

THE WESTWARD MOVEMENT OF THE CORN GROWING INDUSTRY IN THE UNITED STATES¹

Corn is indigenous to America, its origin having been traced back to a period long before the coming of the white man. Ears of corn have been found in tombs of the earlier inhabitants in Mexico and in the countries of Central and South America.² From these countries corn made its way north into the region now included in the United States where it was found by European explorers of the sixteenth and seventeenth centuries. Columbus saw it grown in the West Indies. Numerous references to "Indian corn", as the white man called this new and important grain, are found in the accounts which Spanish and French explorers have left us of their travels through the central region of North America. In short, throughout the vast region from Maine to the Gulf of Mexico and from the Atlantic Coast to the foothills of the Rocky Mountains, corn was grown in great abundance by the Indians when the European colonization of America began.³

¹ For a similar study of the wheat growing industry in the United States see Schmidt's *The Westward Movement of the Wheat Growing Industry in the United States* in THE IOWA JOURNAL OF HISTORY AND POLITICS, Vol. XVIII, pp. 371-395.

² Bremer's *Report on the Cereal Production in the United States*, pp. 93-95, in the *Tenth Census of the United States*, 1880, Vol. III.

³ The writer has found numerous references to Indian corn, or maize (the West Indian name for corn) in the accounts of the early Spanish and French explorers and of the later English settlers. See the index to the volumes of *Original Narratives of Early American History*, edited by John Franklin Jameson, Director of the Department of Historical Research at the Carnegie Institution of Washington, under "corn" and "maize". See

Champlain was the first explorer to leave an account of its cultivation in New England.⁴ In the narrative of his travels in 1605 he reported:

We saw their Indian corn, which they raise in gardens. Planting three or four kernels in one place, they then heap up about it a quantity of earth with shells of the signoc [horseshoe crab] before mentioned. Then three feet distant they plant as much more, and thus in succession. With this corn they put in each hill three or four Brazilian beans, which are of different colors. When they grow up, they interlace with the corn, which reaches to the height of from five to six feet; and they keep the ground very free from weeds. We saw there many squashes, and pumpkins, and tobacco, which they likewise cultivate.

The Indian corn which we saw was at that time about two feet high, some of it as high as three. . . . They plant their corn in May, and gather it in September.⁵

John Smith in his *Description of Virginia*, published in 1612, gives the following very interesting account of corn cultivation and its preparation as a food by the Indians:

The greatest labour they take, is in planting their corne, for the country naturally is overgrowne with wood. To prepare the ground they bruise the barke of the trees neare the roote, then do they scorch the roots with fire that they grow no more. The next yeare with a crooked peece of wood, they beat up the woodes by the rootes; and in that [those] moulds, they plant their corne. Their manner is this. They make a hole in the earth with a also Thwaites's *Early Western Travels, 1748-1846*, Vol. XXXI, index under "corn".

⁴ *Voyages of Samuel de Champlain, 1604-1618*, p. 95, note 3, in *Original Narratives of Early American History*, edited by John Franklin Jameson, Director of the Department of Historical Research at Carnegie Institution of Washington.

⁵ *Voyages of Samuel de Champlain, 1604-1618*, p. 62, in *Original Narratives of Early American History*, edited by John Franklin Jameson, Director of the Department of Historical Research at the Carnegie Institution of Washington.

sticke, and into it they put 4 graines of wheat and 2 of beanes. These holes they make 4 foote one from another. Their women and children do continually keepe it with weeding, and when it is growne midle high, they hill it about like a hop-yard.

In Aprill they begin to plant, but their chiefe plantation is in May, and so they continue till the midst of June. What they plant in Aprill they reape in August, for May in September, for June in October. Every stalke of their corne commonly beareth two eares, some 3, seldome any 4, many but one, and some none. Every ear ordinarily hath betwixt 200 and 500 graines. The stalke being green hath a sweet juice in it, somewhat like a sugar Cane, which is the cause that when they gather their corne greene, they sucke the stalkes: for as wee gather greene pease, so doe they their corne being greene, which excelleth their old. They plant also pease they cal *Assentamens*, which are the same they cal in Italye, *Fagioli*. Their Beanes are the same the Turkes cal *Garnanses*, but these they much esteeme for dainties.

