment :: 1 : 2.90.



COTTON LINT AND SEED.—A recent essay by William J. Land, sent to the Boston Journal of Chemistry, contains analyses representing the composition of cotton-seed and cotton-lint to be as follows:

	Cotton-lint.	Cotton-seed.
Potash.....	50.371	36.712
Soda.....	2.672	0.839
Magnesia.....	11.191	15.600
Limé.....	7.912	4.609
Phosphoric acid.....	4.285	31.093
Sulphuric acid.....	4.112	3.337
Oxide of iron and alumina.....	1.508	1.113
Oxide of manganese.....	.714	
Chlorine.....	2.213	0.507
Sand and charcoal.....	15.112	6.190
	<u>100.000</u>	<u>100.000</u>

The lint contained 0.855 per cent. mineral matter; and the seed, 3.59 per cent.

The same journal also contains the conclusions of a report of experiments with different fertilizers on the cotton plant by Mr. E. M. Pendleton. They are as follows:

That no compound which does not contain soluble phosphoric acid will pay upon the worn-out soils. That 200 pounds of a good ammoniated superphosphate is about the quantity to be used on an acre of cotton; but with bad cultivation it will hardly pay at any price. That cotton-seed makes a good fertilizer when used in connection with good superphosphate.

QUANTITY OF WATER CONSUMED IN GROWTH OF WHEAT.\*—Experiments made at the observatory of Montsouris during the year 1873 show that wheat sown in pots filled with soil from the park and watered each day consumes by way of transpiration from germination until maturity 1,796 grains of water to produce 1 gram of grain. Calculations consequent upon this result indicate that 30 hectoliters of grain grown upon an area of one hectare requires for its production a quantity of water corresponding to a stratum of 0.432 millimeters in thickness, and if this amount be added to the amount of water removed from the soil by evaporation it forms a total, higher than the average amount of rainfall for the entire year in the vicinity of Paris. It would therefore seem that the yield of wheat in the neighborhood of Paris must be limited by the volume of water generally available in the fields.

Woodward and Lawes' experiments indicated that the relation between the amount of water consumed and the weight of grain produced may vary with the nature of the soil and with the quality and quantity of fertilizers which may have been employed. This idea was made the subject of experiment at the same place during the year 1874, and the conclusions arrived at were, that "the fertility of a soil can never be absolute. It changes according to the climate, and even from one year to another, according to the sum of the light, heat, and moisture it receives. The quantity of water necessary to produce a crop cannot be considered any more absolute. It depends upon the sum of the useful mineral matters with which the water may be charged. To a certain extent the water may supply the fertilizer, and to a certain extent the fertilizer may supply the water. This, when suited to the soil, produces a decided economy in the mass of water consumed."

\*Comptes Rendus, t. lxxix, 208.

In the vicinity of Paris a yield of 30 hectoliters per hectare should, under ordinary conditions, cause a consumption of water which, added to that lost from the soil by solar evaporation during the time included between the seed-time and the harvest, should make a total very near the average rain-fall it receives. We have, therefore, good authority for the employment of water for the same purpose as fertilizers.

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## BOTANICAL NOTES.

BY DR. GEO. VASEY.

*Pentstemon* is a North American genus of herbaceous perennial plants of the order *Scrophulariaceæ*, comprising within the limits of the United States over sixty species, a large number of which are showy and well worthy of cultivation. They have, however, received very little attention in this country, whereas in England our species have been sought after, and quite a number of them brought into successful cultivation. The genus is mostly confined to the portion of country west of the Mississippi; only two or three species having a somewhat wide range east of that river. The larger number are found on the elevated plains of the Rocky Mountain region, some at high altitudes in the mountains, others in Arizona, New Mexico, and California, whence the genus extends into Mexico. We will enumerate some of the more showy species, which are hardy, and deserving of more attention among horticulturists and florists.

*Pentstemon Digitalis*, Nutt.—This species grows in the Southern States, and also in the southern portion of the States bordering the Ohio River on the north. It has a mass of large, smooth, radical leaves, with stems rising 3 to 4 feet high, rather leafy, with opposite sessile leaves; the upper ones are large, ovate, and clasping below, becoming oblong or lanceolate, and a rather large and showy much-branched panicle of flowers, which are 1 inch or more long, somewhat clammy, and of a pale blue or white color. The specific name is derived from its resemblance to the fox-glove.

*Pentstemon grandiflorus*, Fraser.—This species is more showy than the preceding; the flowers are about 2 inches long, varying in color from purple to white; the panicle is about 1 foot long and rather narrow; the leaves are remarkably thick, smooth, and of a bluish-green color. This species ranges from Kansas northward, and is found also in the vicinity of the Mississippi, from Oquaka, Ill., to Saint Anthony's Falls, Minn.

*Pentstemon Cobæa*, Nutt.—This is a smaller species than *P. grandiflorus*, with shorter stems and panicle, but the flowers equally large and more bell-shaped above. It is found from Kansas to Texas.

*Pentstemon glaber*, Pursh.—This species grows commonly about 1 foot high, with large flowers in a somewhat one-sided close panicle, the whole plant very smooth, the leaves thick and entire. The flowers are a bright purple. There are several varieties which extend over a large region of country, from Washington Territory and the Upper Missouri to Nevada, Utah, Colorado, and south to Mexico.

*Pentstemon cyananthus*, Hook., is a closely-related species, with a more slender stem and shorter panicle. Found in Wyoming and Utah.

*Pentstemon barbatus*, Nutt.—This species is remarkable for its tall

slender stems, its narrow linear cauline leaves, and the long loose panicle of tubular scarlet flowers, which are about  $1\frac{1}{2}$  inches long. Its range is from Colorado to New Mexico and Arizona.

*Pentstemon acuminatus*, Dougl., grows from 1 to  $1\frac{1}{2}$  feet high, is very smooth, with thick, glossy, bluish-green leaves, and a long panicle of blue or purple flowers, which are nearly an inch long. It is quite variable in form and size, and is found from Washington Territory to Arizona.

*Pentstemon centranthifolius*, Benth., is a species with tubular crimson flowers, resembling *P. barbatus* in general appearance.

*Pentstemon Eatonii*, Gr., and *P. Palmeri*, Gr., are new species discovered within a few years. They have been introduced into England and were last year figured in the Gardener's Chronicle, (London.) The first-named is near *P. centranthifolius*, and the last near *P. Cobaea*. There are many others less known and mostly of smaller size, but of considerable beauty, which, it is probable, will eventually find their way into cultivation.

The Engineer Department of the United States Army has just issued a catalogue of plants collected in the years 1871, 1872, and 1873, under the explorations and surveys of Lieut. George M. Wheeler. The catalogue is in two parts; the first is a report by Mr. Sereno Watson upon the collections made in 1871 and 1872, in Nevada, Arizona, and Utah; the second part is the report of Dr. Rothrock upon the plants collected in Central Colorado, in 1873, by Mr. John Wolf and himself. The first report embraces about 500 species, of which about 14, are new. The second report embraces about 1,150 species of Phænogams, of which 7 or 8 are considered to be new species, and about 125 species and varieties of Cryptogams. This catalogue will prove of much interest to botanists, and in connection with the report of Mr. Watson on the exploration of the fortieth parallel, and the synopsis of the flora of Colorado by Profs. Porter and Coulter, will render our knowledge of the region explored very full and satisfactory.

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## MICROSCOPIC OBSERVATIONS.

BY THOMAS TAYLOR, MICROSCOPIST.

CRANBERRY ROT AND SCALD.—During the present year the Department has received numerous letters from cranberry growers, calling attention to a disease of the cranberry known as rot or scald, which has appeared, especially, in the cranberry plantations of New Jersey, during the last three years. The following letter, placed in the hands of the Commissioner of Agriculture by Hon. S. A. Dobbins, M. C., shows the importance and necessity of a thorough investigation of the disease, with a view to the discovery of its cause and the means of preventing its recurrence:

TRENTON, March 12, 1874.

DEAR SIR: You are aware that the cranberry-culture has become a very large business in most of the sea-board counties of this State. The failure of the crops for the last two or three years has been a serious loss to those counties, and threatens to affect injuriously their productive interests, perhaps for many years to come. Various opinions have been entertained with regard to the blight of this important crop. Some

have attributed it to animalcules, others to climatic causes, but as yet the true cause has not been determined. Much anxiety is felt by hundreds who have invested in the cultivation of this fruit, and the New Jersey Cranberry Association, composed of a large number of respectable citizens of the counties of Cape May, Atlantic, Ocean, and Monmouth, at their late session, desired me to write to you on the subject.

We are informed that the Department of Agriculture at Washington is in the habit, when requested, of sending some scientific person to make a critical analysis and examination in such cases, with a view to ascertain the *real cause* of the rot, and devise, if possible, such treatment as will prevent it.

You will greatly oblige many of your personal friends and fellow-citizens if you will make inquiry, and procure the services of a proper scientist, to make the examination desired. It is said that the Department is very ready to make such investigations, and will, when occasion requires, send a competent person, free of charge, for the purpose.

Yours truly,

Hon. S. A. DOBBINS, *M. C.*

GEO. F. BROWN.

I think it probable that in Ocean County, New Jersey, the loss on the cranberry-crop for the last year approximates \$100,000; that is, the loss by what is familiarly called the "scald."

G. F. B

On the 10th of July last the president of the New Jersey Cranberry Growers' Association wrote to the Department as follows:

BORDENTOWN, N. J., July 10, 1874.

DEAR SIR: At the last meeting of the New Jersey Cranberry Growers' Association, Dr. George Goodale and myself were appointed a committee to procure, if possible, a scientist from the Department of Agriculture to investigate the cause of the cranberry rot, which has been so fearfully destructive in some portions of our cranberry region. If consistent with your views, we should be pleased to have a suitable person sent from your Department to meet us at Philadelphia, for the purpose of making arrangements to visit some of the principal plantations affected with this disease, and to suggest, if possible, a remedy.

Respectfully, yours,

JOHN H. BRAKELEY.

Hon. FREDERICK WATTS,  
*Commissioner of Agriculture.*

These letters were referred to me by the Commissioner of Agriculture, with instructions to make the desired investigation. Previous to visiting the cranberry plantations, I deemed it best to make an examination of the healthy and the unhealthy vines, their roots and fruit, with samples of the soils in which they grew, and now present a preliminary report of the results of my investigations. I accordingly requested A. J. Rider, esq., of Atsion, Burlington County to forward to this Department such specimens as were necessary for my purpose. Two specimens of vines, one healthy the other unhealthy, were in a short time received by the Department, and a specimen of the soil in which each plant grew. An examination of the roots of each vine showed that the one which bore rotting fruit had much larger and darker roots than the other. The peaty muck in which the healthy plants grew had a pleasant odor, and was not in a fermenting condition, while that of the unhealthy plant was in a condition of fermentation, and had the odor of sulphuretted hydrogen. A second set of plants was received, with specimens of the soil in which they grew. It was again observed that the vines on which unhealthy berries grew had darker and larger roots than those which bore healthy fruit, and that the soil of the latter was odorless, while that of the former had a bad odor, and was in a fermenting condition. These facts led me to believe that the sour condition of the soil was the primary cause of the rotting of the berries.

On the 22d of July last. I visited Cranberry Park Station, Atsion,

Burlington County, New Jersey, in company with the Rev. J. H. Brakeley, President of the New Jersey Cranberry Growers' Association, Mr. A. J. Rider, secretary and general superintendent of the Cranberry Park Company, and Messrs. E. W. Crane, of Caldwell; C. G. Rockwood, of Newark; N. R. French, of New York; and Japhet Alston, of Pemberton, all directly interested in cranberry-culture, and made a careful examination of the condition of the soil, the mode of cultivation, the roots of the vines, their foliage and fruit, the construction of water-dams, ditches, &c., at that place.

The plantations of the company comprise about 130 acres of vines, the greater part of which were set out in the year 1869. In 1871 there was a light crop, partly rotted; in 1872 half a crop, and nearly all rotted; in 1873 a full crop, and nearly all rotted, only 300 bushels of sound fruit being picked out of a total crop estimated at 10,000 bushels. No fertilizers were used till the spring of 1873, when sand and plaster were applied to the higher portions of the land, a small area being at the same time treated with a coating of decomposed turf. No rain fell after these fertilizers were applied until June 12, when rot began. The seasons of 1872 and 1873 were noted at this particular locality for protracted droughts during June and July.

In the fall of 1873, sixty acres were drained, by cutting ditches about two rods apart, and a coating of sand was spread over the vines. The outlets and feeding ditches were opened to give free circulation of water, as well as thorough drainage.

Where foliage was destroyed last year by the vine-worm, there was very little fruit; where plaster was applied, with a layer of sand over it, the vines looked healthy and had new rootlets.

Several other plantations in the same vicinity were examined, including those of Mr. Miller and Mr. Rockwood. I visited Bricksburgh, Ocean County, July 24, accompanied by Messrs. E. W. Crane, A. J. Rider, Mr. Teller, I. Foster, F. M. Todd, C. Holman, Dr. Merriman, and the editor of the Times and Journal of Bricksburgh, and made an examination of several cranberry plantations in this neighborhood, commencing with that of Dr. Merriman, two miles southwest of the village. We found the berries very thickly set on the vines where the blossoms had not all disappeared, but traces of the rot were discernible on this plantation. I made a careful examination of the nature of the soil, the roots of the vines, and the degree of acidity of the fruit from the different portions of the bog. Where guano had been applied a marked improvement of the foliage and roots was visible. In answer to an inquiry made by me whether any of the growers present had given attention to the condition of the soil and of the roots of the vines, a unanimous answer was given in the negative. On the afternoon of this day our company was increased by the arrival of Colonel Goodrich, of Stockbridge, Mass., and the Rev. A. H. Dashiell, of Bricksburgh, both of whom are interested in cranberry culture. We visited the plantations of Mr. J. W. Campbell, the Rev. Isaac Todd, and Mr. Ferre, all being connected and forming one continuous plain. This extensive bog was formerly a mill-pond. The soil of such places is generally found to be very favorable for cranberry cultivation, which proved to be the case in this instance. These three plantations have never failed to produce healthy crops. An examination of the soil proved that the peaty matter of which it principally consists, was well decomposed. Our attention was directed to one small portion of the pond where about two years ago the berries rotted. I examined this place, by digging up

the ground, and found that the soil was not well decomposed, and that the muck was in a condition of active fermentation, giving off strong odors of sulphuretted hydrogen. The roots of the vines here were unusually large, matted, and of a dark, unhealthy color.

We next visited the plantation of Messrs. C. G. and E. W. Crane, at Long Swamp, consisting of about thirty acres. This plantation had been recently laid out, and was provided with the latest improvements. The ground here proved generally good, although in some places there were decided indications of sour, fermenting soil. The Darron plantations were next examined. The soil here is of a mixed character, some portions of it proving to be well decomposed and without odor, while other portions were in a state of fermentation. It was observed that the rot was confined to the parts indicating fermenting soil, while the sound berries grew on the well-decomposed soil, which has generally a pleasant odor.

We next visited Butterfly Bridge plantation. Here, a plantation, laid out some years ago by F. M. Todd, esq., in the best manner, and now belonging to different parties, was next visited. The vines on this plantation rotted in spots last season. An examination of these spots showed undecomposed peat, and unhealthy roots, the latter being very large and closely matted. Having stated to the committee of cranberry-growers accompanying me that fermenting soil and stagnating water were probably the principal causes of the rot, I was informed that, although my theory held good thus far, there was a neglected cranberry plantation, known as the Carey Bog, near Bricksburgh, the water of which they believed to be stagnant, as it had no visible outlet, but notwithstanding, the fruit of the bog had not been affected by the disease. An examination of the bog showed that the water which flooded it was perfectly fresh, being supplied probably by means of springs, and passed off through the sand. The whole surface was covered with a dense growth of moss and weeds, interspersed with cranberry plants. The cranberry roots were growing in the moss and confined to it. They were short, of a whitish color, and very healthy; sand to the depth of eight inches had at one time been spread over the peat muck. I cut through it, and found it to be very pure and free from any odor. This bog very much resembles a wild bog, being wholly neglected. I have also examined the roots of the cranberry plants as found growing in the wild state, and in all cases have found them to be healthy and similar to these. I have thus far failed to discover any healthy cranberry vines growing in stagnant water.

I next proceeded to Tom's River, in company with General Morris, Dr. Merriman, S. H. Shreve, and A. J. Rider, esqs. We visited the Berkeley plantation, one and a half miles from Tom's River. This plantation contains about fifty acres of vines, which appeared very promising. They had been planted about nine years. The berries, at the date of our visit, were slightly affected with rot. On my first examination of the soil I detected imperfect roots, but no sulphuretted hydrogen. On going deeper, the latter was found in abundance at a depth of about two feet six inches. The soil of this plantation is of the variety known in New Jersey as savanna, consisting of sand, with a slight trace of vegetable matter. An analysis made in the laboratory of this Department, shows that the proportions are, sand, 97 parts; peaty matter, 3 parts. Mr. Shreve informed us that a layer of peat about two inches in thickness had been spread over the surface of the bog. From some cause this peaty matter was in a state of fermentation, and its odor very bad.

We were informed that gas-lime had been spread over portions of this plantation with but little effect. In my opinion, the use of stone or shell quick-lime would produce more important results. The water in the ditches was highly impregnated with iron—probably as bicarbonate of iron—which is soluble in water. Gas-lime is composed mostly of sulphide of calcium; that is, a mixture of sulphur and calcium. It also contains caustic lime, but in limited quantity. When gas-lime is exposed for a considerable period to the action of rain and air, a large portion of the sulphide is converted into sulphate of lime, or land plaster. I consider that, for the purposes required, caustic shell or rock lime would prove more profitable, for several reasons.

We next visited the plantation of General Morris, of Bogville. His vines are of only four years' growth, and the cranberries have rotted each year. An examination of the peat revealed the presence of sulphuretted hydrogen, which was also found in the substratum of the savanna bottoms of this plantation. One-half of the plantation was covered with sand taken from an adjoining cultivated field, the particles of which were very fine, and it probably contained clay. The vines covered with this fine sand were stunted in growth, while those sanded with coarse sand, taken from an uncultivated bank near by, were very thrifty and in full bearing. Samples of these two kinds of sand have been procured, and will be analyzed in the laboratory of the Department.

I also visited the plantation of A. T. Finn, of New York, consisting of thirteen acres. The vines appeared healthy and were fruited, although the berries were rotting. An examination of the soil of this bog revealed the presence of fermentation and unhealthy roots. We were informed that the vines last year appeared healthy, and yet the berries rotted so badly that but twenty-five bushels were harvested from thirteen acres.

We next visited a very thrifty bog, known as the Shreve plantation, near Tom's River. This bog has always borne fruit free from rot. An examination proved that all the conditions were favorable, the soil being well decomposed and free from odor, and the roots small and healthy in appearance. From this point I proceeded to West Creek, and visited the extensive and highly cultivated plantations of Col. D. R. Gowdy, and also the Eagle Company plantation. I found here good and bad soil, plenty of water, and a refreshing, cool breeze blowing over the surface of the grounds, the latter circumstance being of common occurrence. Mr. Gowdy claims to have a very superior short vine which is known as the "Gowdy vine." He is one of the oldest cultivators in the State of New Jersey, and has been very successful. The land under cultivation at this place is generally good, although I found many spots on it in a state of fermentation.

A diversity of opinion seemed to prevail at this place between Mr. Gowdy and the Eaglewood Company as to the best form and depth of ditches and the width of the lands between them. The irrigation of cranberry land is of the highest importance at all times, but especially, when the soil is sour. The Eaglewood Company lately ditched their bogs very deep, and on the day of my visit to their plantation I observed that the water in the ditches did not come within 18 inches of the roots. There were probably about five inches of sand over the peat-bottoms. I examined the roots of the vines and found them baking in pure, dry sand at a very high temperature. The overseer in charge informed me that they had been in that condition for sometime, and that having no instruction to fill up the ditches with water he was powerless to act. This was probably the condition of about eighty acres during the

hottest days of August last. The peat of this plantation is several feet in depth, (cedar bottom,) and is capable of still higher cultivation owing to the general mellow condition of the soil and its being well supplied with water. I do not consider that the extra depths of these ditches will prove injurious to the vines, provided they are supplied with substantial ditch-gates to enable the person in charge to regulate the height of water in the ditches at will.

With the committee I next visited the bog of Mr. Goodell, near the village of Bricksburgh. We stated the object of our visit to the proprietor, and with his assistance we commenced an investigation. The vines had been treated with a light sprinkling of lime over their surface for the last three years, and he believed that the treatment in question destroyed worms and modified the rot; but on looking over his grounds we found many examples of rotting berries. With his permission we dug up the first clump of vines upon which such berries were found. The roots were very large, and were matted and dark in color. At a few yards' distance from the first plants removed, we found a very healthy clump of vines, the berries of which were sound and of a good, acid taste. The roots of these vines were found to be very small, and much whiter than the first examined. On seeing this Mr. Goodell exclaimed, "Something wrong with the roots," although he was not aware that I had already reached the same conclusion. He complained that the soil was frequently sour, and had sometimes the odor and taste of acid. I was frequently informed during the early part of my investigation that the cranberry on Cape Cod is not subject to rot. Indeed, persons from that section assured me that rot, or scald of the berry, is wholly unknown in that region. As the statements seemed trustworthy, I suggested to the cranberry growers of New Jersey, that an examination of the conditions under which the cranberry-vine was said to be so successfully cultivated there, might lead to practical benefits. With this view I procured proper introductions to the leading cranberry growers of that region, and proceeded to Cape Cod, arriving at Harwich Centre about the 26th of July. The first plantations visited were those of Captains Robins and Small, both extensive and experienced growers of cranberries. I also visited the plantations of Dr. Pitcher and others, at Hyannis. Contrary to expectations and reports, I found the rot of the cranberry to be well known on Cape Cod, and on just such soil and under the same general conditions as in the vicinity of Bricksburgh, N. J. Fermenting peat-bottom, or fermenting sanded grass-bogs, subject to back water, large matted roots, and berries, either bitter or of the flavor of flat acid—such were the circumstances under which diseased berries were uniformly found. But, as in New Jersey, there are on Cape Cod very fine plantations free from disease. Although nearly all of the plantations of Captains Robins and Small indicated high cultivation, the favorable condition of their soil and surroundings had as much to do with the production of good crops as had the attention bestowed on them. Many patches which had proved a failure were pointed out to me during my investigations on Cape Cod, although in some cases more money had been wasted on them in bringing them under high cultivation than had been spent on the successful bogs. My examination has shown, thus far, that in every instance sour soil, high temperature, and large, dark, matted roots are the invariable attendants of rotting berries.

Much diversity of opinion exists on Cape Cod, as well as in New Jersey, as to the best kind of peaty bottoms to be used for cranberries. I have found successful cultivation of this crop on cedar and maple



bottoms, the waters of which were charged with bicarbonate of iron in solution. Not unfrequently would the peat be found six feet in thickness. Captain Small has a successful plot, consisting of coarse, sharp sand, deeply colored with iron. The bed of sand is 18 inches in thickness, and rests on "hard pan," a solid bed of bog-iron. Such iron basins are formed from the precipitation of iron held in solution in the water which flows over the bog land. Captain Small informed me that, on some parts of Cape Cod beach, cranberries grow successfully on pure sand when provided with an adequate and constant supply of peaty water. Much stress is placed on the quality of sand by all cranberry growers. It is claimed by all with whom I have conversed on the subject, that coarse, clean, sharp sand is best adapted to the growth of the vines, and my own experience coincides with this view. In some cases only an inch of sand is placed over a peat bottom, and then it is planted with vines, the roots growing directly in the muck. In other cases as many as 10 inches of sand have been placed over the muck or peat, the growth of roots in such cases being confined wholly to the sand, which, however, conveys the soluble humus of the peat to the roots of the plants. There is always a rankness of root and vine growth when the vines are planted directly in peat, and as the growth of plants is continued longer under such conditions they are longer in bearing their fruit. The same remarks apply to plants which are heavily manured, and constantly supplied with an abundance of water. I have found in every case where the runners have been sanded to the depth of about an inch and properly watered, they readily take root in the fresh sand and produce a fine growth of lateral branches. It has been found in some cases that sanding the vines in this way has as good an effect on their growth as an application of guano. Several small cranberry plantations were pointed out to me which had, at various times, been flooded with salt water, not only on Cape Cod, but also in New Jersey; but there was no evidence to show that salt sea-water, reduced in strength by heavy rains, affected the growth of the vines for good or evil.

It is believed by many successful cranberry growers that the runners of the vines should be sanded at least once in four years when practicable, and some growers sand them as often as once in three years. The great advantage derived from the sanding process consists in the stimulating of new roots along all the runners imbedded in the sand; and it seems from my investigation that the original roots decay in consequence of the vigor of the new ones; but the sand also protects the runners from extreme heat and premature frost.

At the Bricksburgh annual meeting of the Cranberry Growers' Association, I was informed by gentlemen from Pemberton and its vicinity, that the plantations in their neighborhood differ very much from all I had visited. Their soil is savanna and is very dry in most places, and previous to the last three years their berries had not rotted. I was further informed that Mr. Hinchman's plantation near Medford, presented conditions which apparently could be found on no other, his vines being more copiously watered than any I had yet seen, while his berries were exempt from the rot. At the earnest request of members of the association I visited this plantation, and those in the vicinity of Pemberton above referred to, as well as that of Mr. N. H. Bishop, near Manahawkin, Ocean County, in order to obtain additional facts in regard to the habits of the cranberry plant under new and exceptional methods of culture.

I found the plantations of Mr. Bishop, which embrace about 80 acres, in a very high state of cultivation. This gentleman has probably expended a larger amount per acre, and devoted more attention to the preparation of his bogs, than any other cranberry grower in the United States. He is regarded by all the New Jersey cranberry growers as one of the most zealous, clear-headed, and successful of their number. Practically, rot is unknown on his bogs. In company with Mr. Bishop and others, I made a thorough examination of his vines and berries, and also of the muck underlying his cultivated ridges. The peat is about five feet in thickness, is well decomposed, and quite homogeneous in texture. The bog was formerly a white-cedar swamp. Mr. Bishop is fortunate in having a fine supply of water. Cool and uninterrupted breezes pass over his plantations, a circumstance of considerable importance in connection with cranberry culture. It was, doubtless, largely due to these favorable conditions that the extreme heat and drought of last August and September produced no unfavorable effect upon his crops. I examined the muck or peat of an adjacent bog, belonging to the same gentleman, which had dried up during the summer, but had not been drained or brought under cultivation. A hole was dug about three feet in depth to ascertain the character of the sub-soil. We found it as free from odor as the cultivated bog-land, and as well decomposed. It was evident that nearly all the muck of this cedar swamp had long since passed through its fermenting condition. The cultivated land is perfectly drained, and the ditches are filled with running water. Mr. Bishop has put an unusually large amount of pure sand, not less than 10 inches, over the muck of his bogs. The roots of the vines consequently grow in the sand, which, by capillary attraction, conveys to them the soluble humus of the peat.

The true character of peat in relation to cranberry growth is still a matter of doubt; but one thing is evident, namely, that such masses of peat will always absorb and retain a large amount of water, and will thus tend to keep the sand on the top moist. Certainly the humus of the peat is not itself absorbed by the roots of plants, but humic acid is seldom free from ammonia, and the oxidation of peaty matter may also contribute to root and plant growth by supplying them with carbonic acid, which is one of the essentials of plant food.

I visited Pemberton, Burlington County, in company with Senator Gaskill and Messrs. Theodore Budd, Joshua Forsyth, Japhet Alston, David D. Coles, Ives Davis, and others, all engaged in cranberry growing. We visited the principal plantations within several miles of Pemberton, and found that the drought had disastrously affected this region. Pines were on fire in many places and burning with great fury, owing to their extreme dryness. The streams had dried up, with few exceptions, and no water was found within five feet of the surface on the cranberry lands. There is very little heavy bog land in this district; it is nearly all of savanna, (black sand,) composed of pure, sharp, white sand, combined with about 3 per cent. of black, vegetable matter. Sometimes cranberry cultivators at this place cover the runners with pure white sand. In times of great and high temperature, it protects, in a measure, the roots of the vines from the scorching rays of the sun. On the occasion of my visit I found the white sand on the vines so hot that it was disagreeable to hold in the hand, but the black sand near the same place was still hotter, and the cranberries on the vines were literally baked. Previous to visiting this district I had not admitted that rot of the berry was ever produced by a scorching sun, but I now have sufficient evidence of that fact.

On the 9th of September I visited the cranberry plantations of Charles C. Hinchman, situated at Taunton, Burlington County. They are subdivided into several plats, which are peculiarly and favorably situated for cranberry-culture. A stream of pure cold water flows through all his plats, most of which are nearly surrounded by high banks. From these ooze unseen currents of water, which moisten the cranberry plats below them. The stream which flows through Mr. Hinchman's principal bog is about three feet deep and twelve feet wide, and is slightly tinged with soluble humus (peaty matter) and bicarbonate of iron. In several of the bogs belonging to this gentlemen there are sulphur springs, one of which flows in the middle of a cranberry plat without doing any apparent injury to the plants. It may be remarked that Mr. Hinchman's cranberry vines, although cultivated, are growing in water as if in a wild bog. The condition of his bog-land vines and berries at once demonstrates that the cranberry-vine may be brought to a high state of cultivation, although the roots may be submerged in water the year round. Many valuable experiments have been made by Mr. Hinchman to ascertain how much drainage may be profitably employed, and the description of sand, as well as the amount per acre, that should be used on bog-land previous to the planting of vines; also, how much should be laid over the vines when in full growth.

I think that the Taunton plantations would be very little improved by the use of lime, while on the dryest portions of them a much larger yield of fruit would be obtained by the free use of fertilizers applied after the removal of the water of the winter flooding. On the margin of these plantations Mr. Hinchman has erected an extensive building of stone for the assorting, cooling, and storage of berries. Cylinders are supplied with an ice-mixture, through which cooled air is carried by means of suitable machinery over and through the crates of berries awaiting transportation.

This is the only place in the United States where machinery is employed to cleanse, cool, and assort the berries previous to shipment. This important fact was established by my visit to Mr. Hinchman's bogs: that the cranberry-vines are not injuriously affected, even though the roots may be submerged from 1 to 2 inches, provided the water is cool and in motion. Mr. Hinchman's plantations possess greater natural advantages than those of Mr. Bishop, but he will, notwithstanding, have a smaller crop than that gentleman, and his berries will ripen later. While walking over the Taunton vines my feet were frequently in two inches of water, and the use of rubber boots was indispensable, while the surface of the plantations at Manahawkin was comparatively dry. Under the wet system the vines have a greater tendency to extend in woody growth. The blossoms are consequently later in forming and the berries later in maturing than under the dryer system of culture; but in a series of years the wet system might prove more profitable than the other, since it affords a better protection against grasshoppers, and also the berry and vine worm. These pests are unknown on Mr. Hinchman's bogs. An analysis of the berries cultivated under each system would probably show that those from the wet plantations contain less earthy and solid matter generally than those from the dry, and, all other conditions being equal, would probably keep better than the former. A recent analysis of Captain Small's Cape Cod Early Black Bell berries gave one-fifth of 1 per cent. of earthy matter, while the common Cape Cod Bell berries of good quality gave about one-fourth of 1 per cent. All other conditions being equal, the Early Black would prove the better keeper, while the common bell of Cape Cod Bell would prove better for immediate use, being more juicy.

The system of sanding cranberry land is greatly varied. On Cape Cod the cultivators take advantage of their extremely cold winters. When their bogs are covered with ice of sufficient thickness to bear a horse and wagon, sand is carted over it and spread to the thickness required. When the ice melts, the sand is deposited evenly over the vines, at a cost of ten to fifteen dollars per acre, for one inch in thickness. In Southern New Jersey this system of sanding can seldom be taken advantage of, owing to the mildness of its winter. Mr. Theodore Budd, of Pemberton, N. J., informed me that in his neighborhood a layer of sand one inch thick can be spread over an acre of vines at a cost of \$20, provided labor does not exceed \$1.50 per day of ten hours, and when the sand is procured on the edge of the bog to be covered. On large plantations, consisting of one hundred to three hundred acres, a layer of sand one inch thick will cost from \$40 to \$60 dollars per acre. The cost will, of course, vary according to the distance of transportation.

The cranberry growers of New Jersey are very much divided in opinion as to the amount of water that should flow in the ditches of their bogs when the berries are coloring under high atmospheric temperature. Some believe that excessive moisture and high temperature cause the berries to rot, while others equally intelligent affirm the opposite. Much of this uncertainty arises from the limited quantity of water furnished at the fountain-head of many of the bogs under cultivation. A small stream will quickly fill the ditches of a 10-acre lot when stops or gates are used; but, during high temperatures, the water becomes quickly heated, and instead of proving beneficial will prove hurtful to the vines, especially when the sub-soil has not been well decomposed. Under such conditions fermentation will be promoted, producing organic acids and sulphuretted hydrogen in the vicinity of the roots, while a much larger flow of water in the ditches would cool the substratum of the bogs, and remove, at the same time, all soluble noxious substances.

At the Taunton plantation Mr. Hinchman introduced a novel system of washing sand over his bog-land by means of a stream of water conveyed for that purpose along the base of the high sand-bluffs which nearly surround his plats of cranberry vines. I am informed by Mr. Hinchman that by the use of this system sand was washed over his lands at the rate of ten tons per minute. In this way a kind of sand charged with ochreous clay (which is at present deemed worthless for cranberry-culture) may be used, as the water floats and separates the clay from the sand, depositing the latter on the vines, while the clay is washed away in the main stream, which was highly colored in consequence at a distance of ten miles below the point of operation.

Before investing in cranberry-culture more attention should be paid to the condition of the soil than has heretofore been done; for on that depends the quantity of water necessarily required for the purposes of irrigation. When water is very limited in supply, it should be protected from the sun's rays in some practicable way. Small ponds or dams used as reservoirs might be protected by shade trees, and in many cases streams might be easily protected in this way. On my last visit to Bricksburgh, September 12, in company with Dr. Merriman of that place, we visited one of his plantations for the purpose of testing the difference of temperature of the waters at different parts of the bog. The stream which supplied several acres with water was so small that it might have been all conveyed at the time of our visit through a

10-inch pipe. It entered the bog from a ditch four feet in depth. A thermometer when immersed in it indicated 72° Fahr. The water being somewhat protected from the sun's rays, the temperature at the exposed edge of the ditch at the same point was 90° Fahr. At a distance of a hundred yards farther on, where the water was fully exposed to the sun's rays, the temperature indicated 89° Fahr. Shaded water in a ditch a hundred yards still farther removed from the first ditch had the temperature of 78° Fahr., while the sand on the exposed edge of the ditch showed a temperature of 92° Fahr. These observations were taken at 4.30 p. m.

We annex the following in advance from French & Co.'s valuable Annual Cranberry Circular :

The recent statistical report of N. R. French to the New Jersey Cranberry Growers' Association shows the entire acreage in New Jersey, under regular cultivation, to be 4,969 acres. Average cost at three years from setting, (the fruit-bearing age,) \$334.50 per acre, making total investment \$1,662,130. Crops in this State have been, in 1871, 58,839 bushels ; in 1872, 93,322 bushels ; 1873, 116,409 bushels. The average market-prices have been in the years named, \$3.42, \$3.21, \$2.93, respectively. Abating \$1 per bushel from market-price for cost of picking and marketing, would make the crop of 1873 worth, on the vines, \$224,716, or 13½ per cent. on the entire investment.

The New Jersey fruitage in 1873 was most bountiful, but 40 to 50 per cent. was destroyed by the rot. This season the average fruitage upon old plantations is believed to be 30 to 40 per cent. below last year, but the rot on these has not been so severe. New bogs have suffered most, as usual, the entire crop in many cases being lost. Allowing for increase of acreage, we think the entire crop of the State must be 25 per cent. below that of a year ago.

The crop on the eastern portion of Cape Cod is very light, and in many districts almost an entire failure. The western portion and the adjoining islands have good crops. The other cranberry districts of Massachusetts and Rhode Island, nearly all of them, have good crops. The few plantations on Long Island and other portions of New York have good crops.

The fruit not affected by New Jersey rot seems sound and solid, promising to keep well.

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## LIME AND ITS USE.

BY THE COMMISSIONER.

It is now universally conceded that in every quality of soil the use of lime greatly conduces to its fertility, by converting its component parts into the elements which give strength and brightness to straw, and food to the plant.

As to the time, place, and circumstances in which lime may be profitably used, the directions are simple and easy. In its use the farmer has this advantage—that it may be spread upon the land at any time or season, provided it is spread, and not suffered to lie in heaps after it shall have been slaked. It loses nothing by exposure, and soon finds its place commingled with the soil. Whether the land be broken up or in sod is of no importance ; but the circumstance as to quantity brings into consideration this principle, that the more may be used in proportion to the fertility of the soil. While upon a good limestone clay, 250 bushels to the acre might be used with impunity, 100 bushels upon a thin slate or sandy soil, void of vegetable matter, would do more harm than good. Just in proportion to the vegetable substance which is in the land may the quantity of lime be increased. In slate or sandy land,

which has been subjected to the ordinary cultivation of a farm, in which there is the usual amount of vegetation, or where the farmer can precede the spread of lime with a coat of barn-yard manure, 60 bushels to the acre is a proper quantity, and if this be applied in two successive seasons it will be better. Upon limestone land which has undergone like cultivation, double the quantity may be used.

The property of lime is to convert vegetable substances into plant-food, and mineral substances into the component parts of straw; so that, while it prepares food to increase the quantity and quality of the grain, it furnishes a bright and strong straw to conduct that food to the making of grain and supports its weight. A prejudice once existed against the use of lime, under the idea that it heated the land, and thereby subjected the plant the more to the influence of the hot sun. There could be no greater mistake than this, for lime has a magnetic influence which draws to itself all the moisture that abounds in the atmosphere, and thereby makes land less subject to the influence of the hot sun. As to the condition of the land when lime is used one other remark must be made. It should never be put upon land on which water habitually lies until the same be thoroughly drained. And here, in reference to the prevalent idea that lime will dry up wet land, it may be said that it will have no such effect, but, on the contrary, will destroy the character of such land for any purpose. Standing-water, lime, and sand will make a substance adapted to the builder's purpose, but does not make a fertile soil. There is much difference in the quality of material for making lime. In some stone, magnesia prevails largely and this is less profitable. That which makes the best mortar is the strongest and best for land. The experience of the builder, in his choice for mortar, is a good guide for the farmer. Oyster-shells make the best of lime. How a farmer who has access to limestone or oyster-shells may make his own lime is worthy of his study. I do not propose to treat of the use of a lime-kiln, for if the farmer has one of his own, he, of course, knows how to use it; but to burn lime in a stack, at any place which may be made convenient by the location of the stone-quarry or shells, in its details is worthy of consideration. If stone is to be burned with coal, the size should not exceed two pounds in weight, and built in conical form, the outer walls being so carefully laid as to contain the weight within. I may illustrate it by describing a kiln as 30 feet long, 18 feet wide at the base, and tapering gradually and regularly on all sides to the height of 12 feet. This is made up of alternate layers of the stone and coal, requiring, for a kiln of this size, about 22 tons of coal, and which will produce about 2,603 bushels of unslaked lime. This kiln should be built upon six trenches at least one foot square, which are filled with dry wood, and the whole bottom covered with light dry material, such as old rails, stumps, corn-cobs, &c., which will serve to light the coal which is to do the work of burning the stone or shells into lime. A trench may then be dug around the kiln, which will furnish the clay for making the mortar with which the whole outside must be closely covered, and if straw or chaff be mixed with the plaster, it will be less likely to crack and suffer the escape of heat. The size of the kiln may be increased to almost any extent, and perhaps the larger it is the more profitable will be the result, increasing the base and height as well as the length. I may suggest that to build at the base of a rise of ground makes it more convenient to wheel stone upon the kiln in its construction. A ton of coal in a kiln thus properly constructed should produce 120 bushels; and to enable a farmer to estimate the quantity of coal required, and the number of bushels of lime which will

be produced from a kiln of any given size, I subjoin a calculation of the one given:

Width of the base.....	18 feet.
Length of the kiln.....	30 "
	<hr/>
	540
Half the height of the kiln.....	6
	<hr/>
Number of cubic feet.....	3240
Number of cubic inches in a foot.....	1728
	<hr/>
	25920
	6480
	22680
	3240
	<hr/>
Cubic inches in a bushel.....	2150.4)5598720(2603.5 bushels.
	43008
	<hr/>
	129792
	129024
	<hr/>
	76800
	64512
	<hr/>
	122880
	107520
	120)2603.5 bushels.
	<hr/>
Tons to bushel.....	21
Tons of coal required.....	

## AUSTRALIA AND THE CENTENNIAL EXPOSITION.

The secretary of the Agricultural Society of New South Wales, in a recent letter to the Department of Agriculture, says:

I am happy to state that the reports of your Department, to which we give all due publicity, have proved of immense benefit to the Australian colonies. Several of the colonies have established departments of agriculture, and the constantly-increasing number of agricultural societies throughout Australia, with which we are in daily communication, will ere long enable us to concentrate a mass of authentic information which will place us in a position to publish once a year a volume somewhat resembling your annual report. It may be gratifying to you to know that the example so nobly set by the United States has been followed by Australia.

We are now engaged in securing the co-operation of all the colonies of the Australian group in obtaining from the Centennial Commission of the Philadelphia Exposition in 1876 sufficient space to represent at the great centennial gathering the undeniable proof of the immense natural resources of this territory.

## AMERICAN COTTON AND TOBACCO CULTIVATORS WANTED IN THE ISLAND OF CORSICA.

The Department a few years ago embraced an opportunity of sending some Maryland and Virginia tobacco seed to Madame de Angeli, of the Island of Corsica, in the Mediterranean, for experimental culture. From the letter below, from the agent of Madame de Angeli, it will be seen that the experiment has proved so successful as to lead a prominent planter of the island to offer liberal inducements for persons in this country, who may be competent to the undertaking, to go to the

island and engage in the cultivation of both cotton and tobacco, for which the climate and soil of the country are believed to be peculiarly adapted.

PHILADELPHIA, *September 28, 1874.*

DEAR SIR: I am requested to inform you that the seeds of Virginia and Maryland tobacco, which your Department sent to Madame Emilia de Angeli, some four years ago, for planting in Corsica, have produced most gratifying results. The seeds were sown upon the estates of M. Jean de Peraldi, Baron de Commene, and in the district of Vico, lying near the sea. From March to June two crops or cuts were obtained, and the third crop was well up, but did not come to perfection. Potatoes and beans were afterwards planted on the tobacco fields, and produced an excellent crop. The Corsicans, however, do not understand well the art of dressing the tobacco produced. Cotton does not seem to have proved so great a success; probably because the cultivation was not well understood. In order, however, to stimulate the cultivation of both cotton and tobacco, Baron Peraldi authorizes me to inform your Department that he would willingly give a small tract of land on his estates in and around Vico to any Americans who, understanding the management of these products, would go out to Corsica and settle, he, of course, being prepared to provide for them until such time as they could, by means of their own industry in raising these staples, provide for themselves.

Very respectfully,

CHARLES H. A. ESLING,

*Agent for the De Angeli Estates, 208 South Fourth St., Philadelphia, Pa.*

THE COMMISSIONER OF AGRICULTURE.

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## FACTS FROM OFFICIAL SOURCES.

**BRITISH CROPS.**—The London Agricultural Gazette publishes statements, founded upon letters received from 273 correspondents in different localities of England, Scotland, and Ireland, giving the condition of the crops on the 1st of August. Of these, 183 represent the condition of wheat as above average, 83 average, and 7 below average. Last year, of 257 similar reports to the same journal, only 11 were above average, 89 were average, and 157 below. The spring grains of 1874 were inferior to those of the previous year. In Great Britain the prospect of more than half the acreage in barley, oats, and pease was below average and a third, full average.

**FRENCH FARMERS.**—The British Blue Book for 1869 shows that the total number of French agriculturists was 7,333,259, of whom 5,875,945 were land proprietors, and 1,457,314 were landless. Of the proprietors, 56,639 cultivated their own estates, 1,754,934 (small farmers) cultivate their own lands, 1,987,186 cultivate their own land besides laboring on adjoining estates; 648,836 farmers and proprietors; 293,860 metayers and proprietors; 1,134,490 laborers and proprietors. Of the non-proprietors, 386,533 were farming rented land, 201,527 were metayers, farming lands for a share of the produce, 869,254 day laborers. The agricultural land proprietors constitute one-seventh of the entire population, and 80 per cent. of the entire agricultural adult male population.

**AUSTRO-HUNGARIAN CROPS.**—Leading statisticians estimate that of 3,329,800 arpents under cultivation in the Austro-Hungarian Empire, 1,366,000 arpents have yielded crops above average, 1,377,000 arpents full average, and 586,000 arpents below. Hungary has made better crops than the Cis-Leithan provinces.

**ENGLISH GAME-LAWS.**—Statistics laid before a parliamentary commission show that during the past four years in England and Wales the convictions for violations of game-laws have averaged, per annum,



as follows: For minor offenses, punished with fine, 7,000; for offenses punishable with imprisonment for three months or less, 1,500; for offenses punishable with imprisonment for over three and less than six months, 70; for offenses punishable by penal servitude, 10. The severe execution of these laws in many localities has led to the excessive preservation of game destructive of crops.

**CONSCRIPTION OF HORSES.**—*Le journal d'Agriculture pratique* publishes the text of a late law of the French national assembly relative to the conscription of horses. An annual census in each commune, under the authority of the mayor, is to enroll the number of horses and mares six years old and upward, and of mules four years old and upward. A mixed military and civil commission is to inspect these animals, and to select such as are fit for the military service. These are subject to authoritative purchase by the government, at its own discretion. Several exemptions of this right of purchase are specified, such as horses belonging to the chief of state and to some other public functionaries, post-horses, approved stallions, mares with foal or specially adapted to gestation, animals absolutely necessary for army-transportation in time of war, &c. The minister of war fixes the quota to be furnished by each region in such manner as to avoid embarrassment in passing from a state of peace to one of war. The owner of a conscripted animal has the privilege of exemption, provided he can secure a substitute of the same category satisfactory to the commission of *remount*. Horses drawn are classified according to the requirements of different branches of the service, and the prices of each class are fixed by law. Proprietors who refuse or neglect to comply with the requisitions of the law are subject to a variety of penalties for each offense, ranging from 50 francs to 1,000 francs. It is the duty of the owner to deliver conscripted animals to the designated authorities.

**THE GRAIN-TRADE OF EUROPE.**—The railway-system is producing wonderful changes in the production and distribution of crops in the Old World. Königsberg, in Germany, is rapidly becoming a great point for the shipment of Russian and Polish grain and hemp to Western Europe. The extension of the railways is annually adding to the export-trade of that city in spite of the tariff imposed by the Russian government. The grain and hemp brought to this market come mostly from the neighborhood of Orel. A new article of commerce, buckwheat-groats, has lately appeared in this trade, and is largely exported to Holland and Belgium. Russia is completing its lines of transportation from the interior to its own Baltic ports; but Königsberg is but little affected by this competition, as is shown by her annually increasing trade.

**COTTON-LANDS IN CALIFORNIA.**—It is estimated by intelligent parties on the Pacific coast that California embraces over 20,000,000 acres of land suited to cotton-culture, or double the area actually employed in the cotton States of the Atlantic slope and the Mississippi Valley. This land, under proper treatment, may be made to produce from ten to eleven millions of bales of cotton per annum, representing a cash-value of about three-quarters of a billion of dollars. But a small portion of the California cotton-lands have been brought under cultivation.

**BET-SUGAR IN CALIFORNIA.**—The Sacramento beet-sugar factory is reported as under successful operation; the working-up of this year's crop having commenced September 29. The crop of sugar-beets to be worked up amounts to nearly 10,000 tons. The field-gang of 45 men is gathering the crop as rapidly as possible. The factory is worked

night and day by gangs of 45 men each, relieving each other. The sugar produced is said to be superior to any other raw sugar in the market.

**FALSE AGRICULTURAL PHILOSOPHY.**—The partial failure of the wheat-crop for three seasons in England has caused some English farmers to suppose that the land has become "sick" of small-grain culture, and that it needs the rest of a long fallow to recuperate. The Mark Lane Express thinks that the failures of the past three years are largely due to improvident culture, and especially to the lack of fertilization. The fine yield of 1874 is cited as sufficiently explosive of the old idea of "sickness of the land," an agricultural superstition dating back to the commencement of the Christian era. Columella, a Roman writer of the first century, wrote against the croakers of that day, who tormented themselves and the public with this absurd chimera. He charged the failure of crops upon the slothfulness and ignorance of cultivators. It is astonishing how old errors constantly reproduce themselves. In spite of the advance of science and the diffusion of intelligence, men who have opportunities of knowing better surrender themselves to childish delusions, and gravely propound the most fanciful hypotheses to account for facts they do not understand. In the present case, however, the truth lies near the surface. Common sense shows sufficient cause for the late crop-failures in the incompetence or listlessness of farmers themselves. These sharp criticisms find a legitimate application on this side of the Atlantic.

**PRESERVING MANURE.**—The Boston Journal of Chemistry states that the sources of loss in the storage of manure are two: first, the escape of volatile ammonia and other gases; and, secondly, the loss of valuable salts by leaching. The first difficulty may be obviated by covering the excrement with eight or ten inches of good soil or loam, which will absorb all escaping gases. A bushel or so of plaster may be advantageously scattered over the heap before the soil is thrown on. The whole mass should be perfectly covered, leaving no "chimney" for gaseous exudation. The danger of leaching may be avoided by covering the heap with hay or straw sufficiently thick to shed most of the rain. If kept in this way a sufficient time, the manure will undergo spontaneous decomposition, the products of which will be ready for immediate assimilation by plants. The usual process of carting manure to the fields in the autumn to waste, by both the above processes, some of their most valuable constituents.

**PRESERVING GRAPES.**—A French viticulturist has lately published a process by which he has preserved the freshness, beauty, and scent of grapes as late as the month of April. The fruit is left upon the vine up to the last moment, but must be cut, before the first frost, at the second or third joint below the cluster. The cut end is then covered with wax to prevent the escape of vegetable fluids, and then thrust into a bottle of water through a perforated cork. A little charcoal in the water preserves its purity. The cork is then covered with sealing-wax, air-tight, and the bottles placed in a dry room, where the temperature never falls below the freezing-point, and carefully kept in an erect position, the clusters not being allowed to touch each other. Every imperfect grape must be removed as fast as it shows signs of failing.

**ARTIFICIAL FERTILIZATION OF FLOWERS.**—It has been discovered that infertile flowers may be fertilized by touching their pistils with camel's-hair pencils dipped in honey; or, still better, in honey mixed with pollen of a fertile flower. In the botanical gardens of Vienna, a

*Hibiscus Mexicanus* under this treatment yielded a large quantity of good seeds. Several fruit-trees yielded fruit from blossoms to which this application had been made, while others, not subjected to this process, entirely failed. It is supposed that the honey merely retains the pollen-grains that fall upon it from the stamens, and secures their communication with the germinal organs.

**THE HOP-CROP IN EUROPE.**—From the Mark Lane Express of September 14, the following concerning the hop-crop is taken :

The crop of 1874 cannot be so large as merchants and factors would wish the world to believe. Under no circumstances can the amount exceed 272,000 cwt., or 400 per acre, on the excessive acreage of 68,000 acres, equal to an old duty of £136,000. It is simply absurd to think of any higher figures, for there are thousands of acres in Sussex, Mid and West Kent, Hereford, and Worcester that will yield nothing; thousands of acres will not yield more than from 1 cwt. to 1½ cwt. per acre, and thousands that cannot produce 3 per acre. Let it be assumed that there are 29,000 acres in East and Mid Kent, Surrey, and Hants that will give an average of 7 cwt. per acre, or about an average yield; this would make 140,000 cwt. Then put 28,000 acres in Kent, Hants, and Surrey, at 3 cwt. per acre all round, required to make the total equal to 272,000 cwt.

The best proof that the crop will be short, not more than half an average, is that prices are hardening daily, and range from £10 10s. to £13, according to sort and quality. After careful examination of the continental prospects, it seems to be certain that really good hops cannot be imported here and sold under £13 to £15 per cwt.

## MARKET PRICES OF FARM-PRODUCTS.

The following quotations represent the state of the market, as nearly as practicable, at the beginning of the month:

Articles.	Prices.	Articles.	Prices.
NEW YORK.		NEW YORK—Continued.	
Flour, superfine.....per bbl.	\$4 40 to \$4 80	Sugar, fair to good, refining per lb	80 8½ to 80 8½
extra State.....do...	5 00 to 5 75	prime, refining.....do...	8½ to —
superfine western.....do...	4 40 to 4 80	Tobacco, lugs.....do...	10 to 12½
extra to choice western,		common to medium	
per barrel.....do...	4 90 to 9 00	leaf.....per lb.	12½ to 15½
common to fair southern		Wool, American XXX and pick-	
extra.....do.....per bbl.	5 10 to 6 00	lock.....per lb.	58 to 68
good to choice south-		American X and XX, per	
ern.....do.....per bbl.	6 05 to 8 75	pound.....do...	47 to 57½
Wheat, No. 1 spring...per bush.	1 21 to 1 27	American, combing per lb.	55 to 62
No. 2 spring.....do...	1 11½ to 1 20	pulled.....do...	38 to 50
winter, red, western,		California spring clip, per	
per bushel.....do...	1 21 to 1 27	pound.....do...	25 to 36
winter, amber, western,		California fall clip .per lb.	26 to 28
per bushel.....do...	1 21 to 1 27		
winter, white, western,		PHILADELPHIA.	
per bushel.....do...	1 30 to 1 42	Flour, superfine.....per bbl.	3 25 to 3 75
Rye.....do.....per bush.	90 to 95	Pa. extra.....do...	4 25 to —
Barley.....do.....do...	1 25 to —	Pa. family and fancy do...	5 75 to —
Corn.....do.....do...	96 to 1 00	western, extra.....do...	6 00 to 6 75
Oats.....do.....do...	60 to 65	western family and	
Hay, first quality.....per ton.	16 00 to 21 00	fancy.....per bbl.	7 00 to 8 50
second quality.....do...	12 00 to 13 00	Wheat, winter, red....per bush.	1 18 to 1 25
Beef, mess.....per bbl.	12 50 to 13 50	winter, amber.....do...	1 23 to 1 28
extra mess.....do...	14 00 to 15 00	winter, white.....do...	1 25 to 1 45
Pork, mess.....do...	22 65 to 22 75	spring.....do...	— to —
extra prime.....do...	— to —	Rye.....do.....do...	1 00 to 1 05
prime mess.....do...	— to —	Barley.....do.....do...	1 30 to —
Lard.....do.....per lb.	14 to —	Corn.....do.....do...	96 to 1 06
Butter, western.....do...	25 to 38	Oats.....do.....do...	61 to 67
State dairy.....do...	30 to 40	Hay, fresh baled.....per ton.	21 00 to 23 00
Cheese, State factory.....do...	13 to 15	common to fair shipping,	
western factory.....do...	11½ to 14½	per ton.....do...	19 00 to 20 00
Cotton, ordinary to good ordi-		Beef, western mess.....per bbl.	8 00 to 10 00
nary.....per lb.	13½ to 15½	extra mess.....do...	9 00 to 12 00
low middling to good		Wartman's city family,	
middling.....per lb.	15½ to 17½	per barrel.....do...	17 00 to —

## Market-prices of farm-products—Continued.

Articles.	Prices.	Articles.	Prices.
PHILADELPHIA—Continued.		CINCINNATI—Continued.	
Pork, mess .....	per bbl. \$24 25 to \$24 50	Tobacco, lugs .....	per lb. \$0 12 to \$0 25
prime mess .....	do. 23 00 to —	leaf .....	do. 15 to 37½
prime .....	do. 22 00 to —	Cotton, ordinary to good ordi-	
Lard .....	per lb. 14½ to 19	nary .....	per lb. 12½ to 13½
Butter, choice Middle State,		low middling to good	
per pound .....	35 to 40	middling .....	per lb. 14½ to 16
choice western .....	per lb. 2½ to 33	Wool, fleece-washed .....	do. 43 to 47
Cheese, N. Y. factory .....	do. 14 to 14½	tub-washed .....	do. 50 to 52
Ohio factory .....	do. 13 to 14	unwashed, clothing .....	do. 32 to 34
Sugar, fair to good refining .....	do. 8½ to 8½	unwashed, combing .....	do. 35 to 39
Cotton, ordinary to good ordi-		pulled .....	do. 35 to 38
nary .....	per lb. 13 to 15½		
low middling to good		CHICAGO.	
middling .....	per lb. 15½ to 18½	Flour, white winter, fair to good,	
Wool, Ohio X and XX .....	do. 54 to 55	per barrel .....	6 00 to 6 50
Ohio combing .....	do. 60 to 65	choice .....	per bbl. 7 00 to 7 25
pulled .....	do. 42 to 47	red winter .....	do. 5 50 to 6 00
unwashed, clothing and		medium to fancy spring	
combing .....	per lb. 41 to —	extras, per barrel .....	4 62½ to 5 50
		spring superfine .....	per bbl. 3 50 to 4 25
BALTIMORE.		Wheat, No. 1 spring .....	per bush. 98 to 99
Flour, superfine .....	per bbl. 4 00 to 4 50	No. 2 spring .....	do. 98 to 99
extra .....	do. 4 75 to 7 00	No. 3 spring .....	do. 85 to 90
family and fancy .....	do. 7 25 to 8 75	Corn, No. 2 .....	do. 81 to 83
White wheat .....	per bush. 1 18 to 1 28	Oats, No. 2 .....	do. 49 to 53
Wheat, amber .....	do. 1 30 to 1 38	Barley, No. 2 .....	per bush. 1 00 to 1 15
red .....	do. 1 06 to 1 30	Rye, No. 2 .....	do. 89 to 90
Rye .....	do. 98 to 1 03	Hay, timothy .....	per ton. 14 50 to 16 50
Corn, white southern .....	do. 1 00 to 1 03	prairie .....	do. 11 00 to 12 50
yellow southern .....	do. 1 00 to 1 03	Beef, mess .....	per bbl. 9 50 to —
Oats, southern .....	do. 62 to 65	extra mess .....	do. 10 50 to —
western .....	do. 63 to 64	Pork, mess .....	do. 21 75 to 22 00
Hay, Pennsylvania .....	per ton. 18 00 to 20 00	prime mess .....	do. — to —
Maryland .....	do. 18 00 to 21 00	extra prime .....	do. — to —
Beef, Baltimore mess .....	per bbl. — to —	Lard .....	per lb. 14½ to 14½
extra .....	do. — to —	Butter, choice to fancy .....	do. 30 to 35
Pork, mess .....	do. 24 00 to —	medium to good .....	do. 23 to 27
Lard .....	per lb. 15½ to 16	Cheese, N. Y. factory .....	do. 13½ to 14½
Butter, western .....	do. 24 to 35	Ohio and western fac-	
eastern .....	do. 26 to 45	tory .....	per lb. 12½ to 13½
Cheese, eastern cutting .....	do. 15½ to 16½	Sugar, N. O., prime to choice .....	do. — to —
western cutting .....	do. 14 to 15½	N. O., common to fair .....	do. — to —
Sugar, fair to good refining .....	do. 8½ to 8½	Wool, tub-washed .....	do. 45 to 57
Tobacco, lugs .....	do. 6 to 9½	fleece-washed .....	do. 40 to 50
common to medium leaf,		unwashed .....	do. 27 to 35
per pound .....	8½ to 11	pulled .....	do. — to —
Cotton, ordinary to good ordi-			
nary .....	per lb. — to 11	SAINT LOUIS.	
low middling to mid-		Flour, spring .....	per bbl. 3 00 to 4 50
dling .....	per lb. 14½ to 15	winter .....	do. 3 00 to 8 00
Wool, fleece-washed .....	do. — to —	Wheat, red winter .....	per bush. 1 00 to 1 16
tub-washed .....	do. — to —	white winter .....	do. 1 00 to 1 20
unwashed .....	do. — to —	spring .....	do. 80 to 90
pulled .....	do. — to —	Corn .....	do. 80 to 90
		Rye .....	do. 90 to 95
CINCINNATI.		Oats .....	do. 50 to 54
Flour, superfine .....	per bbl. 4 00 to 4 35	Barley .....	do. 95 to 1 20
extra .....	do. 5 00 to 5 15	Hay, timothy .....	per ton. 17 00 to 20 00
family and fancy .....	do. 5 15 to 6 25	Beef, prime mess .....	per bbl. — to —
Wheat, red winter .....	per bushel. 1 00 to 1 06	mess .....	do. 14 00 to 15 00
hill winter .....	do. 1 08 to 1 12	Lard .....	per lb. 12 to 15
white winter .....	do. 1 08 to 1 15	Butter, choice .....	do. 30 to 35
Rye .....	do. 98 to 1 00	inferior grades .....	do. 20 to 25
Barley .....	do. 1 30 to 1 45	Cheese, Ohio and N. W. factory,	
Corn .....	do. 84 to 85	per pound .....	13½ to 14
Oats .....	do. 56 to 58	N. Y. factory .....	per lb. 13 to 13½
Hay, baled, No. 1 .....	per ton. 20 00 to 23 00	Sugar, N. O., common to fair, per	
lower grades .....	do. 15 00 to 19 00	pound .....	— to —
Beef, plate .....	per bbl. 14 50 to 15 00	N. O., prime to choice, per	
Pork, mess .....	do. 26 00 to 26 50	pound .....	— to —
Lard .....	per lb. — to —	Cotton, ordinary to good ordi-	
Butter, choice .....	do. 33 to 35	nary .....	per lb. 12 to 13½
prime .....	do. 28 to 32	low middling to good	
Cheese, factory .....	per lb. 14½ to 15½	middling .....	per lb. 15 to 15½
prime apple .....	do. — to —	Wool, tub-washed .....	do. 50 to 53
Sugar, N. O., fair to good .....	do. — to —	unwashed combing .....	do. 27 to 33
prime to choice .....	do. — to —	fleece-washed .....	do. 32 to 45

## Market-prices of farm products—Continued.

Articles.	Prices.	Articles.	Prices.
NEW ORLEANS.		NEW ORLEANS—Continued.	
Flour, superfine..... per bb	\$4 00 to —	Cotton, low middling to good	\$14½ to \$15½
extra..... do.....	4 25 to \$6 50	middling..... per lb.	
choice to fancy..... do.....	6 62½ to 7 00	Wool, lake..... do.....	34½ to —
Corn, white..... per bush.	95 to 1 00	SAN FRANCISCO.	
yellow..... do.....	97 to 98	Flour, superfine..... per bbl	4 00 to 4 35
Oats..... do.....	64 to 65	extra..... do.....	4 50 to 4 62½
Hay, choice..... per ton.	25 00 to 26 50	family and fancy..... do.....	4 75 to —
prime..... do.....	24 00 to 25 00	Wheat, California..... per cental.	1 40 to 1 50
Beef, Texas..... per bbl.	— to —	Oregon..... do.....	1 40 to 1 50
Fulton market..... per ¼ bbl.	11 00 to 11 50	Barley..... do.....	1 05 to 1 25
western..... per bbl.	— to —	Oats..... do.....	1 45 to 1 65
Pork, mess..... do.....	24 00 to 24 50	Corn, yellow..... do.....	1 55 to 1 60
Lard..... per lb.	16 to 17½	white..... do.....	1 55 to 1 60
Butter, choice Gosben..... do.....	— to 42	Hay, State..... per ton.	8 00 to 14 00
western..... do.....	25 to 35	Beef, mess..... per bbl.	8 50 to 10 00
Cheese, choice western factory,		family mess..... per ¼ bbl.	6 50 to 8 00
per pound.....	15½ to 16	Pork, mess..... per bbl.	22 00 to 24 00
N. Y. cream..... per lb.	18 to —	prime mess..... do.....	17 50 to 18 50
Sugar, fair to fully fair..... do.....	— to —	Lard..... per lb.	15 to 16
prime to strictly prime,		Butter, overland..... do.....	20 to 25
per pound.....	10½ to 10¾	California..... do.....	25 to 50
clarified, white, and yellow		Oregon..... do.....	18 to 25
do..... per lb.	10½ to 10¾	Cheese..... do.....	12½ to 16
Tobacco, lugs..... do.....	8½ to 10½	Wool, native..... do.....	17 to 22
low leaf to medium leaf,		California..... do.....	25 to 30
per pound.....	10½ to 13	Oregon..... do.....	25 to 30
Cotton, ordinary to good ordinary,			
per pound.....	11½ to 13½		

## LIVE-STOCK MARKETS.

NEW YORK.	CHICAGO—Continued.		
Cattle, extra heeves... per cental.	\$12 75 to \$13 00	Cattle, choice heeves, 3 to 5 years	\$5 75 to \$6 00
good to prime..... do.....	— to —	old, 1,250 to 1,950 pounds,	
common to fair..... do.....	8 50 to —	per cental.....	4 25 to 5 25
milk-cows..... per head.	50 00 to 85 00	good heeves, 1,200 to 1,300	4 25 to 5 25
calves..... per cental.	4 00 to 7 00	pounds..... per cental	
Sheep, good to extra..... do.....	4 50 to 6 25	medium grades, 1,150 to	3 75 to 4 25
Swine, common to fair..... do.....	6 00 to 6 75	1,300 pounds, per cental.	
PHILADELPHIA.		lower grade natives, per	2 50 to 3 50
Cattle, heeves..... per cental.	3 25 to 7 50	cental.....	
Sheep..... do.....	4 00 to 6 00	Texans, choice corn-fed,	4 25 to 4 75
Swine..... do.....	11 00 to 11 50	per cental.....	
BALTIMORE.		Texans, north - wintered,	2 00 to 3 75
Cattle, best heeves... per cental.	5 00 to 6 25	per cental.....	
first quality..... do.....	4 00 to 5 00	Texans, through-droves,	1 75 to 3 75
medium..... do.....	3 50 to 4 00	per cental.....	
ordinary..... do.....	3 00 to 3 50	Sheep, poor to medium, per	2 25 to 3 50
general average..... do.....	— to —	cental.....	
most of the sales between.....		good to choice, per cental.	3 75 to 4 50
per cental.....	4 00 to 5 00	Swine, good to extra..... do.....	
Sheep..... do.....	2 30 to 5 25	inferior to medium, do.....	5 00 to 6 50
Swine, corn-fed..... do.....	8 00 to 10 50	SAINT LOUIS.	
CINCINNATI.		Cattle, choice native steers, 1,300	5 00 to 5 75
Cattle, good to prime butchers'		to 1,600 pounds, per cental.	
steers..... per cental.	4 50 to 6 00	prime second-class, 1,150 to	3 00 to 5 00
common to good, medium,		1,400 pounds..... per cental.	
per cental.....	2 00 to 4 25	good third grade, 1,050 to	2 00 to 3 50
milk-cows..... per head.	— to —	1,300 pounds..... per cental	
Sheep, common..... per cental.	3 00 to —	fair butchers', 1,000 to	— to —
good to prime, butchers',		1,200 pounds, per cental	
per cental.....	4 50 to —	inferior native grades, per	— to —
Swine, shipping grades, per cental		cental.....	
good to prime, butchers',		Texans and Cherokees,	2 50 to 4 50
per cental.....	5 40 to 6 00	corn-fattened, per cental.	
CHICAGO.		inferior..... do.....	1 75 to 2 00
Cattle, extra-graded steers, 1,400		Sheep..... do.....	
to 1,500 pounds, per cental.	6 40 to 6 70	Swine..... do.....	2 25 to 4 25
		do.....	4 50 to 7 25
		Horses, plug..... per head.	40 00 to 75 00
		street-car horses..... do.....	75 00 to 125 00
		good work-animals..... do.....	50 00 to 110 00
		driving-animals..... do.....	100 00 to 150 00
		heavy draught..... do.....	130 00 to 170 00

## Live-stock markets—Continued.

Articles.	Price.	Articles.	Price.
SAINT LOUIS—Continued.		NEW ORLEANS—Continued.	
Mules, 14 to 15 hands high, per head.....	\$75 00 to \$120 00	Cattle, first quality.....per head.	\$30 00 to \$35 00
15 to 16 hands high, per head.....	120 00 to 165 00	second quality.....do.....	20 00 to 25 00
extra.....per head.	175 00 to 200 00	western beeves.....per cental.	— — to — —
NEW ORLEANS.		milch-cows.....per head.	35 00 to 100 00
Cattle, Texas beeves, choice, per head.....	— — to 40 00	calves.....do.....	7 00 to 9 00
		Sheep, first quality.....do.....	4 00 to 5 00
		second quality.....do.....	3 00 to 4 00
		Swine.....per cental.	5 00 to 10 00

## FOREIGN MARKETS.

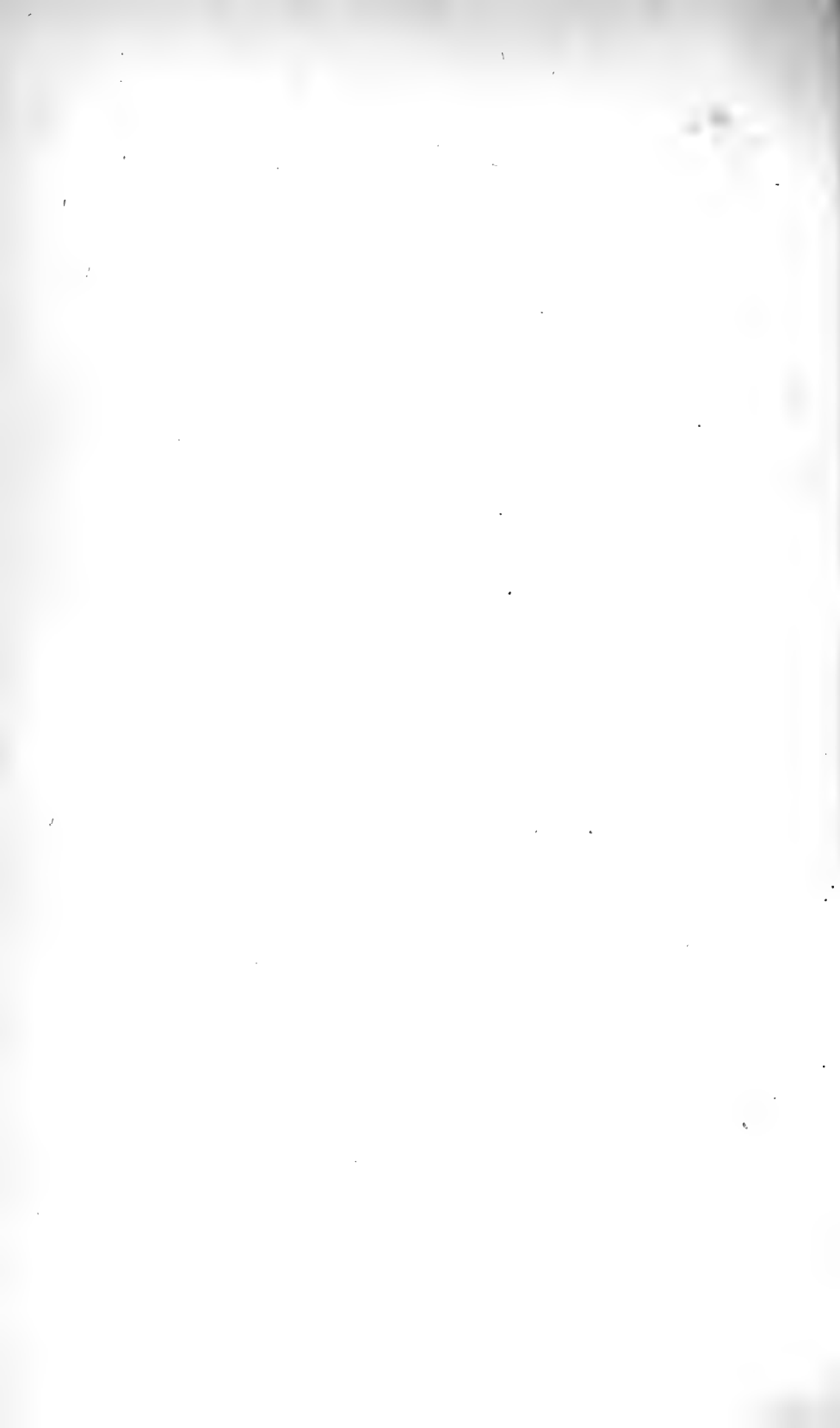
WHEAT.—The latter part of September was very mild in the British Islands, with very serviceable, light rains, facilitating the breaking up of the ground, somewhat parched by previous dry weather. The rain at many points was injurious to potatoes, thus throwing a heavier task of feeding the population upon the cereals, especially the lower descriptions of wheat. Nothing is visible in the wheat-trade to bring speculators upon the market. Small farmers, being somewhat pinched, are freely giving out their boards, causing the millers to think that they hold the mastery of the situation. Prices during the third week of September fell off 1 shilling per quarter. Foreign wheat is also in full supply. In France prices had given way, but with indications of diminished supplies. The west, center, and north of France are more affected than the south, where an effort seems to have been made to maintain previous high prices. Of 114 French interior markets, 14 advanced and 1 showed a tendency in this direction, 13 were firm, 33 were without variation, 8 were calm, 44 declined, and 1 showed a downward indication. Inferior grains remained generally firm. But little change is noted in Belgium, Holland, and Germany, while at Odessa it was hoped that the fineness of the grain would eventually secure better than the ruling prices. At Algiers a dead calm prevailed in the wheat-market.

The sales of English wheat during the third week of September were 72,254 quarters, at 46s. 8d. per quarter, against 62,693 quarters, averaging 64s. 7d., during the corresponding week of 1873. The London averages were 47s. 6d. on 4,849 quarters. The imports into the United Kingdom during the week ending September 19, were 859,156 cwts. In Mark Lane, Essex, and Kent, new white brought 45s. to 50s. per quarter; ditto, red, 42s. to 46s.; Norfolk, Lincolnshire, and Yorkshire, 42s. to 46s. Of foreign wheats, Dantzic mixed ranged from 52s. to 61s.; Königsberg, 48s. to 60s.; Rostock, old, 49s. to 50s.; Silesian, red, 49s. to 53s.; Pomeranian, Mecklenberg, and Uckermark, red, 48s. to 50s.; Ghirka, 42s. to 43s.; Russian, hard, 43s. to 46s.; Saxonska, 47s. to 48s.; Danish and Holstein, red, 49s. to 51s.; American, red, 46s. to 48s.; Chilian, white, 50s.; Californian, 51s.; Australian, 51s. to 45s. In Liverpool, Canadian white brought 9s. 9d. to 10s. 3d. per cental; American red winter, 8s. 10d. to 9s. 6d.; spring, No. 1, 9s. 4d. to 9s. 8d.; spring, No. 2, 8s. 6d. to 9s.; Bombay, 8s. 9d. to 10s. 3d.; Kurrachee, 9s. 3d. to 9s. 6d.; Egyptian, 8s. to 9s. 6d.; Californian, 10s. 1d. to 11s.; Oregon, 10s. to 11s.; Chilian, 9s. 3d. to 9s. 6d.; Australian, 10s. 10d. to 11s.

In Paris wheat averaged 43s. to 50s. per quarter. At Marseilles prices ranged from 42s. 6*d.* to 47s. 6*d.* for Egyptian and other Oriental wheats. At Antwerp fine American red winter maintained its position at 49s. At Rotterdam the quotations varied between 48s. 6*d.* and 53s.

**FLOUR.**—The imports into the United Kingdom during the week ending September 19 were 114,858 cwt. The influx of foreign flour, mostly in barrels, was not large. The latter, though with limited demand, maintained its prices. The Paris trade showed signs of weakness, prices giving way one shilling per quarter. In Mark Lane the best English town households brought 38s. to 47s. per 280 pounds; best country households, 35s. to 36s.; Norfolk and Suffolk, 30s. to 33s.; American, per barrel, 24s. to 25s.; extra and double extra, 25s. to 26s. At Liverpool English and Irish superfines brought 35s. to 39s. per 280 pounds; ditto, extra, 40s. to 45s.; French, 37s. to 50s.; Trieste, 55s. to 62s.; Spanish, 41s. 3*d.* to 43s.; Chilian, 33s. 6*d.* to 36s. 6*d.*; Californian, 38s. to 40s.; American western and extra State, per barrel, 23s. to 25s.; Baltimore and Philadelphia, 22s. 6*d.* to 26s.; Ohio and extra, 23s. to 26s.; Canadian, 22s. to 27s. In Paris prices for consumption ranged from 35s. 3*d.* to 37s. 11*d.* per 280 pounds.

**MAIZE.**—At the close of the third week in September there was a light supply in London and an upward tendency of prices. White was quoted at 38s. to 48s., yellow at 34s. to 37s., per quarter. In Liverpool American ranged from 37s. to 42s. per 480 pounds; Galatz, 39s. 3*d.* to 39s. 6*d.*





MONTHLY REPORT

OF THE

DEPARTMENT OF AGRICULTURE

FOR

NOVEMBER AND DECEMBER, 1874.



WASHINGTON:  
GOVERNMENT PRINTING OFFICE.  
1874.

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# MONTHLY REPORT.

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DEPARTMENT OF AGRICULTURE,  
*Statistical Division; December 16, 1874.*

SIR: I report herewith, for publication, the digest of returns of production of corn, cotton, tobacco, hay, and other crops in comparison with the quantities produced in 1873, with various extracts from correspondence, regular and special; also a communication relative to international statistics of agriculture from the Austrian minister of agriculture; a letter from the United States consul at Tampico upon the agriculture of Tuspan, in Mexico; a translation and condensation of reports of foreign co-operative farming; and the usual work of the departmental divisions, and minor facts mainly from official sources.

J. R. DODGE,  
*Statistician.*

Hon. FREDK. WATTS,  
*Commissioner.*

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## DIGEST OF CROP RETURNS.

### CORN.

There has been an increase in area of corn the present season, but a decrease of aggregate product. The enlargement of breadth planted was confined to the Gulf coast and the region north of the Ohio and west of the Mississippi.

The early reports of condition were quite favorable in Pennsylvania and Maryland, South Carolina and Georgia, Texas, and in most of the Western States. Cold storms on the Northern Atlantic coast caused late planting and unthrifty appearance. Inundations, soaking rains, and consequent replantings gave an unpromising start to corn from Alabama to Arkansas. Cut-worms were quite injurious in the West. Chinch-bugs, after devastating wheat-fields, attacked corn vigorously in many localities; and not content with the abundance of this great American cereal, are reported in some instances as addicted to a potato-diet, and even to tobacco-chewing. As the season advanced, returns were less favorable. The night-temperature was too low, as far south as Pennsylvania, for the best growth. Drought reduced condition in Maryland and Virginia, in the Gulf States west of Georgia, and in the Mississippi and Ohio Valleys generally. West of the Mississippi, the crop encountered disasters of great severity from drought, drying winds, and chinch-bugs. In October, there appeared only a slight improvement in condition upon the previous months. The absence of injurious frosts up to the first of November was very favorable, and served to mitigate the severity of the anticipated reduction in yield and value. Kansas, Nebraska, and Missouri, in addition to the above-mentioned

causes of injury, were terribly afflicted with the scourge of grasshoppers.

The quality of corn is at least an average in all of the Eastern States except Maine and Massachusetts; in all the Middle States except Delaware; in the Carolinas, Georgia, and Texas; and in all the Western States except in Kentucky, Illinois, Missouri, Kansas, and Nebraska.

The yield is less than last year on the Atlantic coast as far south as Virginia, except in portions of New England; larger from North Carolina to Florida, and in Mississippi and Texas, and in Ohio and Iowa; the reduction in other Western States ranges from  $\frac{1}{4}$  to 57 per cent. The apparent reduction (which may be slightly modified in the final estimate) is about 120,000,000 bushels; the aggregate of local estimates exceeding but slightly 800,000,000 bushels. As the crop of last year was not an average one, the present product is not more than four-fifths of the yield of a good corn-year.

The following extracts from remarks of correspondents in returns of estimates are presented:

MAINE.—*York*: Reduced by cold, wet, and frost. *Waldo*: Below average; season unfavorable. *Piscataquis*: Poor start and did not ripen well. *Oxford*: Planted late; season cold. *Cumberland*: Wet spring and cool June nights kept it back.

NEW HAMPSHIRE.—*Sullivan*: Well ripened by the warm September. *Cheshire*: Injured by long drought. *Hillsborough*: Sound and good. *Carroll*: Injured by the wet spring.

VERMONT.—*Orleans*: Ripened well. *Addison*: Season cold and wet.

MASSACHUSETTS.—*Burkshire*: Fine ripening season.

RHODE ISLAND.—*Washington*: Fall fine for ripening corn.

CONNECTICUT.—*New London*: Better filled ears than last year. *Litchfield*: Fine ripening season.

NEW YORK.—*Allegany*: Never better; no soft corn; no serious frost till October 15. *Richmond*: Shortened by drought. *Montgomery*: Fine ripening and harvesting season. *Columbia*: Ripened well. *Seneca*: Growth retarded by late spring; but the fall has been remarkably favorable. *Fulton*: Fair on uplands; lowlands too wet in the spring. *Broome*: Fine harvest-weather. *Wayne*: Generally poor. *Warren*: Fine ripening season. *Sullivan*: Large and fine crop. *Genesee*: Fine ripening weather. *Wyoming*: Remarkably fine ripening weather; frosts kept off late.

NEW JERSEY.—*Camden*: No killing frost before October 15. *Morris*: Good ripening weather. *Warren*: Large yield and good quality.

PENNSYLVANIA.—*Lancaster*: Heavy growth till earing-time, when it was shortened by drought. *Butler*: Fine harvest-weather. *Westmoreland*: Well matured. *Montgomery*: Well matured; ears large and good. *Fayette*: Good. *Bedford*: Excellent and well matured. *Franklin*: Affected by drought in some places. *Cambria*: Well matured; first frost October 13. *Bucks*: Variable, but generally better than last year. *Lawrence*: Good. *Dauphin*: Short, but good. *Beaver*: Not well filled; much soft corn. *Armstrong*: Fine ripening season; no frost till October 14. *Lycoming*: Bottom crops large; uplands shortened by drought. *Clinton*: The fine closing season made a tolerable crop, which was well secured. *Clearfield*: Fine ripening season. *Washington*: Shortened by drought, but of fine quality. *Susquehanna*: First frost October 3. *Perry*: Cribbed too green.

DELAWARE.—*Kent*: The earliest and the latest crops the best.

MARYLAND.—*Prince George*: Short and inferior. *Wicomico*: Average on lowlands; excellent on uplands. *Washington*: No frost till October 15. *Queen Anne's*: Small crop but well matured. *Howard*: Shortened by drought, especially on dry uplands. *Baltimore*: Too well cultivated to be severely injured by drought. *Caroline*: Good in spite of the long summer-drought. *Montgomery*: Drought.

VIRGINIA.—*Princess Anne*: Lighter yield than was promised in September; fodder abundant. *Pulaski*: Matured well; no frost till October 13. *Mecklenburgh*: Shorter than last year, but of better quality. *King George*: Excellent quality. *Greenville*: Good harvest-season. *Highland*: Best crop for several years, though late in maturing. *Augusta*: Much soft corn. *Nelson*: First frost October 15. *Page*: Good on bottoms. *Henrico*: Fine; late plantings were injured by early drought, but brought out by later rains. *Southampton*: Short, but of good quality. *Roanoke*: Shortened by drought. *Gloucester*: Injurious insects. *Clarke*: Some good crops in the northwest, but a failure in the southwest. *Bedford*: Bottom-crops injured by floods. *Richmond*: Matured very slowly. *Westmoreland*: Injured by bud-worms from May till August. *Prince Edward*: Good on flat land and fair on upland; ready for gathering. *Mathews*:

Unusually fine; but for the bud-worm the yield would have doubled last year's. *Essex*: Season late but propitious; best crop for seven years. *Accomack*: Upper section of the county has doubled last year's yield; the rest shows a fair crop. *Orange*: Yield good in spite of the chinch. *Pittsylvania*: Late corn did not suffer so much from the summer-drought. *Madison*: Grain sound. *Craig*: Good. *Buchanan*: Injured by early drought. *Fluvanna*: Fair. *Middlesex*: Turning out well. *Spottsylvania*: Turning out well. *Rappahannock*: Shortened by drought.

**NORTH CAROLINA.**—*Caldwell*: Two weeks later than last year, and hence not so firm or well matured. *Rowan*: Excellent in grain, and turns out better than was expected. *Randolph*: A very fine crop cut down below average by chinch and floods on bottomlands. *Franklin*: Far above average where well cultivated. *Wilkes*: In the west of the county, the crop is better than for thirty-five years; eastern upland-crops were injured by drought, but bottom-crops were fine. *Haywood*: Not very well filled and somewhat loose on the cob. *Burke*: Early drought followed by excessive rains and early fall-frosts injured the crop greatly. *Person*: Damaged by drought. *Camden*: Fine gathering season. *Wayne*: Larger acreage than last year and equally fine quality. *Gaston*: Short, but of good quality. *Gaston*: Fair on lowlands; variable on uplands. *Lincoln*: Long drought. *McDowell*: Better than for years. *Robeson*: Turning out well. *Beaufort*: Crop larger and better than last year.

**SOUTH CAROLINA.**—*Union*: Unusually fine season; acreage increased 25 per cent. *Newberry*: Quality improved by late favorable weather. *Marlborough*: Has done well except on flooded lowlands. *Georgetown*: Damaged by storms and rains. *Chesterfield*: Injured by freshets. *Colleton*: Very fine. *Lexington*: Best crop for years. *Fairfield*: Upland-crops greatly improved; lowlands overflowed.

**GEORGIA.**—*Macon*: Increased yield due to increased acreage. *Madison*: Acreage greatly increased. *Hancock*: Best crop since the war. *Sumter*: Yield satisfactory. *Gwinnett*: Best crop for years. *Wayne*: Great ravages by insects. *Wilkes*: Improved upon last year. *Lee*: Very fine. *Carroll*: Heaviest crop for years. *Dawson*: Gathers better than was expected. *Columbia*: Fine crop. *Dougherty*: Best since 1865. *Bullock*: Yield larger than last year, but quality not so good. *Catoosa*: Cut off half by drought.

**FLORIDA.**—*Orange*: Shortened by drought.

**ALABAMA.**—*Covington*: Drought; light grain. *Concuh*: Drought caused corn to run to shock. *Calhoun*: Drought severe, especially on late corn. *Lawrence*: Short. *Colbert*: Inferior quality and one-half short; selling at \$1 per bushel. *Butler*: Late plantings injured by drought. *Mobile*: Late plantings short. *Shelby*: Decreased yield. *Lauderdale*: Shortened by drought.

**MISSISSIPPI.**—*Amite*: Quality superior. *Holmes*: Drought made the crop short, light and chaffy. *Lee*: Half-crop; acreage increased 20 per cent. *Wilkinson*: The weevil, so damaging for five years past, was but little felt this year; Runner's corn, from the Department, made a very heavy crop. *Grenada*: Very short. *Franklin*: Late plantings largely failed.

**LOUISIANA.**—*Franklin*: Drought and rot. *Rapides*: Improved 75 per cent. on last year both in quantity and quality. *Tensas*: A failure. *Saint Mary's*: Shortened one-half, but of good quality; late corn amounts to nothing. *Madison*: Drought. *East Baton Rouge*: Season unfavorable for late corn. *Richland*: Chaffy and light.

**TEXAS.**—*Matagorda*: Very poor. *Red River*: Drought and chinch-bugs injured the crop very badly. *Harrison*: Light and chaffy. *Burnet*: Fine quality. *Austin*: Light. *Hamilton*: Yellow corn more generally planted than the white, as it is supposed to stand the drought better; white corn from the Department yielded well and ripened ten days earlier than any other variety. *Fayette*: Excellent. *Smith*: Sounder than last year and supplemented by a heavy mast. *Lampasas*: Drought injured the crop, but the yield and quality are 20 per cent. better than last year. *Shelby*: Late crop damaged by drought. *Anderson*: Unpropitious season throughout. *De Witt*: Injured by drought and rains, but the improved quality will compensate for the short yield. *Goliad*: Injured by September rains.

**ARKANSAS.**—*Scott*: Drought. *Washington*: Badly injured by drought and chinch. *Dorsey*: Short and inferior; unfit for bread, and not very good for stock, being badly smutted. *Independence*: Corn has not been so scarce since the war; one-fourth of the people will be without feed for their work-animals. *Fulton*: Worm-eaten and light. *Prairie*: Very light; ground not wet 4 inches since April. *Howard*: Shortened by drought. *Arkansas*: Improved by September rains. *Izard*: Short but better cultivated than usual. *Columbia*: Smutty and poor. *Franklin*: Average on Arkansas River bottoms, but light on uplands. *Baxter*: Almost ruined by chinch and drought.

**TENNESSEE.**—*Obion*: Quality good. *Union*: Drought. *Dickson*: Drought. *Henry*: Drought. *Lauderdale*: Light and worm-eaten. *Wilson*: Very light. *Sullivan*: Crop larger and better than previously estimated. *Bradley*: Early corn inferior; that planted in May is good. *Blount*: Short. *Rhea*: Not so sound as usual. *Washington*: Injurious frosts. *Sevier*: Largest crop ever raised; season remarkably fine. *Monroe*: Light; late-planted somewhat injured by frost. *Gibson*: Almost a failure. *Hardin*:

Drought. *James*: Drought. *Sumner*: But little merchantable corn produced. *Squat-chie*: Escaped the drought by being generally late planted. *Knox*: Short and poor. *Bedford*: Cut down one-half by drought. *Greene*: Late. *Lawrence*: Improved quality. *Lincoln*: Drought.

WEST VIRGINIA.—*Wayne*: Damaged by October frosts. *Tyler*: Increased acreage. *Grant*: Drought, bugs, and frost. *Ritchie*: No rain for four weeks. *Marion*: Dry weather matured the corn well. *Mercer*: Late rains brought up the corn surprisingly, but much of it was late. *Kanawha*: Good on rich land well worked; a great deal of poor corn. *Jefferson*: Drought. *Hancock*: Unusually fine ripening season. *Harrison*: Average quantity and very good quality. *Hardy*: Very bad corn-season. *Gilmer*: Drought. *Doddridge*: Drought. *Brooke*: Large proportion of nubbins husked out. *Boone*: Drought and frost. *Monongalia*: Dry October ripened the corn well.

KENTUCKY.—*Franklin*: Drought. *Lewis*: Old corn brings 70 cents; new corn, 60 cents per bushel. *Marion*: Late corn much injured by an early freeze. *Simpson*: Cut down half by drought. *Scott*: Drought. *Owsley*: Drought. *Ohio*: Drought and frost. *Nicholas*: Drought. *Mason*: Light, chaffy, and loose on the cob. *Lincoln*: Slightly frosted. *Laurel*: Cut down below average by frost. *Jessamine*: One-fourth of last year's crop; drought. *Harrison*: Early plantings well cultivated are above average; late plantings immature. *Hart*: Injured by early frost. *Gallatin*: Late and inferior. *Daviess*: Late plantings injured by drought and frost. *Bracken*: Poorly-filled ears. *Boyle*: Greatly improved by September rains; frost kept off late. *Adair*: A little frosted. *Russell*: Frosted. *Livingston*: Considerably frosted.