Their corne they roast in the eare greene, and bruising it in a mortar with a Polt [thump], lappe it in rowles in the leaves of their corne, and so boyle it for a daintie. They also reserve that corne late planted that will not ripe, by roasting it in hot ashes, the heat thereof drying it. In winter they esteeme it being boyled with beans for a rare dish, they call *Pausarowmena*. Their old wheat [corn] they first steep a night in hot water, in the morning pounding it in a mortar. They use a small basket for their Temmes [hulls], then pound againe the great, and so separating by dashing their hand in the basket, receave the flower [meal] in a platter made of wood scraped to that forme with burning and shels. Tempering this flower with water, they make it either in cakes, covering them with ashes till they bee baked, and then washing them in faire water, they drie presently with their owne heat: or else boyle them in water eating the broth with the bread which they call *Ponap* [pone]. The grouts and peeces of the cornes remaining, by fanning in a Platter or in the wind away the branne, they boile 3 or 4 houres with water; which is an ordinary food they call *Ustatahamen*. But some more thrifty then cleanly, doe burn the core of the eare to powder which they call *Pungnough*, mingling that in their meale; but it never tasted well in bread, nor broth. Their fish and flesh they boyle

either very tenderly, or broyle it so long on hurdles over the fire; or else after the Spanish fashion, putting it on a spit, they turne first the one side, then the other, til it be as drie as their jerkin beefe in the west Indies, that they may keepe it a month or more without putrifying. The broth of fish or flesh they eate as commonly as the meat.

In May also amongst their corne, they plant Pumpeons, and a fruit like unto a muske millen, but leese and worse; which they call *Macocks*. These increase exceedingly, and ripen in the beginning of July, and continue until September. They plant also *Maracocks* a wild fruit like a lemmon, which also increase infinitely: they begin to ripe in September and continue till the end of October. When all their fruits be gathered, little else they plant, and this is done by their women and children; neither doth this long suffice them: for neere 3 parts of the yeare, they only observe times and seasons, and live of what the Country naturally affordeth from hand to mouth, &c.⁶

The European colonists did not readily adapt the crops and methods of agriculture with which they were familiar at home to American conditions. Nor were they able to secure adequate supplies from home; while the proceeds of hunting offered a precarious living. Consequently, they were compelled to rely on Indian knowledge and methods of farming for an adequate supply of food. Corn, the chief cultivated food plant of the Indian, thus became the leading food product first cultivated by the white man.⁷ The settlers obtained their first supplies of corn from the Indians who in turn taught them how to prepare the ground, plant the seed, care for the growing crop, store

⁶ *Narratives of Early Virginia, 1606-1625*, pp. 95-97, in *Original Narratives of Early American History*, edited by John Franklin Jameson, Director of the Department of Historical Research of the Carnegie Institution of Washington.

⁷ For a list of references on Indian agriculture in America see Schmidt's *Topical Studies and References on the Economic History of American Agriculture* (McKinley Publishing Company, Philadelphia, 1919), Topic IV, pp. 26-28.

the ripened grain, and, finally, how to prepare it as an article of food.

The settlers readily took up the cultivation of this new and important grain. They soon found that it was much easier to grow than the imported grains—wheat, rye, oats, and barley—which they had been accustomed to growing before they came to America. These grass-like varieties of grain required smooth ground free from stumps and stones. Such ground was not available in America during the colonial period since the land was heavily wooded. The Indians showed the settlers how to girdle the trees and then how to plant the corn around the stumps. The returns, considering the time and the effort, were much greater than those to which they had been accustomed in the raising of the smaller grains at home. The settlers soon found that they could easily grow more corn than was needed for their own use as an article of food or as a feed for live stock. Corn therefore sought an outlet, and a considerable export trade was developed.⁸

The farmers in the central part of the State of New York floated their corn down the Delaware and Susquehanna rivers to Philadelphia and Baltimore on arks built for the purpose. The farmers in the Ohio Valley in the same manner floated corn down to New Orleans. From these cities it was carried either to the southern States or exported to foreign countries.⁹

⁸ Bogart and Thompson's *Readings in the Economic History of the United States*, pp. 74-81. For a list of references on agriculture in the American Colonies see Schmidt's *Topical Studies and References on the Economic History of American Agriculture* (McKinley Publishing Company, Philadelphia, 1919), Topic VI, pp. 29-31.