OHIO.—*Pike*: Drought. *Vinton*: Drought. *Brown*: Well filled and heavy eared. *Butler*: But little rain since July 27. *Champaign*: Drought at earing-time; driest season for years. *Coshocton*: Ripened well before frost. *Hancock*: Largest crop ever grown here. *Huron*: Grain very dry and sound. *Licking*: Very sound. *Lawrence*: Better than for three years. *Lorain*: Fine condition. *Lucas*: Very little soft corn, but many small ears. *Marion*: Extraordinary crop. *Morrow*: Decreased yield, but improved quality. *Mercer*: Has matured well. *Montgomery*: Early plantings good; late did not mature. *Perry*: Well dried out. *Ross*: Good in Scioto bottoms, but elsewhere light and chaffy through drought. *Scioto*: Early plantings injured by windstorms; medium plantings a full crop; late injured by October frosts. *Seneca*: Early, ripened and excellent. *Warren*: Extreme drought; corn worth 60 cents on the field.

MICHIGAN.—*Branch*: Light; drought. *Macomb*: Injured by drought. *Calhoun*: Drought. *Newaygo*: Long drought. *Ottawa*: Drought; well ripened. *Ingham*: Drought. *Lapeer*: Drought and cut-worms. *Lenawee*: Drought.

INDIANA.—*Lake*: A third of last year's yield, but good. *Perry*: Poorest crop in twenty years; no surplus. *Grant*: Well dried out. *Whitley*: Fine season and good crop. *Wabash*: Drought and chinchies. *Decatur*: Drought and chinch-bugs have greatly injured the crop. *Dubois*: Light. *Dearborn*: Drought and frost. *Franklin*: Greatly shortened by drought and chinchies; husked corn in the field sells at 50 cents per bushel. *Fulton*: Chinchies. *Gibson*: Badly injured by chinchies. *Hamilton*: Splendid condition; less soft corn than usual. *Howard*: Largest crop ever raised. *Jennings*: Extreme drought. *Noble*: Half-crop; drought. *Posey*: Yield on Wabash bottoms 60 bushels per acre. *Pike*: Reduced to average by dry-rot. *Steuben*: Good on timber-land; poor on sandy and gravelly soils on account of drought.

ILLINOIS.—*Mason*: Light and poor. *Washington*: Hardly worth gathering, though near timber some fields are passable. *Vermillion*: Not over 70 per cent. of last year's crop in bushels, but superior in quality; some of it light and chaffy. *White*: Suffered severely from chinchies. *Tazewell*: No frost-bitten corn. *Scott*: All sold to feed Missouri hogs. *Saint Clair*: Suffered less from chinchies on the bottoms than on the wheat-growing prairies. *Richland*: Nearly ruined by drought and chinchies. *Pike*: Generally good, though somewhat chaffy. *Pope*: Injured by drought and chinchies. *Ogle*: Light, but well matured. *Montgomery*: Shortened on the prairies by drought and chinchies; better than usual on bottoms. *Madison*: Light. *Macon*: Good. *Macoupin*: Chinchies. *Johnson*: Chinchies worse than last year. *Hancock*: Chinchies. *Franklin*: Chinchies terribly destructive. *Fayette*: Less than half a crop. *Clinton*: Exceedingly poor. *Champaign*: Bugs and drought; great scarcity of water. *Carroll*: Very ripe and sound. *Henry*: Somewhat shortened by drought. *Boone*: Very short, compelling the general sale of hogs. *Henderson*: Injured by drought. *Edwards*: Nearly destroyed by chinchies, except on bottom-lands.

WISCONSIN.—*La Fayette*: Materially injured by chinchies. *Walworth*: Light and poor; drought. *Trempealeau*: Much more favorable season than last year. *Richland*: Good. *Sheboygan*: Well ripened. *Sauk*: Chinchies. *Iowa*: Chinchies in some places. *Fond du Lac*: Drought and cut-worms. *Columbia*: Drought injurious, but partly compensated by fine closing season. *Brown*: First snow-storm October 30; melted as fast as it fell. *Adams*: Some injury from chinchies. *Jackson*: Price, 50 cents per bushel.

MINNESOTA.—*Jackson*: Increased acreage; good crops where not injured by grasshoppers. *Martin*: Totally destroyed by grasshoppers in many places. *Mower*: Best in quality for many years. *Noble*: Almost a failure. *Nicollet*: Drought and grass-

hoppers. *Rock*: Almost destroyed by grasshoppers. *Sherburne*: Damaged by high winds. *Stearns*: Finely matured through delay of frost. *Steele*: Good crops of sound grain. *Sibley*: Not injured by grasshoppers. *Swift*: Well matured. *Wright*: Shortened by extreme heat in July.

IOWA.—*Grundy*: Not well filled and loose on the cob. *Woodbury*: Double last year's crop, in spite of grasshoppers. *Winneshiek*: In the north, the crop is fine; but in the south, reduced by drought. *Washington*: Condition of the crop variable. *Poweshiek*: Quality first rate; no frost till the crop was dead-ripe. *Pottawattomie*: Cut short by drought and of poor quality. *Polk*: Matured early. *Pocahontas*: Very profitable crop this year. *Page*: Drought. *Montgomery*: Averages 30 bushels per acre, and brings 40 cents per bushel. *Marion*: Turned out surprisingly well. *Jones*: Drought. *Jackson*: Light, but good. *Johnson*: Selling at 40 cents. *Harrison*: About 30 per cent. of the crop was planted after the wheat and corn were destroyed by grasshoppers and turned out poorly; the remainder was very good. *Henry*: Old corn absorbed by feeders at high prices as well as a third of the new crop. *Floyd*: Short, but of good quality. *Des Moines*: Injured by insects. *Dallas*: Ears small but sound. *Calhoun*: Sound and good. *Clinton*: Killing frost October 11, but corn had ripened before it came. *Benton*: Drought. *Story*: Shortened by drought in the silking-stage; will average 35 to 40 bushels per acre. *Plymouth*: Some crops destroyed by grasshoppers.

MISSOURI.—*Pemiscot*: Almost ruined by drought and chinchies. *Taney*: Lightest crop ever raised. *Ralls*: Unusually good. *Polk*: A failure; drought and chinchies. *Putnam*: Injured by wind-storms and excessively wet weather. *Platte*: Will be scarce; sells at 75 cents per bushel. *Phelps*: The only tolerable crops were on the bottoms; drought and chinchies. *Perry*: Not enough to fatten pork; some are feeding wheat to hogs. *Nodaway*: Drought. *Moniteau*: Grain poor and fodder worthless; chinchies. *Johnson*: Almost destroyed by drought and chinchies. *Jasper*: Ruined by drought and chinchies. *Holt*: Chinchies very bad. *Franklin*: Drought and chinchies. *Daviess*: Drought and chinchies. *Crawford*: Eaten by chinchies and starved by drought. *Cole*: Drought. *Clinton*: Drought favored clean culture; crop would have been nearly average but for chinchies. *Callaway*: Drought and chinchies. *Adair*: Made chaffy by chinchies.

KANSAS.—*Smith*: All destroyed by grasshoppers. *Osage*: Drought, chinchies, and grasshoppers have ruined the crops. *Marion*: Destroyed by drought, chinchies, and grasshoppers. *McPherson*: A total failure. *Leavenworth*: This county raised more corn than all the rest of the State, though the crop here was but 40 per cent. of an average. *Republic*: Almost worthless. *Miami*: Light and chaffy. *Labette*: Good on bottoms, failed on prairies; feeding wheat to hogs. *Montgomery*: Bugs and drought. *Jackson*: Hardly worth mentioning. *Ellsworth*: Drought and grasshoppers. *Bourbon*: Early bottom-crops good; upland a failure. *Brown*: Drought, chinchies, and grasshoppers. *Anderson*: Drought and chinchies. *Allen*: Drought, grasshoppers, and chinchies. *Mitchell*: Total failure.

NEBRASKA.—*Richardson*: Sells at 75 cents per bushel. *Lancaster*: Almost destroyed by grasshoppers. *Lincoln*: Damaged by grasshoppers. *Boone*: Destroyed by grasshoppers. *Antelope*: Destroyed by grasshoppers. *Otoe*: Large portions of the county destitute of corn; Texas cattle not fed as extensively as formerly. *Webster*: Eaten by grasshoppers. *Cass*: Will not average 10 bushels per acre. *Pawnee*: Ruined by hot winds, drought, and grasshoppers.

CALIFORNIA.—*Mariposa*: Twenty per cent. above average, though some fields were injured by early frost.

OREGON.—*Grant*: Injured by early fall-frosts. *Columbia*: Ripens late.

## COTTON.

The cotton-product of 1874, as estimated by our correspondents on the 1st of November, aggregates about three and two-thirds millions of bales. The yield per acre is reported less than in 1873 in most of the States. The weather for ripening and gathering the top-crop has been very favorable. The reports are nearly unanimous in stating that the proportion of lint to seed is large. The percentages of last year's aggregate of bales in the principal cotton-States are as follows: Virginia, 89; North Carolina, 89; South Carolina, 92; Georgia, 93; Florida, 100; Alabama, 95; Mississippi, 90; Louisiana, 85; Texas, 90; Arkansas, 60; Tennessee, 57. This result corresponds very closely with the indications of the monthly statements of condition made by the Department. It is larger than that foreshadowed by the Cotton Exchanges. It is as high as an honest rendering of returns warranted on the 1st of November; and though the fine weather since that date may add

something to the quantity opened and safely gathered, and the large proportion of lint may swell the aggregate, the highest estimate that could be based fairly upon these returns could scarcely reach 4,000,000 bales.

The October statement, which has been misinterpreted, (or misrepresented,) as indicating 3,000,000 bales or less, makes the average for ten cotton-States, 71 per cent. of normal condition, or an impairment of 29 per cent. from all causes, against 79 per cent. last year. So far as condition in October indicated final results in bales, the proportion would be : as 79 is to 71 so is the aggregate yield of last year to that of the present season. This would make, within a fraction, 3,748,000 bales on the same acreage ; but on an area 10 per cent. less, it would mean 3,373,000, or, with the outlying area, fully 3,400,000. The fine season for ripening and gathering accounts for the increase in the final returns, and renders the accuracy of judgment in the two returns almost absolutely identical. As to the necessity that all the monthly reports of condition throughout the growing-season should be identical in their percentages, it is an absurdity and an impossibility, which no man of sense would suggest, as there must ever be a constant warfare between the vital and destroying forces of nature, the current results of which it is the business of our correspondents to report from month to month.

The statement of condition, (100 representing normal condition of healthy development, above which extraordinary vigor and growth may sometimes be written, while all impairment of vitality or reduction of healthful growth are represented by lower figures,) during the growing-season of 1874, has been reported as follows ; the figures being in each case an average, for the State named, of the county percentage of normal condition, by the side of which are placed similar State averages for 1873 :

States.	June.		July.		August.		September.		October.	
	1873.	1874.	1873.	1874.	1873.	1874.	1873.	1874.	1873.	1874.
North Carolina .....	85	89	91	102	95	95	95	87	88	83
South Carolina .....	88	81	82	88	87	97	86	86	80	80
Georgia .....	94	80	94	91	95	94	90	77	82	80
Florida .....	102	90	99	96	103	102	85	77	76	81
Alabama .....	93	82	85	92	91	90	85	81	78	75
Mississippi .....	92	78	83	87	88	89	82	74	75	74
Louisiana .....	94	70	80	73	86	83	80	62	65	62
Texas .....	86	90	78	102	83	105	92	65	80	70
Arkansas .....	92	90	106	94	93	87	93	47	83	55
Tennessee .....	90	85	96	97	95	83	92	52	90	56

The condition of the crop in June was reported lower than in the same period of 1873 in every State except Texas and North Carolina. Louisiana, which suffered most by floods, made the lowest average ; Mississippi next ; Georgia, South Carolina, and Alabama coming next in order. Saturating rains, causing overflows of every spring-branch as well as larger streams, left cotton more unthrifty, irregular, and stunted in appearance than for years at the early stage of its growth. The writer of this visited most of the cotton-States, and can testify to the reliability of the first report.

After the rains came exceptionally fine weather ; stands were perfected by replanting ; the plants took root more firmly in the warm soil ; growth became rapid ; and vigilance stimulated by recent fears of utter failure kept the field unusually clear of grass, so the July returns everywhere indicated improvement, as those of the previous year had shown decline of condition. A comparison of the two years in July shows higher con-



dition in 1874 in North Carolina, South Carolina, Alabama, Mississippi, and Texas. In August, a record of continued improvement was made in all the States except North Carolina, Alabama, Arkansas, and Tennessee; deterioration being noticeable in the latter two. At this point in the comparison with 1873, a decline commences in the condition of cotton of the present season, though it is mainly seen in Arkansas and Tennessee, very slightly in Georgia, Florida, Alabama, and Louisiana, while in South Carolina and Texas a higher condition is marked than in August last year.

In September this slight difference is widened, especially by the low returns of Tennessee, Arkansas, Louisiana, and Texas, resulting from drought and drying winds and other causes, which would have made still greater reduction of product but for the fact that losses from the caterpillar were far less than in 1873. In October, there appears a slight improvement in Georgia, Florida, Texas, Arkansas, and Tennessee; small reduction in the Carolinas and Alabama; and in Mississippi and Louisiana no change is indicated. The general average for this month is 71.

The pretense of misunderstanding the Department system of crop-reports on the part of a small class of cotton-speculators, whose aim is to deceive for mercenary ends, is palpably dishonest; the mass of planters, factors, and manufacturers find no difficulty in the premises, and express their appreciation of the fullness and honesty of the returns.

There are but three general inquiries each season: 1. The *acreage*, expressed as a percentage of the total area of the previous year in each county. 2. *Condition*; normal vitality and growth being the unit of comparison, or 100. 3. *Product*; or total quantity in each county as compared with the actual yield of the previous year. The first and last of these are each given but once, but "condition" is reported monthly through the season.

Now, the moment the plant has germinated and emerged from its natal bed, the report of its "condition," its appearance as to vigor and size, is seized upon by cotton-gamblers, and the figures for *condition* are instantly transmuted into those of ultimate *yield*, and dishonestly published as the "Bureau's" prediction of the crop. The next month cotton may be submerged by rain or choked by grass, and the "average" condition may be greatly impaired, and be so reported, as it must be if reported fairly. [It is only in bear-gardens on Manhattan Island that "cold, wet springs are usually favorable to cotton which has been previously planted."] Then the figures are produced again, and exhibited as a prediction of half a crop, and the growl of the bears at "inconsistency of the Bureau" in reporting the truth rises above Wall street. Stimulated by the fear of utter failure and blessed with highly favorable weather, planters succeed in cleaning the crop and giving it lease of life and possible vigor and fruitfulness, and the next report, truthful and accurate, makes the condition higher. Perhaps in August or September worms may devastate whole districts, and destroy cotton to the value of tens of millions of dollars, reducing the average condition very materially. Then comes an ursine howl from speculators, who growl that the report is inconsistent with that of the previous month. So with all the vicissitudes and calamities to which the crop is subject, causing reports of condition to vary from month to month with the changing circumstances which affect present growth and apparent health of the plant. Men of sense and judgment know that this cannot be otherwise, while another class either stupidly or wickedly substitute ultimate yield for present

condition, and declare that the Department of Agriculture makes the monthly predictions thus dishonestly concocted by themselves.

Some go still farther in their dishonesty. After making such false deductions in a given year, they continue the next their tabulations of product in bales from current reports of condition of the immature crop, and, instead of taking percentages of the last year's crop, they make their comparison, when it suits their purposes, with their own fabrications imputed to the Department as actual estimates. And, worse still, they make their calculations, either from malice or ignorance, by false percentages. For example: if in a given State, the reported area is 20 per cent. less, and condition upon that area 10 less, they make the loss 30 per cent., when 10 per cent. reduction from 80 per cent. of present area makes the actual loss  $20+8$ , or 28 per cent. Should there be 50 per cent. reduction upon an area 50 per cent. of that of the previous year, the proper expression (except that there is *no* propriety in writing amount of yield when only condition of growing plant is meant) would be 25, or a loss of 75 per cent., instead of which these sapient mathematicians add the two fifties, and write the loss 100 per cent. Should the reduction of area be 60 per cent., and that of condition 50, of course these wise calculators would make a reduction of 110 per cent., and charge the 10 per cent. below zero to "the Bureau."

Recent tables, thus made in defiance of truth, honor, and mathematics, have misrepresented by nearly half a million bales the real indications of the Department's monthly history of condition. It is not expected that speculators should deal fairly or honestly, and their course is of no sort of consequence, except that honest men may be misled by their blatant falsehoods in a matter of some importance.

There is one point that should be better understood. The statistician does not evolve cotton-estimates from his inner consciousness, nor make guesses from a small number of data, but simply gives a fair expression of the returns made by planters, (not Government officials, as has been falsely charged,) only correcting obvious errors and eliminating unreliable material. As to the history of the growing crop, with its vicissitudes and changes, as recorded in reports of condition from June to October, there has never been a method approaching it in fullness and accuracy; and no cotton-merchants nor sidewalk-planters can possibly equal it. As to ultimate estimates of yield, the interests of producers are a conservative force tending to low estimates, and if their aggregate is slightly too low it must be given, and not the arbitrary dictum of the statistician. At the same time, correspondents are urged to deliberate and accurate judgment; and whenever a bias is shown, or strongly suspected, such figures are slightly modified or discarded in sheer justice to the more reliable majority. Further than this the statistician is not at liberty to go, and there his responsibility ceases. Thus is the planter's estimate made up but once, annually, at the close of the season, not monthly from the date of planting; and whether it is as high as consumers would like or not, it is the fairly-written estimate of the producers, and is taken by intelligent men as such.

If such bias exists, it is generally less than in other local reports; those of the cotton-exchanges usually representing lower cotton-prospects than Department returns, though the exchange-reports are more indefinite in their modes of expression. For instance, there may be thirty reports of growing cotton in Tennessee, twenty indicating decrease, ten increase of yield; but those counties might possibly be the ten which have heretofore produced four-fifths of the crop of a State which now includes ninety-three counties.

The following is a careful statement of the exchange-reports of the season, which are in their tenor strikingly like those of this Department, except that their indications point to somewhat lower estimates.

The GALVESTON COTTON EXCHANGE, from statistics gathered early in April, reported an unfavorable planting-season in thirty-eight counties of Texas, and a favorable season in sixteen counties. Of these fifty-four counties, nineteen report an increase of acreage, averaging 15 per cent. upon last year; in twenty-one counties, the decrease averages 10 per cent.; the remaining fourteen report the same acreage as in 1873.

The MEMPHIS COTTON EXCHANGE, from reports received from ninety-four counties in Tennessee, Mississippi, Arkansas, and Missouri, of date averaging May 20, estimates the acreage in cotton in those counties at 8.1 per cent. below that of 1873, and 3.1 per cent. below that of 1872. Planting-operations, on an average, were sixteen days later than in 1873. Of the area planted, 55 per cent. had come up; one-half the stands were bad; one-fourth, fair; one-fourth, good. Drought is alleged as the cause of this poor condition.

The GALVESTON EXCHANGE, about the 1st of June, from correspondence in sixty-six counties of Texas, reported that the early season had been less favorable than in 1873. Of these counties, twenty reported an increase of acreage, ranging from 10 to 20 per cent.; nineteen an increase of 5 to 15 per cent.; twenty-two the same acreage as in 1873. Only seven hundred acres had been abandoned. Good stands were reported in forty-two counties, and bad or indifferent in nineteen; crop generally from ten to twenty days later than last year.

The MOBILE EXCHANGE, from correspondence in twenty-seven counties in Alabama, average date about June 1, reports an unfavorable planting-season in only six counties. It was stated that January and February had been rather favorable; March and April cold, with excessive rains; May rather dry. The growing-season was less favorable than in 1873. The reduction in acreage averaged 12 per cent., besides about 2 per cent. abandoned after planting; 33 per cent. had been replanted. Early stands were poor; such of the replanted crops as had come up were rated from fair to good.

The same authority, from correspondence in seventeen counties in Mississippi, stated the season to have been generally unfavorable—excessively wet up to May 1, and excessively dry afterward; only two counties reported the weather as favorable as in 1873. The acreage planted had decreased 8 per cent., besides 5 per cent. abandoned; 25 per cent. had been replanted. The crop was "more backward than poor." Dry weather had injured late plantings.

The same authority also reports, for six counties in Tennessee, a season everywhere too dry and less favorable than last year, with a decrease in acreage of 7 per cent. Planting here is generally a month later than in the Gulf States.

The NEW ORLEANS EXCHANGE gave the following summary of reports up to July 1: *Mississippi*: Forty-four counties; acreage decreased 7 per cent.; fair average condition; crop two weeks later than last year; clean, though small and backward. *Louisiana*: Twenty-six parishes; acreage decreased 20 per cent.; weather less favorable than last year; plants in good condition, but backward. *Texas*: Forty-five counties; acreage increased 15 per cent.; stand good; planting two weeks later than last year, but in fine growing condition. *Arkansas*: Twenty-five counties; acreage decreased 8 per cent.; weather less favorable, but stand better than last year, though three weeks backward. *Tennessee*: Twenty-four counties; decrease of acreage, 3½ per cent.; weather favorable; stands

fair and clean, but small; two weeks later than last year. *Alabama*: Twenty-seven counties; acreage decreased 16 per cent.; late-planted looks better than old cotton; crop late, but clean and growing fast. *North Carolina*: Forty-one counties; average decrease in acreage, 19 per cent; weather less favorable; stand, fair average; crop healthy and clean, but planted two or three weeks later than last year. *South Carolina*: Twenty-one counties; acreage decreased 17 per cent.; weather unfavorable; fair average stand since replanting; plants small, but in good condition, clean and growing well. *Georgia*: Sixty-nine counties; decrease of acreage, 10 per cent.; weather less favorable; stand and condition good; plants clean and growing finely, but small, and ten days later than last year. *Florida*: Reports meager; acreage decreased 4 per cent.; stand and condition good; plants clean and growing well; a week earlier than last year.

The MEMPHIS COTTON EXCHANGE report for July, from two hundred and eighty-six letters, counties represented not specified, says that one hundred and eighteen report favorable weather, and the rest unfavorable. Of the land planted,  $2\frac{3}{4}$  per cent. had been abandoned. Of late plantings, one hundred and seventy-five report stands better than last year, and one hundred and five not so good; two hundred and six report cotton well formed and balled; sixty report the opposite; one hundred and forty state condition better than last year; fifty-two the same; fifty-three not so good. Of late plantings, one hundred and sixty-five report better stands than last year, and one hundred not so good; one hundred and forty report cotton well formed and balled, and one hundred and thirty otherwise; one hundred and two report better condition than last year; seventy-four the same, and ninety not so good; 42 per cent. was planted early; 20 per cent. after May 1; 29 per cent. came up after June 1; cultivation better than for years; drought since May 15 generally complained of.

The GALVESTON, July report embraces one hundred and thirty-nine replies from sixty-one counties of Texas, dated from May 27 to July 10, but does not report by counties. Of correspondents, one hundred and twenty-five say that the weather, after May 27, was more favorable than last year; eight about the same; six less favorable; one hundred and twenty-three report good stands, and sixteen poor ones; thirty-nine say the crop is earlier than last year; seventy-four later; twenty-six the same; one hundred and thirty-eight report the crop in good condition; nine fair; two poor and unpromising.

The MOBILE, July report presents the following summary: *Alabama*: Forty-six counties; weather since June 15 was rainy in twenty-nine; seasonable in fifteen; dry in two; in nineteen more favorable than last year; sixteen less favorable, (the last all south and east of Montgomery.) Of early plantings, thirty-six report poor stands, and ten fair to good; in late plantings, the proportions are reversed; thirty-four report cotton well formed and balled, and twelve not so; thirty-nine report fair to good condition, and in early plantings better than last year; seven poor, and worse than last year. *Mississippi*: Twenty counties; seventeen report weather more favorable than last year; four abandonment of plantings from  $2\frac{1}{2}$  to 5 per cent.; in thirteen, half the stands of early cotton are not good; in five, average; in two, good; late plantings from average to good; early plantings well formed and balled; late plantings have good forms, but few bolls.

SAVANNAH, July report.—*Georgia*: sixty-five counties; weather generally too wet; few lands abandoned; stands poor for early plantings, and the reverse for late; early cotton well formed and balled in Middle

and Southern Georgia; late cotton too tall and long-jointed; caterpillar appeared in Southwestern Georgia; rain producing too rapid growth. *Florida*: Fifteen counties; too much rain; almost as favorable as last season; stands compare well with last year, late being the best; plants growing too fast and not bearing well; condition compares well with last year; early the most promising; some apprehensions from worms.

NASHVILLE, August report.—*Middle Tennessee*: Forty-five letters from eighteen counties, but the counties are not distinguished. One letter reports good weather; six average, and thirty-eight severe drought; weather reported ruinous by two; moderately favorable by six; injurious by thirty-eight; two report condition better than last year; six expect an average crop; thirteen three-fourths of a crop; thirteen, one-half; six, one-third; five, one-fourth; twenty-two report good fruitage; twenty-three, poor; twenty-one report shedding of leaves and bolls; twenty, shedding badly; four, not shedding at all—plants very small, owing to severe drought. *North Alabama*: Forty letters from ten counties, not distinguished; twenty report severe drought; five, dry; five, average; thirty-five report the crop damaged; five, moderately good; four, better than last year; five, average; five, seven-eighths of a crop; seven, three-fourths; ten, two-thirds; nine, one-half; twenty-five report good fruiting; fifteen, poor; twenty-four report shedding; sixteen, shedding badly.

September report of the NATIONAL COTTON EXCHANGE.—NEW ORLEANS DEPARTMENT.—*Mississippi*: Twenty-five counties; excessive drought causing leaves and forms to fall, especially on hill-lands; disastrous since the first week of August. *Louisiana*: Thirty parishes; drought causing premature opening and shedding; growth stopped and fruitage checked. *Arkansas*: Seventeen counties; extreme drought since July 15 caused severe shedding, stopped growth and fruitage, and caused great despondency among planters.

MEMPHIS DEPARTMENT.—*West Tennessee and eight counties of Mississippi*: Drought through nearly the whole department since July 15, stopping growth and causing shedding of forms and bolls; condition much below last year.

NASHVILLE DEPARTMENT.—*Middle and East Tennessee*: Eighteen counties; damaging drought; condition below last year; fruitage good, but plants shedding badly. *North Alabama*: Ten counties; drought reduced the average condition below last year; shedding badly.

NORFOLK DEPARTMENT.—*Virginia and part of North Carolina*: Thirty-one counties represented by sixty-three correspondents; of the latter, forty report favorable weather and twenty-three unfavorable; thirty-eight, vigorous and healthy growth; twenty-five rust and decaying foliage; forty-nine, condition good; fourteen, below last year; fifty-two, good fruitage; eleven, poor fruit, and shedding.

WILMINGTON DEPARTMENT.—*Part of North Carolina*: Sixteen counties; good condition; fruiting well.

CHARLESTON DEPARTMENT.—*South Carolina*: Thirty counties; weather up to August wet and cool, and then hot and dry; too rapid growth, causing much shedding.

SAVANNAH DEPARTMENT.—*Georgia*: Sixty counties; weather seasonable or rainy up to August 1, when it became hot and dry; plants fruited well, but shedding; crop in a critical state; fruitage below last season. *Florida*: Nine counties; fruited well to August 1; drought then caused shedding and checked fruitage; condition better than last year; light-lands rusting.

MOBILE DEPARTMENT.—*Alabama*: Fifty-one counties; forty-two re-

port weather dry and hot; six dry since August 1; three seasonable; thirty-six report very unfavorable effects, shedding and stoppage of growth; eleven better condition than last year; fifteen the same; twenty-six worse. *Mississippi*: Twenty counties; dry and hot since August 1; effect bad in all but two; stoppage of growth and shedding of fruit; on sandy uplands no fruit since August 1.

**GALVESTON DEPARTMENT.**—*Texas*: Sixty-two counties; dry and hot since July 15; partial rains between 15th and 20th of August; uplands suffered severely, bottoms little; fruited well, but shed badly.

**SAINT LOUIS DEPARTMENT.**—*Missouri*: Five counties; damaging drought. *Kansas*: Five counties; condition better than last year. *Indian Territory*: Drought very injurious.

**GALVESTON, September report.**—Forty-nine counties in Texas; thirty-four report weather dry and hot up to September, with heavy rains since; forty-three, injuries from rain, which prevented picking, beat out cotton, &c.; twenty-one, injury from worms; eight, the crop larger than last year; forty-one, less, the average decrease being one-half. Unless the correspondents are mistaken, the crop of Texas will be 20 per cent. short of last year.

**SAVANNAH, September report.**—*Georgia*: Fifty-eight counties; dry and hot since August 20, caused premature opening and profuse shedding; bottom crops not injured. If frost is about the usual time, Southwest Georgia will yield a little more than last year; Middle Georgia will decline 15 per cent.; northern counties, 20 per cent. Fine picking weather. *Florida*: Nine counties; three correspondents report the weather seasonable, the rest, as hot and dry, stopping growth and causing rust and fall of fruit; crop less on the sea-islands than last year, but greater in the middle and west; opened very fast.

**MEMPHIS, September report.**—Fifty-four letters from West Tennessee; fifty-one from North Mississippi; thirty-one from Arkansas, north of Arkansas River; and ten from North Alabama; counties not distinguished; average date, September 20. Of one hundred and forty-nine responses, sixty-seven indicate dry, warm weather; sixty-six, generally dry, with local showers; fourteen, abundant rain; two, too much; sixty-four report serious shedding of fruit; twenty-three, improved growth of bolls; twenty-seven, second growth too late for maturity; eighty-one, premature opening of bolls; seven, open cotton soiled, and beaten out by rain; thirteen, crops not seriously affected; upland plantations entirely open, with small bolls, short and light staple, and almost worthless seed. In many cases, freedmen, having realized their interest in the crop in previous advances, were indifferent about picking it out. Great anxiety among planters.

**NASHVILLE, September report.**—Only half as many letters as in the August report. Counties not distinguished. *Middle Tennessee*: Twenty-six letters from eighteen counties; seven letters report favorable weather; twelve, showery; eight, drought; eleven, a second growth of staple; four, no change; four, improvement; ten estimate the yield at one-third of a crop; eleven, one-half; three, two-thirds; two, three-fourths, making the average a little lower than in the previous report. *North Alabama*: Twenty-seven letters from ten counties; twelve report drought; twelve, favorable weather; eight, unfavorable; six report shedding of squares and bolls; five, no change; four, second growth; three, improvement, rust; eleven estimate the yield at half a crop; eleven, two-thirds; five, three-fourths; present prospects not capable of material improvement, even with the best of picking weather; frequent complaints of the indifference of freedmen in picking out the crop.

MOBILE, September report.—*Alabama*: Forty-five counties; thirty-one report drought and heat; fourteen, generally seasonable with occasional showers; thirty-seven, stoppage of growth, shedding, and ruting in many places, destroying the top-crops; eight, good results of drought on bottoms and stiff lands; twenty counties, mostly stiff bottom-lands, estimate 10 per cent. increase of yield; twenty-five upland counties, 11 per cent. decrease; premature opening; estimates of decline from August prospects vary from 25 to 50 per cent., average 33. *Mississippi*: Nineteen counties; sixteen report drought and heat; three, seasonable weather; effects of drought serious, shedding and premature opening of bolls; thirteen expect 33 per cent. of last year's yield; five, still less; one, no decrease.

NATIONAL COTTON EXCHANGE, October reports.—CHARLESTON DEPARTMENT.—*South Carolina*: Sixty-two letters from twenty-seven counties, not distinguished; fourteen report slight damage from frost; four, serious damage; fifty-eight, favorable weather since September 29; three, unfavorable; average decrease of yield from last year, 19 per cent.

SAVANNAH DEPARTMENT.—*Georgia*: Forty-nine counties; frost in all except the extreme south, but only injurious in the extreme north; increase of 10 per cent. expected in the south; 10 to 15 per cent. decrease in the middle; 20 per cent. in north; weather can no longer affect the yield; fine picking-season; more rapid marketing of crop than ever before. *Florida*: Sixteen counties; no injury from frost; fine picking-season; yield about the same as last year in the sea-island district; in the upland districts, one county decreased; the remainder increased at an average of 25 per cent.; drought favorable to lint, but top-crop cut off.

AUGUSTA DEPARTMENT.—*Georgia*: Thirty-two counties; all lowland crops damaged, and uplands in the north belt slightly; middle-belt uplands not injured; favorable picking-weather; decrease of yield in three counties, 50 per cent.; in thirteen, 33 per cent.; in eleven, 25 per cent.; in five, 10 to 20 per cent.; crop clean and rapidly marketed.

MOBILE DEPARTMENT.—*Alabama*: Thirty-seven counties; little injury from frost; good picking-weather; twelve counties report from 5 to 100 per cent. increase last year, averaging 25 per cent.; one, no change; twenty-four, a decrease from 10 to 50 per cent., averaging 25 per cent.; crop picked earlier and cleaner than usual. *Mississippi*: No frost; good picking-weather; one county expects 25 per cent. increase; one, no change; the rest, decrease from 10 to 50 per cent.; average, 33.

NEW ORLEANS DEPARTMENT.—*Louisiana*: No injury from frost; good picking-weather; yield a little greater than last year, increase averaging 10 per cent.; injured by drought, but clean and bright. *Mississippi*: Twenty counties; little or no injury from frost; good picking-season; average decrease of yield 25 per cent.; complaints of light and short lint yield. *Arkansas*: Little damage from frost; good picking-season; decrease of yield 25 to 66 per cent., average, 41; river-bottoms may turn out better; finest picking-season will not balance the drought.

GALVESTON DEPARTMENT.—*Texas*: Fifty-nine counties; no frost; heavy rains from September 20 to October 1, but very favorable picking and ripening weather afterward; thirteen counties that failed last year report an increase; thirteen, a decrease of 10 to 25 per cent.; nineteen, 25 to 50 per cent.; six, 50 to 75 per cent.; eight, no decrease; caterpillars destroyed the top-crop of some coast-counties; some expect a top-crop, but others say it is too late to mature.

NASHVILLE DEPARTMENT.—*Middle Tennessee*: Eighteen counties; considerable damage from frost; good weather for picking; average decrease of yield estimated at 50 per cent. against the estimate of 46 per cent. in last report. *Alabama*: Ten counties; considerable damage from frost; almost universally a good picking-season; average decrease of yield, 40 per cent.

NORFOLK DEPARTMENT.—*North Carolina and Virginia*: Thirty-six counties; nine report damage from frost; in some cases, frost beneficial in checking weed-growth; very favorable picking-season; six counties report increase from 15 to 20 per cent.; nineteen, decrease 10 to 15 per cent.; twenty, from 20 to 25 per cent.; nineteen, 33 per cent.; weather can only affect the quality of cotton unpicked.

MEMPHIS, December report.—One hundred and seven responses from North Arkansas, West Tennessee, North Mississippi, and North Alabama; counties not designated; forty-three report damage from frost, averaging for the whole  $3\frac{1}{2}$  per cent.; average decrease of acreage  $1\frac{1}{2}$  per cent.; due exertions made to save the crop; picking will close about December 7; unprecedentedly rapid marketing; entire crop will be saved in better order than usual.

The following brief extracts from remarks accompanying reports are appended:

VIRGINIA.—*Prince George*: Larger yield than was anticipated. *Dinwiddie*: Shortened 20 per cent. by frost; no top-crop; much stained and yellow cotton. *Southampton*: Much injured by heavy frosts. *Sussex*: Shortened 25 per cent. by cool weather—quality excellent.

NORTH CAROLINA.—*Rowan*: Shortened by drought in August and by frost in October. *Wake*: Not over 150 pounds of lint per acre. *Franklin*: Yield better than was expected. *Wilson*: Picking-season unusually fine; acreage estimated at 12,000 acres, producing 7,200 bales. *Alexander*: Late spring and early fall frosts very injurious. *Stanly*: Favorable season for late-opening cotton. *Camden*: Yielding well. *Chowan*: Short, but of good quality. *Mecklenburgh*: Top-crop frosted; bolls opening fast. *Gaston*: Early frost has done damage not yet appreciated. *Beaufort*: Fine October weather has enlarged the yield; mostly picked and marketed. *Polk*: More cotton planted than usual, but it was taken by a killing frost October 12; much of it will be yellow. *Columbia*: Fine season. *Wayne*: The blight, rust, worms, and lice passed away without inflicting much damage. *Lincoln*: Injured by summer-drought and fall-frost. *Robeson*: Yield of lint better than usual. *Pasquotank*: Acreage not over half of last year's, but the product will be only 10 per cent. less. *Anson*: Late cotton has greatly improved.

SOUTH CAROLINA.—*Orangeburgh*: First killing frost November 1. *Union*: Unfavorable season. *Newberry*: Fine gathering and ripening season. *Marlborough*: Not a full crop, but equal to last year's. *Georgetown*: Injured by storm and rain. *Beaufort*: Below last year. *Colleton*: Sea-shore crop superior to any since the war. *Lexington*: Short but good. *Fairfield*: Maturing-season better than the growing-season.

GEORGIA.—*Decatur*: Crop greatly improved. *Madison*: Suffered from a variety of adverse influences; half of last year's crop. *Hancock*: Short; will be marketed within thirty days. *Hart*: Great falling-off in the crop; late crop frosted. *De Kalb*: Somewhat frosted; finest gathering-season for years. *Douglass*: Killing frosts in October; still greater injury in quality than in quantity; very favorable harvesting-weather. *Walton*: Late fine weather will bring the crop nearly up to last year's yield. *Upson*: Decreased acreage, and average yield; about a bale to five acres. *Taliaferro*: Fall favorable to the development of lint-cotton, partly compensating the loss of the ground-crop from hot winds and other unfavorable conditions. *Sumter*: Excellent season for gathering; more fair cotton gathered than in any previous year. *Glynn*: No frost yet. *Gwinnett*: Greatly injured by October frosts; but the proportion of lint unusually large, amounting to a third in weight of the seed-cotton. *Clayton*: Picking-season fine; crop of fine quality, but 25 per cent. short; poor stand and drought. *Butts*: Falling off from last year, but quality better. *Wilkes*: Short crops and low prices. *Morgan*: Ice, October 31, froze many bolls; shipments in excess of last year; planters ginning and selling as fast as possible; lint good and well saved. *Lee*: Unexpectedly large proportion of lint to seed. *Terrell*: Drought reduced the crop a third below last year's.  *Heard*: Good gathering-season; fatal frost October 13. *Jefferson*: Cotton three-fourths of a crop; quality good. *Banks*: Injured by frost; much yellow



cotton. *Richmond*: Proportion of lint 20 per cent. above average. *Miller*: Top-crop cut off by drought. *Forsyth*: Heavy frost October 12 injured the crop, which was generally late. *Carrall*: Early frost. *Dawson*: Frost. *Columbia*: About half of last year's yield. *Dougherty*: Better than was expected; probably a larger yield than last year. *Telfair*: Short; good gathering-season. *Bullock*: Decreased acreage and yield. *Catoosa*: Increased acreage and yield. *Whitfield*: Not gathering so well as was expected. *Gordon*: Killing frosts in October. *Muscogee*: Shortened by drought on uplands and by worms on bottoms. *Murray*: Shortened 40 per cent. by worms.

FLORIDA.—*Gadsden*: Fine weather for opening and picking; crop rapidly marketed. *Suwannee*: Crop light and late. *Orange*: Short of last year's yield. *Jackson*: Yield increased by the closing season.

ALABAMA.—*Covington*: Average lint-product per acre fell off 14 per cent. *Conecuh*: Fine picking-weather. *Lowndes*: Fine closing season; yield improved. *Calhoun*: Late bolls all frosted. *Lawrence*: Short. *Colbert*: Half of last year's yield. *Clarke*: Short of last year through drought. *De Kalb*: Late plantings damaged by October frosts; good picking season. *Blount*: A falling-off of 1,000 bales from last year in this county. *Greene*: All the bottom-cotton was frost-killed October 12; some left on hills and ridges; crop very short and will not go far toward paying the farmers' debts. *Hale*: About 9,000 bales against 7,000 last year; we made 17,000 in 1870.

MISSISSIPPI.—*Washington*: Killing frosts. *Amite*: Loss from drought partly compensated by the fine growth of the closing season; quality superior. *Holmes*: Shed badly from drought; subsequent rains caused second growth; there will be no surplus. *Le Flore*: Killing October frosts. *Jefferson*: Mostly picked; 25 per cent. short of last year; killing October frosts. *Madison*: Yield somewhat improved; quality good. *Lee*: Lint good; seed small, and promises to sprout poorly next year. *Winston*: Very short. *De Soto*: Crop short and prices low. *Rankin*: Unusual proportion of lint. *Lincoln*: Opened prematurely by drought. *Lauderdale*: Late plantings ruined by drought. *Carroll*: Reduced yield. *Tishomingo*: Fine picking-season. *Grenada*: Yield increased by fine picking-season. *Covington*: Drought. *Franklin*: A third short. *Pike*: Somewhat improved by late picking-season.

LOUISIANA.—*Jackson*: Two months of fine closing season have been greatly in favor of the crop, though the top-crop is almost worthless. *Franklin*: Shortened by floods, drought, and cut-worms. *Rapides*: Better than last year; yield of lint double. *Tensas*: Very fine picking-season, enlarging the lint-product. *Union*: Yield better than was promised in September. *Caldwell*: Fine ripening and gathering season. *Washington*: Drought. *Morcheuse*: Increased yield from fine picking-weather. *Madison*: Finest picking-season in five years; lint of good quality; white frost October 13. *East Baton Rouge*: Fine closing season. *Richland*: Injured by heavy rains in September.

TEXAS.—*Matagorda*: Not over half a bale of lint per acre, the ordinary yield being 500 pounds. *Fort Bend*: Fine ripening and picking season greatly increased the product. *Kaufman*: Late frosts cut off late bolls. *Washington*: Fine closing season brought the yield up to last year's. *Red River*: Great improvement. *Houston*: Fine picking-season. *Harrison*: Very short. *Ellis*: Much will yet ripen if the weather continues favorable. *Cherokee*: Many fields have not made a bale to five acres. *Burnet*: Worms injurious. *Austin*: Very little top-cotton; 15 per cent. rotted by excessive rains. *Fayette*: Crop improved in the eastern part of the county. *Upshur*: Improved yield of lint has raised the product per acre above last year's. *Williamson*: Last picking shortened by worms. *Waller*: Ripened rapidly in the charming weather; fully five-sevenths of the crop already marketed. *Victoria*: Injured by freshet. *Smith*: Yielding better than was expected. *Medina*: Greatly improved. *Montgomery*: Fine growing and picking weather since September 28. *Hunt*: Shortened by drought. *Parker*: Late bolls will not mature. *Lavaca*: Cost of production exceeds the price. *Caldwell*: Top crop may yet come out. *De Witt*: Damaged by rains and wet weather. *Wilson*: A bale to four or five acres against a bale per acre last year. *Bexar*: Greatly damaged by September rains. *Goliad*: Injured by September rains. *San Jacinto*: Large yield of lint in proportion to gross product.

ARKANSAS.—*Scott*: Drought. *Dorsey*: A very serious failure. *Independence*: Short, but all saved in the fine picking weather. *Jackson*: Injured by heavy rains in September causing a second growth. *Sevier*: A bale from six acres. *Fulton*: The middle and best crop was destroyed by drought; the top crop by frost. *Pulaski*: Three-fourths already marketed. *Prairie*: Increased acreage will bring the yield up to 60 per cent. of an average. *Crittenden*: Frost damaged late cotton. *Bradley*: Better lint yield. *Howard*: Shortened by drought. *Arkansas*: Short, but greatly improved. *Izard*: Upland crops nearly destroyed by wet in spring and drought in summer. *Columbia*: Short-but of improved quality. *Franklin*: Bottom crops average; uplands a fourth of a crop, *Van Buren*: September rains caused the crop to take a second growth, but too late to mature.

TENNESSEE.—*Lauderdale*: Almost a total failure through drought and wet. *Harris*: Short. *Gibson*: Almost a failure. *Hardin*: Half crop; good quality. *Bedford*: Drought

## POTATOES.

Our November returns show a yield of potatoes but little less than last year. The only States equaling or exceeding last year's yield are, New York, 102; Rhode Island, 100; Connecticut, 110; South Carolina, 104; Illinois, 106; Wisconsin, 110; Iowa, 135; and Oregon, 104. These States produce about one-eighth of the entire crop. In northern New England the rot was prevalent. In the Middle States, drought and the Colorado beetle are the leading causes of decline. In most of the Middle and South Atlantic States the crop is largely decreased, Maryland losing a third. A heavy decline is noted in the Gulf States, and a still heavier one in the inland Southern States, where an unprecedented drought crippled vegetation generally. North of the Ohio River, the same destructive influence was felt to a minor degree. The Colorado beetle was here less formidable than in former years, but still gave some traces of its mischievous power. West of the Mississippi River, the ravages of grasshoppers were serious in many localities, while in Johnson County, Missouri, the chinch-bug varied its usual diet by devouring potato-vines and tobacco, in addition to the corn. California reports a decrease of 9 per cent. In Oregon, the potato-blight appears to be decreasing.

MAINE.—*Penobscot*: Rotted badly. *Waldo*: Loss heavy from rot. *Piscataquis*: Extra in quantity and quality, though many crops were affected by rot. *Oxford*: Quality good, though there was considerable rot.

NEW HAMPSHIRE.—*Sullivan*: Some rot. *Cheshire*: Shortened by long drought. *Hillsborough*: Crop large, but tending to rot. *Carroll*: Crop not so large as last year, but of better quality.

VERMONT.—*Rutland*: Some rot. *Orleans*: Good market for potatoes through the starch manufacture. *Caledonia*: Injured by rust. *Addison*: Unusually good. *Franklin*: Plenty and good.

MASSACHUSETTS.—*Berkshire*: Crop short and prices rising.

RHODE ISLAND.—*Washington*: Large and good crop.

CONNECTICUT.—*New London*: Some rot; yield large.

NEW YORK.—*Richmond*: Shortened by drought. *Columbia*: Shortened by drought. *Seneca*: Colorado beetles not very injurious. *Jefferson*: Late plantings shortened by drought, but the crop is generally good and sound. It has been found best to plant as early as practicable. *Genesee*: Greatly improved by late fall rains.

NEW JERSEY.—*Burlington*: Late plantings seriously injured by drought; severe ravages of Colorado beetles. *Morris*: No rot. *Warren*: Short but good.

PENNSYLVANIA.—*Lancaster*: Late plantings suffered from drought and bugs. *Westmoreland*: Badly injured by drought and Colorado beetles. *Fayette*: Colorado beetles troublesome. *Bedford*: Colorado beetles injurious, but the quality of the crop good. *Bucks*: Late Rose did well. *Lawrence*: Short but good. *Dauphin*: Colorado beetles very destructive. *Clearfield*: Colorado beetles destructive. *Washington*: Poorest yield for years.

DELAWARE.—*Kent*: Short but of good quality.

MARYLAND.—*Prince George*: Short but good. *Washington*: Short. *Queen Anne*: Shortened by drought. *Howard*: Short and poor. *Harford*: Shortened by Colorado beetles. *Baltimore*: Shortened by drought and bugs. *Montgomery*: Shortened by drought and bugs. *Anne Arundel*: Nearly destroyed by drought and bugs.

VIRGINIA.—*Mecklenburgh*: Almost an entire failure. *Highland*: Better than usual in spite of Colorado beetles. *Augusta*: Some of the finest tubers ever raised in the county. *Page*: Colorado beetles. *Henrico*: Drought. *Clarke*: The only tolerable crops were those planted after June 20; some damage from Colorado beetles. *Bedford*: Drought. *Essex*: Early plantings failed; late ones are very fine. *Craig*: Good and cheap. *Buchanan*: Drought and rot. *Fluvanna*: All short except the "Lake-Shore" variety. *Spottsylvania*: Crop large and fine. *Frederick*: Colorado beetles injurious. *Rappahannock*: Drought.

NORTH CAROLINA.—*Granville*: Poorest crop for years. *Wilkes*: Injured by drought and late frosts. *Haywood*: Drought injured early plantings; Campbell's Late Rose very productive. *Mitchell*: Rot. *Burke*: Drought. *Alexandria*: A failure. *Person*: A complete failure. *Beaufort*: Drought.

GEORGIA.—*Wilkes*: Very fine. *Terrell*: Drought.

ALABAMA.—*Covington*: Good and sound, but small. *Blount*: Drought.

MISSISSIPPI.—*Jefferson*: Almost a failure.

LOUISIANA.—*Franklin*: Shortened by drought.

TEXAS.—*Austin*: Second crop very good, especially Early Rose. *Fayette*: Yielded well and kept well. *Scott*: Drought.

ARKANSAS.—*Washington*: Drought. *Fulton*: Early plantings did well; late, shortened by drought. *Columbia*: Early Rose did well.

TENNESSEE.—*Hancock*: Abundant and fine. *Dyer*: A failure. *Monroe*: Early plantings a failure; later somewhat better. *Hardin*: Drought. *James*: Short. *Sequatchie*: Early plantings ruined by drought. *Knox*: Drought. *Greene*: Short. *Lincoln*: Drought.

WEST VIRGINIA.—*Tyler*: Drought. *Ritchie*: Early plantings injured by insects; late ones good. *Marion*: Small but sound. *Mercer*: Very good. *Kanawha*: Short. *Jefferson*: Colorado beetles. *Hancock*: Drought and bugs. *Harrison*: Bugs and drought. *Hardy*: A failure except where Paris green was used. *Doddridge*: Drought. *Brooke*: Better than last year; Colorado beetles destroyed by picking, and Paris green. *Boone*: Early crops light; later ones good. *Berkeley*: Early plantings swept by the bugs; later plantings escaped.

KENTUCKY.—*Scott*: Drought and bugs. *Nicholas*: Colorado beetles. *Lincoln*: Late plantings good; early scarce returned the seed. *Harrison*: Very poor. *Hart*: Very poor; drought. *Gallatin*: Half average, and of inferior quality. *Boyle*: Ruined by drought and bugs.

OHIO.—*Pike*: Drought. *Belmont*: Very inferior; bugs and drought. *Crawford*: Tolerable; injured by drought and bugs. *Champaign*: Drought and bugs. *Delaware*: A failure, except in moist low lands. *Lawrence*: Extrordinarily good. *Lorain*: good in spite of bugs. *Lucas*: Light, but good quality. *Morrow*: Closing season fine. *Mercer*: Sound. *Montgomery*: Early plantings good; late did not mature.

MICHIGAN.—*Branch*: Crops on oak openings scarcely worth digging. *Lake*: Abundant and good. *Macomb*: Drought. *Calhoun*: Early injured by drought; Paris green effectually used against the bugs. *Newaygo*: Good crops of peachblows since September 1; early kinds no better than last year. *Oakland*: Drought and bugs. *Ottawa*: Drought and bugs. *Grand Traverse*: Colorado beetle injurious. *Houghton*: Rot in some localities; skin appears sound, but when taken in hand it feels like a bag of water. *Ingham*: Drought. *Lapeer*: Bugs.

INDIANA.—*Whitley*: Seldom better. *Switzerland*: Drought. *Dubois*: Unusually small; drought. *Franklin*: Short and scarce; \$1 per bushel. *Fulton*: Colorado beetles not so bad as formerly. *Gibson*: Shortened by rain. *Howard*: Largest crop ever raised. *Noble*: Scarce; severe drought. *Posey*: Late crops good; in the beech hills the yield is 100 bushels per acre. *Pike*: Late plantings improved. *Steuben*: Good in timber lands; a failure in sandy and gravelly soils; 50 to 60 cents per bushel.

ILLINOIS.—*Mason*: A few late crops are good. *Sangamon*: Very poor; drought and bugs. *Winnebago*: No frost to injure vines. *White*: Bugs. *Shelby*: Late rains have greatly improved the crops. *Saint Clair*: Remarkably good. *Pike*: Good what there is of them. *Pope*: Injured 30 per cent. by drought. *Ogle*: Drought and bugs. *Montgomery*: Late potatoes fine. *Massac*: Late plantings better than for several years. *Macon*: Very fair crops, especially when early planted. *Hancock*: Good and well secured. *Fulton*: Late fine weather has made the crops. *Fayette*: Have grown rapidly since late rains. *Clinton*: Crops covered with straw took a second growth, and gave us a splendid yield after the bugs left. *Champaign*: Bugs and drought. *Carroll*: Late potatoes good; 40 cents per bushel. *Henry*: Poor quality; not well ripened. *Boone*: Struck by frost; many unsound ones. *Henderson*: Late crops good; early ones poor.

WISCONSIN.—*Walworth*: Better than for years. *Trempealeau*: Better crop than last year; better season, and an effective use of Paris green. *Saint Croix*: Drought and Colorado beetles. *Sheboygan*: Good season. *Sauk*: Late potatoes greatly improved. *Iowa*: Never better. *Columbia*: Some bugs. *Chippewa*: Potato bugs abundant. *Adams*: Good. *Jackson*: Bugs not so bad as last year.

MINNESOTA.—*Chisago*: Badly rotten. *Isanti*: Good in spite of drought and bugs; early plantings more practiced than formerly. *Martin*: Brought out by rains after the grasshoppers left. *Sherburne*: Double last year's yield and of fine quality. *Stearns*: Reduced by beetles. *Sibley*: Injured by grasshoppers to some extent. *Swift*: Drought. *Todd*: Some rot in the cellar. *Wright*: Bugs.

IOWA.—*Page*: Shortened by drought. *Montgomery*: Early Rose a fair average; peachblows a failure. *Marion*: Crop made within six weeks. *Lee*: Grew too rapidly to be as good as usual in quality; ready sale at 50 and 60 cents per bushel. *Jones*: Crop made by the August rains. *Jackson*: Abundant and good. *Harrison*: Failed through insects and drought. *Henry*: Early crop almost a failure. *Delaware*: Very fine. *Dallas*: Colorado beetles injurious. *Buena Vista*: Greatest failure ever known. *Benton*: Late crops fine.

MISSOURI.—*Pemisot*: Both early and late crops an entire failure through drought. *Chariton*: Late varieties failed. *Platte*: Scarce; \$1.20 per bushel. *Perry*: Shipping

potatoes from Saint Louis for our home consumption. *Johnson*: Almost destroyed by drought and chinchies. *Jasper*: Early crops good; late ones failed. *Franklin*: Scarce. *Daviess*: Early crops good; late ones failed. *Cole*: Drought. *Clinton*: Early crops good; late ones failed.

KANSAS.—*Marion*: Early crops light; later ones not worth digging. *McPherson*: Early crops average; late, a failure; drought. *Miami*: Late crops injured by drought; quality fair. *Labette*: Shortened by drought. *Montgomery*: A failure; grasshoppers and drought. *Jackson*: Early Rose did well; late plantings poor. *Bourbon*: Early Rose good; late varieties failed. *Mitchell*: No late potatoes; early, half a crop.

NEBRASKA.—*Lincoln*: Destroyed by bugs. *Antelope*: Early Rose good; late varieties failed, except the Harrison; grasshoppers. *Webster*: Drought.

OREGON.—*Columbia*: Blight decreasing.

## BUCKWHEAT.

Our returns indicate an increase in this crop over last year in the New England States; Delaware, Virginia, North Carolina, Tennessee, West Virginia, Indiana, Illinois, Wisconsin, Minnesota, Iowa, and Oregon, equal last year's crop; New York, the largest buckwheat State, is but one per cent. below last year; Pennsylvania, the next in production, declines six per cent. These two States produce nearly two-thirds of the entire crop. Other large-producing States come short of last year's yield.

NEW YORK.—*Warren*: Straw thin and short, but heads well filled with fine grain.

PENNSYLVANIA.—*Lycoming*: Straw large and well loaded. *Dauphin*: Two or three days of extreme heat at blooming-time reduced the yield one-half.

MARYLAND.—*Howard*: Filled poorly.

VIRGINIA.—*Highland*: Abundant; "silver hull," from the Department, a great improvement. *Heurico*: Brought up finely by August rains.

NORTH CAROLINA.—*Haywood*: Fine yield and quality. *Mitchell*: Very good. *Ashe*: Shortened by drought.

TENNESSEE.—*Greene*: Silver hull grows small, but fills well.

WEST VIRGINIA.—Poor; long drought. *Mercer*: Excellent. *Hardy*: Drought.

OHIO.—*Pike*: Injured by drought.

MICHIGAN.—*Bay*: A quart of seed from the Department returned two bushels and nine quarts of splendid grain. *Lake*: Never finer.

INDIANA.—*Wabash*: Good.

WISCONSIN.—*Columbia*: Silver hull has done well; better than last year. *Adams*: Acreage doubled and product per acre increased fifty per cent.

IOWA.—*Harrison*: Acreage doubled.

MISSOURI.—*Taney*: Almost a failure; drought from July 1 to September 15.

KANSAS.—*Nemaha*: Entirely lost.

NEBRASKA.—*Pawnee*: Destroyed by grasshoppers.

## HAY.

The hay-crop of the whole country is about the same as last year. In all the New England States, except Maine, there was an increased yield, and in all of them an improved quality. In some parts of Maine an increase of swale hay is noted. In Berkshire, Massachusetts, it is stated that, though the crop is clean and nice, it is less nutritious than last year. In the Middle States, except Pennsylvania, the yield is largely increased, and nearly all the counties report an improvement in quality. Of the South Atlantic States, Maryland, and Virginia show a smaller yield, but without any appreciable decline in quality. North Carolina and South Carolina equal or exceed last year's crop, with a considerable improvement. In the latter state pea-vine hay is cured in increasing quantities. Georgia, through drought, loses 10 per cent., but maintains her standard of quality. Alabama loses 10 per cent. but the other Gulf States fully equal last year's yield, Texas showing an increase of 13 per cent. In quality, these States show a decline of about 3 per cent. Drought, so injurious to other

crops of the inland Southern States, has been felt severely by the hay-farmers. Arkansas declines 26 per cent.; Tennessee, 25 per cent.; West Virginia, 22 per cent., and Kentucky, 33 per cent. from last year's crop, while all show a very serious decline in quality. German millet is a successful crop in Tennessee. All the States north of the Ohio show declining yields, but nearly or quite maintain the quality of the crop. West of the Mississippi, Iowa alone equals her last year's crop. The quality is maintained, except in Kansas and Nebraska. The Pacific coast raised a superior crop, equal to last year's in Oregon and one-third greater in California. In Kern County of the latter State, alfalfa has yielded five cuttings since May, besides leaving a fine pasture.

MAINE.—*Cumberland*: Winter-killed to some extent. *Oxford*: More swale hay than usual; cured well. *Piscataquis*: Considerably winter-killed where not protected by snow.

NEW HAMPSHIRE.—*Hillsborough*: Hay abundant and fine. *Carroll*: Fully up to last year.

VERMONT.—*Rutland*: Hay-crop excellent. *Caledonia*: Hay of excellent quality. *Chittenden*: Fall-feed fine; no hay used yet. *Windham*: Best second crop of hay for many years.

MASSACHUSETTS.—*Berkshire*: Clean and nice, but appears to be less nutritious than last year. *Bristol*: Quality reduced by unfavorable curing weather.

RHODE ISLAND.—*Washington*: Crop heavy.

CONNECTICUT.—*New London*: Hay-crop larger and finer than last year.

NEW YORK.—*Richmond*: Crop large and well secured. *Seneca*: Hay well secured. *Fulton*: Large crop of hay. *Wayne*: Crop large and good. *Warren*: Quality depreciated through the unusual growth of weeds. *Sullivan*: Hay abundant and fine. *Wyoming*: Feed abundant.

NEW JERSEY.—*Burlington*: No second hay-crop cut. *Sussex*: Finely cured and harvested. *Warren*: Crop fine, and well secured.

PENNSYLVANIA.—*Lancaster*: Season fine for growth and harvesting of hay. *Butler*: Fall pastures good, putting cattle in fine order for winter. *Montgomery*: Shortened by drought; good quality. *Fayette*: Light, but good. *Cambria*: Good and well matured; sells for \$25 per ton. *Lawrence*: Short, but good. *Beaver*: Stock cannot be wintered on the hay harvested. *Lycoming*: Clover short and timothy thin. *Washington*: Hay scarce, but fine; pasture gone, and stock must be fed early.

DELAWARE.—*Kent*: Heavy and clean hay-crop.

MARYLAND.—*Wicomico*: Hay a new crop here; culture increasing, and more profitable. *Howard*: Fine hay-crop. *Baltimore*: All kinds well secured. *Caroline*: Well saved.

VIRGINIA.—*Charles City*: Shortened by drought. *Highland*: Hay-crop light through drought. *Henrico*: Fine growing and harvesting weather. *Gloucester*: Shortened by drought. *Bedford*: No hay saved in many parts of the county; farmers depend on corn-fodder. *Madison*: Hay of good quality. *Craig*: Shortened by summer drought.

NORTH CAROLINA.—*Ashe*: Grass-crops shortened by drought. *Mitchell*: Hay improved in quality. *Buncombe*: About equal to last year. *Chowan*: Quality of hay very good. *Beaufort*: Increased acreage in grass.

SOUTH CAROLINA.—*Marlborough*: An unusual quantity of pea-vine hay secured. *Chesterfield*: Hay-crop shortened by freshets.

GEORGIA.—*Jefferson*: Hay-crop good. *Carroll*: Shortened by drought.

LOUISIANA.—*Tensas*: Immense yield of grass, which was secured in fine condition.

TEXAS.—*Austin*: Artificial and crab grass a failure; prairie-hay abundant, and cut in large quantities. *San Saba*: Good. *Fayette*: Short. *Medina*: Pastures excellent. *Uvalde*: Pastures fine. *De Witt*: Hay abundant and fine. *Bosque*: Alsike and blue grass stood the drought well.

ARKANSAS.—*Scott*: Army-worms destroyed red-top and timothy in many localities.

TENNESSEE.—*Obion*: Hay very good. *Dickson*: Standard grasses generally a failure, but German millet did well; army-worms about. *Wilson*: Shortened by drought. *Blount*: Shortened by drought. *Knox*: Great difficulty in getting a stand of clover or timothy. *Greene*: Shortened by drought. *Grundy*: German millet an extraordinary growth. *Lawrence*: German millet excellent. *Lincoln*: Drought.

WEST VIRGINIA.—*Wood*: Pastures very short. *Mercer*: Hay light, but well cured and good. *Kanawha*: Half crop of hay. *Jefferson*: Very good crop. *Hancock*: Shortened by drought. *Harrison*: Hay-crop short. *Hardy*: Drought. *Brooke*: Timothy poor; clover good, especially the second crop.

KENTUCKY.—*Lewis*: Short crop; brings \$22 per ton. *Ohio*: Drought and worms. *Mercer*: Pasture excellent. *Lincoln*: Hay-crop light. *Laurel*: Shortened by summer

drought. *Jessamine*: A third of a timothy crop; drought; clover nearly average. *Daviess*: Pastures short.

OHIO.—*Vinton*: Hay-crop short; pastures burned up. *Crawford*: Hay short. *Champaign*: Hay half short; grass nearly gone. *Delaware*: Greatly shortened by drought. *Erie*: Grass very short; cattle suffering for water. *Harrison*: Pasture gone. *Lawrence*: Half a hay-crop. *Lorain*: Pastures green and good. *Morgan*: Hay short. *Morrow*: Fine in quantity and quality. *Meigs*: Pastures dried up. *Montgomery*: Hay shortened by drought. *Perry*: Pastures nearly dried up; water for stock scarcer than ever known.

MICHIGAN.—*Marquette*: Pasture improved. *Branch*: Poorest hay-crop ever raised. *Livingston*: Fall feed used up by drought. *Macomb*: Drought. *Newaygo*: Hay short, but good. *Oakland*: Quality good; shortened by drought. *Saginaw*: Hay light, but fine; millet sown in considerable quantities, which, through careful curing, turned out well. *Lapeer*: Good. *Lenawee*: Shortened by drought.

INDIANA.—*Lake*: Hay-crop very good. *Grant*: Pasture short. *Warren*: No fall pasture. *Franklin*: Very little for sale. *Howard*: Hay deficient in quality and quantity; drought; stock-water failing. *Lawrence*: Extreme drought; stock-water scarce. *Orange*: Pastures very short; hay scarce; \$20 per ton, against \$10 last year. *Posey*: Hay very short.

ILLINOIS.—*Sangamon*: Extra good when put up, but many stacks injured by weather. *Richland*: Many meadows cut a second time, the second crop being about half average. *Pope*: Shortened by drought in June. *Piatt*: Pastures short. *Macon*: Better than for years. *Hancock*: Increased attention to hay and grasses. *Fayette*: Short hay-crop; drought; pastures fine. *Carroll*: Timothy \$10 per ton.

WISCONSIN.—*Lafayette*: Hay injured by floods. *Saint Croix*: Shortened by drought. *Richland*: Short; drought. *Ozaukee*: Pastures better than for years. *Fond-du-Lac*: Hay product increased by the use of gypsum. *Chippewa*: Drought. *Adams*: Light, but good.

MINNESOTA.—*Stearns*: Fine harvest weather. *Steele*: Hay never better.

IOWA.—*Wayne*: Hay light, but fall pastures fine. *Pottawattamie*: Light grass-crop, requiring the curing of an extra amount of prairie-grass. *Marion*: Improved quantity and quality. *Lee*: Fall pasture excellent. *Jones*: Drought. *Hardie*: Tame grasses light. *Johnson*: Pasture unusually fine. *Henry*: A good crop of hay, but injured to a considerable extent in the stack. *Floyd*: Hay still lighter than last year. *Clinton*: Fall feed good.

MISSOURI.—*Putnam*: Pasture fine. *Johnson*: Hay-crop made before the drought became severe. *Daviess*: Hay-crop escaped the drought. *Clinton*: Fine harvest-weather. *Adair*: Hay-crop 10 per cent. greater than ever before; it will be the main crop hereafter; thousands of acres have been sown this fall.

KANSAS.—*Marshall*: The few packages of grass-seed received from the Department have, by their results, convinced our farmers that it would be a great advantage to supersede our wild grasses with cultivated ones. *Marion*: Never knew hay to spoil so much after being stacked. *Miami*: Prairies all mowed over. *Labette*: Good, considering the drought. *Montgomery*: Hay-crop large and fine. *Jackson*: More hay in stack than ever before. *Bourbon*: Unprecedented hay-crop. *Barton*: The destruction of the corn by grasshoppers caused the farmers to give special effort to securing hay, of which there is abundance for stock-feed. *Mitchell*: Hay short and injured by rain in the stack.

NEBRASKA.—*Lincoln*: Hay-crop short, but good. *Antelope*: Large quantities secured, but injured in the stack by rains. *Webster*: Hay plenty and good.

CALIFORNIA.—*Placer*: Hay-crop superior in quantity and quality. *Mendocino*: Larger hay-crop than usual. *Kern*: Farmers have just finished cutting their alfalfa-hay crop, having cut four or five times since May; fine pasture.

OREGON.—*Columbia*: Hay never better; good timothy \$4 and \$5 per ton in the field pasturage good all season.

## TOBACCO.

The depressed yield of tobacco was sufficiently foreshadowed in our previous monthly reports. All the large tobacco States show results indicating a disastrous year to this productive interest. From Missouri comes the report of a new enemy to this crop, the chinch-bug. A final report of the crop of 1874 will be made after the receipt of special returns from all the principal tobacco-growing counties, including more particular and complete information which may modify in some cases the State percentages of yield published in the accompanying tables.

## CONDITION OF WINTER-WHEAT.

The following notes from our December returns show some of the local aspects of the growing crops :

Vermont.—*Grand Isle* : In good condition. *Addison* : Not over 52 per cent. of last year's acreage sown. *Rutland* : Has not come forward.

New York.—*Steuben* : Remarkably promising. *Yates* : As fine a growth as ever known here.

New Jersey.—*Burlington* : Winter-wheat under average, but improved by late rains. *Morris* : Wheat remarkably good.

Pennsylvania.—*Clinton* : Wheat looks well ; the Hessian fly has done some damage, but the plant is strong enough to resist the severity of winter as well as the ravages of the insect. *York* : Wheat looks sickly in places, but late rains will bring it out. *Cambria* : Weather favorable for putting in fall crops. *Lancaster* : Looks poorly ; will be very short without abundance of snow. *Perry* : Acreage of winter-wheat increased by the failure of young clover. *Indiana* : Wheat and rye look remarkably well ; the fall has been all that could be desired. *Tioga* : Specimens of rye from the Department have succeeded so well that the farmers are encouraged to revive this branch of culture, which had nearly ceased. *Beaver* : Drought. *Sullivan* : Best prospect for years. *Green* : Growing wheat good ; abundant rains.

Maryland.—*Caroline* : Injured by drought ; no rain from September 16 to November 23. *Dorchester* : Looks well in spite of drought. *Harford* : Injured by extreme drought ; it is feared that the grain is too poorly rooted to stand the winter. *Wicomico* : Recent rains have improved its hitherto unpromising appearance. *Washington* : Wheat improved by late rains. *Baltimore* : Wheat sown late to avoid the fly ; drought has injured its growth. More attention is given to rye ; it brings nearly as high prices as wheat, requires less manure, and produces a more valuable straw. *Calvert* : Injured by drought. *Howard* : Small growth ; drought. *Saint Mary's* : Injured by drought ; fly destructive.

Virginia.—*Cumberland* : Extreme drought has prevented the wheat from coming up freely. *Warwick* : Not moisture enough to enable the grain to germinate. *Stafford* : Injured by drought. *King George* : Drought. *Campbell* : Late sown, and hence backward. *Prince William* : Wheat and rye seeded late and in a slovenly way through lack of moisture. Late-seeded grain has come up thin ; drilled grain the best. *Russell* : Wheat looks 15 per cent. worse than last year. *Warren* : Dry season. *Amelia* : Severe drought ; wheat seems very thin, especially where shallow implements are used, such as "cultivators." *Gloucester* : Wheat looks poorly, on account of drought and drying winds. *Elizabeth City* : Extremely dry. *Caroline* : Unusually dry. *Westmoreland* : Drought. *Page* : Better cultivation makes the growing crops look better ; an unusual application of fertilizers has been made. *Nelson* : Thin ; ground too dry. *Mecklenburg* : Wheat looks badly ; drought. *Madison* : Drought ; broadcast-wheat thin ; drilled looks better ; drills coming into general use. *Dinwiddie* : Drought. *Fluvanna* : Wheat backward. *Highland* : Wheat looks well. *Roanoake* : Wheat looks remarkably well. *London* : Wheat looks well.

North Carolina.—*Wilkes* : Most favorable sowing-season ever known here.

Georgia.—*Lumpkin* : Wheat prospect flattering. *Appling* : Wheat backward ; drought.

Texas.—*Marion* : Prospects gloomy for winter-grain. *McLennan* : Largely increased wheat-acreage.

Arkansas.—*Van Buren* : Wheat sown too early. *Franklin* : Very promising. *Independence* : About 10,000 acres of wheat sown ; many crops injured by the fly.

Tennessee.—*Lawrence* : More grain sown than ever, and more pains in its preparation. *Warren* : Fall fine for winter-grain. *Bradley* : Fly in early-sown wheat. *Carter* : Early-sown wheat looks fine. *Cannon* : Soil put in better condition than last year. *Greene* : Looks well, what has come up.

West Virginia.—Wheat thin through drought. *Putnam* : Drought. *Raleigh* : Wheat looks well. *Cahill* : Wheat very poor. *Mercer* : Injured by drought. *Nicholas* : Wheat looks well.

Kentucky.—*Hardin* : Looks finer than ever. *Jessamine* : Acres in wheat, 14,250 *Mason* : Wheat small but healthy. *Henry* : All sorts exceedingly fine. *Ohio* : Very favorable season. *Owsley* : Wheat looks poor ; late sown on account of drought. *Galatin* : Improved by late rains.

Ohio.—*Monroe* : Largest wheat-acreage sown in fifteen years. *Ross* : Looks well in spite of drought. *Lucas* : Looks very badly ; drought ; drilled wheat better. *Hamilton* : Late drought prevented plowing for fall-grain and decreased the acreage. *Fairfield* : Wheat not tillering as much as usual ; drought. *Coshocton* : Nearly 30,000 acres in wheat ; great increase in consequence of loss of clover-crops. *Van Wert* : Wheat sown after the middle of September was greatly retarded by drought. *Tuscarawas* : Wheat looks remarkably well. *Union* : Some damage from the fly.

MICHIGAN.—*Monroe*: Many fields as bare as the roads. *Charlevoix*: Tendency towards spring-wheat. *Grand Traverse*: Average in spite of the fly. *Lenaewee*: Has not come up well; drought. *Wayne*: Greatest drought in forty-nine years; not half the wheat on the clay hills came up. *Cass*: Wheat has made an unusual growth; fly in some pieces. *Hillsdale*: Wheat looks well. *Livingstone*: Did not come up well on clay soils. *Montcalm*: Never looked better. *Barry*: Slim through drought.

INDIANA.—*Dearborn*: Drought restricted the wheat acreage. *Dubois*: Looks well in spite of drought. *Fayette*: Drought. *Gibson*: Wheat looks fine; some fields a perfect mat of dark green. *Noble*: Injured by drought. *Morgan*: Wheat fine. *Brown*: Acreage of wheat restricted by drought. *Perry*: Looks well in spite of drought. *Howard*: Injured by droughts on clay soils. *Tipton*: Wheat looks well. *Jennings*: What little wheat was sown looks badly; drought. *Warren*: Wheat never looked better. *Cass*: Came up well; fine rains wetting the ground six inches deep. *Marion*: Low prices have discouraged sowing, consequently the acreage has been reduced. *Martin*: Acreage restricted by drought.

ILLINOIS.—*Marion*: Acreage enlarged; crop looks well. *Pike*: Never looked better. *Johnson*: Increased use of the drill in wheat-seeding. *Marion*: Snow threatens to smother some fields of wheat. *Champaigne*: Wheat injured by drought. *Fulton*: Wheat looks unusually well; increased acreage. *Jersey*: Wheat never better. *Pope*: Retarded by fall drought. *White*: Wheat acreage increased 50 per cent. *Hancock*: Never looked so well. *Logan*: Wheat prospect never finer. *McLean*: Very fine in spite of drought. *Shelby*: Wheat more promising than for twelve years.

WISCONSIN.—*Sauk*: About 5,000 acres of winter-wheat sown. *Waupaca*: Wheat never looked better; acreage greater than ever before. *Walworth*: A hard year for farmers.

MINNESOTA.—*Isanti*: Fine weather has caused the grain to stool out well; it is now well covered with snow.

MISSOURI.—*Ripley*: Acreage in wheat at least two and a half times greater than in any former year. *Texas*: Double the acreage of last year; sown mostly in September, and looks better than for ten years past; fly in some places. *Caldwell*: Wheat looks extremely well. *Adair*: The best prospect for wheat. *Franklin*: Early-sown wheat looks better than last year. *Montgomery*: Wheat covered with 15 inches of snow. *Phelps*: Putting in our wheat better than ever; more drilling.

KANSAS.—*Coffee*: Wheat sown in September never looked better; later sowings in danger of freezing out. *Clay*: Early-sown wheat looks well; late broadcast wheat injured by drought; no rain since September 15. *Leavenworth*: Late rains and a heavy snow protect the wheat from winter-killing. *Labette*: Looks promising considering the late sowing. *Shawnee*: Never better.

NEBRASKA.—*Cass*: Timely rains have given our grain a good start.



Table showing the condition of the crops, &c., on the 1st day of November, 1874.

States.	CORN.		POTATOES (Solanum tuberosum.)		POTATOES, (Batatas edulis,) SWEET.		TOBACCO.		HAY.		BEANS.
	Product compared with last year.	Average quality compared with last year.	Product compared with last year.	Average quality compared with last year.	Product compared with last year.	Average quality compared with last year.	Product compared with last year.	Average quality compared with last year.	Product compared with last year.	Average quality compared with last year.	
Maine.....	95	87	95	97					94	102	106
New Hampshire.....	95	100	93	93					106	100	97
Vermont.....	95	101	94	95					100	104	92
Massachusetts.....	99	92	101	101					128	97	99
Rhode Island.....	94	100	100	103					123	100	105
Connecticut.....	110	104	120	96					129	115	112
New York.....	95	102	102	102					125	103	101
New Jersey.....	90	101	82	102	96	96			125	105	97
Pennsylvania.....	97	101	87	97	96	100			99	103	101
Delaware.....	94	90	105	100	110	100			133	100	100
Maryland.....	96	98	66	91	86	98			125	98	94
Virginia.....	99	99	86	95	97	99			90	100	101
North Carolina.....	102	101	76	85	95	90			92	100	101
South Carolina.....	117	101	104	102	109	104			111	103	98
Georgia.....	108	105	79	97	101	109			100	109	101
Florida.....	100	105	79	97	102	101			90	102	102
Alabama.....	91	95	80	84	85	85			83	97	92
Mississippi.....	100	95	62	85	69	79			95	90	83
Louisiana.....	81	89	77	87	72	82			100	101	81
Texas.....	103	110	94	96	87	92			113	98	91
Arkansas.....	50	69	49	60	65	78			74	88	54
Tennessee.....	63	84	50	70	81	93			75	96	68
West Virginia.....	88	95	71	96	90	97			78	96	93
Kentucky.....	80	87	55	69	80	96			62	86	75
Ohio.....	100	103	91	97	89	99			77	101	96
Michigan.....	86	100	91	99	80	113			83	102	96
Indiana.....	94	100	98	96	98	102			84	96	106
Illinois.....	81	92	106	94	102	99			95	100	87
Wisconsin.....	92	102	110	103	103	100			77	98	97
Minnesota.....	96	102	85	101	109	100			92	100	92
Iowa.....	110	104	135	107	100	92			100	98	99
Missouri.....	65	77	67	85	92	80			98	101	78
Kansas.....	43	62	45	76	81	81			81	82	30
Nebraska.....	50	64	72	80	94	100			94	93	36
California.....	101	101	91	101	111	100			103	104	99
Oregon.....	100	36	104	103					100	100	108



## EXTRACTS FROM CORRESPONDENCE.

## FROM NOVEMBER RETURNS.

**AGRICULTURAL PROSPECTS.**—*Greene, Ala* : There seems to be a disposition toward fall plowing ; the negroes seem to be anxious to get to work at it. If we can manage to do the greater part of the heavy work now, instead of waiting till spring, to overtax our mules, it will be a great point gained.

*Lowndes, Miss.* : Short cotton-crops and low prices have produced great stringency. Ordinary brings but 13 cents per pound ; it costs 15 cents per pound, with an average of 150 pounds of lint per acre.

*Jackson, Ark.* : Our planters are very much discouraged ; many of them have not made enough cotton to run them another year, and not half enough corn. Fortunately we have a good mast to fatten our hogs, or we should be without pork, and no money to buy with.

*Montgomery, Tenn.* : The coming winter stands a horror before the farmers ; corn and hay very short.

*Dyer, Tenn.* : Very short corn-crop, and scarcity of hogs will make meat scarce this winter.

*Livingston, Ill.* : It is a most singular fact that our seasons have become more dry for the last five years. We expect much destitution and suffering here this winter from the failure of crops.

*Grundy, Ill.* : The longest and most severe drought ever known here, from June 20 ; streams all dry.

*Franklin, Ill.* : The great question with our farmers now is, how we can destroy the chinch-bugs, for they must be destroyed or we must stop growing corn until they leave. We are agitating the propriety of burning all over our timber and all other land, so far as it can be done.

*Douglass, Wis.* : Farmers only hold their own. Nearness of copper and silver mines causes some neglect of farms.

*Mille Lacs, Minn.* : Stringency in the money-market affects the lumbermen, but the farming community are well prepared for the winter.

*Pope, Minn.* : The farmers do not appear to be discouraged on account of the short crops, but have manfully proceeded to prepare for a crop next year.

*Van Buren, Iowa* : In a residence of thirty-one years I have never known a season of so great abundance in the State. There is no general failure of the ordinary farm-products, except, probably, a small corner of the northwest portion of the State, where the grasshoppers have eaten a portion of the great abundance.

*Lee, Iowa* : Our county has been highly favored this year ; splendid corn, potato, and fruit crops find a ready market at good prices ; excellent fall pasturage.

*Benton, Mo.* : Drought still continues ; no rain since May ; no such dearth within the recollection of the oldest inhabitant.

*Taney, Mo.* : Drought from July 1 to September 15.

*Ray, Mo.* : Unparalleled drought.

*Ralls, Mo.* : Our season has been one of unparalleled fruitfulness, and our farming population are in a position to appreciate it, since our neighboring counties have suffered such terrible devastations this year. Last year was a poor season, and not much was raised ; the reverse is true this year.

*Moniteau, Mo.:* Our prospects are gloomy indeed ; our splendid wheat-crop is all we have to depend on.

*Jasper, Mo.:* No rain for four months.

*Crawford, Mo.:* Poorest crop-year ever known in the county.

*Cowley, Kans.:* Times hard ; money monopolies using all the advantage that the grasshopper, chinchies, and severe drought will give them.

*Sedgwick, Kans.:* We are not in as destitute a condition as is supposed farther east. There are a few families that must have help ; the rest of us are in a poor condition to give this aid.

*Boone, Nebr.:* Grasshoppers destroyed all the corn, nearly all the oats, and garden vegetables, and injured the wheat.

*Merrick, Nebr.:* Grasshoppers numerous.

*Thayer, Nebr.:* Everything, except small grains, taken with drought, grasshoppers, and potato-bugs.

*San Joaquin, Cal.:* Notwithstanding San Joaquin County has raised about 1,600,000 cents of the finest wheat this year, the farmers, as a rule, are comparatively poor, owing to the heavy expense attending the harvesting and sacking of their wheat at the low price it brings. The grangers have loaded about twenty vessels with wheat on their own account, and the warehouses are full all over the State.

FRUIT-CULTURE.—*Monroe, N. Y.:* At Charlotte, the port of Rochester, the receipts of winter-apples average 5,000 barrels per day. The market price is about \$2 per barrel.

*Wicomico, Md.:* Cranberries have been planted here in considerable quantities during the last four years. Lack of knowledge of their proper treatment has delayed good yields. Experience indicates, in the future, a profitable growth.

*Ashe, N. C.:* Cranberries almost a failure ; cause unknown.

*Liberty, Ga.:* An enterprising lady, Mrs. R. Screven, planted some young pear-trees three years ago, and from their fruit this year shipped to Savannah fifteen barrels of Pound pears, retailing at 5 cents each. She has also successfully cultivated many thousands of tea-plants.

*Bandera, Tex.:* Peach-trees that bore a good crop this year commenced blooming again about October 12. Should the warm weather continue the trees will soon be in full bloom.

*Van Buren, Mich.:* Cranberries half a crop. Our fruit-crop will exceed in value our wheat-crop at present prices—95 cents to \$1 per bushel.

*Pulaski, Ill.:* I can only repeat with earnestness my former statements, that the blights of the roots and trunks of our apple-trees must soon make it impossible to grow apples in this locality unless remedies can be found for these diseases.

*Jackson, Mo.:* Some of our apple-trees have bloomed since the rains.

*Osage, Kans.:* There are some curious phenomena to be mentioned. The fruit-trees (stripped by the grasshoppers) have all relieved, and many of them have bloomed with double flowers. Most of the embryo fruit is double.

*San Joaquin, Cal.:* There will be hundreds of tons of the finest grapes left on the vines, there being no demand for them. Wine-makers are paying \$15 per ton, and very few buying at that price.

*Sonoma, Cal.:* No such a crop of grapes was ever before known in this county, where the grape attains the most perfect development and growth. Your correspondent harvested in his own vineyard eight tons of grapes per acre. Foreign grapes have also done well, though injured by frosts. The wine-product of the county, even at 30 cents per gallon, will be worth more than all the other products ; yet there is not more than one acre in grapes of a thousand suited to that culture.

*Butte, Cal.*: I have made about five tons of raisins this season from the grape called Muscat of Alexandria, or White Muscat, which is identical with that from which the Malaga raisins are made in Spain.

**CORN-CULTURE.**—*Orleans, Vt.*: During several years it has been the prevailing sentiment that it is cheaper to buy western corn than to raise it here.

*Plymouth, Mass.*: The farmers plant less grain every year; one may ride several miles without seeing a single acre of Indian corn; more attention to milk production, vegetables, and fruit.

**GRASS-CROPS.**—*Orleans, Vt.*: Hay is our principal crop, and is all stored in barns; very few stacks in the county.

*Caldwell, N. C.*: Italian rye-grass wholly worthless here.

*Lincoln, N. C.*: The blue-grass has been taken in hand by one of our most enterprising farmers, but no one seems willing to try the Italian rye-grass for fear it may prove like some other foreign grasses, hard to eradicate.

**TOBACCO-CULTURE.**—*Person, N. C.*: The counties of Person, Granville, and Caswell are the finest tobacco-growing counties in the State. All other crops are much neglected or laid aside. The crop this year is one of the finest in color and quality.

**RICE-CULTURE.**—*Camden, Ga.*: This county has on the Saint Illa River 6,200 acres of rice-land under bank, all being under cultivation prior to 1861, and producing 279,000 bushels of rough rice, or 45 bushels per acre. In 1866 about 400 acres were planted, and the acreage has gradually increased from that time. The present year about 3,000 acres were planted, producing 120,000 bushels, or 40 bushels per acre.

**LIVE STOCK.**—*Montgomery, Va.*: This county is superior for grazing, which is a prominent occupation of the people. We have this year been eminently successful in this branch. Cattle were made very fat and sold at remunerative prices. Sheep-husbandry is on the increase, and the breeds of both cattle and sheep have been improved by importation.

*Montgomery, Iowa*: This county at the recent election adopted a regulation requiring stock of all kinds to be restrained from running at large, unless under the care and attention of some person, during the whole year.

*Polk, Mo.*: Farmers are selling all the stock they can get into selling condition. I expect to see more thin stock next spring than was ever seen in Polk County.

*Platte, Mo.*: Hogs a quick sale at \$5 per cental gross.

*Sedgwick, Kans.*: Those that have what farm-stock their homesteads can carry are, in this time of trial, in the best condition. Those that depended on grain alone, and would not be bothered with cattle, are in rather a bad fix.

**COTTON-CULTURE.**—*Edgefield, S. C.*: Last year a friend, with no little persuasion, induced me to plant a small portion of a very productive lot with seed of his raising, a variety known here as the Bancroft Cluster cotton, and the increased yield over the portion planted with common seed was truly wonderful, amounting to 20 per cent. These plants may be crowded very thickly, while the bolls, being in clusters, are easier to gather. It is said also to yield more lint from the same amount of gross cotton.

**PRODUCTS OF SOUTHERN TEXAS.**—*Cameron*: This section of Texas is not a farming country. Between the Nueces and Rio Grande—a ter-

ritory larger than the State of Pennsylvania—the people are almost exclusively engaged in stock-raising. There is a little cultivation along the margin of the Rio Grande, but it is very limited. In the whole valley there are not one hundred bales of cotton grown. The principal crops consist of corn, beans, melons, and a few vegetables. This is the dry region of Texas, and there will never be any agriculture until the waters of the Rio Grande are used for irrigation. This section consists of widely extended plains or prairies, with scarcity of water, but with good grass, and the plains are covered with cattle, horses, sheep, and goats. One gentleman in Nueces County, Mr. Mifflin Kennedy, has under fence 140,000 acres, and brands from 12,000 to 15,000 calves annually. Another, Captain King, has under fence about 60,000 acres and as much outside pasture, and he also brands annually 15,000 calves. Another stock-raiser, Mr. Clark, sold one of his brands and the stock with it, a few days since, for \$24,000 specie. These are the largest stock-raisers, but there are hundreds who count their herds by the thousands.

FROM DECEMBER RETURNS.

*AGRICULTURAL PROSPECTS.—York, Me.:* The opportunity for continuous farm labor has seldom been exceeded. Quantity and quality of butter produced are 20 per cent. better than last year, and the growth of young cattle in the same proportion. Farmers have bought as many goods and have paid as promptly as in past years. The middlemen have fallen off one-half. The results of the year show a greater balance in favor of our farmers than any year of the last six.

*Cumberland, Me.:* Crops all above average; no lack of food for man or beast at reasonable prices.

*Hancock, Me.:* One of our hardest seasons. Farmers are going into winter quarters with meagerly supplied larders. Throughout the long winter before us those who best solve the bread problem will be accounted our best brain farmers.

*Montgomery, Md.:* Good farming pays better during dry weather than any other time.

*Howard, Md.:* People much depressed by small production and low prices.

*Floyd, Va.:* Fall season very favorable; but little stock feeding yet.

*Orange, Va.:* The distressing want of money is a bar to all enterprise or improvement.

*Prince William, Va.:* A lean year with farmers.

*Greenville, Va.:* Some English and Scotch farmers have settled in the county and have commenced operations in a very different manner from the southern planters. The raising of turnips is a specialty with them, in which they have very good success.

*Prince George, Va.:* Low price of wheat and western competition since the opening of the Chesapeake and Ohio Railroad, has caused a decline of wheat acreage. We raise about 1,000 bales of cotton per annum.

*Camden, N. C.:* Farmers are in good heart and greatly encouraged; more manure made and more inquiry in regard to cultivated grasses. Our farmers do good work, but are deficient in farm-machinery. They accomplish too little for the labor employed.

*Greenville, S. C.:* Cotton, guano, and ruin are the three principal articles in this county. The land has been in corn one hundred years. It is difficult to make a crop or a report. The ship is sinking.

*Harris, Ga.:* Labor lower and more easily obtained.

*Schley, Ga.*: This section in far better condition than at any time since the war; more provisions; people nearer out of debt.

*Laurens, Ga.*: Few farmers are able to sustain themselves.

*Liberty, Ga.*: Agriculture slowly improving.

*Douglas, Ga.*: The repeal of the lien-law will cause some farmers to be pinched next year. This law created extravagance among certain classes. The county is well furnished with breadstuffs, but meat is scarce.

*Morgan, Ga.*: Low prices of cotton and high prices of supplies.

*Hamilton, Fla.*: All crops short.

*De Kalb, Ala.*: Rigid economy necessary.

*Henry, Ala.*: Farms more self-sustaining; more oats sown and more pork raised.

*Shelby, Ala.*: People more hopeful.

*De Soto, Miss.*: The pressure of the bread question has enlarged our wheat acreage to six times that of last year.

*Noxubee, Miss.*: Unequaled breadth of wheat sown.

*East Feliciana, La.*: Our condition deplorable.

*Henderson, Texas*: Plenty of corn; if our lands had been worked well we would have had abundance to spare.

*Dallas, Texas*: Hard times.

*Jackson, Ark.*: Half of the farmers will have to buy corn. Farmers of the hills to the west of us are bringing their cattle to winter on the cane of the river bottoms, which is abundant.

*Prairie, Ark.*: Immigration heavy, especially from Illinois and Kansas.

*Giles, Tenn.*: Stock in good condition but no demand for it; money scarce.

*Hardin, Tenn.*: Money scarce.

*Bedford, Tenn.*: The most trying year we have yet known, but the farmers have gone to work with a will and have put in more wheat and in better order than ever before.

*Lewis, Ky.*: The county is filling up with small tobacco-growers from Virginia. Tobacco land is selling at \$5 per acre. The acreage will be increased 50 per cent.

*Floyd, Ind.*: Money scarce.

*Whiteside, Ill.*: Looking for a good and rather prosperous winter.

*Livingston, Ill.*: Farmers in better condition than in any year since the war.

*Saint Croix, Wis.*: The poor yield and low prices of wheat depress our farmers. The flouring mills of Saint Croix keep the price at least 10 cents per bushel above what it would be otherwise.

*Washington, Wis.*: Low prices of wheat are very discouraging, causing farmers to hold back for higher prices. It costs 75 cents per bushel to raise wheat in this county, and the price is but 85.

*Crawford, Wis.*: Provisions plenty, but money scarce.

*Nicollet, Min.*: The prospect for a large crop of grasshoppers is flattering; any amount of eggs deposited.

*Washington, Iowa*: High price of pork compensates the low price of wheat.