⁹ Johnson's *History of Domestic and Foreign Commerce of the United States*, Vol. I, pp. 203, 204, 214, 215; Tench Coxe's *A View of the United States of America, 1787-1794* (Philadelphia, 1794), p. 414. This gives a table showing the exports of corn, wheat, oats, rye, buckwheat, and other commodities for each of the thirteen States for the year 1791-1792.

The completion of the Erie Canal in 1825 opened an eastern water route via the Hudson River from Buffalo to New York City. In the fifties the rapid development of railway transportation was begun. The eastern markets were now brought within easy reach of the Middle West, with the result that population and grain production began their rapid march across the continent.¹⁰

As population moved westward into the Mississippi Valley the country became differentiated into three great economic sections. The East, including New England and the Middle Atlantic States, became more and more devoted to manufacturing and commerce; the South to the raising of the staple plantation products—cotton and tobacco; and the West to production of food. This economic specialization placed the East, the South, and the West in a dependent relation to one another. The West was thus enabled to devote its attention more exclusively to the production of those commodities for which it was best adapted. Grain thus constituted the leading product which this section contributed in rapidly increasing quantities as the live stock industry was developed and transportation facilities were expanded and improved.¹¹

By 1840, the year of the first agricultural census, the corn growing industry had definitely entered the Missis-

¹⁰ For a brief sketch of the westward movement of agriculture see Kinley's *The Center of Agricultural Production* in Bailey's *Cyclopedia of American Agriculture*, Vol. IV, 1909, pp. 119-125. See also the *Twelfth Census of the United States*, 1900, Vol. V, pp. xxxvii-xlii; Schmidt's *The Westward Movement of the Wheat Growing Industry in the United States* in *THE IOWA JOURNAL OF HISTORY AND POLITICS*, Vol. XVIII, pp. 371-395; Brooks's *The Story of Corn and the Westward Migration*, 1916. The last reference gives a popular account.

¹¹ Johnson's *History of Domestic and Foreign Commerce in the United States*, Vol. I, Ch. XIV. See also Schmidt's *The Internal Grain Trade of the United States, 1850-1860*, in *THE IOWA JOURNAL OF HISTORY AND POLITICS*, Vol. XVIII, pp. 94-124.

issippi Valley. This is shown by reference to Table I, giving the rank of the first ten corn producing States, together with the number of bushels and the per cent of the entire crop produced by each State. Tennessee ranked first in corn production with 44,986,000 bushels which constituted 12 per cent of the entire crop; Kentucky was second with 39,847,000 bushels, or 11 per cent of the whole product; Virginia was third with 34,577,000 bushels, or 9 per cent of the entire product; Ohio was fourth with 33,668,000 bushels, or 9 per cent of the entire crop; Indiana was fifth with 28,156,000 bushels, or 7 per cent of the whole crop; North Carolina was sixth with 23,894,000 bushels, or 6 per cent of the whole product; Alabama was eighth with 20,947,000 bushels, or 6 per cent of the whole crop; Georgia was ninth with 20,905,000 bushels, or 6 per cent of the entire crop; and Missouri ranked tenth in the list with

TABLE I

TEN LEADING CORN PRODUCING STATES IN 1839 ¹²			
RANK	STATES	BUSHEL	PER CENT OF ENTIRE CORN CROP
1	Tennessee	44,986,188	12
2	Kentucky	39,847,120	11
3	Virginia	34,577,120	9
4	Ohio	33,668,144	9
5	Indiana	28,155,887	7
6	North Carolina	23,893,763	6
7	Illinois	22,634,211	6
8	Alabama	20,947,004	6
9	Georgia	20,905,122	6
10	Missouri	17,332,524	5

¹² The statistics in this table are taken from Brewer's *Report on the Cereal Production in the United States*, p. 91, in the *Tenth Census of the United States*, 1880, Vol. III.