*Pocahontas, Iowa*: Considering the threatening aspect of the grasshoppers last spring, farmers have reason to be satisfied with their crops.

*Appanoose, Iowa*: High prices of corn, oats, and hogs are making a very successful season for our farmers.

*Sioux, Iowa*: All our corn and half our wheat destroyed by grasshoppers.

*Putnam, Mo.*: Farmers are liberally rewarded by ruling prices of produce.

*Crawford, Mo.* : Drought and chinchés nearly ruined the crops.

*Clay, Mo.* : Gloomy prospect for the winter; little stock to be fed and but little to feed with.

*Coffee, Kans.* : Pretty fair crops.

*Nemaha, Kans.* : The disastrous failure of many of our crops does not discourage us; we are preparing a still larger crop area.

*Franklin, Nebr.* : People suffering for food and clothing. Crops destroyed by grasshoppers and drought.

*Hall, Nebr.* : Grasshoppers destructive; they have left but few eggs.

*Boone, Nebr.* : Grasshoppers.

*Madison, Nebr.* : Many farmers destitute.

*Fumas, Nebr.* : Many settlers left destitute by grasshoppers.

*Sacramento, Cal.* : Hop-growers excited by the good demand for their products; good hop-land in demand at fancy prices; wool flat and dull.

*Alameda, Cal.* : Fall clip of wool the largest ever produced; producers holding up for higher prices; hemp yielded splendidly.

*San Joaquin, Cal.* : About 60,000 tons of wheat in the warehouses of Stockton.

*Corvallis, Oreg.* : Hop-culture attracting attention. Willamette bottom-lands produce a fine quality of hops. Flax-culture also increasing, and is the most profitable crop this year, yielding about 15 bushels per acre, with \$1.75 per bushel.

*El Paso, Colo.* : Grasshoppers and drought destructive.

*Fremont, Colo.* : Grasshoppers and drought.

*Box Elder, Utah* : Prices about the same as last year, when trains loaded with grain were constantly rolling to the Pacific. The farmer dispenses with superfluous merchandise and pays his laborers in products. Many persons in delicate health and crippled find suitable employment in the manufacturing establishments of clothing, shoes, furniture, &c. This makes us partly independent of foreign markets.

LIVE STOCK.—*Camden, N. J.* : Some farmers are losing their hogs. They are first affected with sleepiness and loss of appetite. The ears and belly become dark-purple, and then death ensues. No remedy. The disease attacks young pigs as well as fattened hogs.

*Frederick, Md.* : Sheep-husbandry increasing.

*King George, Va.* : Hogs not so heavy as last year, but their increased number will enlarge the yield of pork.

*James City, Va.* : Drought has left our cattle in poor condition for winter.

*Hart, Ky.* : Some farmers, after feeding nearly all their corn, have lost most of their hogs by cholera.

*Logan, Ky.* : Drought and worm so injured our corn as to impair its fattening qualities; there is a great difficulty in fattening hogs.

*Boone, Ill.* : A large amount of stock-feed must be imported.

*Marshall, Ill.* : Stock-growing has increased to an extent sufficient to consume nearly all the grain raised; about 23,000 hogs sold, averaging 300 pounds gross per head.

*Marshall, Ill.* : More hogs fattened than ever before.

*Delaware Iowa* : More fattened hogs than at this period of any year since 1861.

*Washington, Iowa* : Hogs 6½ cents per pound gross.

*Caldwell, Mo.* : Corn scarce; stock-hogs shipped to Iowa and Illinois for feeding.

PRICES OF FARM-PRODUCTS.—MAINE.—*Androscoggin* : Hay good and



prices fair. *Cumberland* : Sweet corn, our principal crop, has averaged \$70 per acre.

NEW YORK.—*Otsego* : Our staple crop is hops ; yield moderate but of extra quality, and nearly all marketed at 35 to 40 cents per pound. This will probably stimulate the cultivation next year and produce a large acreage.

PENNSYLVANIA.—*Philadelphia* : Rye grown mostly for the straw, which sells at 85 cents per cental.

MARYLAND.—*Frederick* : Pork \$9 per cental—a very profitable return.

SOUTH CAROLINA.—*Beaufort* : Short staple-cotton, 14 cents per pound ; sea-island, 33 cents ; rice \$1.50 per bushel.

TENNESSEE.—*McMinn* : Farmers refuse to sell their wheat on account of low prices.

TEXAS.—*Burnet* : Very little corn sold as yet ; farmers are holding on for higher prices, though the demand is yet small.

ARKANSAS.—*Franklin* : All crops maturing late in the summer were shortened by drought, but the prices range very low, owing to scarcity of money.

KENTUCKY.—*Hardin* : Hogs, 7½ cents per pound ; cattle, 3½ cents per pound ; horses and mules, no market. *Jessamine* : Hogs, 6½ to 7 cents per pound ; nearly all sold. *Henry* : Hogs all sold at an average of 7 cents per pound, a very remunerative price.

INDIANA.—*Gibson* : Pork 5½ to 7 cents per pound. *Floyd* : Hogs, 7 cents per pound. *Marshall* : Hogs, 6 to 6½ cents per hundred, gross ; cattle plenty at 2½ to 3 cents.

ILLINOIS.—*Putnam* : Good beef-cattle, 4 to 4½ cents per pound ; fat hogs, \$6.80 to \$7.25 per cental ; hogs nearly all sold. *Sangamon* : Very few hogs shipped to Chicago ; spring field-packers paying very good prices. Cattle are too cheap to pay for the corn they eat. *Washington* : Red wheat, weight 60 pounds per bushel, brings 85 cents, with a deduction of 5 cents for every pound short of 60.

WISCONSIN.—*Richland* : Hogs have brought 5 cents gross, live weight, which is very remunerative ; beef-cattle mostly sold at very low rates. *Crawford* : Hog-crop one-half short ; prices from 5½ to 6 cents per pound, gross ; beef-cattle from 2 to 2½ cents, gross.

IOWA.—*Delaware* : Prices of wheat lower than for ten years ; corn and oats command fair prices.

MISSOURI.—*Putnam* : Hogs selling at 6 cents per pound, live weight. *Marion* : Hogs 7 cents on the hoof. *Platte* : Hogs 6 cents, gross. *Caldwell* : Horses and stock-cattle bring very low prices ; fat cattle and hogs very good ones.

KANSAS.—*Douglas* : Pork selling from 5 to 7 cents, gross. *Cherokee* : Wheat is very low—65 to 80 cents per bushel. It is most profitable to keep a car-load for shipment, as it will then bring from 5 to 7 cents more.

SOUTHERN NEW MEXICO AND ITS CHARACTERISTICS.—*Doña Ana*.—Southern New Mexico, including the valley of the Rio Grande in this county, presents advantages greater than any other Territory.

*Climate and geographical features*.—The climate is unsurpassed in salubrity for man and domestic animals. The snows of winter never cover the summer-grown grasses from the stock. All the fruits are produced which can be grown where the thermometer averages 80° F. during five months in the year. The ground is not frozen to hinder the plow forty-

eight hours at a time in winter; and winter-wheat, rye, and such grasses as can be grown in its hot summer, grow the year round. The elevation, 4,000 feet above the sea-level, and the great distance from the oceans, produce an arid and clear atmosphere, highly charged with electricity, which invigorates and nerves the human system, inflates and heals the lungs, and is free from miasms. The region only needs facilities of access to make it celebrated as a resort for the asthmatic and the consumptive.

*Fruit.*—Extraordinary crops of apples, peaches, and grapes have been produced. Trees in many instances have been so overloaded that they have been crushed beneath their burdens. Grape-vines have nearly recovered from the frost of April, 1873, which killed the new growth and destroyed some entirely, as it fell on them while in bloom. The yield the past season was 80 per cent. of a full average crop. The eight grape-vines sent me from the Department in February last have all lived and made fine growth, none less than 3 feet and some 6 feet in length. The growth of our El Paso vines has been enormously large this year in all the vineyards which have been cared for, and the grapes have met with no mishap. Mildew, (*oidium*,) owing probably to our arid atmosphere, never affects the fruit or vines, and the root-louse is unknown; perhaps our alkaline soils will not allow it to live. This valley has been proved to be one of the best in the Union for the production of apples, pears, quinces, and grapes, except that the winter-apples of the Northern States ripen here in the fall, and we have as yet but few of the longest keepers.

*Insects.*—The codling moth, curculio, and other destructive insects are unknown in this region; the fruit is, consequently, fair and free from insect injuries. A large green beetle eats the ripe apples and peaches on the trees; but as they are not abundant and remain but a few days, they do but little damage. Corn has three enemies: a green worm which enters the ear by the silk, or through the husk, and eats the young grain; a worm which enters the stalk near the ground and weakens it till it falls, often before the grains are perfected; and a small black bug, (about the size of the chinch-bug of the Northwestern States, but not fetid, and, if I mistake not, in the larva state it is a white grub, about three lines in length,) which also feeds on the young grain, entering the ear by way of the silk, if no other opening presents itself. The grasshopper tribe never do any damage here—in fact, few are seen west of the Pecos River and south of the thirty-fourth parallel, though more made their appearance in the latter part of October than had been seen before. The system of irrigation in this valley would meet and prevent their advance if they should attempt to come among us. The large brown squash-bug, (*Coreus tristis*, Harris,) is likely to render precarious the production of fine squashes and pumpkins in this valley. Beans are attacked and greatly injured by what is evidently a *doryphora*, the larva of which is yellow, considerably smaller than the *decemlineata*. The perfect insect greatly resembles the lady-bird in color, though not so bright and much larger. They feed on the leaves of the beans. Potato beetles are here, but as potatoes are only raised in limited quantities, they are doing no damage. A slate-colored bug, six lines long, attacked the grape leaves in June, but did no damage besides eating them, and thus thinning the foliage. They staid three weeks, and left no eggs or young on the vines. The plant-lice, (*Aphides*,) in the spring destroy all the cabbage tribe, so that seed cannot be raised here; but later the lady-birds increase and destroy many of them, allowing cabbage to make fair heads. The wheat midge is injurious to old wheat in the bin, so that little or no old wheat is kept over.

## INTERNATIONAL STATISTICS OF AGRICULTURE AND FORESTRY.

The Secretary of State has referred to this Department a communication from the Austrian ministry of foreign affairs, received through Baron Lederer, Austrian minister resident at New York, inclosing the "decisions" of the "first international congress of agriculture and forestry," held during the Vienna Exposition of 1873, upon several leading points. An abstract of these decisions is herewith presented:

I. In regard to the measures to be taken for the protection of birds useful to agriculture.

The congress determined to petition the imperial and royal government of Austria to conclude treaties with other governments embracing the following points: 1. To prohibit the taking or destruction of insectivorous birds. 2. To designate an international commission of specialists who shall prepare a detailed list of such birds as should be protected. 3. To prohibit the taking or killing of grain-feeding birds between March 1 and September 15. 4. To forbid the use of nets, snares, or bird-lime for the capture of birds. 5. To prohibit the taking of eggs or young of birds, or the derangement of their nests, except in the case of injurious birds specified by the international commission. 6. To prohibit the exposure for sale of any insectivorous bird, dead or alive. This prohibition applies to grain-feeding birds during the time in which it is unlawful to molest them, as well as to the nests and eggs of all birds not officially classed as injurious. 7. Special cases, in the interest of science, may be excepted from the operation of these rules.

II. What sections of agricultural and forest statistics, and what methods of abstract presentation of facts, render it desirable that an international agreement take place in order to obtain results susceptible of comparison.

The congress expresses the conviction that agricultural and forest exploitation, as now developed, cannot give statistical data sufficiently exact for comparison upon its actual condition and progress in different countries. The efforts of international statistical administration, hitherto, have been insufficient to meet this necessity, which can only be met by researches of specialists in the matter, and upon the basis of common agreement between governments. This agreement should fix the stand-point of investigation, and arrange a uniform programme, exposing clearly what should be the aim of the statistical abstracts and the meaning of the nomenclature adopted. The governments should be pledged to each other for the execution, as regularly as possible, of the programme, and for the intercommunication of the results obtained.

For this reason the congress prayed the Austrian government to take the initiative steps to secure such an agreement between governments, and to expedite the organization of a system of agricultural and forest statistics. It is recommended that a census be taken every ten years in all countries at the same time that the census of population is taken; that it should comprehend the greatest subdivision of administrative districts, and especially the segregation of the most important agricultural regions; the area covered by agricultural and forest culture in general; the cultivation of the most important crops, and their medium yield calculated upon the largest possible number of years; the systems of culture in use; the superficies covered with different kinds of forest,

and the mass of woods they contain; the aggregate of live-stock, and the profit derived therefrom; the approximate number of great agricultural exploitations; the aggregate of rural population, &c., with a tabular summation of the whole.

This movement should result in publications showing clear and precise statements capable of comparison upon—

1. The market prices of agricultural and forest products as well as the exchange to which they give rise. These statements should be as prompt as possible, and as often as once a week in times of special interest.

2. The annual yield of crops in percentages of an average yield, for the earlier crops in September, and for the later ones before the end of November. These should be given in absolute figures by unity of surface and in totality as soon as possible after the period of production.

3. The prices of transportation by quantity and distance, by rail or other roads or by water; the wages of laborers; interest on money; voluntary or involuntary mutations of property; the purchase-price and insurance of goods, &c. These statements should be made as far as possible from official data or other reliable information, and should be made annually.

III. Question A. What points of agricultural experiment demand the organization of an international system of observations?

Among the many points of this character the following are specially recommended for international observation:

*a.* Examination of the amount of ammonia and nitrous acid precipitated in rain, with indications, as precise as possible, of the place and time of such researches. This involves the question of nitrogen.

*b.* Determination of the power of absorption of the soil by chemical and mechanical analyses, as well as the influence of fertilizers upon absorption.

*c.* Researches upon the scientific basis that should be given to agricultural hydrotechny, embracing gardens for hydrotechnic studies.

*d.* Analyses of the principal grains and seeds of different countries selected from different localities, showing their nutritive and commercial value.

*e.* Definition of the influence of nourishment and breed upon the quantity and quality of milk, and the capacity of animals for fattening.

*f.* Management of the feed, seed, cocoons, and eggs of silk-worms.

*g.* Essays upon the variation of plants from the same seed through the medium of different methods and conditions of culture—that is, of acclimation.

To accomplish the above-indicated labors the governments are requested to complete the number of experimental stations and to furnish them with necessary means. The chiefs of experimental stations should assemble periodically with governmental delegates to deliberate upon the works to be accomplished, the most eligible methods of procedure, and the publication of results.

III. Question B. What points of forest experiment demand the organization of an international system of observations?

The congress decides—

1. Governments should by all means in their power introduce and organize forest experimentation.

2. Chiefs of experimental stations should be specialists in this business, and, as far as possible, devote all their time and energy to their work, satisfactory results being obtainable only by the accumulation

without delay of a large mass of observations to be utilized in a way corresponding to forest exploitation.

3. As soon as a system of forest experiment is organized in any country it should be placed in communication with similar systems in other countries, in order to act together upon points of international interest, as well as to determine the proper methods of action.

4. Questions demanding international observations are those which investigate the influence of forests upon climates, the amount of rainfall, the formation of springs, inundations, &c. This class of inquiries should be prosecuted at once, as the solution of the question of forest preservation depends upon the information obtained on this subject.

5. A permanent commission should be constituted for deliberating upon measures suited to the development of forest experimentation, with liberty to call in the aid of specialists.

6. The aid of different countries is invoked.

IV. What international measures seem necessary to remedy the ever-increasing devastation of forests.

1. An international effort has become necessary, especially for the preservation of forests at the sources of great water-courses, as their unlimited destruction brings about a fluctuation of water-levels very injurious to commerce and industry, filling the channels with sand, weakening the banks, overflowing the cultivated fields, and occasioning injuries affecting not only a single territory, but also other countries.

2. The preservation and management of forests, planted upon shifting sands, upon the summit and upon the declivities of mountains, upon the sea-shore, and other exposed places, is a matter of interest to all civilized nations, wherefore general principles should be established and put in force in all countries, binding upon proprietors of forests, the preservation of which is demanded by agriculture.

3. The preservation of forests being dependent upon good and sure management, especially in common forests, an international agreement is essential in order to make the researches and to obtain communications in regard to existing arrangements in different countries.

4. The Austrian minister of agriculture is requested to confer with other governments in regard to the preparation of statistical reports, embracing the localities of the forests to be protected, their extent, character, &c.

The congress finally concludes, that an international agricultural and forest congress, composed of delegates of governments and of great agricultural and forest associations, be convoked for the examination of legislative measures, facilitating the international exchange of agricultural and forest products, of finely-bred animals, of agricultural machinery, of artificial fertilizers, &c. The congress should also deliberate upon such scientific questions as will stimulate the progress of these great industries. The delegates should, at each session of the congress, report upon the international trade in alimentary products. The president should place himself in communication with governments and great agricultural and forest associations, in order to rally the force of these great interests to the statistical work contemplated.

## AGRICULTURE OF TUSPAN, IN MEXICO.

The Department is indebted to the United States consul at Tampico for the following interesting sketch of the natural resources, methods of husbandry, and agricultural capabilities of the comparatively unknown country in the neighborhood of the city of Tuspan, in Mexico, which has been to some extent settled by emigrants from the United States :

UNITED STATES CONSULATE,  
*Tampico, September 30, 1874.*

The city of Tuspan is in the State of Vera Cruz, about one hundred and twenty-five miles north of the city of Vera Cruz, and about ninety miles south from Tampico. It is located on the north side of the river Tuspan, about nine miles from its mouth, by the river, and about six miles in a direct line. There are about five thousand inhabitants in the city and some twenty thousand in all the canton or district of Tuspan. Of these, about two hundred and fifty are of foreign descent, principally from the United States and Spain. It is quite a picturesque city, as it is built at the foot of several hills, which are constantly covered with verdure. There are many beautiful groves of mangoes, interspersed with the graceful palm and orange, which, with a little foreign taste, could be made into beautiful gardens.

The land surrounding Tuspan, consisting of four hundred thousand acres, belongs to a stock company, and cost almost nothing some twenty years ago, the company having bought it from the original owner, who had his title to it from the viceroys of Spain. The price paid for it was about \$15,000, divided into shares of \$25 each. Notwithstanding the great desire of the Mexican government to induce immigration, there is really very little or no encouragement given by the people themselves; for, whatever may be the reasons for it, they will not sell an acre of the land. The planters who have come here, up to this time, bought one share from such person as was willing to sell, which share gives the planter the right to cultivate all the land he can, free of rent. This, at first sight, seems most favorable, but when the planters commenced their work it was with the expectation that in a short time they would get a title to the land and thus feel that they were improving what belonged to them, and not that they held an insecure title under a constitution that could be altered by an ignorant and prejudiced majority, which could at any time put most extortionate charges on their improvements. The probability is that if all these lands thus held by companies and municipalities are not put into the market, the government, either by taxation or purchase, will get possession of them, for nearly, if not all, the land on the Gulf coast is held by one or the other. The planters, therefore, do but little in the way of improvements, only putting up the necessary buildings for their families and their machinery.

The crop of sugar last season would have been over a million of pounds, but owing to adverse circumstances a large part of the cane was left in the field. There would also have been some twenty-five thousand barrels of molasses. The parties who are working these small plantations have but limited capital, and there are no large commission-houses in Tuspan from which planters could get such assistance as was needed at the time of sugar-making. Many of them were obliged, therefore, to lose a part of their cane. As there were no coopers in the place, the planters were obliged to get their barrels and boxes from Galveston, that being the only port in immediate and regular connection with Tuspan. Barrels from Galveston cost the planter over \$4 each, and as the lumber comes also from Galveston it makes the sugar cost half a cent per pound for only boxing it. Coopers are now establishing themselves in the place, who will soon have their steam-machinery, and as there is plenty of cypress a barrel can be made here as well and as low as in the United States. There are also plenty of trees suitable for box-lumber, and as there are now two steam saw-mills at work the boxes for sugar will cost very little for the future. There are also three steam sugar-mills, which of course reduces the cost of making the sugar. Another difficulty the planters encounter is that in Galveston, which is our principal market, the same sugar pays a half cent per pound more duty than in New York. The planters also suffer from the excessive freight to the ports of the United States. It is now supposed that, with the lines of steamships about to be established for New York, New Orleans, and Galveston, besides the sailing-vessels now running from Texas and other southern ports, boxes for sugar and barrels for molasses at fair prices, increased facilities for money to operate with, the sugar-crop will be doubled next season.

This part of Mexico is certainly one of the most favored by nature. The sugar-cane, once planted, lasts from fifteen to twenty years, and this with the very little care that is given to it by the Mexicans generally, and it is supposed that the same planting

will last for even a longer time when cultivated with the intelligence and experience of the foreign planter. Besides the cane, which grows to the height of 18 and 20 feet, and thick in proportion, some of the most valuable products of the world are produced spontaneously; for instance, vanilla beans, tobacco, gum-elastic, cedar, fustic, mahogany, sarsaparilla, jalap, anacahuite, and many other articles useful as medicines and dyes. Besides these, which grow naturally, there are in cultivation coffee, the best in the world; cotton, which, if left alone, grows to be quite a tree, bearing cotton for several years without replanting; tobacco, corn, beans, pease, and other vegetables; bananas, plantains, pine-apples, oranges, lemons, grapes, mangoes, and many other of the tropical fruits. So far does nature lend itself in aiding cultivation that when a native farmer commences work on a piece of land he cuts down the trees, lops off the branches, cuts down the weeds, and when dry burns the latter off, leaving the trees with the larger limbs as they fell in cutting, which lie there rotting for years. As soon as the burning is done, without plowing or harrowing, with a pointed stick, he makes a hole in the ground, into which the cane, corn, or other seed is planted. Should a few weeds spring up in the course of the year, they are cut down with a kind of cutlass called "machete." When the weeds become troublesome, he cuts down more woods, and abandons the old place. With no more cultivation than this the cane gives from 2,000 to 5,000 pounds of sugar to the acre; corn gives 30 to 35 bushels to the acre, and two crops a year, worth 75 cents to \$1 per bushel. There are times when it runs up to \$1.50. As corn can be planted every month in the year, one can always have green corn to eat. With nearly every other vegetable it is the same, as there are no frosts, the thermometer seldom falling below 40°, and rarely rising over 90° in the shade. From so little attention being given to these things, potatoes and onions generally retail at 12½ cents per pound, and other vegetables in proportion, all of them producing about the same quantity to the acre as in the United States. Beans are sold generally from \$2 to \$3 per bushel.

In starting a new plantation, and, of course, before one has time to cultivate a field of grass for his animals, he finds in the woods a tree which gives him all the forage he needs. The tree is called "Ojite," the leaves of which give more nourishment than the best clover. It is only necessary to cut down the small branches and twigs with their leaves on, and all the animals will eat it. As the tree grows wild, it is found everywhere, and an acre of woodland may have a hundred trees upon it. In clearing land they are generally left standing.

The grass most used here is called "Sacateparrol." It is a jointed grass, and grows to be 4 or 5 feet high, and can be cut five or six times each year, and when once planted cannot be killed out. Where planters have many animals they are allowed to run on the grass, which saves the cutting. This, of course, requires a much larger space, and must be divided into five or six acre lots, and by changing the animals from one lot to another it gives time for the grass to grow. Allowing animals to run upon it gives a chance for weeds to grow, which must be cut off every two or three years. I have seen this grass growing among trees, and supported by the branches, attain the height of 15 or 16 feet.

The vanilla-bean (properly called vainilla) grows on a vine which, although growing from the root, is a parasite, as it will grow even cut from the root, for it takes its substance from the tree around which it clings by means of its thousands of fine tendrils. Like all parasites there are trees which are particularly adapted to its support. They are planted about 10 feet apart, in rows, at the foot of small trees which are left in clearing the lands. They begin to bear the third year, and in favorable years give from \$400 to \$1,000 per acre. No cultivation is needed but to cut down the grass and weeds; no plowing or spading being necessary. The bean is often gathered in September and October, but as it is not yet ripe the vanilla is of inferior quality and sells for a low price; but if left till the end of November or December it comes to perfection. It is then gathered carefully and spread out in the sun on mats, if the weather be favorable, but if otherwise it is placed in ovens, which processes change the color from a pale green to a deep rich brownish or purple and at the same time develop the oil which on pressure exudes from the bean. They are then packed in blankets while warm and put into large tin cases to go through a sweating process, again put in the sun and again in the blankets until they attain the proper color. They are then placed in a dry room upon shelves made of some open material so that the air can circulate around and under them. This evaporates all the watery part of the bean. When sufficiently dried they are put into large cases ready to be assorted into sizes and qualities. The person that raises the beans seldom cures them, for that requires a good deal of care and special attention. There are about fifteen different classes, but they are sold by the packers at one round price. Four years ago the value here was \$60 to \$70 per thousand beans; now they are worth from \$130 to \$180 per thousand, such has been the increase in the consumption without a proportionate increase in the cultivation. The people will work only about one hundred days in the year, which provides them with all they need, and as they will do no more there is very little increase in the production of anything. When the beans are assorted they are tied up neatly in

bunches of fifty beans each and packed in cases of tin holding from two to three thousand. These tin cases are lined with tin-foil and a ticket put on the lid giving the quality, size, and quantity. Some five or six of these tin cases are put into a neatly made cedar chest, which is sometimes lined with zinc and hermetically sealed so as to prevent moisture from getting to the vanilla in transporting, which would ruin it. These cedar cases are then sewed in mats, and these are covered with a coarse bagging to avoid the dangers of transportation on mules. In this manner all the Mexican vanilla goes to places of sale in Europe and the United States, where it is worth from \$9 to \$20 per pound, the thousand beans weighing from nine to ten pounds.

Formerly France was the great market for vanilla, but the enterprise of some of our American merchants has diverted the trade to New York, which is now the great depot of vanilla, and parties from Europe come to New York to buy.

Bananas and plantains yield from \$100 to \$125 per acre, and only require to be planted once, for as fast as the mother stock gives its bunches of fruit and dies, a dozen little ones start, phoenix-like, from its roots. They are planted about 9 feet apart, but after two or three years there are a dozen stalks in each hill, each bearing its bunch of fruit, worth here 12 to 18 cents a bunch.

The pine-apple yields even more, for it is planted in rows, about 3 feet apart each way, thus producing about four thousand to the acre, worth here about 6½ cents each, or over \$200 per acre. Like the banana, it only requires to be planted once in ten or twelve years, grows from the root, and each plant yields but one fruit. After the first year bananas and pine-apples must be thinned out, or the fruit becomes inferior.

Tobacco is destined to become one of the most valuable products of this part of Mexico, for the country presents the same advantages of climate, soil, &c., as the island of Cuba. Already has the attention of the planters been extensively devoted to its cultivation, and now there are cigars made here very little inferior to the best Havanas. There is a great want of experience in curing, and when men of intelligence shall come here, very handsome returns will be made for their labor. Already from \$300 to \$500 are realized from an acre, and, properly attended to, more may be. In places where it is now cultivated, it can be had at a very low rate in its green state.

A large business has been established in the exportation of honey from this place. Formerly all the honey was thrown away, bees being kept for the wax only, of which enormous quantities are used in all the ceremonies of the church. Now that honey has taken a commercial value, which it did not have three years ago, the number of hives has been quintupled, and is still increasing.

The first shipment was of 500 gallons, and last year there were over 30,000 gallons shipped from this place alone. As there is no winter here, and there are flowers all the year round, the bees swarm about four times in the year. Formerly there was no care taken of them and the bees died; but now each swarm is looked after, and new hives are made, as a valuable addition to the family resources. Some of the Indians in the neighborhood have as many as five hundred hives, from which the comb is taken about every four months.

Tuspan was an important place of business in former years, but it was overwhelmed by Tampico and Vera Cruz, and business died out, leaving but a small local trade. From the impulse given by the arrival of foreigners, some of whom have gone into planting and others into commercial affairs, business has again increased wonderfully. Six years ago the customs receipts rarely passed \$15,000 a year. Now they exceed \$50,000. Formerly there were occasional coasting-vessels coming in, but rarely a foreign vessel. The following will show the extent of the commerce for the year from July 1, 1873, to July 1, 1874. The English vessels named on the list are all vessels sailing to and from the United States, and which, added to the American vessels, show the importance of the trade which is growing up between the two countries.

Exports to Europe .....	\$43,849 00
Exports to the United States .....	89,149 56
	<hr/>
	132,998 56
	<hr/>
Imports from Europe .....	65,815 45
Imports from the United States .....	34,922 31
	<hr/>
	100,737 76
Number of vessels entered during the year—	
National vessels .....	47
American vessels .....	38
French vessels .....	9
English vessels .....	3
German vessels .....	1
	<hr/>
Total .....	98
Tonnage, 10,851.	



From the hills of Tuspan can be seen some of the spurs of the "Sierra Madre," which I suppose are a continuation of the Rocky Mountains of the United States. From the Telegraph Hills can be seen the perpetual snows of the peak of Orizaba, some seventy-five miles distant. In the San Juan Mountains, distant about thirty miles from Tuspan, and running parallel to the coast for some forty miles, are to be found some of the richest deposits of gold, silver, quicksilver, copper, &c., that are to be found in Mexico. Owing to the frequent revolutions there have been but few important explorations made, and these have been by persons of small capital. Let immigration commence, and it will not take long to make a small California in these mountains. Besides the San Juan Mountains there are many others that are said to be very rich in silver and gold. There are hundreds of petroleum-springs within a diameter of fifty miles around Tuspan, but none of them are worked. While kerosene, &c., can be brought from the United States at such low rates it will not pay to work these springs. Some of the asphaltum has been shipped to the United States, but the result has not been very favorable. One company was formed to work some rich springs near Papantla, and machinery was brought out, but the kerosene was very inferior, and could not compete with that brought here. The failure, I think, was attributable to a want of experience, and proper persons to superintend the work. There are no wagon-roads in this part of Mexico. All transportation is on the backs of mules. Trains of these animals are constantly coming and going, bringing in the products and taking back to the interior all the goods used.

EDMUND JOHNSON,  
*United States Consul.*

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## CO-OPERATION IN AGRICULTURE.

The question of large or small farms, like most others, has two sides. Neither system of farming can have the preference under all circumstances; each is best, both for high culture and large profit, under the proper conditions. To attempt large farming with small means and limited executive capacity is unwise and quite sure to be unprofitable. This rule would limit farming practice in this country to small areas in most cases. At the same time it is equally true, in agriculture as in manufacturing, that the largest return for each dollar expended is obtained by systematic operations on a large scale. This has been repeatedly demonstrated in this country, as in foreign lands, and notably in the West and in California. This has led to association for conducting the business of harvesting, thrashing, cheese-making, as it should lead to steam-plowing and other farm-work, and wherever better results may be secured by combining capital and labor in the management of large areas in general farm-culture.

A brief account of a co-operative-farm enterprise in England is given below, and also a translation and condensation from a record of long and successful experience in France, being the report of M. Victor Borie to the *Societe Centrale d'Agriculture de France*, of the co-operative farm of M. Bignon of Theneuille.

The abundant supply of capital in England, and the self-reliance and marked individuality of Englishmen, make the progress of practical association slower than in the neighboring country across the channel. In England the agricultural laborers are not the owners of the soil, or even renters of the land, though there were formerly "yeomen," or peasant proprietors, and in Westmoreland and Cumberland a class of small owners known as "statesmen." Few of the land-owners of England direct the cultivation of their lands, a third class, the "farmers," leasing lands, paying a money rental, and farming more thoroughly and successfully than the owners of the soil themselves. They furnish the working capital, which often amounts to \$50 per acre, and in some cases nearer \$100 per acre. In France there is a large class of small proprietors whose condition is in few respects superior to that of the English

laborer; who divide and subdivide, in the course of inheritance, until the plot of each is insufficient for the most meager maintenance. This class was in existence before the great revolution, but was increased greatly in the distribution of the extensive landed property of the church. There is another class, perhaps larger than the peasant proprietors, more numerous in southern than in northern districts, who have no ownership of land, but rent holdings, a part by the payment of a specified sum of money, and a part by a return in kind, under various conditions, similar to cultivating "upon shares" in this country. These share farmers are known as "metayers." While the entire metayer system is one of association, and of labor with capital, a co-partnership of landlord and laborer, it is only occasionally that the union involves a sufficient amount of labor under compact and manageable organization to produce the best results. Unlike the case of England, therefore, rented farms in France are not generally the best managed and the most productive. Yet there are cases in which success of a higher order has been achieved in co-operation on a large and liberal scale, notable among which may be named the

**CO-OPERATIVE FARM OF M. BIGNON.**—The intelligent political economist in France has long bewailed the unsatisfactory condition of French agriculture, the difficulties in the way of its rapid advance to an elevated status, among which have been named ignorance of the laborers, increase of wages, and emigration from the country. Many have deemed the *metayer* system a scourge to agriculture. They say "share-farming perpetuates ignorance and misery; ignorance and misery perpetuate share-farming." It is conceded that the standard of cultivation attained in England, if reached in France, would increase, at least one-half, the present production of the latter country; and yet it is properly claimed that great and incontestable progress has been made during the last quarter of a century.

With a desire to demonstrate the feasibility of ameliorating the condition of the farm-laborer, by a system of association in which the production of the soil and the profits, both of proprietor and laborer, could be increased, M. Bignon, in 1849, gave up to his brother his business in Paris, and purchased lands in the vicinity of his ancestral home, about 520 acres, at a cost of 81,220 francs, or about \$16,000, which is very nearly at the rate of \$31 per acre. "The land was argillo-silicious, with an impermeable subsoil; poor, damp, and almost entirely uncultivated; furze, broomsedge, brushwood, and heather covered the portions which were not gullied or denuded by flowing water." It produced a little rye and a few cart-loads of hay, scarcely sufficient to feed a meager stock of cattle, consisting of only 27 head, valued at 2,774 francs, or \$20 per head. Neither wheat nor artificial forage plants were ever grown. There was no lime or marl to aid recuperation. There were no practicable roads between the different domains, or farms, of which there were three, Lacroix, Bonneau, and Grandfy; and the farm-buildings were mere hovels. One of these, a miserable hut, such as still exist by thousands in France for the occupancy of metayers, has been retained in the midst of a fine meadow as a reminder of former days.

General opposition was encountered from the metayers, though nearly all were badly lodged, and insufficiently fed, crushed with toil, and "over head and ears in debt." With nothing to lose and everything to gain, they resisted improvement, as ignorance and squalor have always done. Compelled to undertake patiently their conversion by degrees, he resided continually among them, and by his intelligent direction, tact, the justice of his requirements, and his tenacity of purpose, advanced prosperously

with the work of disarming their prejudice and overcoming their opposition. As they were not sufficiently intelligent to appreciate an address to their reason, M. Bignon first spoke to their eyes, in the results of a few experiments undertaken at his own expense, so convincingly as to induce them to follow his lead haltingly. The contract entered into between proprietor and laborer, which has remained unchanged for more than twenty years, is substantially as follows:

ARTICLE 1. The proprietor renounces *a toute espeece de redevance*—all rents or dues whatever, except the taxes which the estate is required to pay to the state.

ART. 2. The cultivator must furnish the number of men necessary to execute the work.

ART. 3. The work to be performed, the cultivation undertaken, the management of the stock department, shall be mutually discussed and agreed upon, and no change can be made without the consent of both parties.

ART. 4. The proprietor shall furnish, besides the land, the farm-stock, and shall pay the cost of the lime at the kiln, the cultivator transporting it, with the right to use the animals of the farm in its transportation. The cost of other manures, as guano, animal-charcoal, &c., shall be divided equally between the parties in the absence of special agreement. The proprietor shall pay for all manures used in the creation of permanent meadows upon lands not occupied by cereals or other crops. When these meadows are successfully established, the cultivator is accorded, by way of encouragement, 50 francs per hectore—fully \$4 per acre.

ART. 5. All products shall be equally divided between the lessor and lessee.

ART. 6. Profits of live-stock shall be similarly divided.

ART. 7. Extraordinary improvements, such as drainage, shall only be executed upon agreement between the proprietor and cultivator, who shall fix, in each case, the proportion in which each shall contribute to the work.

ART. 8. The direction of cultivation belongs to the proprietor.

This division of the charges was deemed essentially equitable, throwing the larger portion of the expense of improving the soil upon the proprietor, and dividing equally between the parties the cost of manures destined to double the common crop; and dividing equally the profits and losses of cultivation. There was one vital exception to this equality: in management, there was no division of responsibility in the control of labor; a competent director was a necessity, and the direction properly fell upon the owner of the property, whose interest in its income had been placed upon an equality with that of the labor which was to aid in its production.

So successful has been this copartnership that none of the metayers have ever withdrawn from the association, and the proprietor has long since declined active participation in the management of the estate, leaving farmers to their own direction, under the surveillance of his oldest son.

The improvement made has embraced lands, buildings, and the thrift, comfort, and material and mental elevation of the people. First the sedge and brushwood was removed, and the *débris* spread in yards, stables, sheep-folds, and roads, and, when sufficiently reduced, mixed with lime, and rendered available as a fertilizing compost. The great Dombasle plow, drawn by three or four pairs of oxen, and making furrows 10 to 12 inches deep, was used in breaking up; the heather-surface, turned under in winter, was harrowed in summer and sown with

rye in autumn, the seed being mixed with animal-charcoal. Wheat in the clover, fertilized by compost, followed the rye, and brought fine crops. A drain-pipe factory was established, the flat meadows drained, and a system of irrigation, by ditches and trenches economically run upon levels, gathered the fertilizing waters for distribution wherever their benefits were most needed. A quinquennial rotation of a restorative character, with three forage to two grain crops, was adopted, as follows:

*First year.*—Forage crops, roots, and fallowing wherever deemed necessary.

*Second year.*—Wheat and fall rye.

*Third year.*—Clover and ray-grass pastures, white clover.

*Fourth year.*—Clover and ray-grass pastures.

*Fifth year.*—Winter and spring oats or winter barley.

Not a rod of surface is unoccupied; and the example has been so contagious that heather and broom-sedge have disappeared from the neighborhood. Besides clover, lucerne, and ray-grass, the forage resources were increased by maize, vetches, the cavalier cabbage, and the forage-roots, rape and turnips.

In 1849 forage resources consisted of meager pastures and 40,000 kilograms of natural hay of poor quality; in 1869 it had increased to 240,000 kilograms of natural hay, 460,000 of cultivated forage, and about 400,000 kilograms of roots; in all about 1,100 English tons of feeding-material. In the same period the grain product was increased from 61 hectolitres\* of rye and 42 of oats to 1,541 hectolitres, consisting of wheat, barley, rye, oats, and buckwheat. In twenty years the value of live-stock had advanced from 2,774 francs to 69,480 francs, of which half was the property of the farmers.

The improvement in buildings was equally marked. The ruins were rebuilt or repaired by the proprietor. "Light, cleanliness, health, and happiness penetrated these residences formerly so miserable." Education followed; the children were taught to read, write, and cipher, and means taken to initiate the adults, in the long winter evenings, in the language and methods of progressive agriculture, presented in works from the libraries which M. Bignon had established upon each of the three farms. The stables were airy, spacious, and provided with all conveniences. Similar improvement had been attained in the animals themselves. Formerly numerous paths tracked field and heath, the ravines constituted roads, and the roads were lost in the swamps. These were all discarded, and a system of roads, intelligently surveyed and thoroughly constructed, took their place.

What has been the financial result of this enterprise? Certainly the metayers have been greatly benefited in large increase of income and comforts of life, in educational and social progress. The proprietor had invested originally 81,220 francs; the expense of improvement, including the cost of contiguous property purchased, was 71,597 francs. Upon this investment M. Bignon received an average return of 8 per cent., an income claimed to be superior to revenue from government stocks, and almost equal to the highest profits of the most doubtful of mobile values. At the same time the value of the estate had advanced from 384 francs to 1,500 francs per acre.

As early as 1858, M. Bignon received an honorable reward from his own *arrondissement*, and has received many since from regional and stock-growing associations: from the *Exposition Universelle*; in 1868, the

\*A hectolitre is 2.83782 bushels.

decoration of the Legion of Honor; and later, an award of the great gold medal of the *Société Centrale d'Agriculture de France*, which at the same time awarded silver medals to Messieurs Dausset, Guet, and Luchot, metayers of Theneuille, for the part in the improvement taken by the metayers.

The triumph of M. Bignon over the prejudices of the laborers, and his ultimate success in achieving as great improvement in the men as in the land, is thus recorded by M. Borie, in his official report of the inception and history of this enterprise:

M. Bignon desired that the demonstration should be complete and that the transformation which he had conceived should influence men as well as things. Men were also transformed. We have spoken with heads of families, malevolent witnesses of the first essays of the proprietor; they loyally confessed their error, and blessed him who had made them what they were. The misery of the metayers of 1849, which they have not forgotten, has disappeared from the domestic hearths. The debts (they had been able to go in debt) have been paid for many years; their savings have accumulated; metayers have become proprietors; they own domains worth from 20,000 to 30,000 francs; they have metayers under them whom they are educating in turn.

The families, by God's blessing, are augmented, but labor has increased with the number of children. Everybody can find, in the domain, occupation, and occupation profitable to the community. Thus at Theneuille, there is no such question as emigration, nor lack of hands. Labor does not fail and workmen are not lacking for labor. Here is one of the capital consequences of the work, essentially social, of M. Bignon. By association, intelligent, complete, devoted, on the part of the proprietor and his metayers, misery may be forever banished from our rural districts; the products of our soil may be multiplied; union subsists between capital and labor, a union sincere, complete, which becomes profitable to the whole country.

Is such association practicable? The testimony of Theneuille, the example of the other group of farms, which M. Bignon is engaged in constituting upon the same basis, proves in an irrefutable manner how easy that association is when the proprietor desires to make it so. The example of Theneuille shows that such association is not only practicable, but that it is profitable to the proprietor who knows how to take the initiative, and to the metayer who supports it. This example, finally, shows that an association upon this equitable basis is durable by the sole will of the contracting parties for at Theneuille there are neither contracts nor bonds nor engagement of any sort.

**A CO-OPERATIVE FARM IN ENGLAND.**—In 1830 a large land-proprietor, named Gurdon, in Assington, Suffolk County, undertook the project of founding an association for co-operative farming. Inviting a few farm-laborers to meet him, he offered them jointly, at moderate rent, a farm of 60 acres and the use of £400, without interest, for ten years, on the condition that each member of the contemplated association pay into its treasury a fee of £3, (this fee was designed principally as a guarantee of good faith,) with the proviso that the farm should be managed by one of their number at fixed wages; the remaining members were to be at liberty to continue in the service of their old employers. Though this scheme involved little risk and the advantage of capital without interest, its author found laborers who had been always trained to rely exclusively upon wages for income reluctant to enter upon it. But a beginning was made, and, at the end of ten years, the association had accumulated, beyond what was needed for current expenses, enough to repay Mr. Gurdon the capital he had advanced. Fifteen years later they rented from the same patron 65 acres more, making 133 in all, to which 8 have since been added. The greater part of the additional outlay this involved was met by their surplus earnings, and the remainder by money borrowed at  $2\frac{1}{2}$  per cent. With this enlargement of land the number of members was increased from 15 to 20, and these limits of land and members continue up to the present day. The largest portion of the members continue to work for wages in the service of employers. A manager, with seven or eight hired hands, carries on the co-operative farm. The wife of the manager cares for the dairy prod-

nets, receiving for this service £10 annually. The present manager has been in charge the last twenty-five years.

A writer in the Pall-Mall Gazette, who visited this co-operative association the past season, reports that, at the age of over forty years, it is in a condition of assured and substantial prosperity. He found the farm stocked with 6 horses and 1 colt, 16 horned cattle, "milk-cows and fattening bullocks," 110 sheep, and large numbers of pigs and poultry, "varying according to the seasons." All the varieties of farm animals were of good breeds and in excellent condition. Artificial manures are largely used, and the fields of wheat, turnips, and other growing crops afforded proof of clean, good farming. The members and their families, by visible evidences of thrift and contentment, as well as by direct testimony, evinced a high appreciation of the advantages derived from this co-operative investment. "It is a rare, good thing for us poor folks," said one. Another said, "I wish there were such things in every parish, so that the good the rich people do the poor might be handed down from generation to generation; but poor folks must have a start; they have no money to begin with." The writer concludes:

A co-operative society that has been in existence for forty years; that has never got in debt, and has furnished a satisfactory balance-sheet at the end of the year; that, moreover, has developed thrift, independence, and good feeling to the extent here witnessed, cannot be pronounced a failure, but it must always be remembered that "poor folks must have a start;" nothing could have been done without capital—in this case borrowed capital.

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## ENTOMOLOGICAL RECORD.

BY TOWNEND GLOVER, ENTOMOLOGIST.

GRAPE-ROOT GALL-LOUSE.—As the *Phylloxera vastatrix*, or grape-vine-root gall-louse, is attracting universal attention in Europe, and especially in France, in consequence of the injury the insect does to the roots of the grape-vine, and is also said to be spreading in the United States, it will be of interest to our vine-growers to learn that a congress is to be held in the Tuilleries in Paris to discuss the subject in all its phases. We therefore give the following questions in an extract from the Wine and Fruit Reporter, New York, (copied from the London Wine Trade Review,) November 25, 1874:

1. Is the *Phylloxera* the cause of the new disease of the vine or is it the result? 2. How is it to be accounted for that hitherto none of the insecticides applied, nor other means recommended, have been able to destroy it? 3. If the *Phylloxera* is but the consequence of the disease, would it not be advisable to treat the affected vines prophylactically by means of powerful manure easily applied? 4. How is the destruction of the insect by submersion of the vines explained? 5. In what manner does the *Phylloxera* carry the infection from a plant infected to a healthy plant? 6. Is the *Phylloxera* that attacks the roots of the vines (the species best known in Europe) identical with the *Phylloxera* that preys on the leaves, (the species most prevalent in America?) 7. Are there one or more parasites of the *Phylloxera* in existence and known to science? 8. Are there any species or varieties of the vine-plant that successfully resist its attacks and defy contagion? 9. Would it be possible and practicable to multiply such varieties in France by grafting them on to the descriptions commonly planted in France? 10. Is it possible to calculate the money-value of the losses occasioned by the *Phylloxera* in the south of France? 11. What is the economic influence of the insect on the price and consumption of wine, on the traffic of the railways, and the revenue derived by the State from the tax on wine?