17,333,000 bushels, which represented 5 per cent of the nation's product.

The ten leading corn producing States in 1839 contributed 77 per cent of the nation's entire product. Six of these States were southern States—Tennessee, Kentucky, Virginia, North Carolina, Alabama, and Georgia—which together produced 50 per cent of the entire crop of the nation, while the four remaining States—Ohio, Indiana, Illinois, and Missouri—belonged to the North Central group and produced 27 per cent of the nation's product. Tennessee, Kentucky, and Virginia together produced 32 per cent of the entire crop, while Ohio and Indiana together produced 16 per cent of the whole crop. It will be noted that the North Atlantic division was not represented in the list of the first ten, while the South Atlantic division was represented by three States—Virginia, North Carolina, and Georgia—which together produced 21 per cent of the whole crop. The remaining seven States belonging to the Central division, produced 56 per cent of the entire crop.

The ten leading corn producing States in 1849 were the same as those listed by the previous census, though there was a significant change in the relative rank of these States, which shows that the corn growing industry had definitely begun to move into the North Central region. It will be seen by reference to Table II that in 1849, Ohio advanced from fourth to first place, while Tennessee was reduced from first to fifth place. Kentucky retained second place. Illinois rose from seventh to third place, while Virginia dropped from third to seventh place. Indiana advanced from fifth to fourth place. Missouri rose from tenth to sixth place, while North Carolina dropped from sixth to tenth place. Georgia rose from ninth to

eighth place, while Alabama dropped from eighth to ninth place.

These ten States in 1849 produced 75.1 per cent of the

TABLE II

TEN LEADING CORN PRODUCING STATES IN 1849 ¹³			
RANK	STATES	BUSHEL	PER CENT OF ENTIRE CORN CROP
1	Ohio	59,078,695	10.0
2	Kentucky	58,672,591	9.9
3	Illinois	57,646,984	9.7
4	Indiana	52,964,363	8.9
5	Tennessee	52,276,223	8.8
6	Missouri	36,214,537	6.1
7	Virginia	35,254,319	6.0
8	Georgia	30,080,099	5.1
9	Alabama	28,754,048	4.9
10	North Carolina	27,941,051	4.7

entire corn crop of this country. That the corn growing industry was rapidly moving not only westward across the Alleghanies into the Mississippi Valley but also northward into the North Central division is shown by the fact that whereas in 1839 the three Atlantic Coast States of Virginia, North Carolina, and Georgia contributed 21 per cent of the nation's product, in 1849 they contributed but 15.8 per cent of the whole product; and whereas in 1839 the six southern States of Virginia, North Carolina, Georgia, Alabama, Tennessee, and Kentucky contributed 50 per cent of the entire corn crop, in 1849 they contributed but 40.4 per cent of the entire crop. Finally, whereas the North Central States of Ohio, Indiana, Illinois, and

¹³ The statistics in this table are taken from the *Twelfth Census of the United States*, 1900, Vol. VI, p. 81.

Missouri in 1839, contributed but 27 per cent of the entire corn crop of the nation, in 1849 they contributed 34.7 per cent of the entire product. Meanwhile the center of corn production had crossed the Ohio River and was located at a point eighty-six miles east-southeast of Columbus, Ohio.¹⁴

The movement of the corn growing industry into the North Central region was further continued during the decade of the fifties. It will be seen by Table III, giving the ten leading corn producing States in 1859, that Illinois had now advanced from third to first place, thus displacing Ohio which was reduced to second place. Missouri advanced from sixth to third place, while Indiana retained fourth place. Kentucky dropped from second to fifth place and Tennessee from fifth to sixth place. Iowa now entered the list of the first ten as seventh. Virginia dropped from seventh to eighth place and Georgia from eighth

TABLE III

TEN LEADING CORN PRODUCING STATES IN 1859 ¹⁵			
RANK	STATES	BUSHEL	PER CENT OF ENTIRE CORN CROP
1	Illinois	115,174,777	13.7
2	Ohio	73,543,190	8.8
3	Missouri	72,892,157	8.7
4	Indiana	71,588,919	8.5
5	Kentucky	64,043,633	7.6
6	Tennessee	52,089,926	6.2
7	Iowa	42,410,686	5.0
8	Virginia	38,319,999	4.6
9	Alabama	33,226,282	4.0
10	Georgia	30,776,293	3.7

¹⁴ *Twelfth Census of the United States*, 1900, Vol. VI, p. 24.

¹⁵ These statistics are taken from the *Twelfth Census of the United States*, 1900, Vol. VI, p. 81.

to tenth, while Alabama retained ninth place, and North Carolina dropped out altogether.

The ten leading corn growing States in 1859 produced 70.8 per cent of the entire corn crop of the country. Of these States, the two Atlantic Coast States of Virginia and Georgia contributed 8.3 per cent of the entire product, and the five southern States of Virginia, Georgia, Alabama, Tennessee, and Kentucky contributed 26.1 per cent of the whole product, while the five North Central States of Ohio, Indiana, Illinois, Missouri, and Iowa contributed 44.7 per cent of the nation's product. Whereas the best three corn producing States in 1839 were the southern States of Tennessee, Kentucky, and Virginia which together constituted 32 per cent of the entire product, in 1859 the first three corn producing States were the North Central States of Illinois, Ohio, and Missouri, which furnished 31.2 per cent of the nation's corn crop. In further evidence of the rapid movement westward of corn production it may be noted that the center of production was by 1859 moved to a point forty-seven miles west-southwest of New Albany, Indiana.¹⁶

The decade of the fifties witnessed the rapid development of the forces which were destined after 1860 to transform agriculture from a primitive, pioneer, largely self-sufficing occupation to a modern business organized on a capitalistic commercial basis. This transformation was effected so rapidly during the period from 1860 to the close of the century that it may properly be designated as an agricultural revolution. Contributing to this revolution were the following factors:¹⁷

¹⁶ *Twelfth Census of the United States*, 1900, Vol. VI, p. 24.

¹⁷ For an extended treatment of these factors see Schmidt's *Some Significant Aspects of the Agrarian Revolution in the United States* in *THE IOWA JOURNAL OF HISTORY AND POLITICS*, Vol. XVIII, pp. 371-395. See also Ross's

1. The vast empire of virgin land, and the liberal land policy of the Federal government. By the passage of the Homestead Law of 1862, the Federal government made it possible for a person to locate upon 160 acres of unappropriated land, to live upon the same for a period of five years, and at the end of that period to receive a patent therefor free of cost. By 1880 entries under this law numbered 469,782, comprising an area of 55,667,045 acres of the best land available for agricultural purposes.¹⁸ Under this law and various other land laws enacted during this period, the government disposed of 461,894,000 acres during the period from 1860 to 1890, with the result that the farming area of the country was expanded with remarkable rapidity.¹⁹

2. The rapid growth of population and immigration. Population was doubled in the thirty-year period from 1860 to 1890, increasing from 31,443,000 to 62,995,000.²⁰ One-third of this increase was composed of foreign immigrants, considerable numbers of whom took advantage of the government's liberal land policy and settled on the virgin lands of the Middle West which were especially well adapted to cereal production.

3. The introduction and popularization of improved labor-saving farm implements and machinery. The great epoch-making machines, which transformed farming from hard labor to horse and steam power, were the cast iron plow, the corn planter, the grain drill, the two-horse cultivator, the reaper, and the stacking machine. These in-

The Agrarian Revolution in the Middle West in *The North American Review*, Vol. 190, pp. 376-391, and Ross's *Agrarian Changes in the Middle West* in *The Political Science Quarterly*, Vol. XXV, pp. 625-637.