We expect the action of this congress will result in giving to the world some new facts regarding the natural history and habits of the

insect, which may clear up many hitherto-contested theories as to the identity of the grape-leaf gall-louse of the United States with the true root-gall louse of France, and which is supposed to be the same insect in a different form, and with different habits; the means by which they can be destroyed to the best advantage, no doubt, will be of the greatest utility to the grape-growers, both of Europe and this country, especially if the two are satisfactorily proved to be merely varieties of the same insect.

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## CHEMICAL MEMORANDA.

By WM. McMURTRIE, CHEMIST.

PARIS GREEN—ITS USE IN AGRICULTURE.—The question of the use of arsenical compounds in agriculture for the destruction of noxious insects has elicited considerable discussion, and we have received from our correspondents in different sections, especially those infested with the Colorado potato beetle, very many and various questions, which have led us to the consideration of several points concerning it.

Some of the farmers seem to consider that, when applied to the potato crop for the destruction of the beetle, it will have an injurious and poisonous influence upon the tubers. Others fear the absorption of arsenic by the tubers to a sufficient extent to be injurious to the health of the consumer. We have also received applications for information concerning the use of arsenical compounds in solution and their probable effect upon vegetation. And the question as to whether or not arsenic could be absorbed and assimilated has also raised in our own minds the question whether the arseniates of the alkaline earths can substitute the corresponding phosphates, all being included in the same chemical classification, in the economy of plant-growth. The results of our experiments in this particular, though not complete, may, to a certain extent, settle the first point. The full description of these experiments must be given hereafter, but a partial statement of the results seems pertinent here. A number of boxes of soil were prepared with pure washed sand containing a mixture of kainit, (crude sulphate of potash,) gypsum, (sulphate of lime,) and each of the boxes containing respectively the arseniates of lime, baryta, strontia, and magnesia. Alongside of these boxes were others prepared in a similar manner, but containing the phosphates instead of the arseniates of the alkaline earths. In all of the boxes pease were sown, and after ten days a large number of the seeds planted in the boxes containing the arseniates had failed to germinate, and those plants which had sprung up were very weak and sickly. Fresh seeds were sown in those portions of the boxes in which the seeds had previously failed to grow, and this time a tolerably fair proportion of the seeds germinated. But, as in the previous instance, they failed to evince a healthy condition of growth. The seeds were sown early in August, and on account of the frost it was found necessary to collect the plants in the latter part of October, when they were just about blooming. On testing specimens at different stages of growth by means of Marsh's test, after having boiled the green plant with solution of chlorate of potash and hydrochloric acid, not a trace of arsenic could be detected. When the plants were taken up it was found that the tap-root was destroyed, and that sufficient small fibrous lateral roots had

been thrown out to form a thickly matted mass. The end of the tap root, or what remained of it, was covered with a thick, fleshy knob, not very large, but apparently an extension of the bark of the root. We are not fully satisfied as to whether this condition is due to a deficiency of nutriment in the soil, or to a distinctly poisonous action of the arsenical compounds. It would seem, however, that the latter was the case, since the tap-root of the boxes similarly prepared, but containing no arseniates, were perfectly sound. We shall, nevertheless, vary our experiments with a determination of this point in view.

Mulder states\* that plants may be poisoned by many principles which are poisonous to the animal organism, but holds that they do not attack directly what is called the vital principle, but affect the proximate organic principles of the plants, changing the conditions under which they exist, and thus prevent the transmission of liquids from the roots. In support of this idea he cites the coagulation of the albumen of the plants by the metallic oxides, such as lead, copper, &c. In case of arseniates of the alkalis and alkaline earths this would scarcely occur, since the acids of arsenic have no such effect upon albumen, and indeed there is, so far as we know, no fact recorded in which they have been known to form any combination with the other constituents of the plant. In the use of metallic compounds of arsenic, however, this action may possibly take place.

We have also conducted some investigations upon the assimilation of arsenic by plants in case of direct application of Paris green itself, but the results of our experiments seem in this instance also to be of a negative character. The investigation has not been as full as we desire, but we shall give the results for what they are worth. Upon a lot of "cow-pea," a leguminous plant used as a foddering material in the South, growing in the Department grounds, was freely dusted Paris green as obtained from the shops without any admixture of foreign substances. The material did not, however, seem perfectly unadulterated. In the first case the amount applied seems to have been too large, as all the plants were killed. Subsequently, however, a mixture of Paris green and gypsum, in the proportions usually recommended, was applied, and the small terminal buds and leaves were killed. But in a short time lateral buds appeared, healthy branches developed, and the plants grew thriftily without seeming to be otherwise affected. Examinations of the plant at different stages of growth, by means of Marsh's test, carefully applied, failed in any case to reveal the presence of arsenic. It is, however, possible that, had the plants had an opportunity to mature, arsenic might have been assimilated. In this connection the results of the experiments of Prof. E. W. Davy† are exceedingly interesting. Being aware of the fact that nearly all of the sulphuric acid employed in the manufacture of superphosphates in Dublin was made from pyrites, which almost invariably contained arsenic, he considered it of some importance to determine whether the arsenic which thus passed into the superphosphates, and must, therefore, be communicated to the soil in the most favorable condition for assimilation by plants, could enter into the vegetable organism. As a preliminary experiment to determine whether arsenic could be taken up by the plant, he watered pease, which had been transplanted into a pot containing rich garden-soil, with a concentrated aqueous solution of arsenious acid. This treatment was repeated every second or third day for more than a week, and then discontinued. At the end of some

\*Chemistry of Animal and Vegetable Physiology. English translation, 1849, page 626.

†Phil. Mag., vol. xviii, p. 105.



months, the plants having grown to full size, flowered, and fruited, it was found by application of both Marsh's and Reinsch's tests that the arsenic had permeated every part of the plants. Being thus satisfied that plants were capable of taking up arsenic during their development, he made some experiments with the use of phosphates containing arsenic. The sulphuric acid employed in their manufacture contained about 2.8 pounds arsenic per ton, and the proportions employed were one ton of acid per two tons of bone. The amount of arsenic in the superphosphate was therefore relatively very small.

In his next experiment he prepared a soil consisting of one part superphosphate and four parts garden-mold, into which he transplanted a small cabbage-plant. At the end of three weeks an examination for arsenic, with a small portion of the plant, (113 grains,) gave the "most distinct indications of the presence of that substance." Since, however, he considered the conditions in this case very favorable to the absorption of arsenic, he examined carefully different samples of Swedish turnips which had grown in a soil to which superphosphate had been applied at the rate of six hundred-weight per Irish acre, and found arsenic in each case. It is also stated that sheep refused to feed freely upon the turnips grown upon soil to which the superphosphate had been applied.

The results of Professor Davy's experiments do not, however, seem to have been confirmed by the results of later investigations, and, in fact, so far as we have been able to learn, these have been of a decidedly contradictory character. Thus Mr. E. H. Ogston,\* doubting that a saturated solution of arsenious acid could be applied to plants without injury to them, and that the amount of arsenic communicated to the soil by the application of superphosphates would be large enough to appear in the plant in sufficient quantity to be detected by the ordinary tests of the laboratory, repeated the experiments by watering some strong cabbage-plants of some weeks' growth with a saturated solution of arsenious acid, and though only two doses were administered in three days, the plants drooped and died in less than a week. Repetition of this experiment with Scotch kale afforded similar results. After a few days all the plants experimented upon were removed from the ground and various portions of the stems and leaves examined for arsenic by means of the Marsh's test, when the poison was found "only in the portions of the stems close to the roots, which were darkened in color in the interior. In no case was the poison found in the stem at more than five inches from the ground." Mr. Ogston experimented with other solutions of arsenious acid, but found that when the dilution was sufficiently great to prevent injury to the plant, no arsenic could be detected in any portion above ground.

With regard to the absorption of arsenic in case of the Swedish turnips, without any experiments, he reasons that the quantity applied per acre in the superphosphate is not sufficient to render it possible to detect its presence in the root. But admitting that the plant will absorb arsenic with the same avidity as phosphoric acid, which, reasoning from the evidences on record, is scarcely possible, close calculation shows that when the quantity which might be introduced to the soil through the medium of the superphosphate is present, enough could be taken up to be detected by the delicate tests at our command.

The conclusions arrived at by Mr. Ogston seem to be corroborated by the results of the investigations of Daubeny.† In his experiments he

\* Gardner's Chronicle, 1860, 216.

† Jour. Chem. Soc., XIV, 225.

watered a plot of ground of 100 square feet, containing young barley, with a solution of arsenious acid in the proportion of two ounces per ten gallons of water, and after six days the crop had a blighted appearance. A similar plot was then watered with a solution of half this strength, and after two applications at an interval of twelve days, this crop also appeared to be injured. The treatment was, however, again continued after a short time, so that in all five applications were made, yet the crop matured.

A similar plot sown with turnips received applications amounting to 4 ounces arsenious acid per 100 square feet, and were in no wise injured. In case of the barley the indications of arsenic shown by the Marsh test were very slight, and in case of tests made both by the author and by Professor Brodie decidedly negative results were given.

It will therefore be seen that the general character of the results which have been obtained from investigations upon this subject has in the main been negative.

Having thus given the results of our preliminary experiments and the history of the matter, so far as we have been able to obtain it, we shall continue our investigations in this regard and publish the results from time to time as they may be obtained.

**ALUMINIUM IN PLANTS.**—It is well known that alumina is seldom if ever present in the ashes of the phænogams; but since 1853, when the fact was determined by Ritthausen, its presence in the cryptogams has been generally admitted. Prof. A. H. Church has furnished evidences of this fact in the results of his late researches upon plants of this class, as exhibited in the following table :

	Percentage of ash in dry plant.	One hundred parts of ash contain—	
		Silica.	Alumina.
<i>Lycopodium alpinum</i> .....	3.68	10.24	33.50
<i>L. Clavatum</i> .....	2.80	6.40	15.24
<i>L. Selago</i> .....	3.20	2.53	7.29
<i>Selaginella artensii</i> .....	11.66	41.03	0.26
<i>Selaginella spinulosa</i> .....	3.44	6.67	None
<i>Equisetum maximum</i> .....	20.02	62.95	None
<i>Ophioglossum vulgatum</i> .....	8.25	5.32	None
<i>Psilotum triquetrum</i> .....	5.06	3.77	Trace (?)

**SULPHOCYANIC ACID POISONOUS TO PLANTS.**—The poisonous and corrosive action upon plants, lately attributed by European agriculturists to phosphoric acid, has been found to be due rather to the sulphocyanic acid existing in the crude sulphate of ammonia obtained as a by-product in the manufacture of coal-gas, and employed in the manufacture of superphosphates. This sulphate of ammonia often contains considerable quantities of sulphocyanide of ammonium, which, according to certain German investigators, exerts a decidedly poisonous influence upon vegetation. Since, therefore, it is advisable that the commercial sulphate of ammonia used for agricultural purposes should be free from this compound, it should be previously examined by testing with salts of the peroxide of iron, which indicates its presence by the appearance of a red coloration.

**WHAT IS AN AMELIORATING CULTURE ?**—This subject has been ably

discussed in a very interesting paper by M. Gaetan Cantoni, Director of the Royal Superior School of Agriculture at Milan, Italy, published in a late number of *Journal d'Agriculture Pratique*. The discussion is based upon the opinion that the best system of rotation is not that of a succession of crops according to their different chemical necessities, nor that which takes from the soil the smallest quantity of mineral plant-food, but rather that which, though it takes from the soil more of fertilizing materials, also returns a larger quantity in the residual matter which remains after harvesting the crop. Fields may preserve an undiminished rate of production without manuring for a year or two. Thus, after crops of clover or lucerne, either of which make large demands upon the soil, the land with an application of fertilizers entirely insufficient to supply the deficiency caused by the demand already made upon it, may be devoted to other crops to advantage, and the profit of subsequent crops will be proportionate to the time during which the land has been in clover or lucerne. The same experiment after a single crop of wheat or barley would furnish small results, yet the amount of valuable constituents of plant-food removed by these crops is by no means as large as that removed by the two crops of clover or lucerne. In evidence of the latter fact the following table was prepared, showing a comparison of the total quantities of valuable fertilizing materials removed by a number of crops of clover or lucerne and a single crop of wheat.

Matter extracted.	Clover, two crops.	Lucerne, five crops.	Wheat, one crop.
	<i>Pounds per hectare.</i>	<i>Pounds per hectare.</i>	<i>Pounds per hectare.</i>
Dry matter in normal condition produced.....	44,095	165,255	11,023
Nitrogen .....	882	3,805	97
Phosphoric acid .....	308	842	46
Potassa .....	448	2,513	57
Lime .....	545	4,763	22

The amount of fresh manure necessary to restore these elements of plant-food are exhibited below.

	Clover.	Lucerne.	Wheat.
	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>
To restore nitrogen.....	89	383	10
To restore phosphoric acid.....	67	182	10
To restore potassa.....	34	190	5
To restore lime.....	43	380	2

This shows that the exhaustion of the soil by crops of clover and lucerne must be much greater than in the case of wheat.

The leguminous crops are considered ameliorating, because they seem capable of absorbing and assimilating atmospheric nitrogen, but they cannot obtain from the atmosphere the mineral matter they contain. The favorable action must therefore be sought in some other cause. According to M. Cantoni, this cause may be found in the modifications occasioned by different crops in the soil, among which may be enumerated the mechanical treatment necessary for certain crops; abundant fertilizing, with a view to the production of surplus leaves; and, finally,

the quantity and quality of residues of crops returned to soil after the harvest. The latter is considered by the author the main point in question, and in this connection cites the results of the observations of M. Weiske, as follows :

*Crops leaving residue upon the soil.*

Crops.	Air-dried matter.	Nitrogen.	Phosphoric acid.	Potassa.	Lime.
Red clover, lbs., per hectare.	22,090	475	186	203	648
Lucerne, lbs., per hectare..	23,940	335	97	91	487
Wheat, lbs., per hectare ...	8,610	58	29	46	210
Barley, lbs., per hectare ...	4,930	57	30	24	93

On comparison of the figures found in the above table, we find that the residue from the crop of clover will furnish enough nitrogen to satisfy the demands of a crop of wheat producing about 283 bushels per hectare,\* and phosphoric acid sufficient for 227 bushels; the crop of lucerne leaves enough of nitrogen for a crop of 227 bushels, and of phosphoric acid, for 113.5 bushels. The wheat and barley would, however, leave sufficient for only 28 bushels. The difference in the value of these crops for the purposes mentioned is very evident, since it appears that the leguminous crops leave in a favorable condition for assimilating enough of fertilizing materials to satisfy the demands of several crops of cereals; while in case of cereal crops nearly all of the elements of plant-food are carried off in the grain.

In favor of leguminous plants for green manuring, the author advances the idea that besides carrying into the soil these mineral elements of plant-food, they also supply to the soil an amount of moisture corresponding to a rain-fall of about three millimeters, or about 0.12 inch. The moisture received by the soil in this way affords an advantage over that supplied by the rain in that it is not so rapidly dissipated by evaporation.

In conclusion he considers that the explanation of the good effects of the so-called ameliorating crops does not depend upon any special faculty possessed by certain plants to assimilate atmospheric nitrogen; that this ameliorating property cannot be taken in an absolute sense, since all plants diminish rather than increase the quantity of materials for plant-food in the soil; that an ameliorating culture should be defined as one which yields to the soil residues, which, by their quantity and quality, may favor the demands of subsequent crops; that the quantity and quality of the residues of green plants are more favorable than those of dead plants; that it is therefore unadvisable to wait for the death of a crop of clover or lucerne before changing the culture; that the usefulness of a meadow in rotation and plowing under green vegetation may be explained by the power displayed by each plant to seek, choose, assimilate, and accumulate valuable materials which may be returned to the soil in a readily assimilable form; that plowing under green vegetation, as well as fertilizers, should be specialized according to the subsequent crop.

\* 2.47 acres.

## BOTANICAL NOTES.

BY DR. GEO. VASEY.

**THE PERSIMMON.**—Colonel Barr has presented to this Department specimens of a variety of persimmon, grown on the grounds of the Reform-School near this city, which possesses such qualities as entitle it to attention. The tree is young, nine or ten feet high, and not over 1½ inches in diameter. It grows under an oak tree. There is a group of seven or eight trees in the vicinity, but only this one bears the peculiar fruit. This is somewhat acorn-shaped, and larger than the common persimmon fruit. It does not seem to possess much astringency, and its flavor is excellent. Some of our nurserymen would do well to make a specialty of the improvement of the persimmon, and here is one of nature's hints in that direction. The fruit referred to matures in November. One tree of the group bears fruit which matures in August. It is of medium size, and very sweet.

**OXYTROPIS LAMBERTI**, (said to be poisonous to cattle.) Recently some specimens of a plant sent from Colorado by Dr. P. Moffatt, assistant surgeon, U. S. A., to the office of the Surgeon-General, were submitted to this Department for name, accompanied by the following extract from the report of Dr. Moffatt:

Cattle-men inform me that a weed grows among the grass, particularly in damp ground, which is poisonous to horned cattle and horses, and destroys many of them. From the manner in which they describe its effects upon the animals it must be of the nature of a narcotic, and they assure me that cattle, after having eaten it, may linger many months or for a year or two, but invariably die at last from the effects of it. The animal does not lose in flesh apparently, but totters on its limbs and becomes crazy. While in this condition a cow will lose her calf and never find it again, and will not recognize it if presented to her. The sight becomes affected so that the animal has no knowledge of distance, but will make an effort to step or jump over a stream or an obstacle while at a distance off, but will plunge into it or walk up against it upon arriving at it. The plant was pointed out to me, and seems to be related to the *Lupin*.

The plant submitted to us as the one in question was the *Oxytropis Lambertii*, a plant of the pea-family, nearly related to *Astragalus*, and also to the *Lupin*. It grows in considerable abundance upon the elevated plains near the mountains, and extends up into the mountains to the elevation of 7,000 or 8,000 feet. It is perennial and grows in small clumps, the leaves being all at the base, and sending up a few erect flower-stalks, seldom over a foot high, which have a spike-like raceme of rather showy flowers, varying in color from cream to purple. These are succeeded by short, stiff, pointed pods, which contain a number of small, clover-like seeds. The effects ascribed to this plant are quite similar to those produced by several species of *Astragalus* in California, as mentioned in several of the monthly reports of this Department. (See Monthly Report, October, 1873.) Careful observations should be made by residents of the region where this plant grows to ascertain if it produces the effects ascribed to it.

**A VALUABLE GRASS FOR THE SOUTH AND SOUTHWEST.**—Specimens of a grass have been sent to us from Texas by Mr. Pryor Lee, concerning which he makes the following remarks:

1. General experience has not fully tested the qualities of this grass, but some characteristics are recognized by many practical observers in Southwestern Texas.
2. In this region this grass, in the condition of well-cured hay, is regarded as more nutritious than any other grass.

3. This grass grows only in cultivated land ; it best prospers in the warmest fourth of the year ; during this time two full crops may be gathered. Its luxuriant growth without much root subdues other grasses and some weeds, with the result of leaving the ground in an ameliorated condition.

4. This grass little interferes with cultivation of a corn-crop ; and, after the corn is worked enough, this grass matures its heavy crop simultaneously with maturity of the corn ; and, the corn being gathered, both the corn-stalks and the grass together may be turned under the surface in preparation for an autumn, winter, and spring crop of some other kind of grass or small grain.

5. Without a corn-crop this grass may give two cuttings in the summer, and also give full opportunity for using the same ground in one or more other crops during the autumn, winter, and spring.

6. Diligent inquiry has not obtained information that this kind of grass has yet appeared either out of Texas or within it eastward of the Colorado Valley, leaving an impression that such grass cannot be successfully propagated, except in such a climate as obtains in Southwestern Texas.

This grass is a species of *Panicum*, probably *P. fasciculatum*, Swartz, which grows in Mexico and South America. It has likewise been sent from Colorado, where it has probably been introduced. We hope that those farmers living in the Southwestern States will give this grass a trial, as it seems to promise well for that section.

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## MICROSCOPIC OBSERVATION.

BY THOMAS TAYLOR, MICROSCOPIST.

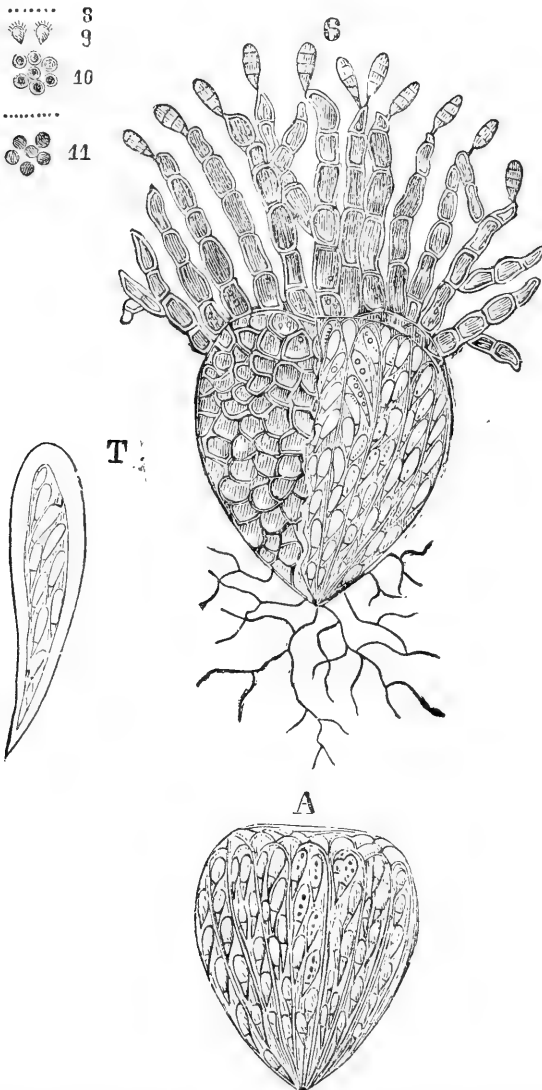
BLACK-KNOT OF PLUM AND CHERRY TREES—(Continued.)—Having recently received from a gentleman of New Jersey, Mr. Abram McMurtree, some excellent specimens of black-knot taken from plum and cherry trees of different ages, I resumed my investigations of that disease with very satisfactory results. A portion of the fungus being removed from a specimen of the black-knot which had grown on a plum-tree about seven years old, and being submitted to an examination by the microscope, at a very low power, exhibited forms of fruit (perithecia) as seen at 8. When viewed in section by a higher power, it appears as at 9 ; and in top view as at 10, showing an indentation in each perithecium.

When a perfect specimen, as seen at 9 or 10, is submitted to the action of nitro-muriatic acid for about thirty minutes, a slight decomposition of the acid takes place, indicating that the resinous or oily matter of the perithecium becomes oxidized. These strong mineral acids have no destructive action on the organic structure of the perithecium, although they have the property of bleaching it in some degree, thus rendering it translucent, and making its cellular structure visible. If ammonia is added in drops to the specimens, after having been treated with acids, their albumenoids become pliable. This process is especially valuable when applied to matured and dry specimens ; 6 represents a very highly magnified specimen of a perithecium, a part of which is in section and represents the internal arrangement of the asci and sporidia in them. From my recent experiments on black-knot I am now able to demonstrate its structure. If a perfect perithecium which has been treated with acid and ammonia, as previously described, is gently bruised on a microscopic glass slide, by any of the well-known modes, the asci containing the true sporidia will escape, and frequently the sporidia will be seen in profusion on the glass. I have counted as many as ten sporidia in one ascus. When the perithecium is very pliable, and the interior mass of

asci well matured, it may be removed entirely by pressure, as represented at A. A power of about 600 diameters is necessary to see it properly.

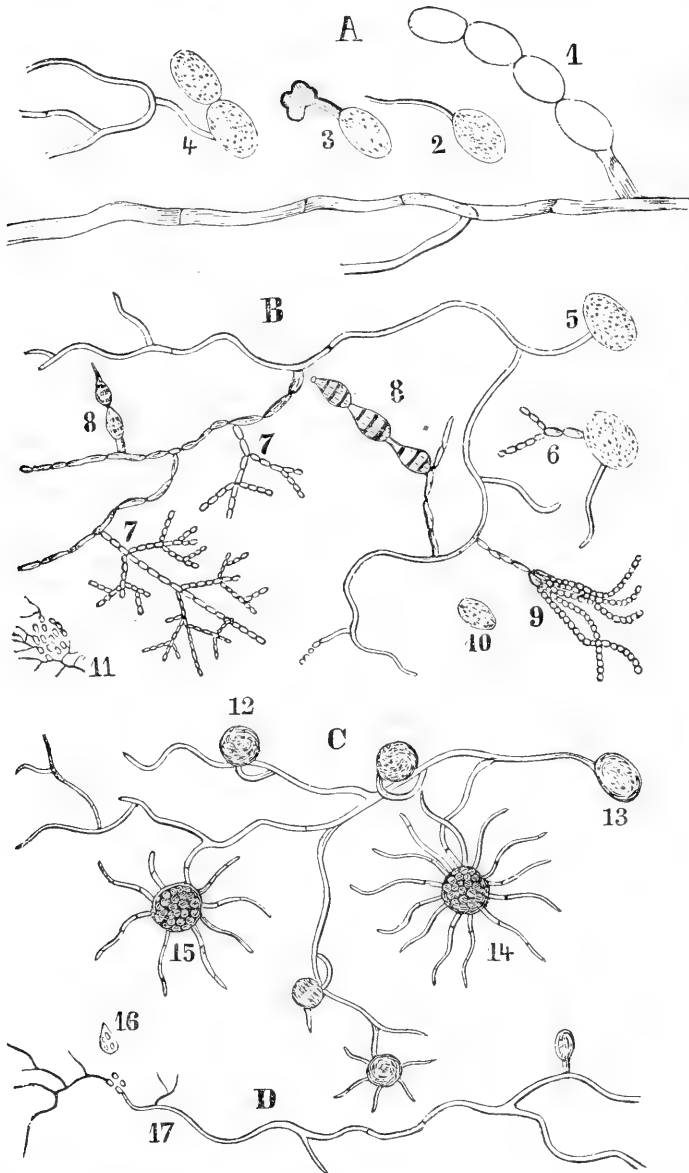
An ascus measures about the one thousandth of an inch in diameter, and is about seven times its diameter in length.

If an ascus is treated with an alcoholic solution of iodine, containing a few drops of nitric acid, its nitrogenous matter becomes stained of a dark amber while the sporidia retain their natural color. The asci will frequently exhibit, when treated with acids and alkalies, an expanded membrane of very delicate texture and quite transparent, as exhibited at T.



The true cause of this disease is unknown at present. My future investigations will be principally confined to its mode of propagation. In-

vestigations of this character lose much of their value when they are confined to the microscope and laboratory. Districts affected with the dreaded pest should be visited, and the roots of the trees and their branches examined, that the investigator may become acquainted with all the stages of growth of the fungus, and thus ascertain how the disease is propagated.



**THE FUNGUS ERYSIPIHE TUCKERI.**—On the 15th of May last, one of the foreign grape-vines of the experimental graperly of the Department was found to be affected with the fungus called *Oidium Tuckeri*. It first



appeared on the leaves, then on the green branches, and finally on the fruit.

I determined to take advantage of its presence to make further investigations in reference to its habits. I secured on a glass slide a few of its oidium spores, placed them in a clean glass jar containing a little water, excluded the atmosphere by a ground-glass stopper, and subjected the jar to a temperature of about 75° Fahr. during the investigations. On the second day the spores were examined, when it was found that many of them had germinated.

1, group A, represents the oidium. I think that the spores in this case are thrown out from the peduncle\* in the same manner as soap-bubbles from a pipe. I have never seen a case of an oidium spore having a small spore attached to it as if in the act of reproducing a fac simile of itself, as is so frequently observed in the spores of the common yeast-plant, (*Torula cerevisiæ*.) The oidium spores germinated and threw out branches as shown in the drawings 2, 3, and 4. The protruding branch of spore 2 differs in form from that of 3. The branched state of 4 illustrates the changes which take place in 2. I have observed many spores germinating like 3, upon the functions of which I have been unable to decide. After exposure for a few days, more new forms of fungi appeared on the branches of the mycelium of the oidium. (See 5 and its ramifications, group B.) Nos. 6 and 7 next appeared, followed by 8 and 9; 10 represents a highly magnified spore of *Penicillium glaucum*, 9; 11, the spores of 7 germinating, which resemble *Penicillium Armeniacum*, Berk. The flask-shaped spores, 8, (*Antennaria tenuis*, Ness.) are generally the last to appear. They belong to a genus of *Torulacei*, remarkable for their close resemblance to a Florence flask.†

My object was to ascertain what changes, if any, would take place during the germination of the spores. I therefore varied my experiments in numerous ways, and am satisfied that the forms 6, 7, 8, and 9 have no relation to the oidium under experiment, but are distinct fermenting plants, living on and consuming the mycelium and spores of the oidium, preventing the further healthy growth of the vine fungus. The facts observed have an important bearing on the cultivation of foreign grape-vines when grown in moist hot-houses, for since it has been shown that parasitic fungi are nourished by the spores and mycelium of the *Oidium* of the vine and grow profusely on them, the vine itself will become affected by the growth of the fungi over its leaves, green branches, and fruit. I have frequently transferred to varnished glass slides the same class of spores direct from a leaf which had been kept unusually moist while growing. These will doubtless hasten the death of the plant on which they grow. The evidence is conclusive that when the flowers of sulphur have been applied early to mildewed vines, they have been saved, and that later applications have been unavailing. This may arise from the fact that the other forms of fungi, such as I have pointed out, may assist in the destructive work. These experiments have been repeated often under varied conditions, with an unvarying similarity of results. A slip of glass was varnished, and, when nearly dry, a vine-leaf covered with the *Oidium* was pressed on it, so that many of the spores adhered to the varnish. When the slip was introduced into a moist jar at the temperature mentioned, the spores adhering to the varnish germinated, as shown at B. When placed in an atmosphere containing turpentine, benzine, or carbolic acid, they failed to germinate, and the

\*The stem or stalk that supports the flower and fruit of a plant.

†The microscopic dictionary says of this genus that "no British representatives of this genus appear to have been recorded hitherto," (p. 29, vol. 1, second edition, 1860.)

distorted forms of the *Oidium* were clearly seen, showing the destructive action of these substances on fungus germs.

I next placed the dust of roll sulphur on *Oidium* spores, and also the dust of the flowers of sulphur on a second lot, each set being secured on glass slides, an inch and a half wide by six inches long.

These slides were subjected to moisture and heat, as before, in separate jars. After the usual exposure it was observed that the same fungus forms of group B appeared on the germinating *Oidium*.

These results were not expected, as it has been generally supposed that sulphur is a perfect preventive of fungoid growth. This led me to test the effectiveness of sulphur for that purpose. I placed in an eight-ounce jar four ounces of pure water, one ounce of green peach-leaves, and two ounces of the flowers of sulphur, and subjected the whole to a temperature of 75° to 80° F. In three days fermentation commenced in full force, giving off a strong odor of sulphureted hydrogen. In the course of ten days the leaves were completely destroyed by the fermentation, demonstrating that, if the flowers of sulphur are anti-fungoid, the beneficial results of its application have not been due, as has been supposed, to its chemical qualities, but, probably, to its absorption of moisture.

These experiments also go to show that the vine fungus is a true parasite, and that it will not fruit when removed from the plant on which it grows. A peculiar condition of the atmosphere may also be necessary. The *Oidium* form of the fungus is not supposed by mycologists to be a true mold, but merely a condition of a species of *Erysiphe*. Group B represents a theoretical view of its supposed condition; 12, 13 and 14, its stages of fruiting. Figs. 14 and 15 are filled with little sacs containing sporidia which germinate. Fig. 16, group D, represents one of them, and 17 a branch of mycelium growing from them on which grows the *Oidium*.

It is stated on good authority that the fruit of this fungus has not been seen on the vine in Europe. In the fall and summer of 1871 and also 1872 I found specimens of its perfect fruit in great profusion on the foreign vine of the graperly of the Department. During the last two years, 1873 and 1874, not a single specimen of fruit could be found. Late in the fall of 1872 Mr. William Saunders, superintendent of the experimental gardens, had all the branches of the foreign vines in the graperly painted with a mixture of clay and carbolic acid, for the purpose of destroying the fruit of the vine fungus. Future observations may show that such treatment will prevent, in a measure, the ravages of the vine fungus. It has long been observed that very dry seasons are favorable to the growth of the *Erysiphe* fungus. Although a hundred foreign vines were exposed to the *Oidium* in the same graperly, very few were affected by it during the last season; and it is observed that the mildew is confined to certain varieties. The black Hamburgh, for example, was not affected at all by it, although growing side by side with mildewed vines. The green wood is always more injured by the *Oidium* than the ripe; consequently, as some varieties of vines ripen sooner than others under the same conditions, so the green branches of the later varieties will probably be more affected than those of the early. It was shown by my paper on the fungus of the American grape-vine, in the Annual Report of the Department for 1871, that the early spring leaves of American grape-vines are not affected by the mildew (*Peronospora viticola*) during the summer months, under ordinary conditions, although the leaves that sprout in summer, particularly during rainy weather, when sappy and of a very light-green color, are very liable to be affected with the mildew, particularly some varieties.

In the fall of 1872 I selected several vine-leaves from the foreign Department grapery, having on their surface patches of mildew intermixed with perithecia of the *Erysiphe Tuckeri*. Having removed portions of them, I placed them on glass slides and secured them in position with gum-water, over which I placed a thin glass disk. While viewing them under a power of about 100 diameters I applied pressure on the disk in order to burst the perithecia. I used great care in my manipulation, but failed to get sporangia out of them. I then laid the leaves aside until November, 1874. In consideration of recent successful experiments on perithecia of black-knot fungus, I resumed my experiments on those of the foreign grape-vine mentioned. I removed a small portion of the leaves procured in 1872, containing the perithecia, placed it in a capsule and poured over it concentrated ammonia with the view of softening its albuminoid matter. To another portion I added nitro-muriatic acid and neutralized the acid by ammonia. This latter method has the advantage of bleaching the perithecium, which is naturally opaque, but when partially bleached is of a translucent Vandyke-brown color. Under either treatment the perithecia become soft and pliable, and the proper degree of pressure may be given during the operation while viewing them under the microscope. In this way I have succeeded in bursting them and forcing out their sporangia in perfect form. I had previously failed in this experiment, probably for the reason that the sporangia had not matured sufficiently, and in consequence of the thinness of their cell-walls they burst with slight pressure, and a grumous mass was all that I obtained. The sporangia of perithecia of *Microspheria* are easily removed and seem to bear more pressure without breaking the cell-walls of the sporangia than those of the vine, judging from my experience thus far.

During the last four years I have examined many hundreds of specimens of the *Oidium* form of the vine fungus, but in no case have I seen connected with them pycnidia, forms of a cell described and illustrated by Professor Amicé and Doctor Plomley, of Europe, and represented by them as connected in some way with the *Oidium*. I am certain, however, that I have found in great profusion, during the summer and fall of both 1871 and 1872, on the vines in our foreign grapery, the true fruit or perithecia of *Erysephe Tuckeri*. The Rev. M. J. Berkley says:

It is true that the real sporangia of the vine mildew have not yet been observed. \* \* \* We do not doubt, therefore, that at some future period the true sporangia may be found, and we trust that the little parasite which has been of such unlooked-for importance may still preserve the specific name originally assigned to it, in honor of the meritorious cultivator who first observed it. \* \* \* It may, therefore, be named *Erysiphe Tuckeri*, and the name of *Oidium Tuckeri* should be rejected.

When Professor Planchon visited this Department last year, I prepared for him a microscope-slide containing specimens of the *perithecia* of *Erysiphe Tuckeri*, taken from a foreign vine of the Department grapery.

Should the climatic condition of the summer and fall of 1875 prove favorable for further investigation in this direction, I may be enabled to define more clearly the habits of *Erysiphe Tuckeri*, on a knowledge of which depends the proper remedies to be applied for its destruction and the consequent protection of the vine.

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## FACTS FROM OFFICIAL SOURCES.

AGRICULTURAL AND POLYTECHNIC INSTITUTES.—Mr. Lowndes, of Maryland, in January, 1874, introduced into the National House of Representatives, "a bill to aid in establishing agricultural and poly-

technic institutes in the several counties of the States and Territories, and the District of Columbia." The passage of this bill will be urged at this session. Section 1 appropriates \$5,000,000 to aid in the establishment of such institutes in every county or school-district at or near the capital town thereof. Section 2 requires the Commissioner of Education, under the direction of the Secretary of the Interior, to apportion one-half of the \$5,000,000 upon the basis of the entire population, and one-half in proportion to the number above ten years unable to write, as stated by the late decennial census. Section 3 awards a share in the apportionment to each State, Territory, or the District of Columbia, which shall by law provide for the establishment of such institutes, open to all actual residents, under reasonable and just regulations, in which instruction shall be given in such branches as "foster agriculture and manufactures, develop mining resources, and benefit commerce," under regulations devised by the Commissioner of Education, the Commissioner of Agriculture, and the Chief Signal-Officer. Section 4 makes each apportionment payable upon the warrant of the Commissioner of Education, countersigned by the Secretary of the Interior, to the State, territorial, or district officer authorized by law to receive it. Such officers are required to report to the Commissioner of Education, on or before the 30th of June next ensuing, a detailed statement of the moneys disbursed or still unexpended. The term "school-districts" includes cities, towns, parishes, or other subdivisions designated by law as competent to maintain institutions of learning. Section 5 requires the immediate apportionment and disbursement of each State, territorial, or district share; the portion derived from each half of the entire appropriation is to be locally distributed upon its own basis of distribution. Section 6 makes the embezzlement of these funds a felony punishable with a fine of double the amount embezzled, or imprisonment not exceeding three years. Section 7 gives the exclusive jurisdiction in such cases to the United States circuit courts, with power to compel by writ the performance of the duties specified, or to restrain their undue performance. Section 8 appropriates the \$5,000,000.

**AGRICULTURAL EDUCATION.**—At a meeting of the Highland and Agricultural Society of Scotland, held in June last, it was resolved to memorialize the government in behalf of agricultural education. Among other reasons for affording the working-classes of the country special instruction in the sciences bearing on agriculture, and their practical application, it was urged:

That in times past crops were raised and stock reared by the operation of very simple and primitive processes. In the present age the implements required by farmers depend on ingenious and complicated mechanical contrivances. Not only for the construction, but for the management and working of these implements, a knowledge of mechanics is required. The fertility of the soil needs to be stimulated by artificial compounds, which must be prepared with special reference to the nature both of soils and crops. The stock bred and fed on farms must obtain particular treatment, so as to insure production of good meat in a short time and at small expense. All these processes depend more or less on a knowledge of mechanics, chemistry, and physiology. The most important recent improvements in agriculture have been made by persons versed in these sciences.

That with this view, your memorialists ask that the grants of the department shall be declared to cover instruction in chemistry, mechanics, physiology, botany, morphology, steam, and other scientific subjects, when taught in the abstract, in so far as necessary for agriculture; and also to cover instruction given in the principles of agriculture as an applied science, and to place it in the same position as machine construction, applied mechanics, the principles of mining, and navigation, which are already included in the list of scientific arts toward instruction in which aid is given, and in which examinations are carried out by the department.

The society have since received a reply to their petition from "the lords of the committee of council on education," in which it is stated

that while their lordships are disposed to accede to the request contained therein, it is too late now to include for this year the science of agriculture in the list of subjects toward instruction in which aid is granted by this department. The case is, therefore, reserved for future but early consideration." In the mean time this committee call attention to the fact that the branches which must be the foundation of any course of instruction in agriculture are already aided, both in elementary schools and in the department of science and art :

EXPERIMENTS IN AGRICULTURE.—The following is an abbreviated statement of experiments and their results, conducted by Dr. E. M. Pendleton, professor of agriculture in the Georgia State College of Agriculture and the Mechanic Arts, as reported by him at the semi-annual meeting of the Georgia State Agricultural Society :

*Wheat, broadcast and drilled* : Sown the 1st of November, plats 1 and 2, side by side, on poor land of equal fertility, without manure ; plat 1, broadcast, at the rate of 2 bushels per acre, through mistake, only 1 bushel being intended. But as about half, before it was well rooted, was killed out by the first cold spell, it only "stood about as thick as from one bushel of seed." In preparing plat 2 for the drill, the soil was thrown up in sharp ridges by running parallel furrows about 15 inches apart. As the seed at the rate of one-half a bushel to the acre was sown, the most of it fell into the furrows between the ridges. By splitting the latter with a bull-tongue, the remainder was thrown in, and the whole covered "beautifully." In March, when the wheat on this plat was in the joint, a single furrow was run between each two rows by a subsoil-plow. "The helve of this plow, being a bar of iron, threw up no dirt on the wheat, but answered the double purpose of draining the land and opening it that the atmosphere might penetrate, and thus prepare additional food for the plants. The good effect was very perceptible." The variety sown was Tappahannock. The broadcast yielded at the rate of 414 pounds, or 6.09 bushels, of wheat, and 836½ pounds of straw, per acre ; the drilled at the rate of 517.5 pounds, or 8.62 bushels, of wheat, and 812 pounds of straw. The professor, assuming that the proportion of seed per acre required is, for the broadcast one bushel, and for the drilled one-half bushel, and that it is sown on land equivalent to that on which the experiment was made, reckons as compensation for the additional labor, before harvesting, in the drilling process, as follows : besides a gain, on a field of 10 acres, of 31.5 bushels of wheat, "for every bushel of grain made on the broadcast system there is carried off 137 pounds of straw, while for the same amount of grain when drilled there is carried off 99 pounds of straw. This, then, involves considerably more labor in cutting, hauling, and thrashing for the same amount of grain obtained, and takes off about 35 per cent. more of the valuable substances making up agricultural plants."

Plat 3, fertilized with 300 pounds, per acre, of ammoniated superphosphate in the drill, with one-half bushel of seed, yielded at the rate of 724.5 pounds—12.07 bushels—of wheat, and 979 pounds of straw, per acre. The fertilizer cost \$9.75 ; gain in wheat over that without a fertilizer, 3.45 bushels.

Plat 4, with the same treatment, except that the seed was doubled, yielded exactly the same amount of wheat, but 80 pounds more straw, per acre.

Plat 5, with 300 pounds per acre of superphosphate and 1 bushel of seed in the drill, produced at the rate of 700 pounds—11.67 bushels—of

wheat, and 1,043 pounds of straw. Cost of the fertilizer, \$7.50; gain in wheat, 3 bushels.

The professor infers that when the farmer gets back in the first crop the cost of commercial fertilizers, it pays well to use them, "because there is left in the soil insoluble phosphates, lime, sulphur, and organic nitrogen, which will doubtless pay for the fertilizer the second year on most soils."

• *Oats*.—Sown on the 18th of December, 1½ pounds of seed, a yellow Georgia variety, with 500 bushels of home-made manure put in at the time of sowing. Product, 29½ bushels of oats and 1,275 pounds of straw; cost of production, \$14.25; value of the products, \$33.69; net profit per acre, \$19.44.

*Cotton*.—With a view to test the effects of organic matter on growth, one flower-pot was filled with river-sand, out of which all soluble matter had been washed; another with such sand mixed, half and half, with rotten wood, (though not fully decomposed.) The same fertilizer, in equal quantities, was added to both, and a plant of cotton grown in each. At the date of report, (in August,) that in pure sand, compared with that in sand mixed with rotten wood, was "much smaller and less vigorous, the leaves having a paler and more sickly aspect, with just one-half the number of forms, (6 to 12,) and wilting much sooner from the lack of water." Again, in the autumn of 1873, 200 pounds of green weeds were put in a row 70 yards long, and covered with a turning-shovel; another 200 pounds were burned, thus dissipating the organic matter, and the ashes covered in a row of the same length. Last spring cotton was planted in both; at date of reporting that on the weeds had "the appearance of being treated with 200 pounds of a good fertilizer," while that on the ashes of weeds appeared to have received scarcely any benefit from them.

WHEAT-IMPORTS OF GREAT BRITAIN.—The following is the official statement of the quantities and value of wheat and wheat meal and flour imported into Great Britain for the nine months ending September 30, 1874, accompanied by a statement of the total value, and value per hundred-weight, in our currency.

Countries.	1874.			
	Cwts.	Value.	Value.	Value per cwt.
WHEAT.				
From Russia.....	3,374,915	£2,037,021	\$10,185,105	\$3 02
Denmark.....	123,955	81,109	405,545	3 27
Germany.....	2,004,563	1,435,270	7,176,350	3 58
France.....	233,258	133,233	666,165	2 85
Austrian territories.....	1,047	810	4,050	3 87
Turkey, Wallachia, and Moldavia.....	453,863	272,095	1,360,475	3 00
Egypt.....	291,990	171,123	855,615	2 93
United States.....	18,387,344	11,756,222	58,781,110	3 20
Chili.....	1,682,006	1,052,742	5,263,710	3 13
British North America.....	2,868,736	1,741,778	8,708,890	3 03
Other countries.....	2,313,977	1,495,551	7,477,755	3 23
Total.....	31,735,654	20,176,954	100,884,770	3 18
WHEAT MEAL AND FLOUR.				
From Germany.....	556,669	546,575	2,732,875	4 91
France.....	298,307	309,526	1,547,630	5 19
United States.....	2,720,173	2,475,181	12,375,905	4 55
British North America.....	335,105	290,767	1,453,835	4 34
Other countries.....	957,125	974,290	4,871,450	5 09
Total.....	4,867,379	4,596,339	22,981,695	4 72

The average value of United States wheat differs little in the last three annual statements. Taking the same periods of nine months, the averages of the past three are respectively \$3.14, \$3.23, and \$3.20. The highest price is for wheat of the Austrian territories.

**BRITISH IMPORTS OF NEW WHEAT.**—Since the wheat-harvest in Great Britain the imports of flour have been over 5,000,000 quarters, the estimated wants of this kingdom being from 8,000,000 to 9,000,000 quarters. At the same rate of arrivals it is estimated that within five months after harvest much the largest part of the requirement for the year will be imported, leaving only 3,000,000 to 4,000,000 quarters for the remaining seven months.

**PROGRESS OF THE COTTON-MANUFACTURE.**—The following figures, collected under the direction of the late secretary of the Cotton-Manufacturers' Association, illustrate the present status of that important interest:

States.	Number of mills.	Number of looms.	Number of spindles.	Average size of yarn.	Average running-time.	Average consumption of cotton per spindle.	Quantity of cotton used.	
<b>NORTHERN.</b>								
				<i>No.</i>	<i>Weeks.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Bales.</i>
Maine.....	24	12,415	609,898	25.23	50.71	59.67	36,473,547	78,607
New Hampshire.....	42	20,422	855,189	23.43	51.46	69.89	59,759,468	123,792
Vermont.....	10	1,274	58,948	29.75	46.34	46.34	2,734,167	5,895
Massachusetts.....	194	71,202	3,769,692	28.55	49.89	53.93	203,325,299	438,201
Rhode Island.....	115	24,706	1,336,842	35.20	48.10	43.51	58,146,985	125,317
Connecticut.....	104	18,170	908,202	31.40	48.45	53.43	48,514,613	104,557
New York.....	55	12,476	580,917	32	47.70	42.22	24,536,249	52,880
New Jersey.....	17	2,070	150,968	29.30	51	53.50	8,078,647	17,411
Pennsylvania.....	60	9,772	452,064	17.51	42.80	84	37,989,726	81,872
Delaware.....	8	796	47,976	22.24	49.66	66.14	3,174,174	6,841
Maryland.....	21	2,299	110,260	11.50	47.35	174.24	19,222,703	41,438
Ohio.....	5	236	20,410	11.83	36.80	89.48	1,826,304	3,936
Indiana.....	4	618	22,988	14.56	47.44	159	3,671,227	7,912
Minnesota.....	1	24	3,400	3	52	99.41	338,000	728
Total northern...	660	176,480	8,927,754	28.56	49.33	56.86	507,790,099	1,094,387
<b>SOUTHERN.</b>								
Alabama.....	16	1,360	57,594	10.50	48.37	112.83	6,490,079	13,772
Arkansas.....	2	28	1,256	12	51	121.69	136,000	293
Georgia.....	42	2,934	137,330	12.71	47.77	133.57	18,522,899	39,920
Kentucky.....	4	42	10,500	6.26	49.24	178.86	1,878,020	4,047
Louisiana.....	3	300	15,000	12	47.02	86.31	1,294,560	2,790
Mississippi.....	11	348	15,150	11.33	39.29	75.17	1,138,804	2,545
Missouri.....	4	382	18,656	10.75	49.66	183.25	3,481,573	7,288
North Carolina.....	30	1,055	55,498	12.08	46.52	123.10	6,832,673	14,726
South Carolina.....	18	1,238	62,872	13.36	39.67	113.25	7,134,558	15,376
Tennessee.....	42	1,014	47,058	12.32	51.10	133.38	6,272,458	13,518
Texas.....	4	230	10,225	12	47.02	127.80	1,278,125	2,755
Virginia.....	11	1,564	56,490	16	47.57	95.23	5,334,025	11,496
Total southern...	187	10,495	487,629	12.50	47.02	122.53	59,793,774	128,526
Grand total.....	847	186,975	9,415,383	27.73	48.26	60.29	567,583,873	1,222,913

**STATISTICS OF A FLOCK OF SHEEP IN TEXAS.**—Our correspondent in Waller County furnishes the following statistics of his flock for seven consecutive years. He states that the sheep have been penned at night, but have received no other attention, not being fed or sheltered from cold in winter.

Date of shearing.	Sheep.				Wool.				Value of total products.	Lambs marked.			
	Ewes.	Wethers.	Rams.	Total.	Average per head.	Total.	Price per pound.	Total value.		Ewes.	Wethers.	Rams.	Total.
March, 1869.....	No. 292	No. 96	No. 16	No. 404	Lbs. 2.7	Lbs. 1,089	Cts. 18	\$196 02	\$196 02	No. 49	No. 47	No. 1	No. 97
May, 1870.....	294	105	5	404	3.3	1,327½	19	252 22½	448 24½	104	108	.....	212
September, 1870.....	412	210	4	626	1.8	1,140	18	210 90	659 14	.....	.....	.....	.....
May, 1871.....	322	133	4	459	2.5	1,145	24	160 30	819 44	.....	.....	.....	.....
May, 1872.....	341	164	9	514	3.2	1,653	37	623 31	1,442 75	74	56	9	139
May, 1873.....	221	98	6	325	2.5	837	18	150 66	1,593 41	30	30	.....	60
May, 1874.....	222	72	6	300	2.6	805	24½	197 22	1,790 63	75	93	2	170

**SHEEP-HUSBANDRY IN TASMANIA.**—The sheep of Tasmania are developing qualities as fancy breeds which are now bringing high prices in the market. A careful selection of breeding-stock, great care of flocks, and very favorable climatic conditions are claimed as special advantages for this industry. Some pure Leicester ewes sold in Melbourne lately as high as £21 10s. per head. A pure merino ram, “one of the grandest sires in the colonies,” brought the astonishing price of £714. A flock of 26 stud rams, the progeny of the last-named, averaged £53 per head.

**EXPERIMENTS WITH FERTILIZERS.**—Our correspondent in Windham, Conn., thus states the results of his experiments with different preparations of bone as a fertilizer: No. 1 was a celebrated brand of pulverized bone, which appeared to be rich in ammonia, but it was the least valuable kind experimented with. No. 2 was a common crushed bone converted into superphosphate by sulphuric acid. This caused a luxuriant growth in the fore part of the season. No. 3 was crushed bone mixed with two parts of ashes; the mixture, after being thoroughly wet, was allowed to stand two weeks before using. It was not so effective in the fore part of the season, but after harvest its effect was as great, if not greater, than any other. It is also the cheapest manure, not costing more than half as much as the others, and fully equaling their efficiency.

Our correspondent in Elk, Pa., states that a farmer there raised 500 bushels of corn from two acres of land which had received a good coat of lime. This has “turned the heads of half the farmers in the neighborhood.” Bushels of ears are doubtless meant.

**GUANO-DEPOSITS OF PERU.**—The results of late measurements of guano-deposits upon several Peruvian islands are stated by the South Pacific Times, as follows: Chiapa, 89,000 cubic meters; Huanillos, 700,000; Punta de Lobos, 1,601,000; Pabellon de Pica, 5,000,000; Patache, 125,000; Chavanoja, 150,000; Patillos, 16,000. Each cubic meter will yield from 2,866 to 2,976 pounds. Many other islands, smaller than the above, present a very considerable aggregate. Specimens of several of these deposits have been analyzed by order of the Royal Agricultural Society of England, upon which Dr. Voeleker remarks, that those of Pabellon de Pica are very dry, of a clear brown color, and approximating the best guanos of the Chincha Islands. Their alkaline salts vary from 9 to 23 per cent., with a greater or less proportion of marine salts. Those of Punta de Lobos contain a large quantity of sand, amounting, at 8 feet depth, to 28 per cent.; the proportion of nitrogen, however, is very small, 2.6 per cent. The last ingredient, however, varies at different depths, amounting to 6½ per cent. at 5 feet, and to 10



per cent. at 40 feet, where the guano is fine and still drier than that of Guanape, and contains as small a proportion of sand. The guano of Huanillos is very dry, pulverulent, and of clear brown color; the proportion of nitrogen varies from 7 to 10 per cent.; sand, from 2 to 6 per cent. Several specimens were rich in phosphate of lime, but poor in nitrogen. Alkaline salts are present in large proportions, varying from 16 to 20 per cent. in some deposits. The proportion of nitric acid ranges from .01 to 2.9 per cent. Nitrate of soda is probably due to the nitrogen of large organic portions of the large deposits exposed for a long time to the action of atmospheric oxygen, and also to the action of sea-water. These researches lead to the expectation that large deposits of nitrate of soda will yet be discovered in the south of Peru. Dr. Voelcker thinks the variable character of these deposits renders it necessary to carefully examine each cargo imported. The English Royal Society has petitioned the government to press the Peruvian government to institute a standard analysis guaranteeing a stated medium of nitrogen and phosphoric acid, and of regulating prices accordingly.

ENGLISH AGRICULTURAL STATISTICS.—The British Board of Trade has returns showing the following areas under culture in 1874: Wheat, 3,632,063 acres; barley, 287,983 acres; oats, 2,596,367 acres; potatoes, 520,428 acres; hops, 65,824 acres; the last-named crop shows a considerably increased acreage, but barley and oats have decreased. The livestock returns embrace 6,125,505 head of horned cattle of all grades in the British Isles; 30,313,949 sheep, and 2,422,834 swine; the first two show an increase, and the third a decrease, compared with 1873.

CINCHONA IN CEYLON.—The experiment with cinchona in Ceylon, as in India, is still continued successfully. The original design of the Ceylon government was to grow plants only for free distribution, on the condition that they be planted and cared for. At first it was difficult to get planters to accept of them with this proviso; but the success of the first trials was such that, for the last two years, it has been difficult for the gardens at Hakgalla to keep up with the demand at the price, first, of 5 and, latterly, of 10 rupees per thousand. The latter price has been paid even for unrooted cuttings. The greater demand has been for the *succirubra*, (red bark,) which large-leaved species thrives well every where, side by side with coffee. This is the favorite, not because it is the best, but because it is the best grower and suited to a lower elevation, 3,000 feet being the minimum for the production of the alkaloid in sufficient quantity, while *officinalis*, *calasaya*, and other crown barks require an elevation not lower than 4,000 feet, furnishing an even quantity of alkaloid at all higher elevations than 6,500 feet, below which the quantity is less, and the resin of the bark becomes as troublesome as in the red bark. Though cinchona *trees*, like most others, flourish best under conditions of abundant sunlight, yet repeated experiments have conclusively proved that the quality of the *bark* can be greatly improved by shielding it from the direct influence of the sun's rays. The formation of injurious resinous and coloring matter, most difficult of separation from the valuable qualities, seems to be in proportion to the influence of direct sunlight. Planting the trees very thickly, and then pruning judiciously, goes far toward securing the benefits without the disadvantages of shade, the most favorable condition for the production of quinine being "that the leaves should be well exposed to the light while the stem-bark is shaded from the direct action of the sun." A Mr. McIvor has adopted a mossaing process, which completely secures all

the advantages of excluding the bark from the sun's rays, while it enables the cultivator to obtain several crops of bark from the same growing stem. Mr. McIvor thus describes his process:

Two parallel cuts should be made down the stem, at the distance apart of the intended width of the strip of bark; this done, the bark is raised from the sides of the cut and drawn off, beginning at the bottom; care being taken not to press or injure the sappy matter (*Cambium*) left on the stem of the tree. This *Cambium*, or sappy matter, immediately granulates on the removal of the bark, and, being covered, forms a new bark, which maintains the circulation undisturbed.

With a view to show that scientific cultivation may modify the bark so as to increase largely the valuable alkaloids and sulphates, and at the same time decrease the resin and other objectionable matter, Mr. Broughton, chemist, employed by the Madras government, made the following experiment: After taking samples of the bark of two trees, as it grew in the natural state, he covered the bark on one with a shield of tinned plate, and on the other with cloth. Analyses showed the following results: Bark from the tree covered with plate, before covering, quinine, 2.16; cinchonidine and cinchonine, 3.13; total alkaloids, 5.29; covered ten months, quinine, 1.65; cinchonidine and cinchonine, 6.45; total, 8.10. From the tree covered with cloth, before covering, quinine, 2.26; cinchonidine and cinchonine, 2.78; total, 5.04; covered six months, quinine, 2.03; cinchonidine and cinchonine, 4.88; total, 6.91; covered ten months; quinine, 2.34; cinchonidine and cinchonine, 5.58; total, 7.92. Mr. Broughton states: "The alkaloid was obtained crystallized with nearly the same readiness as in mossed bark. The amount of quinine, however, has not been increased as in the case of mossaing. This is a circumstance which I did not expect, and it is opposed to deductions from other experiments." He thinks that the reason for non-increase of quinine may be that the black cloth and tinned plate did not shield from the heating effect of the sun's rays as did the moss. He also gives the result of a new analysis, which makes the amount of quinine in bark (of *Succirubra*) sixteen months under moss, 4.02; and the same renewed, under moss for the same time, 3.87. The old bark, however, was sixty-six months old.

To show the comparative value of different varieties, analyses of two kinds of bark produced in Ceylon are given. The first, *Officinalis*, (believed to have been subjected to the mossaing process,) gave sulphate of quinine, 3.93; quinine uncrystallized, 2.41; cinchonidine, .51; cinchonine, .28; total, 7.13. The second, *Succirubra*, from trees grown in the open garden at Hakgalla, gave, sulphate of quinine, 2.35; quinine uncrystallized, .95; cinchonidine, .11; cinchonine, .58; total, 4.99.

§ CINCHONAS IN INDIA.—Dr. Edward Nicholson, of the Anglo-Indian army, informs *Le Journal de Thérapeutique* that the culture of this precious bark is rapidly increasing in India. In the presidency of Madras alone the product of cinchona bark, up to July 31, 1873, was: *Cinchona succirubra*, 1,215,963 superficial feet; *C. officinalis*, 4 varieties, 1,284,748 feet; *C. calisaya*, 2 varieties, 54,881 feet; other species, 93,346 feet. During the second quarter of 1873 these plantations furnished for the manufacture of alkaloids of Madras 11,164 lbs. of green bark from the trunk; 30,089 lbs. of green bark from the branches; 2,597 lbs. of renewed bark. There were exported to England 23,699 lbs. of dried bark, making the product of three months 67,485 feet, giving an estimated product of alkaloids amounting to 3,376 pounds. Dr. Nicholson estimates the total product of India at over 200,000 pounds of bark.

RAIN ON THE PACIFIC COAST.—Rain on the Pacific coast has set in earlier than usual. In the month of October it fell at Sacramento to

the depth of  $2\frac{1}{2}$  inches, which was more than in the same month in any year since 1858, when  $3\frac{1}{10}$  inches fell. The next highest amount was in 1869,  $2\frac{3}{8}$  inches. In San Francisco the United States signal-service report that in the twenty-four hours ending at 8 p. m., November 23,  $4\frac{7}{10}$  inches fell. Rain has been general in the interior. At Yreka, it is claimed that  $7\frac{3}{8}$  inches fell during one storm in November, making a total of  $14\frac{1}{2}$  inches for the month, and of 20 inches for the season.

**INFLUENCE OF TREES ON RAIN-FALL AND CLIMATE.**—At a recent meeting of the Scottish Arboricultural Society, a report was made by Mr. Buchan, secretary of the Scottish Meteorological Society, of experiments on rain-fall at Carnwath. "The forest selected contained about 62 acres, and a little outside, to the northwest, was a green knoll quite clear of trees. In the interior of the wood, and 320 yards distant, was another knoll of precisely similar character. Immediately on the top of the western slope of this knoll was a bare patch about 50 feet in diameter, and this was surrounded on all sides with trees of various sorts, varying from 40 to 50 feet in height. The growth of the green sward and of the plants around showed that the situation was well fitted for the inquiry." Two sets of meteorological instruments, exactly alike, were placed, one on each knoll, at exactly the same elevation above the ground. Observations were begun on the 16th of September, 1873, and continued to the end of October, 1874. "The precise points to be elucidated were the temperature and the condition of the atmosphere as regards moisture outside the wood as compared with the interior of the wood." In the interior, the highest temperature was  $79^{\circ}.4$ ; the lowest,  $19^{\circ}$ ; range  $60^{\circ}.4$ ; on the outside, during the same days as the preceding) the highest,  $78^{\circ}.1$ ; the lowest,  $19^{\circ}.8$ ; range,  $58^{\circ}.53$ . The mean of all the maximum day-temperatures at the station within the woods was  $52^{\circ}.2$ ; on the outside,  $51^{\circ}.7$ ; of all the minimum day-temperatures in the interior,  $38^{\circ}.8$ ; on the outside,  $38^{\circ}.7$ . The means of night-temperatures were very nearly identical at both stations during the whole period of observation; except in June, the difference was never more than a fifth of a degree, but for the days of maximum temperature, the averages showed an excess of half a degree in favor of the station inside.

The remarkable result disclosed during the annual rise of temperature in the spring and summer months was, that in the inside of the wood the temperature was two degrees higher than on the outside, while during the annual fall of temperature in the autumn, the temperature of the day inside of the wood was in the mean half a degree lower than on the outside.

In respect to moisture, the results were as follows: The average dew-point, at 9 o'clock in the morning, was, at the interior station,  $42^{\circ}.5$ ; at the exterior,  $42^{\circ}$ ; at 9 in the evening, respectively,  $42^{\circ}.2$  and  $40^{\circ}$ . In the month of August the dew-point at the interior was, on the average,  $1^{\circ}.8$  higher than at the exterior.

**FORESTRY AND DEFORESTING IN CEYLON.**—A writer in the Ceylon Observer, from facts in the official report on the forest department of the Madras presidency, concludes that the rainfall would be equally abundant, on the tops of mountains 4,000 to 8,000 feet high, if there were no trees higher than coffee, tea, or cinchona shrubs. He states further that all observation and experience in Ceylon tends to prove that the substitution of coffee-bushes 4 feet, for forest-trees 40 or 60 feet high, on elevated lands, will not be followed by a diminution of rainfall in the slightest degree. Those who clear away every tree from their land inflict great injury on their own interests and those of the country, not because they diminish the rain-fall, but because from such

land the rains run off more rapidly, the moisture is sooner dissipated from the surface, and there is no vegetable deposit from leaves and decayed wood for enriching lower lands.

**FOREST PROTECTION IN RUSSIA.**—The Moscow Gazette, in commenting upon a correspondence from the provinces of the Vistula, predicts that if the wholesale destruction of timber be not placed under effective limitations within the next quarter century, that finely-wooded region will become an arid plain. Volhynia, in which formerly 42 per cent. of the land was forest, now contains but 25 per cent. Riga will soon lose its character as a timber-exporting point. Renza has reduced her forest area from 35 per cent. to 20 per cent. of her surface. Other provinces show a similar tendency. These complaints are re-echoed by the other leading journals of the empire. The danger of injurious denudation of forest areas has attracted the attention of the leading agricultural societies, and the impression is gaining ground among all classes of the people that prompt action must be taken by the government to avert the injurious consequences of a general destruction of forests.

**EXPORT OF HORSES FROM FRANCE.**—Horses were exported from France, in the first nine months of 1874, to the value of \$3,000,000. They included 5,217 mares, 536 stallions, and 11,959 geldings. The exports for the corresponding period in the two previous years were: 1873. Mares, 4,957; stallions, 616; geldings, 12,990. 1872. Mares, 4,265; stallions, 992; geldings, 7,126. They are exported principally to England, Belgium, and Germany.

**BARLEY VERSUS WHEAT.**—The Mark Lane Express, in reporting that the best malting barley, for the first time, sells in the British market at a higher rate than the best red wheat, says that “a very remarkable change is about to take place in the history of agriculture, consequent on the change in the value of English wheat and barley.” Reckoned by measure, barley is quoted at 48 shillings, and wheat at 46, per quarter; by weight, (barley being 7 pounds per bushel lighter than wheat,) while 456 pounds of barley bring 48 shillings, 456 pounds of wheat bring only 41.

**PROGRESS OF AGRICULTURE IN VICTORIA.**—The Department of Agriculture in Victoria, Australia, has published its second annual report. The volume is described as “an exact counterpart” of those issued by this Department. It reports results of investigations with respect to the state of crops, the cultivation of special plants, (including flax, the grape, and native grasses,) diseases of cattle and sheep, injuries of birds and insects, characteristics of different soils in the colony, &c. The Department is furnished with a chemist and an entomologist, who report on their specialties. Agricultural education is largely discussed, and a sketch of all the principal agricultural schools and colleges in Europe and America is given. It is also reported that the Department is about adding to its own facilities an experimental college and farm.

**STEAM CULTIVATION.**—The following statements are gathered from a letter written by an experienced cultivator, at the request of Sir William Cunningham, M. P., and read at a recent meeting of the Carrick Farmers' Society, Scotland. The writer began to cultivate by steam, in 1861, with a “roundabout set of tackle; that is, with rope and anchor at each end of the field, and one engine.” The next year he procured a 14-horse power engine and tackle, and in 1864 another. These two en-

gines have worked regularly up to the present, not only on level ground, but on hill-sides, and are now in a more efficient state than when new.

Experience has enabled the writer to surmount such difficulties as keeping the water in the boiler while moving on steep hill-sides, signaling from one engine to the other over intervening hills, the sinking of engines in miry ground, &c. He has added to his steam-force "a traction-engine for conveying dung to the fields, and carrying stones and wood and other work on the estate." He also says: "I have successfully brought into use on my farms a combined harrow and roller, and expect to be able to turn out a drain-plow, to cut drains  $3\frac{1}{2}$  to 4 feet deep, at a cost of only a few shillings per acre. The greatest advance, however, that I have made is by the purchase of two 20- (nominal) horse power engines for the purpose of kufing or subsoiling to a depth of from 2 to 3 feet."

Illustrating the economy of steam-cultivation, he states:

Taking the present price of horses at £75 per horse, harnesses, plows, and implements at £300, makes a saving in stocking a farm of £1,650, or within a little of the cost of a double set of engines, with tackle complete, costing £1,800. The higher wages of the engine and plow drivers, with the amount paid for coal and oil, will bear no comparison with the keep of horses; besides, when the engines are idle they do not eat. The wire-rope on clay-land lasts five years. Put the cost of repairs, at the outside, at £70 or £100 per annum, which is much less than blacksmiths' bills and the tear and wear of horse-flesh and implements, &c.

CO-OPERATIVE LAND MOVEMENT.—A law recently passed by the British Parliament provides that any industrial and provident society, registered under the act, "shall have power to purchase, erect, and sell and convey, or to hold land and buildings." A paper read before the statistical society in June last by Mr. E. W. Brabrook, reports results as follows: Up to November 18, 1873, thirty-three societies had been registered under the act, organized for the sole purpose of buying and selling land. From these recently-formed societies, with a single exception, no returns of results are as yet available; but many of the ordinary co-operative societies have registered for the same purpose, and returns to the registrar of friendly societies for the year 1872 show that under the act above mentioned buildings and lands had been purchased as an investment, or to sell again, to the value of £231,788, or 13 per cent. of £1,792,967, the total assets.

ALGERIAN AGRICULTURE.—The French province south of the Mediterranean embraces a large belt of cultivable land, stretching along the coast and protected from the hot blasts of the desert by the Atlas Mountains, with sides well wooded, and summits capped with snow. Here about 30,000,000 of acres, a surface 20 per cent. greater than that of Ohio, is capable of cereal culture, but not over a third is actually occupied. The migratory natives, indisposed to assume the care and responsibility of cropping, are still available in sufficient numbers in the heavy labors of harvest. Plowing and sowing take place in October. Heavy April rains insure a good crop even with the imperfect methods of culture in use. The plow is a wooden share, unshod with iron, such as is used in Spain and Provence. The grain is reaped by hand and trodden out by cattle, after which it is winnowed by the winds of heaven. It is mostly the *Triticum durum*, or hard wheat of the country, which is highly esteemed for the manufacture of maccaroni, vermicelli, &c. Its large proportion of gluten makes a flour very profitable to the baker, as it absorbs large quantities of water. Barley is grown in the place of oats, either as a forage-crop or a grain-crop. It supplies the breadstuffs of the poorer classes. It is well adapted to malting. The most productive variety is the *Hordeum noxusticum*.

The Atlas Mountains inclose large plateaus too elevated for crop-culture, but admirably adapted to grazing. This advantage is utilized in sheep-raising. Before the French conquest sheep husbandry was of little value to the Arab breeder, except for mere clothing and subsistence. Sheep began to bring from 2s. to 3s. per head until this cheap meat supply found its way to the Paris markets. Now sheep bring as high as 16s. to 20s. More than 20,000 sheep per month are sent from Algeria to France. There are two kinds of sheep in the province; one small with large tails, and a larger breed in the country of the Getulæ. The milk of sheep and goats is used by the poorer classes in making butter and cheese. The cattle are a black breed of inferior milking qualities. The stock of cattle averages annually about 1,500,000 head. The common beasts of burden are camels, dromedaries, asses, and mules. The horses are by no means of the pure Arab type, being lank and round-shouldered, but hardy, docile, and fleet. Those of Oran are the best. They are stabled in the family tent, and are only used for riding.

But stock-raising cannot compete with cereal culture, which finds an increasing demand for its surplus products. England alone could absorb the yield of this province, which, it is estimated, might be enlarged to 220,000,000 bushels of all sorts of grain per annum. A great effort is now being made by the French government to attract settlers from Alsace and Lorraine. The native tribes are unsuited to a civilized industry and unable to meet its demands for labor. Their physical and intellectual capacities and their boundless prejudices unfit them for steady and profitable employment. They are exceedingly awkward in handling all kinds of agricultural implements, and have too little desire for improvement ever to become valuable laborers. Civilized men find great difficulty in adapting their labor, and serious local results have frequently grown out of this misunderstanding, greatly retarding the progress of this country. Whether this new effort to colonize European civilization upon the African continent will be any better than its predecessors, is yet to be tested by its results.

AGRICULTURAL PROPERTY IN ENGLAND.—Mr. Snell, in a paper lately read before the Devon and Cornwall Chamber of Agriculture, stated that the tenant-farmers of England are assessed for income-tax upon a basis of £60,000,000 per annum, which is about half their rental. Small holdings, covering about one-seventh of the soil, were assessed upon £20,000,000, making the rental value of agricultural land about £140,000,000, or \$700,000,000. As it requires six years' rental to repay the tenant for his investment, the capital represented is over £800,000,000, or \$4,000,000,000, a sum exceeding the British national debt. Of the tenant-farmers a small proportion are protected by special stipulations in their leases, allowing them compensation for unexhausted improvements at the close. More than half the land of England is let to tenants-at-will, a relation which forbids very high farming. It presents constant temptations to superficial and exhaustive culture. There is no inducement to this class of tenants to invest any capital in permanent improvements, seeing that it is likely to be taken from them by a sudden eviction. While the landlord enjoys full legal protection for his property, the tenant has but a limited and precarious recourse. Anomalies of the landed system are annually becoming more serious in their operation upon the productive interest, and early legislation, reforming the system of tenure, the writer thinks, is of prime necessity. Mr. Joseph Arch, the great social reformer, declares that the English chambers of agriculture are worthless as protectors of tenant-rights, being overshadowed by the landlord interest.

**BRITISH MINERAL-PRODUCTION IN 1873.**—From the introduction to the annual returns of mineral-production, lately published by the keeper of mining records, it appears that the United Kingdom, during 1873, produced raw minerals to the value of £59,479,486. The leading items of this production were as follows: 127,016,747 tons of coal, worth £47,631,280; 15,577,499 tons of iron-ore, worth £7,573,676; 80,188½ tons of copper-ore, worth £342,708; 14,884¾ tons of tin-ore, worth £1,056,835; 73,500½ tons of lead-ore, worth £1,131,907; 15,969 tons of zinc-ore, worth £61,166; 58,924 tons of iron pyrites, worth £35,485; 5,448¾ tons of arsenic, worth £22,854; 8,671¼ tons of manganese, worth £57,766; 6,368½ of ocher and amber, worth £5,410; 1,785,000 tons of fine and fire clay, worth £656,300; 1,785,000 tons of salt, worth £892,500. The metals obtained from the above ores are valued at £21,409,878, including 6,566,451 tons of pig-iron, worth £18,057,739; 9,972 tons of tin, worth £1,329,766; 5,240 tons of copper, worth £502,822; 54,235 tons of lead, worth £1,263,375; 537,707 ounces of silver, worth £131,077; 4,471 tons of zinc, worth £120,099, and other metals valued at £3,000. The total product of coal, metals, and non-metallic minerals is valued at £70,722,992, or over \$350,000,000, against £70,193,416 in 1872. The coal-product increased about 3,400,000 tons, but the iron-ore exportation declined over a million tons, necessitating a decrease in pig-iron production of 175,478 tons. Copper-ore also fell off 11,695 tons, and the metallic product 500 tons. All the other metals show a decline, except tin. The coal-product is the largest ever realized. The keeper of the mining records estimates that of the total product 12,712,222 tons were exported; 3,790,000 tons used on railways; 35,119,709 tons used in iron-manufacture; 763,607 tons in smelting other metals; 9,500,000 tons in mines and collieries; 3,650,000 tons in steam-navigation; 27,550,000 tons in steam-power manufactures; 6,560,000 tons in gas-manufacture; 650,000 tons in water-works; 3,450,000 tons in potteries, glass-works, &c.; 3,217,229 tons in chemical and other works; 20,050,000 tons in domestic consumption.

**SEWAGE-FARMING IN ENGLAND.**—Upon the sewage-farm of Lord Warwick, near Leamington, in England, twenty acres of mangel-wurzel (of two kinds, orange and intermediate globe) produced 82 tons to the acre, the crop being the greatest ever known in England. The field had been in Italian rye-grass in 1871 and 1872, and wheat in 1873. It received no manure other than sewage during the past four years. The mangel was sowed in rows, 2 feet apart, and the plants were thinned to 1 foot. The roots were so large that tons and tons were selected which did not exceed one hundred roots to the ton.

**FARM-ANIMALS IN ENGLAND AND WALES.**—The following table gives the totals of the several classes of farm-animals in England and in Wales, as shown by official returns, on the 25th of June, in 1873 and 1874:

Animals.	1874.		1873.	
	England.	Wales.	England.	Wales.
<b>HORSES.</b>				
Used solely for agricultural purposes .....	739, 221	69, 026	736, 530	69, 580
Breeding mares and unbroken horses .....	268, 177	54, 497	242, 482	50, 693
Total.....	1, 007, 398	123, 523	979, 012	120, 273

Animals.	1874.		1873.	
	England.	Wales.	England.	Wales.
<b>CATTLE.</b>				
Cows and heifers in milk or in calf.....	1, 614, 477	263, 616	1, 580, 912	259, 612
Other cattle not under two years old.....	1, 105, 773	125, 289	1, 051, 681	107, 064
Other cattle under two years old.....	1, 585, 290	276, 200	1, 541, 042	276, 151
Total.....	4, 305, 540	665, 105	4, 173, 635	642, 857
<b>SHEEP.</b>				
Not under one year old.....	12, 441, 794	2, 111, 069	11, 908, 391	2, 050, 297
Under one year old.....	7, 417, 964	953, 627	7, 261, 460	916, 565
Total.....	19, 859, 758	3, 064, 696	19, 169, 851	2, 966, 862
Pigs.....	2, 058, 781	213, 754	2, 141, 417	211, 174

**CORN IN MASON COUNTY, ILLINOIS.**—Our correspondent for Mason, Mr. William McDuffey, of San Jose, reported for October, as published, "Corn light and poor in quality." Mr. J. Cochran, of Havana, wrote to the Department, saying, "This is a very great error. The corn-crop of Mason County is *the best in quality ever grown and the largest in quantity*, with a single exception." This was forwarded to Mr. McDuffey, who replies, "My report is correct for an *average* of Mason County, notwithstanding Mr. Cochran's statement. I think he has more reference to corn produced in Fulton and Menard, on the bottoms of the Illinois and Sangamon rivers, (which corn is marketed at Havana,) than to that in Mason. Extra corn was produced in those counties on such lands this year; but I have nothing to do with that in my report. In this county, in one and perhaps two towns, where, in a common season, no corn could be raised, it was good; but in the remaining eleven towns it is poor, light, and chaffy. For the first time within my knowledge, our corn inspects in Chicago 'rejected.' Heretofore, so sure as our corn went to Chicago, it has inspected 'No. 1' or 'No. 2' always, but this season it is not so. Several fields in the county produced 12 bushels to the acre, but some not half of that. It was never lighter nor of so inferior a quality."

**MIXED HUSBANDRY IN GEORGIA.**—A correspondent in Taylor County reports that almost every farmer now plants wheat and oats, and, with proper fertilization and cultivation, finds it profitable. While unmanured land yields only 3 to 5 bushels of wheat per acre, manured yields 8 to 20. These wide extremes of yield are owing to different grades of fertilization and culture. With 50 pounds of Peruvian guano and 20 bushels of cotton-seed, mixed and drilled in rows 18 inches apart, and the seed-wheat drilled in the same rows, our correspondent raised 20 bushels per acre of good wheat, "on land that would not produce one bale of cotton to three acres." With the same treatment he raises 30 to 50 bushels per acre of oats. Rust-proof is the only variety he plants, which readily brings in market \$1 per bushel.

**MIXED HUSBANDRY SUPERSEDING COTTON-PLANTING.**—A correspondent in Lincoln County, Mississippi, reports as follows:

I make it a point to converse with every person I meet, whether white or black, to learn what he intends to do next year in the cotton business. The answer invariably is, "I intend to plant corn, oats, and other grain, if the seed can be had; also plenty of sweet-potatoes, and but little (and many say no) cotton." Judging from the pres-



ent feeling on the subject of cotton, the area in this county, also in Lawrence, Covington, Marion, Pike, Simpson, Copiah, and Franklin, will be very much reduced. Every one here says it is time we should begin to raise the wheat we consume at home.

**AGRICULTURAL HINDERANCES AND HELPS IN EAST TENNESSEE.**—In a communication from the secretary of the agricultural board of Sullivan County various discouragements and encouragements to agriculture in that section are set forth. Among the former are specified inveterate habits among farmers of skimming over as much as possible of land already exhausted without any attempts at increasing its productiveness; of letting the greater part of manure and other available fertilizers, which ought to be carefully saved and applied to the land, run to waste; and of resting contented with primitive and crude inherited modes of farming, without any disposition to learn and profit by modern improvements; a consequent disposition of the more enterprising among the rising generation to quit the farm and emigrate; laziness; one-horse gentlemen; speculators and kid-glove gentry; too many office-seekers; too many professional men, and other consumers who are not producers; and, lastly, too many dogs. “We have one of the best sheep-countries on the globe; but our people prefer to raise dogs, and the sheep are decreasing rapidly. On the other hand, a few are taking the necessary steps to increase the productiveness of their farms, and manufactures, in the train of which agricultural prosperity is sure to follow, are springing up. We have in our county several new factories, one cotton and one woolen factory at Bristol, and one just across the line, on the Virginia side. One cotton-factory at Union, on the railroad, ten miles below Bristol, is doing a fine business; and since the war a woolen-mill has been established in Carter, ten miles south of Union, which is also doing a prosperous business. Still another has gone up in Hawkins County, or on our county-line, which is largely patronized from four counties. Although we have no money, we are beginning to feel the effects of these improvements.”

**HEDGES IN TEXAS.**—Our correspondent in Austin County calls attention to the gradual destruction of the timber and the inefficiency of the fence-laws. He thinks the *bois d'arc*, a native of Texas, is not remarkably available on account of ignorance of its culture and the depredations to which it has been subjected. A good, reliable hedge-plant is a desideratum.

**MINERAL WEALTH IN NORTH CAROLINA.**—Our correspondent in Stokes County says that the deposits of coal, iron, and lime in that region have attracted the attention of English miners. These minerals are plentiful and of good quality. Railroad communication within twelve miles.

✻ **EXCELSIOR OATS IN OREGON.**—Mr. H. Shortridge, of Lane County, received from this Department, three years ago, a package of this variety of oats. From the seed of successive sowings he raised, the past season, a fair quantity, reported to be very heavy in yield and to weigh 50 pounds to the bushel.

**BENEFIT FROM SEED DISTRIBUTION.**—Our correspondent in Fulton County, Arkansas, reports that the two best varieties of wheat in that section, in respect to both yield and quality, are the Tappahannock and Fultz, the seed of which was received from this Department. He adds that the usual acreage in wheat was nearly doubled the past fall; that no complaint of the fly has been heard, and that, at the last of November, the growing crop never looked more promising.

**VITALITY OF SEEDS.**—Two years ago a few peas, in a very dry and hard state, were found in a sarcophagus containing a mummy, in the course of certain excavations going on in Egypt. The idea was conceived of testing the vitality of these peas, buried as they had been for thousands of years. Three of them were planted, which vegetated and produced enough to cover, in the year following, a considerable field. Some of the stalks grew to the height of more than six feet, and attained a size which was altogether extraordinary, and a strength which rendered them self-supporting. The flowers were white and rose-colored, and of delicious freshness. The pods were grouped on either side of the stalk, in a sort of circular zone toward the top, and not regularly distributed throughout the plant, as in the common pea. It is believed by those who have examined this ancient pea and tested its edible qualities that it belongs to the family of the ordinary pea of our gardens, but that it is a special variety distinguished by the characteristics above mentioned in regard to the form of the stalk and the disposition of the pods.

In corroboration of the fact that seeds will retain their vitality for an indefinite period when embedded deep in the earth, Professor Von Helldreich, of Athens, Greece, states that on the removal of the mass of slag accumulated in working the Laurium silver-mines, some fifteen hundred years ago, a quantity of a species of *glaucium*, or horn-poppy, has made its appearance; and, what is remarkable, it proves to be a new and undescribed species to which the name *glaucium serpieri* has been given. Professor Niven, of the Hull Botanic Garden, England, in further corroboration of the same fact, mentions several instances of extraordinary vitality of seeds, from his own observation, and remarks that, "Doubtless the absence of air, an equable and unvarying condition as regards moisture and temperature, and above all the complete neutralization of the physical influence of the sunlight, constitute the means by which nature exercises a preservative power in seeds as astounding as it is interesting."

**DISEASE-PROOF POTATOES.**—A committee of the Royal Society of England reports that six varieties of potatoes entered for experiment as disease-proof, and planted in twenty trial-plots in different parts of the United Kingdom, have all failed to stand the test. The council had reserved a power to enforce a penalty of £20 in each case of failure, but the committee recommended that this penalty be not enforced. Professor de Bary, in a communication to the committee, claims to have ascertained definitely that this disease is not propagated by infected tubers. He recommends that potatoes be not planted near or after plants known to be suitable to the development of oospores of the *Peronospora infestans*.

**TEST OF SEEDS IN WASHINGTON TERRITORY.**—A correspondent in Waukiakum County reports that seeds received from the Department of Agriculture have proved very successful. "The flowers were splendid," and "the Victoria rhubarb had stalks an inch in diameter early in September. One mammoth pumpkin weighed 122 pounds."

**THE ROLLER AGAINST DROUGHT.**—Our correspondent in Stearns County, Minnesota, reports that while wheat generally averages about 14 bushels per acre the past season, his own averages 20, and is satisfied that the difference in his favor is mainly owing to a prevention of injury from drought by thoroughly rolling the land.

**THE WORLD'S PRODUCTION AND CONSUMPTION OF PAPER.**—The following statistics of paper-making are given on the authority of Rudel, of Vienna, Austria: It appears that there are 3,960 paper-manufacturers in

the world, employing 80,000 men and 180,000 women, besides the 100,000 employed in the rag-trade; 1,809,000,000 pounds of paper are produced annually. One-half is used in printing, a sixth for writing, and the remainder for packing and for other purposes. The United States averages 17 pounds per head; an Englishman consumes 11½ pounds; a German, 8 pounds; a Frenchman, 7 pounds; an Italian, 3½ pounds; a Spaniard, 1½ pounds; and a Russian only 1 pound annually, on an average.

**CRANBERRY PRODUCTION.**—Mr. N. R. French, statistician of the New Jersey Cranberry-Growers' Association, estimates the cranberry-crops, and their sources, for the past three years as follows:

	1872.	1873.	1874.
	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>
Cape Cod and adjacent islands.....	20,000	80,000	35,000
Massachusetts and Rhode Island.....	20,000	25,000	70,000
New Jersey.....	100,000	110,000	90,000
Wisconsin, Minnesota, Indiana, and Michigan.....	135,000	60,000	50,000
New York.....			5,000
Total.....	275,000	275,000	250,000

The area under regular cultivation in New Jersey in 1874 is estimated at 4,969 acres, and the capital invested at \$1,662,130. Though there was an increase in acreage over the previous year, the crop was 25 per cent. less. The rot, with the failure of the crop on new bogs, is the assigned cause. The crop on the eastern part of Cape Cod was in some districts a failure and in others very light; but on the adjacent islands, in the remainder of Massachusetts, in Rhode Island, and Long Island, it was good. The western reports show a great reduction.

**FORAGE GRASSES IN TEXAS.**—A correspondent in Austin County writes:

I have been in search of an article of green winter forage for horses and cattle, and have made experiments with several grasses. Orchard-grass grows finely on uplands, both in the shade and open fields, so also does red clover. Italian rye-grass makes a fine winter and spring pasture, and is better adapted to the climate than the orchard or perennial rye-grass, but it requires a rich, moist soil. Being a biennial it also requires reseeded, or it will run out. All the above grasses succumb to a severe Texas drought.

I have been more successful with a grass which I suppose to be indigenous to this latitude. It was brought from Louisiana to Texas, during the late war, by the confederate cavalry, and is now spreading over the country from the old camps of those troops. I know it only by the name of "Louisiana grass." It is often disseminated by the droppings of animals. It takes hold slowly, but vigorously. When the seed is sown it makes but little show till the second year, at which time it forms a complete turf, taking the sway over weeds and other grasses. So far as I have observed, horses, cows, and sheep are very fond of grazing on it, and it makes an excellent hay, being about as rich in seed as timothy. It stands the close grazing of sheep equally with our excellent Bermuda-grass. It is not much affected by summer heat and drought, and bears the tramping of stock; yet it easily yields to the plow, and may be exterminated by one season's tillage. Two horses or mules turn it under with ease. It is not a winter grass, though it is but little affected by frost, putting up green in favorable weather all winter. It makes good grazing early in the spring and goes to seed in August. From the progress it is now making it is destined, at no distant day, to take our Texas prairies, and make a stock range equal to, if not better than, what the country had in a state of nature.

For green winter forage in this part of Texas, where there is but little frost, many persons sow wheat, barley, or rye. These are all very good, and keep horses and milch cows in fine plight. But for this purpose the winter oat, or what is here called the "red rust-proof oat," is gaining the preference. I have seen it, planted in October and November, grazed till the 1st of March, when the out-range becomes good, and then

yields from 30 to 40 bushels to the acre. Stock appear to relish it better than other small grain. It ripens and is harvested in this latitude the 1st of June. The grain is of a reddish color, weighing, generally, 32 pounds to the measured bushel, has a bright, stiff straw, seldom falling from wind or storm. It withstands rust almost effectually.

**SUCCESS IN RAISING CORN IN MISSISSIPPI.**—Mr. J. L. Blanks, of Lauderdale County, reports that he raised, the past season, on an acre of poor pine-land, 70 bushels of corn, by actual measurement, and thinks that the yield was diminished one-third in consequence of the drought, which began in the middle of July and continued till after the corn was harvested, which was the last week in September. The land was subsoiled to the depth of about one foot, and thoroughly pulverized. Early in April about 575 bushels of compost (from scrapings of a cow-lot, loose soil under and about his gin-house, and a small quantity of cotton-seed) were distributed and covered in rows 4 feet apart. April 30, these rows were opened, and the corn planted 8 to 10 inches apart, which was subsequently thinned about one-half. June 1, about 200 bushels of heated cotton-seed were sown on the acre and mixed with the surface soil. The corn received frequent and thorough cultivation.

**AGRICULTURE IN SAINT LANDRY, LA.**—A local authority gives the agricultural statistics of this parish, for 1873, as follows: Land cultivated, 42,595 acres; uncultivated, 548,342. The census of 1870 returns 80,452 acres cultivated, and 232,376 uncultivated, showing in the later statistics a falling off in cultivated area of nearly one-half, and an increase of land in the parish of 278,109 acres. The area and yield of the several crops reported are: Corn, 23,433 acres, yield, 162,927 bushels, equal to 67 bushels per acre; cotton, 17,668 acres, yield, 3,315 bales; cane, 1,299 acres, yield, 193 hogsheads of sugar and 343 barrels of molasses; rice, 195 acres, yield, 669 barrels. The products of these several crops in the parish, in 1869, as reported for the census, were: Corn, 368,897 bushels; cotton, 14,305 bales; sugar, 1,988 hogsheads; molasses, 118,110 gallons; rice, 33,375 pounds. The figures show that one or both of these reports must be greatly wanting in accuracy.

**A SUBSTITUTE FOR CREAM IN CHEESE.**—The American Dairy and Commercial Company—president, Henry D. Gardner—hold a patent for making cheese from milk, after the cream is taken from it, by substituting therefor oleo-margarine. The following description of the apparatus, process, and results thus far, is condensed from a report made after personal investigation. The company, of which Henry O. Freeman, inventor of the patented process, is agent, have their factory at McLean, Tompkins County, New York. The building is 326 feet by 32, and two stories high, with a pool in one wing. The oleo-margarine used is described as white, opaque, fine-grained, odorless, and presenting to the taste a pure oily flavor. The milk is skimmed at twenty-four to thirty-six hours. While this is heating in a vat to a temperature of 92°, the oleo-margarine is being melted, and slowly raised in a water bath to a temperature slightly above that of the milk. Over the center of the vat, supported by a simple frame, is placed a tin vessel about 18 inches square, with a finely-punctured bottom. After the annotto has been stirred into the milk, and when that and the melted oil are at a proper temperature, the latter is poured through the tin strainer and quickly spreads over the surface "in a bright golden flood." Sufficient rennet is put in to cause coagulation in eight to ten minutes, and the temperature gradually raised about 2° higher. Between the pouring in of the oil and the coagulation, the mixture is vigorously stirred. The design of this is

to cause the oil (which would otherwise remain on the surface) to mingle with the milk, so that it may be caught and held in the concrete mass by the sudden coagulation. In about twenty minutes after putting in the rennet the cutting of the curd begins. Being cut and worked by hand into pieces about as large as "good-sized dice," it sinks beneath the surface, upon which a coating of the oil appears. This is skimmed off, and used, as at first, in the next manufacturing process. The manufacture of the curd into cheese does not differ from the ordinary mode. In the particular process witnessed, 2,500 pounds of skimmed milk took up 28 pounds of the oleo-margarine.