¹⁸ Donaldson's *The Public Domain*, pp. 350, 355.

¹⁹ This figure is based on tables in the *Annual Report of the Commissioner of the General Land Office* (Washington), 1860, p. 25, 1890, p. 121.

²⁰ *Thirteenth Census of the United States*, 1910, Vol. I, p. 24.

ventions were all produced before 1860, but it was the Civil War and the consequent withdrawal of so many laborers from the fields that popularized these inventions. The improvements made on these inventions brought them into more general use and the result was that larger areas of land were cultivated and the productivity of each unit of land and of labor was greatly increased. Especially was this true in the production of the cereals of which corn was the most important.²¹

4. The extension and development of transportation facilities. The Mississippi River with its navigable tributaries constituted the great interior waterway for the transportation of the surplus products of the Middle West destined for consumption in the southern States and for export via New Orleans to the Atlantic Coast States and to Western Europe. The construction of the Erie Canal in 1825 opened up an eastern waterway—the Great Lakes-Erie Canal-Hudson River route which hastened the settlement of the prairie country with the result that the eastern waterway soon outstripped its southern rival in the transportation of grain to the seaboard. Meanwhile railroads were extended into the Middle West. Considered at first merely as tributary to the waterways they soon became the principal means of transportation. In 1860 there were 30,626 miles of railroad in the country distributed about equally among the three great sections of the country: the East, the South, and the Middle West. This was practically doubled every ten years until by the close of the century there were 198,964 miles of railroads in operation.²² This rapid development of rail transpor-

²¹ Quaintance's *The Influence of Farm Machinery on Production and Labor* in *The Publications of the American Economic Association*, Series III, Vol. V, No. 4, November, 1904, pp. 1-103. See also Thornton's *The Revolution by Farm Machinery* in *The World's Work*, Vol. VI, pp. 3766-3779.

²² *Statistical Abstract of the United States*, 1902, pp. 404, 405.

tation was accompanied by great improvements in road beds and rolling stock which further increased the value of the railroads as commercial highways for the transportation of the surplus grain and live stock which the Middle West was able to furnish in rapidly increasing quantities to the consuming centers of the East, the South, and Western Europe.

5. The growth of domestic and foreign markets. The various factors which have already been mentioned—the vast empire of virgin land and the liberal land policy of the Federal government, the rapid growth of population and immigration, the introduction and popularization of improved farm implements and marketing, and the extension and development of transportation facilities—made possible that territorial division of labor among the three great sections of the country—the East, the South, and the West—upon which the growing volume of trade depended. While the West devoted itself to the production of grain and live stock, the East turned its attention more to manufacturing and the South to the raising of plantation products. Thus did the East and the South become increasingly dependent on the Middle West for its food products. This afforded a market for the growing surplus which found its way eastward and southward to the consuming regions, while Western Europe came in for a considerable share of this surplus which was transported in ocean steamships at reduced rates. As a result of this competition, the Western European countries—especially England—now turned their attention more exclusively to industry and commerce.²³

6. The development of agencies for the promotion of

²³ Schmidt's *The Influence of Wheat and Cotton on Anglo-American Relations During the Civil War* in THE IOWA JOURNAL OF HISTORY AND POLITICS, Vol. XVI, pp. 400-439. See also Schmidt's *The Internal Grain Trade of the United States, 1860-1890*, in THE IOWA JOURNAL OF HISTORY AND POLITICS, Vol. XIX, pp. 196-245, 414-455, Vol. XX, pp. 70-131.

scientific knowledge relating to agriculture. Among these may be mentioned the Federal and State departments of agriculture, the agricultural colleges and experiment stations, including rural extension work, farmers' organizations, and the agricultural press.²⁴