As to the quality of the cheese, Mr. Willard reports that there were about 3,000 on hand which were examined "very thoroughly," with the following conclusion: "The curing seems to be delayed longer than in full cream cheese; and the greater age given, the more perfect seems to be the incorporation of the oil and the smoother and sweeter the body of the product. The cheese at McLean is above the average of the full cream cheese, which we have inspected this season, in marketable qualities."

The milk is bought according to a plan by which the patrons are credited one pound of cheese for every ten pounds of milk, and are paid for the cheese thus credited "the highest New York quotation, less 2 cents" per pound. The alleged result is, that the dairymen of McLean, by supplying the factory at this rate, have received more for their milk than ever before.

**THE SHORT-HORN CONVENTION.**—The association so named recently held its annual meeting at Springfield, Ill., and elected the following officers: President, J. H. Pickrell, Harristown, Ill.; vice-presidents, William Warfield, Lexington, Ky., David Christie, Paris, Canada; secretary, S. F. Lackridge, Indiana; treasurer, Claude Matthews, Indiana; directors, Lucius Desha, Kentucky; T. C. Jones, Ohio; M. Miles, Michigan; J. R. Page, New York; Stephen White, Ontario; M. H. Cochrane, Quebec; Clinton Babbitt, Wisconsin; A. J. Dunlap, Illinois; George Sprague, Iowa; J. H. Kissenger, Missouri; Harvey Craver, Indiana; Cyrus Jones, California; D. W. Crane, Kansas; M. S. Cockrill, Tennessee.

Committees were raised to collect short-horn statistics, and to urge upon breeders a more general support of the association. It was voted to hold the next meeting, December 2, 1875, at Toronto, Canada.

**RAPACITY OF MIDDLE-MEN.**—A casual correspondent in Lincoln County, Mississippi, reports the following facts: In May, June, and July, good flour could be bought at New Orleans at \$7 to \$8 per barrel, while in his own county middle-men were paid \$12.50 to \$13 cash, or \$16 on time, with good mortgage. Bacon, ribbed sides, sold at New Orleans at 8 to 9 cents; at Brookhaven, Lincoln County, 15 cents cash, or 16 to 17½ on time. Corn-meal quoted at the former place \$4.50, sold at the latter for \$6 cash, and \$7.50 on time.

**ANOTHER RAMIE-MACHINE.**—M. Felix Roland, of Paris, has invented a machine for decorticating the ramie plant, which is spoken of by French journals as very satisfactorily answering the much desired end of separating the fiber from the bark and the bark from the stalk. The difficulty of such separation has been a serious drawback to the culture of this unquestionably very valuable plant. The East Indian government, in view of the great desideratum, offered, several years ago, a prize of \$25,000 for a machine or process that would accomplish the object. The liberal offer has brought out many competitors, and machines of

various descriptions and qualities have been invented, both in Europe and in this country; but no one as yet has obtained the prize. The new machine of M. Roland is described by the Paris Journal of Practical Agriculture as being valuable for its simplicity, its moderate price, and the amount of work it is capable of performing. It is designed not only for the treatment of ramie, but of other textile plants of which the fibers are utilized for the fabrication of tissues. The stems can be worked by it either green or dry, and whether rotted or not. Rotting can thus be dispensed with to great advantage, if the time and expense and unhealthiness of the operation are considered. These repeated efforts are at least important steps in the right direction.

AMERICAN COTTON IN CHINA.—A quantity of upland cotton was sent from this Department a few years ago to the United States chargé d'affaires at Peking, China, at his request, for experimental purposes. The following letter communicates the somewhat singular result of the experiments that were made. It will be observed that the attempt to introduce American cotton into the mountainous district of Shantung is substantially a failure. It is obvious, however, from the statement which is made in regard to the latitude of the district where the experiments were tried, that the climate is too cold and the season too short for the maturity of cotton.

LEGATION OF THE UNITED STATES,  
*Pekin, June 5, 1874.*

DEAR SIR: In August, 1868, I requested the Commissioner to send me a quantity of upland-cotton seed, which he was obliging enough to do, so that the three packages came during the next summer in excellent condition.

I distributed them to various persons in this city, through whom the seeds were sent to different parts of this province south of Peking. One of these was an English missionary at Tien-Tsin, of whom I recently inquired as to the success of the cultivators to whom he had given this cotton-seed. He writes me as follows:

"I have made inquiries respecting the growth of cotton in Shantung from the seed you gave me a few years ago. I am informed that in each case (for it was given to several farmers) the result was the same. It grew into a fine shrub, much higher and larger than the native plant. One root yielded over a hundred pods, three times the size of native pods, but none of them opened, and consequently no cotton-fiber was obtained. The seeds were preserved and planted by one or another every successive year with the same result, so that they are now planted in gardens as a flowering shrub, and are much admired. The farmers say that the climate is too cold, and hence the cotton will not ripen."

The native cotton in this part of China is not over six inches high, and the fiber (as cultivated without much care) is short, almost like wool; perhaps it would develop if more manure was applied. The cloth made from it, by those who rear it generally, is durable. The latitude of that part of Shantung province where the experiment above referred to was tried, is about 38°, and the seed, I suppose, came from Eastern Tennessee. Perhaps more fiber will be developed as the plant becomes acclimatized.

Your obedient servant,

S. WELLS WILLIAMS,  
*United States Chargé d'Affaires.*

FREDERICK WATTS, Esq.,  
*Commissioner of Agriculture, Washington.*

## MARKET-PRICES OF FARM-PRODUCTS.

*The following quotations represent, as nearly as practicable, the state of the market at the beginning of each month.*

Articles.	November.	December.
<b>NEW YORK.</b>		
Flour, superfine State.....per barrel..	\$4 00 to \$4 55	\$4 00 to \$4 50
extra State.....do.....	4 70 to 5 65	4 80 to 5 65
superfine western.....do.....	4 00 to 4 55	4 00 to 4 50
extra to choice western.....do.....	4 60 to 8 00	4 75 to 8 00
common to fair southern extras.do.....	4 80 to 5 75	4 80 to 5 75
good to choice southern extras.do.....	5 80 to 8 25	5 80 to 8 25
Wheat, No. 1 spring.....per bushel..	1 09 to 1 17	1 18 to 1 25
No. 2 spring.....do.....	1 02 to 1 14	1 11½ to 1 18
winter, red, western.....do.....	1 14 to —	1 18 to 1 23½
winter, amber, western.....do.....	— to 1 23	1 18 to 1 28½
winter, white, western.....do.....	1 25 to 1 36	1 30 to 1 40
Rye.....do.....	90 to —	94 to 97½
Barley.....do.....	1 45 to —	1 55 to —
Corn.....do.....	77 to 92	87 to 92½
Oats.....do.....	59 to 62	67 to 71
Hay, first quality.....per ton..	16 00 to 20 00	12 00 to 19 00
second quality.....do.....	12 00 to —	— to 12 00
Beef, mess.....do.....	11 00 to 12 00	9 50 to 10 50
extra mess.....do.....	12 00 to 13 50	11 50 to 12 50
Pork, mess.....per barrel..	19 80 to —	21 00 to —
extra prime.....do.....	17 00 to 18 00	16 25 to 17 25
prime mess.....do.....	20 00 to 21 00	18 50 to 19 75
Lard.....per pound..	14 to —	14½ to —
Butter, western.....do.....	18 to 40	20 to 40
State dairy.....do.....	30 to 42	30 to 42
Cheese, State factory.....do.....	14 to 16½	14 to 16
western factory.....do.....	12½ to 15½	12 to 15½
Cotton, ordinary to good ordinary.....do.....	12½ to 14	12½ to 14½
low middling to good middling.....do.....	14½ to 15½	14½ to 15½
Sugar, fair to good refining.....do.....	8½ to 8½	8½ to 8½
prime refining.....do.....	8½ to —	8½ to —
Tobacco, lugs.....do.....	10½ to 13	8½ to 12
common to medium leaf.....do.....	12½ to 17	12 to 16
Wool, American XXX and picklock..do.....	58 to 68	53 to 65
American XX and X.....do.....	47 to 57½	47 to 56
American combing.....do.....	55 to 62	51 to 65
pulled.....do.....	33 to 50	33 to 45
California, spring-clip.....do.....	25 to 36	25 to 36
California, fall-clip.....do.....	25 to 28	18 to 28
Texas.....do.....	18 to 37	18 to 36
<b>PHILADELPHIA.</b>		
Flour, superfine.....per barrel..	4 00 to 4 25	3 87½ to 4 00
Pennsylvania extra.....do.....	5 50 to 5 75	4 37½ to 4 75
Pennsylvania family and fancy.do.....	6 00 to —	5 37½ to 6 00
western extra.....do.....	4 25 to 4 75	4 37½ to 4 75
western family.....do.....	5 00 to 7 75	5 25 to 6 25
Wheat, winter, red.....per bushel..	1 10 to 1 20	1 18 to 1 22
winter, amber.....do.....	1 20 to 1 25	1 25 to 1 28
winter, white.....do.....	— to —	1 30 to 1 35
spring.....do.....	— to —	— to —
Rye.....do.....	1 07 to —	97 to 1 00
Barley.....do.....	1 20 to 1 50	1 30 to 1 60
Corn.....do.....	70 to 88	80 to 95
Oats.....do.....	55 to 62	62 to 67

## Market-prices of farm-products—Continued.

Articles.	November.	December.
PHILADELPHIA—Continued.		
Hay, prime, baled.....per ton...	\$20 00 to \$22 00	\$20 00 to \$22 00
common to fair shipping.....do.....	19 00 to 20 00	19 00 to 20 00
Beef, western mess.....per barrel..	8 00 to 10 00	8 00 to 10 00
extra mess.....do.....	9 00 to 12 00	9 00 to 12 00
Warthman's city family.....do.....	17 00 to ———	17 00 to ———
Pork, mess.....do.....	20 50 to 21 00	21 00 to 22 00
prime mess.....do.....	19 00 to 19 50	20 00 to ———
prime.....do.....	19 00 to ———	19 50 to ———
Lard.....per pound..	13 $\frac{3}{4}$ to 14 $\frac{1}{2}$	14 to 18 $\frac{1}{2}$
Butter, choice Middle State.....do.....	38 to 40	30 to 45
choice western.....do.....	30 to 32	20 to 32
Cheese, New York factory.....do.....	16 to 16 $\frac{1}{2}$	16 to 16 $\frac{1}{2}$
Ohio factory.....do.....	15 $\frac{1}{2}$ to 16	15 $\frac{1}{2}$ to 16
Sugar, fair to good refining.....do.....	8 $\frac{3}{8}$ to 8 $\frac{5}{8}$	8 $\frac{1}{2}$ to 8 $\frac{3}{8}$
Cotton, ordinary to good ordinary.....do.....	12 $\frac{3}{8}$ to 14	12 $\frac{3}{8}$ to 14 $\frac{1}{2}$
low middling to good middling.....do.....	14 $\frac{1}{2}$ to 15 $\frac{1}{2}$	14 $\frac{1}{2}$ to 15 $\frac{5}{8}$
Wool, Ohio fleece X and XX.....do.....	— to —	53 $\frac{1}{2}$ to 55
Ohio combing.....do.....	61 to 66	62 to —
pulled.....do.....	32 to 46	31 to 46 $\frac{1}{2}$
unwashed, cloth'g and comb'g.....do.....	25 $\frac{1}{2}$ to —	27 $\frac{1}{2}$ to 42 $\frac{1}{2}$
BALTIMORE.		
Flour, superfine.....per barrel..	4 12 $\frac{1}{2}$ to 4 37 $\frac{1}{2}$	4 00 to 4 50
extra.....do.....	4 75 to 5 50	4 75 to 5 50
family and fancy.....do.....	5 45 to 7 00	5 50 to 8 50
Wheat, white.....per bushel..	1 15 to 1 30	1 20 to 1 40
amber.....do.....	1 20 to 1 30	1 25 to 1 38
red.....do.....	1 15 to 1 23	1 22 to 1 33
Rye.....do.....	1 00 to 1 05	1 00 to 1 05
Corn, white, southern.....do.....	80 to 95	75 to 82
yellow, southern.....do.....	80 to 83	75 to 82
Oats, southern.....do.....	58 to 60	62 to 65
western.....do.....	55 to 60	62 to 64
Hay, Pennsylvania.....per ton..	17 00 to 20 00	17 00 to 19 00
Maryland.....do.....	17 00 to 21 00	17 00 to 21 00
Pork, mess.....per barrel..	21 50 to ———	21 00 to ———
Lard.....per pound..	15 to 15 $\frac{1}{2}$	15 $\frac{1}{2}$ to 17
Butter, western.....do.....	22 to 36	18 to 36
eastern.....do.....	33 to 40	26 to 40
Cheese, eastern.....do.....	16 to 16 $\frac{3}{4}$	15 $\frac{1}{2}$ to 16 $\frac{1}{2}$
western.....do.....	14 $\frac{1}{2}$ to 15 $\frac{3}{4}$	15 to 16
Sugar, fair to good refining.....do.....	8 $\frac{1}{2}$ to 8 $\frac{3}{4}$	8 $\frac{1}{2}$ to 8 $\frac{3}{8}$
Tobacco, lugs.....do.....	6 to 11 $\frac{1}{2}$	6 to 11 $\frac{1}{2}$
common to medium leaf.....do.....	8 $\frac{1}{2}$ to 14 $\frac{1}{2}$	8 $\frac{1}{2}$ to 13
Cotton, ordinary to good ordinary.....do.....	— to 13 $\frac{3}{4}$	— to 14
low middling to middling.....do.....	13 $\frac{1}{2}$ to 14	14 $\frac{1}{2}$ to 14 $\frac{1}{2}$
CINCINNATI.		
Flour, superfine.....per barrel..	3 75 to 4 00	3 75 to 4 00
extra.....do.....	4 65 to 4 85	4 75 to 4 90
family and fancy.....do.....	4 85 to 6 00	5 00 to 6 00
Wheat, red winter.....per bushel..	1 00 to 1 06	1 03 to 1 10
hill winter.....do.....	1 08 to 1 12	1 07 to 1 12
white.....do.....	1 05 to 1 16	1 05 to 1 20
Rye.....do.....	92 to 95	1 05 to 1 07
Barley.....do.....	1 05 to 1 40	1 20 to 1 55
Corn.....do.....	60 to 80	70 to 73
Oats.....do.....	52 to 55	56 to 60



## Market-prices of farm-products—Continued.

Articles.	November.	December.
CINCINNATI—Continued.		
Hay, baled, No. 1 .....	\$21 00 to \$23 00	\$20 00 to \$23 00
lower grades .....	15 00 to 19 00	15 00 to 19 00
Pork, mess .....	— to —	20 75 to 21 00
Lard .....	11 to 12 <sup>3</sup> / <sub>8</sub>	13 to 14 <sup>1</sup> / <sub>4</sub>
Butter, choice .....	— to 30	27 to 33
prime .....	25 to 28	24 to 26
Cheese, prime factory .....	15 <sup>1</sup> / <sub>2</sub> to 16	15 to 15 <sup>1</sup> / <sub>2</sub>
Sugar, New Orleans, fair to good .....	— to —	8 <sup>1</sup> / <sub>4</sub> to 8 <sup>3</sup> / <sub>4</sub>
prime to choice .....	— to —	9 to 9 <sup>1</sup> / <sub>2</sub>
Tobacco, lugs .....	12 to 25	12 to 15
leaf .....	15 to 37 <sup>1</sup> / <sub>2</sub>	15 to 37 <sup>1</sup> / <sub>4</sub>
Cotton, ordinary to good ordinary .....	11 <sup>1</sup> / <sub>4</sub> to 13	12 to 13 <sup>1</sup> / <sub>4</sub>
low middl'g to good middl'g .....	13 <sup>1</sup> / <sub>4</sub> to 14 <sup>1</sup> / <sub>4</sub>	13 <sup>1</sup> / <sub>2</sub> to 14 <sup>1</sup> / <sub>2</sub>
Wool, fleece, common to fine .....	43 to 47	43 to 47
tub-washed .....	50 to 52	48 to 50
unwashed, clothing .....	32 to 34	32 to 33
unwashed, combing .....	35 to 39	35 to 38
pulled .....	37 to 38	35 to 38
CHICAGO.		
Flour, white winter .....	5 25 to 6 25	— to —
red winter .....	— to —	— to —
spring, extras .....	4 25 to 5 00	4 40 to 4 75
spring, superfines .....	3 00 to 4 00	3 12 <sup>1</sup> / <sub>2</sub> to 3 65
Wheat, No. 1 spring .....	88 to —	94 to —
No. 2 spring .....	83 to 83 <sup>3</sup> / <sub>8</sub>	92 <sup>1</sup> / <sub>2</sub> to —
No. 3 spring .....	79 to —	85 to —
Corn, No. 2 .....	70 to 71 <sup>5</sup> / <sub>8</sub>	74 to 77
Oats, No. 2 .....	40 <sup>1</sup> / <sub>2</sub> to 47 <sup>1</sup> / <sub>4</sub>	53 <sup>1</sup> / <sub>2</sub> to 54
Rye, No. 2 .....	82 to 83	91 to —
Barley, No. 2 .....	1 24 to 1 32	1 21 to 1 25
Hay, timothy .....	13 00 to 16 50	13 00 to 18 00
prairie .....	8 50 to 13 00	9 00 to 13 50
Beef, mess .....	8 50 to —	8 25 to —
extra mess .....	9 50 to —	9 25 to —
Pork, mess .....	18 00 to 19 50	20 25 to 20 30
prime mess .....	— to —	17 75 to 18 00
extra prime .....	— to —	15 00 to 15 50
Lard .....	12 <sup>3</sup> / <sub>8</sub> to 12 <sup>3</sup> / <sub>8</sub>	— to 13 <sup>1</sup> / <sub>2</sub>
Butter, choice to fancy .....	30 to 38	33 to 38
medium to good .....	24 to 28	25 to 28
Cheese, New York factory .....	15 to 16	15 to 15 <sup>1</sup> / <sub>2</sub>
Ohio and western factory .....	14 to 15	14 to 14 <sup>1</sup> / <sub>2</sub>
Sugar, New Orleans, prime to choice .....	9 <sup>1</sup> / <sub>2</sub> to 9 <sup>7</sup> / <sub>8</sub>	— to 9 <sup>1</sup> / <sub>4</sub>
common to fair .....	8 <sup>1</sup> / <sub>2</sub> to 9 <sup>1</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>2</sub> to —
Wool, tub-washed .....	45 to 57	45 to 57
fleece-washed .....	40 to 50	40 to 47
unwashed .....	27 to 35	27 to 34
pulled .....	— to —	— to —
SAINT LOUIS.		
Flour, spring .....	3 00 to 4 50	3 00 to 4 50
winter .....	3 00 to 8 00	3 00 to 7 00
Wheat, red winter .....	90 to 1 12	90 to 1 12
white winter .....	1 00 to 1 10	95 to 1 08
spring .....	80 to 85	88 to 92
Corn .....	70 to 75	67 to 82
Rye .....	83 to 86	90 to 97
Barley .....	95 to 1 20	1 10 to 1 42
Hay, choice timothy .....	19 00 to 24 00	19 00 to 22 00
prairie .....	12 00 to 15 00	12 00 to 16 00

## Market-prices of farm-products—Continued.

Articles.	November.	December.
SAINT LOUIS—Continued.		
Beef, mess .....	per barrel.. \$14 00 to \$15 00	\$14 00 to \$15 00
Pork, mess.....	do. 21 50 to 22 00	19 70 to 20 50
Lard.....	per pound.. 12 to 15	12 to 14
Butter, prime to choice.....	do. 23 to 36	32 to 36
lower grades.....	do. 22 to 26	23 to 33
Cheese, factory.....	do. 13 to 13 $\frac{1}{2}$	13 to 13 $\frac{1}{2}$
Cotton, ordinary to good ordinary.....	do. 11 $\frac{1}{2}$ to 13 $\frac{1}{4}$	12 to 13 $\frac{1}{2}$
low middling to good middl'g.....	do. 14 to 15	13 $\frac{3}{4}$ to 14 $\frac{1}{2}$
Wool, tub-washed.....	do. 50 to 53	50 to 54
fleece-washed.....	do. 32 to 45	32 to 52
unwashed combing.....	do. 27 to 33	28 to 36
NEW ORLEANS.		
Flour, superfine.....	per barrel.. 4 25 to —	4 25 to 4 37 $\frac{1}{2}$
extra.....	do. 4 50 to 5 75	4 50 to 5 25
choice to fancy.....	do. 5 55 to 7 00	5 37 $\frac{1}{2}$ to 6 50
Corn, white.....	per bushel.. 1 05 to —	1 07 $\frac{1}{2}$ to 1 08
yellow.....	do. 1 00 to 1 02 $\frac{1}{2}$	1 05 to —
Oats.....	do. 62 to 63	70 to 72
Hay, choice.....	per ton.. 25 00 to 26 50	27 00 to 29 00
prime.....	do. 27 00 to 28 00	26 50 to —
Beef, Texas.....	per barrel.. — to —	— to —
Fulton Market.....	per half barrel.. 11 00 to 11 50	11 25 to 11 50
western.....	per barrel.. — to —	18 00 to —
Pork, mess.....	do. 22 00 to 22 50	21 00 to 23 00
Lard.....	per pound.. 14 $\frac{1}{4}$ to 15 $\frac{1}{2}$	15 $\frac{3}{4}$ to 16
Butter, choice western.....	do. 30 to 32	28 to 30
northern.....	do. 40 to —	42 to 43
Cheese, choice western factory.....	do. 15 to 15 $\frac{1}{2}$	15 to 15 $\frac{3}{4}$
New York cream.....	do. 17 $\frac{1}{4}$ to 18	16 to 18
Sugar, fair to fully fair.....	do. 8 $\frac{3}{4}$ to 9 $\frac{2}{5}$	6 $\frac{1}{2}$ to 7 $\frac{1}{2}$
prime to strictly prime.....	do. 8 $\frac{3}{4}$ to 9	7 $\frac{1}{2}$ to 8 $\frac{1}{2}$
clarified, white and yellow.....	do. 10 to 10 $\frac{1}{2}$	8 $\frac{3}{4}$ to 10 $\frac{1}{4}$
Cotton, ordinary to good ordinary.....	do. 13 to 13 $\frac{3}{8}$	— to 13 $\frac{3}{8}$
low middling to good middling.....	do. 13 $\frac{7}{8}$ to 14 $\frac{1}{2}$	14 $\frac{1}{2}$ to 15
Tobacco, lugs.....	do. 9 to 11 $\frac{1}{2}$	9 to 11 $\frac{1}{2}$
low leaf to medium leaf.....	do. 12 to 14	12 to 14
Wool, lake.....	do. — to —	25 to —
SAN FRANCISCO.		
Flour, superfine.....	per barrel.. 3 90 to 4 25	4 00 to 4 25
extra.....	do. 4 02 $\frac{1}{2}$ to 4 87 $\frac{1}{2}$	4 50 to 4 75
family and fancy.....	do. 5 00 to 5 12 $\frac{1}{2}$	5 00 to 5 12 $\frac{1}{2}$
Wheat, California.....	per cental.. 1 35 to 1 55	1 35 to 1 55
Oregon.....	do. 1 40 to 1 50	1 40 to 1 55
Barley.....	do. 1 05 to 1 35	1 15 to 1 45
Oats.....	do. 1 25 to 1 65	1 25 to 1 65
Corn, white.....	do. 1 25 to 1 30	1 35 to 1 42 $\frac{1}{2}$
yellow.....	do. 1 25 to 1 30	1 35 to 1 42 $\frac{1}{2}$
Hay, State.....	per ton.. 9 00 to 15 00	17 00 to —
Beef.....	per barrel.. 9 00 to —	9 00 to 10 00
Pork, mess.....	do. 22 00 to 24 00	23 00 to 24 00
prime mess.....	do. 17 50 to 18 50	18 00 to 21 00
Lard.....	per pound.. 15 to 16	14 $\frac{1}{2}$ to 16
Butter, overland.....	do. 20 to 25	25 to 40
California.....	do. 25 to 50	25 to 60
Oregon.....	do. 20 to 30	20 to 35
Cheese.....	do. 12 $\frac{1}{2}$ to 16	12 $\frac{1}{2}$ to 16
Wool, native.....	do. 14 to 22	12 to 20
California.....	do. 18 to 22	15 to 20
Oregon.....	do. 20 to 22	18 to 20

## LIVE-STOCK MARKETS.

Articles.	November.	December.
NEW YORK.		
Cattle, extra beeves ..... per cental..	\$12 30 to \$13 00	\$13 75 to \$14 00
good to prime ..... do.....	to 12 00	to 13 25
common to fair ..... do.....	7 25 to ———	to ———
milch-cows ..... per head..	40 00 to 70 00	40 00 to 70 00
calves ..... do.....	8 50 to 14 00	9 00 to 11 00
Sheep ..... per cental..	4 50 to 7 00	4 00 to 7 50
Swine ..... do.....	5 00 to 6 50	6 75 to 7 00
PHILADELPHIA.		
Cattle, beeves ..... per cental..	3 00 to 7 12½	4 00 to 9 25
Sheep ..... do.....	2 50 to 5 50	———— to ———
Swine, corn-fed ..... do.....	9 50 to 10 00	———— to ———
BALTIMORE.		
Cattle, best beeves..... per cental..	4 75 to 6 25	5 37 to 6 75
first quality ..... do.....	3 75 to 4 75	4 37 to 5 37
medium ..... do.....	3 00 to 3 75	3 25 to 4 37
ordinary ..... do.....	2 25 to 3 00	3 00 to 3 25
general average of the market. do.....	3 87	4 25
most of the sales ..... do.....	3 62 to 4 62	3 87 to 5 00
milch-cows ..... per head..	35 00 to 50 00	35 00 to 50 00
Sheep ..... per cental..	4 00 to 5 00	4 00 to 5 50
Swine ..... do.....	8 00 to 8 75	8 75 to 9 75
CINCINNATI.		
Cattle, common to good medium .. per cental..	2 00 to 3 50	2 50 to 4 50
good to choice ..... do.....	3 75 to 5 00	4 75 to 5 50
milch-cows ..... per head..	30 00 to 50 00	30 00 to 55 00
veal-calves ..... per cental..	3 50 to 6 00	6 50 to 7 50
Sheep, common to good ..... do.....	3 00 to 4 00	3 25 to ———
extra ..... do.....	———— to ———	———— to 5 00
Swine, common to medium ..... do.....	5 00 to 5 85	———— to ———
good to extra ..... do.....	5 90 to 6 10	6 50 to 7 50
CHICAGO.		
Cattle, extra-graded steers, 1,350 to 1,550 pounds ..... per cental..	Nominal.....	6 25 to 6 50
choice beeves, 3 to 5 years old, 1,300 to 1,450 pounds... do.....	5 25 to 5 75	5 50 to 6 00
good beeves, 1,150 to 1,300 pounds ..... do.....	4 00 to 4 75	4 50 to 5 00
medium grades, 1,100 to 1,250 pounds..... do.....	3 25 to 3 75	4 00 to 4 50
lower grade, natives..... do.....	1 50 to 3 25	1 75 to 4 25
Texans, choice corn-fed..... do.....	3 75 to 4 50	4 25 to 4 50
Texans, north-wintered..... do.....	1 75 to 3 50	2 25 to 4 25
Texans, through droves..... do.....	1 50 to 3 25	1 75 to 3 75
Sheep, poor to medium ..... do.....	2 50 to 3 50	2 50 to 3 50
good to choice ..... do.....	3 75 to 4 50	3 75 to 4 50
Swine, inferior to medium ..... do.....	5 25 to 6 00	6 50 to ———
good to extra ..... do.....	6 05 to 6 40	———— to 7 50
SAINT LOUIS.		
Cattle, choice native steers, 1,300 to 1,600 pounds ..... per cental..	5 00 to 5 50	4 75 to 5 75
prime native steers, 1,200 to 1,400 pounds..... do.....	4 75 to ———	———— to 4 50

## Live-stock markets—Continued.

Articles.	November.	December.
SAINT LOUIS—Continued.		
Cattle, fair butchers' steers, 1,000 to 1,200 pounds.....per cental..	\$3 00 to \$4 00	\$3 25 to _____
inferior native grades.....do.....	1 00 to 3 50	2 00 to \$3 50
Texans and Cherokees, good and fat.....do.....	2 00 to 3 50	2 75 to 3 50
Texans, through droves.....do.....	_____ to _____	1 75 to 2 50
Sheep, common to good.....do.....	2 50 to 4 00	2 25 to 3 00
choice and extra.....do.....	4 25 to 5 00	3 00 to 4 75
Swine, inferior to good.....do.....	3 25 to 5 25	5 50 to 6 50
good to extra.....do.....	5 25 to 6 25	6 50 to 7 50
Horses, plugs.....per head...	40 00 to 75 00	40 00 to 75 00
plain.....do.....	80 00 to 110 00	80 00 to 110 00
street-car.....do.....	75 00 to 125 00	75 00 to 125 00
•good drivers.....do.....	100 00 to 150 00	100 00 to 150 00
heavy draught.....do.....	130 00 to 170 00	130 00 to 170 00
extra.....do.....	175 00 to 180 00	175 00 to 180 00
Mules, 14 to 15 hands high.....do.....	75 00 to 120 00	75 00 to 120 00
15 to 16 hands high.....do.....	120 00 to 180 00	120 00 to 180 00
extra.....do.....	175 00 to 200 00	175 00 to 200 00
NEW ORLEANS.		
Cattle, Texas beeves, choice.....per head...	_____ to 40 00	_____ to 40 00
Texas beeves, first quality.....do.....	30 00 to 35 00	30 00 to 35 00
Texans, second quality.....do.....	20 00 to 25 00	20 00 to 25 00
western beeves.....per cental..	_____ to _____	_____ to _____
milk-cows.....per head..	40 00 to 100 00	35 00 to 100 00
calves.....do.....	7 00 to 9 00	7 00 to 9 00
Sheep, first quality.....do.....	4 00 to 5 00	4 00 to 5 00
second quality.....do.....	3 00 to 4 00	3 00 to 4 00
Swine.....per cental..	5 00 to 9 00	5 00 to 9 00

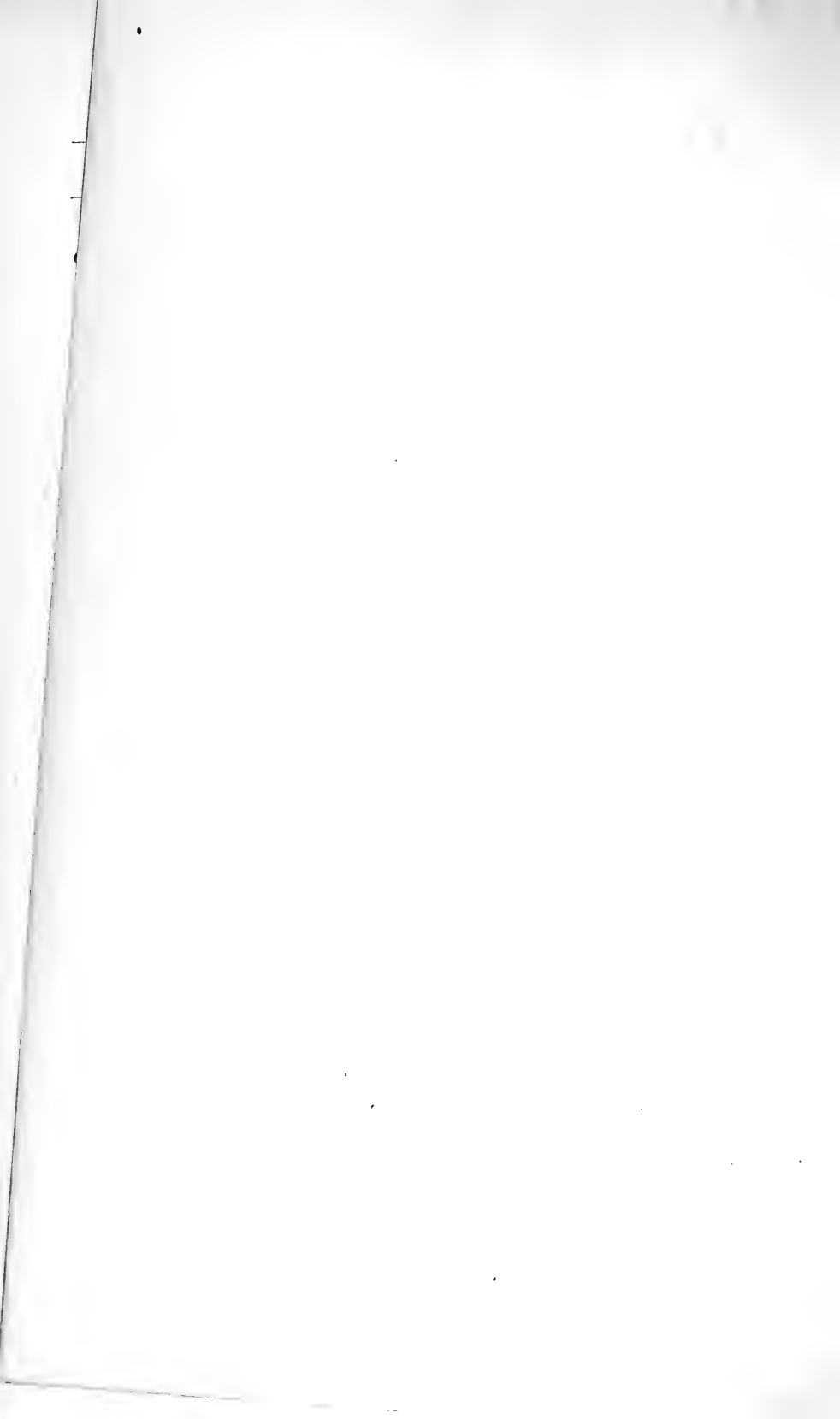
## FOREIGN MARKETS.

WHEAT.—The decided winter weather about the middle of November, in England, was favorable to the growing wheat, by checking its luxuriance. Farmers had become uneasy at the unusual growth of the plant, fearing that it would work ultimate injury to the grain. The slight tendency to upward prices had realized no important results. The Paris market, however, had shown an improvement of 1 shilling per quarter in wheat and 1 shilling 4 pence per sack in flour, but the French provincial markets did not respond to this upward movement. The advances were but slight and isolated. Odessa wheat was in rapid shipment, both to France and England. Growers have exhibited great disappointment at the prices realized, and have reduced their offerings. Holders are also withdrawing from market in Belgium, Holland, and most parts of Germany. Hungary is exporting very scantily. Odessa, with increased supplies by water, is still shipping largely at full rates, although advices from western Europe do not seem to warrant such buoyancy of prices. The sales of English wheat during the second week of November in England amounted to 54,695 quarters, at 44s. 5d. per quarter, against 58,180 quarters, at 60s. 9d., in the corresponding week of 1873. The London averages were 45s. 5d. on 2,073 quarters. The imports into the United Kingdom during the first

week in November were 1,106,111 cwts. The second week in Mark Lane opened on moderate supplies of English wheat, with good arrivals of foreign, two-thirds of which were from Russia. Sales were slow, but holders, by perseverance, obtained full rates. Foreign white wheats held their own, but foreign reds were dull. Essex and Kent brought 45s. to 50s. per quarter; ditto, red, 42s. to 46s.; Norfolk, Lincolnshire, and Yorkshire, red, 42s. to 46s.; Dantzic, mixed, 50s. to 59s.; Königsberg, 47s. to 58s.; Rostock, 47s. to 50s.; Silesian, red, 46s. to 51s.; Pomeranian, Mecklenberg, and Uckermark, red, 45s. to 49s.; Ghirka, 41s. to 43s.; Russian, hard, 40s. to 44s.; Saxonska, 45s. to 47s.; Danish and Holstein, red, 40s. to 51s.; American, 42s. to 46s.; Chilian, white, 51s.; Californian, 52s.; Australian, 52s. to 55s. In Liverpool Canadian white brought 9s. 5d. to 10s. per cental; American, white, 9s. 6d. to 10s. 2d.; ditto, red winter, 9s. 2d. to 9s. 6d.; No. 1, spring, 8s. 6d. to 9s. 6d.; No. 2, spring, 8s. 3d. to 9s.; California, 9s. 8d. to 10s. 8d.; Oregon, 10s. 6d. to 10s. 8d.; Chilian, 9s. 2d. to 9s. 4d.; Saidi, 8s. 3d. to 8s. 6d. In Paris holders demanded 44s. to 48s. for white, and 42s. 6d. to 46s. for red, the market closing very firm on fine qualities. The French country markets showed a buoyant tendency. At Rotterdam the tendency was somewhat downward. Algerian granaries were full of soft wheat, and holders were disposed to abate their expectations.

**FLOUR.**—The imports of flour into the United Kingdom during the first week in November amounted to 99,781 cwts. English flour was in good supply in Mark Lane at the opening of the second week, but foreign supplies were by no means full. In Mark Lane the best town-households were quoted at 36s. to 43s. per 280 pounds; best country-households, 31s. to 33s.; Norfolk and Suffolk, 29s. to 30s.; American, per barrel, 23s. to 25s. In Liverpool English and Irish superfines brought 33s. to 36s. per 280 pounds; extras, 38s. to 42s.; French, 37s. to 47s.; Trieste, 48s. to 60s.; Spanish, 41s. 3d. to 43s.; Chilian, 33s. 6d. to 36s. 6d.; Californian, 38s. to 40s.; American, Western and extra State, 23s. to 25s. per barrel; Baltimore and Philadelphia, 22s. 6d. to 26s.; Ohio and extra, 23s. to 26s.; Canadian and extra, 22s. to 27s. The Paris flour-market tended upward, prices for consumption ranging from 33s. 4d. to 35s. 11d. per 280 pounds.

**MAIZE.**—In Mark Lane small supplies kept prices too high for an active trade. White American brought 38s. to 40s. per quarter; ditto yellow, 34s. to 37s. In Liverpool American, new and old, ranged from 36s. to 38s. 6d. per 480 pounds; Galatz, 37s. 9d. to 38s. Some attention has of late been directed by English farmers to the importation of this grain for stock-feeding.

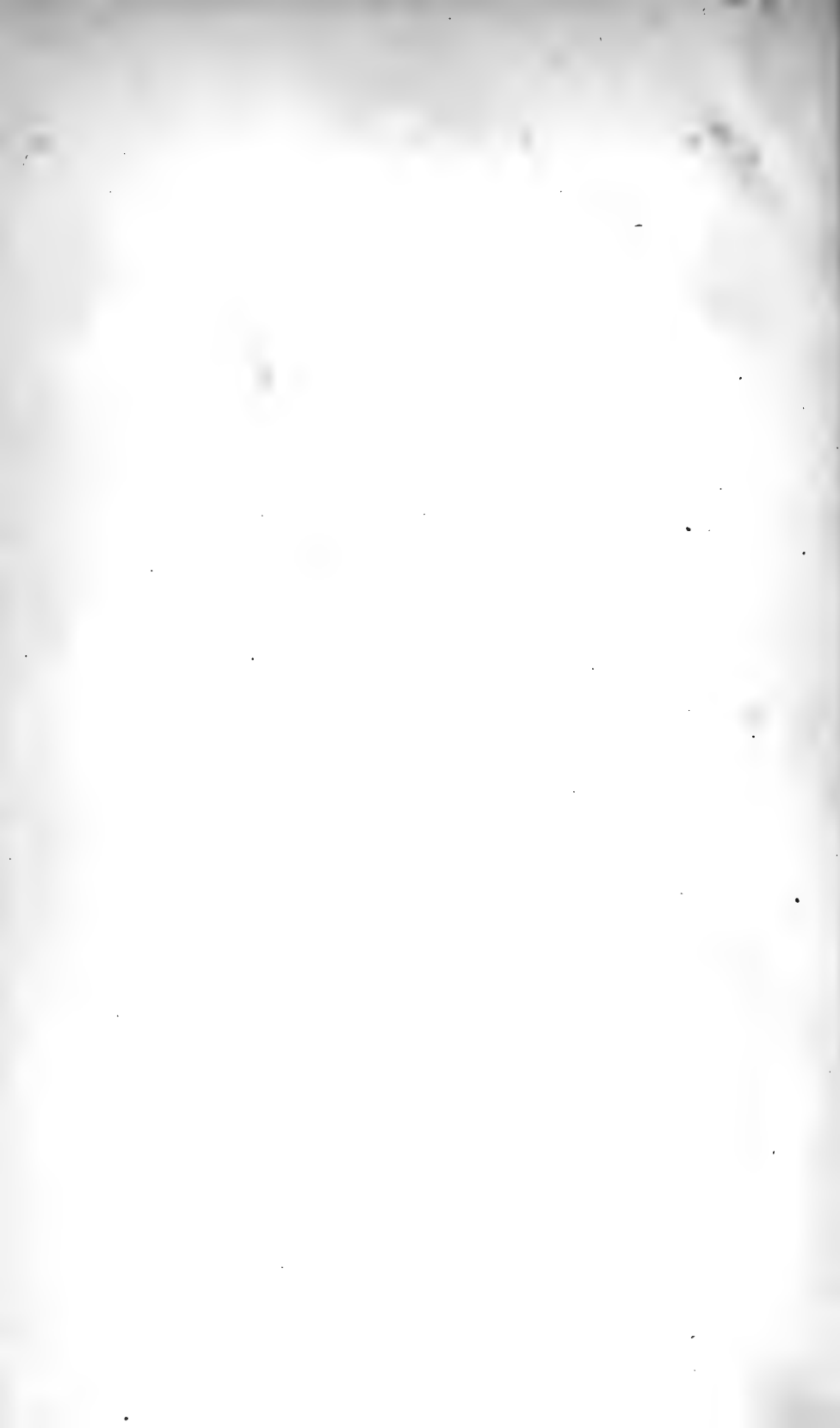




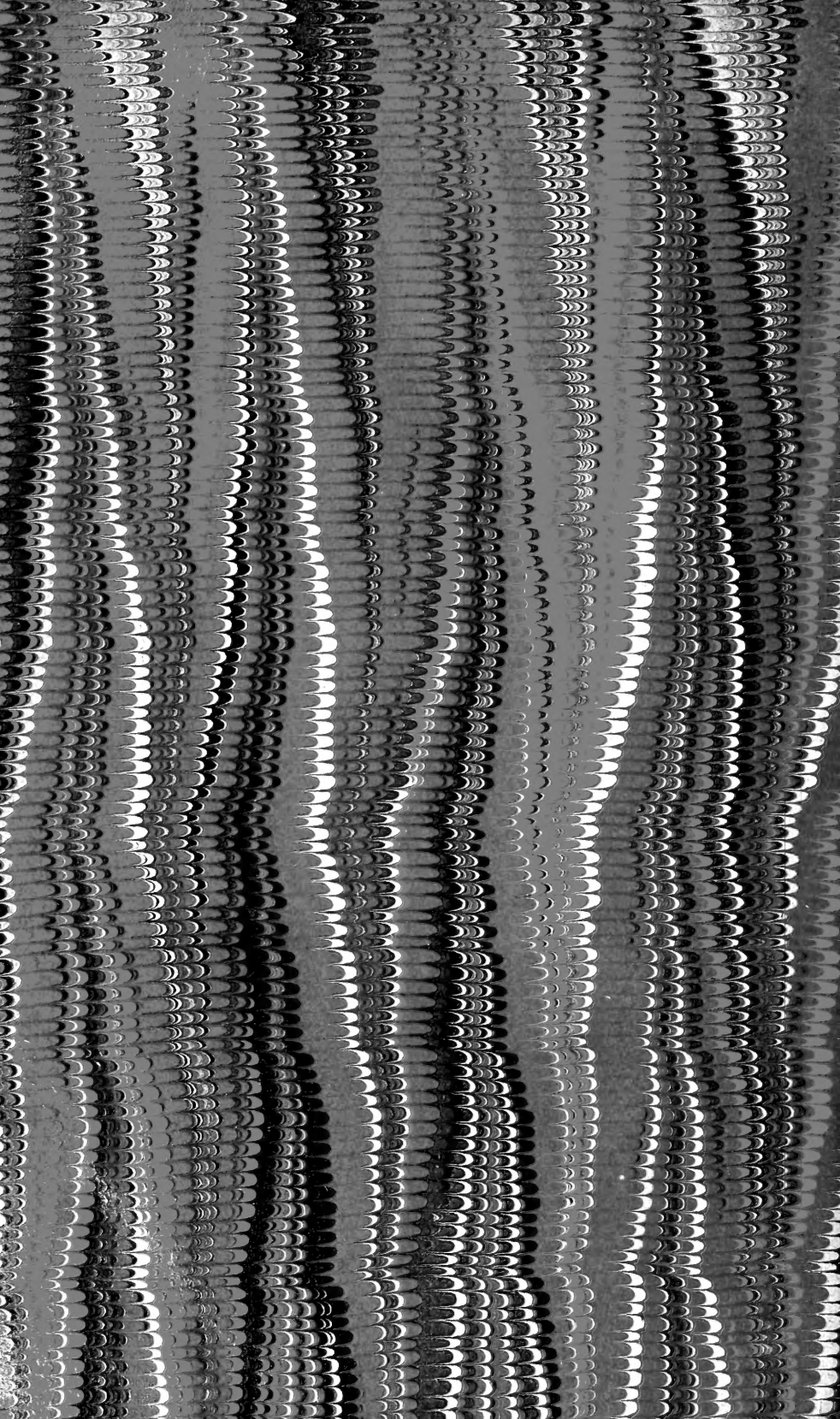












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