These six factors combined revolutionized American agriculture during the latter half of the century. The colonization of the great agricultural empire of the Mississippi Valley and the Pacific Coast was completed and a huge surplus of farm products was accumulated which found its way into the markets of the world. Of fundamental significance in the transformation of the farming industry was the production of corn. This grain, however, differs from other cereals, especially wheat, in that wheat is primarily an article for human consumption, being the leading breadstuff of the United States and the western countries of Europe, while corn is primarily an article for animal consumption, going to market in the form of beef, pork, and dairy products.²⁵

²⁴ For a list of references on the development of the various agencies for the promotion of scientific knowledge relating to agriculture see Schmidt's *Topical Studies and References on the Economic History of American Agriculture* (The McKinley Publishing Company, Philadelphia, 1919), Topics XXXI, XXXII, XXXIII.

²⁵ "The question has been frequently asked, What is the necessary consumption of maize per capita in the United States? No fixed quantity can be designated as a necessity in the whole country, or in a particular State. It depends not only upon the numbers of people, but upon the farm animals to be fed and fattened, and the comparative quantity and price of hay and forage, and all substitutes for corn which may be used in larger proportion in a season of scarcity. The West, under existing circumstances, can consume 55 bushels for each unit of population, ship 30, and have 5 as a surplus; or with 800,000,000 instead of 1,200,000,000 bushels, it can, by economy and substitution, make 40 bushels answer, and ship 20, the increased price naturally reducing both consumption and exportation. A reduction of over 500,000,000 in a single year has had this effect: It has increased the price more than 50 per cent. and advanced the average price of swine, sold for packing, to 31 per cent.; the actual average of 1881-'82. It increased the cost of beeves, but not in that proportion, as they are the

With the foregoing factors in mind, attention will now be given to a comparative study of the ten leading corn growing States at the various census periods from 1870 to 1910.

It will be seen by reference to Table IV that in 1869 Illinois retained first place, Ohio dropped from second to third place, while Iowa advanced from seventh to second place. Missouri dropped from third to fourth place, Indiana from fourth to fifth place, Kentucky from fifth to sixth place, and Tennessee from sixth to seventh place. Pennsylvania entered the list as eighth thus taking the place of Virginia, which now dropped out altogether. Texas entered the list as ninth, thus taking the place of Alabama which was reduced to tenth place, while Georgia which had occupied tenth place dropped out altogether.

The ten leading corn producing States in 1869 produced 72 per cent of the entire crop of the nation. The North Atlantic division, was now represented in the list of the first ten by the single State of Pennsylvania which contributed 4.6 per cent of the entire crop. The South Atlantic

growth of three or four years, and not of a single season, and the product of grass rather than corn. But when, during the planting season of 1882, there was prospect of another failure, a panic seized the beef market, and the advance was temporarily 30 per cent. additional.

"The comparison of production of corn by States, according to the population in June, 1880, and the crop of the preceding calendar year, gives precedence to Iowa as the first in rank, with 169.3 bushels to each inhabitant. Nebraska claims the second place, with 144.7 bushels, Kansas has 106.1 bushels, and Illinois 105.9 bushels. The State first in actual quantity is therefore fourth in per capita standing. There are but nine States that have more than 30 bushels per head. The fifth in rank, Missouri, has 93.4 bushels; sixth, Indiana, 58.4; seventh, Kentucky, 44.2; eighth, Tennessee, 40.7; ninth, Ohio, 34.9. New England, New York, New Jersey, the Pacific coast and the Territories, exclusive of Dakota, have each less than 10 bushels per head."—*Report of the Commissioner of Agriculture* (United States), 1881-1882, p. 583. See also *Report on the Internal Commerce of the United States* (Bureau of Statistics, Treasury Department), 1879, Appendix, pp. 174-176, 183-185.

TABLE IV

TEN LEADING CORN PRODUCING STATES IN 1869 ²⁶			
RANK	STATES	BUSHEL	PER CENT OF ENTIRE CORN CROP
1	Illinois	129,921,395	17.1
2	Iowa	68,935,065	9.1
3	Ohio	67,501,144	8.9
4	Missouri	66,034,075	8.7
5	Indiana	51,094,538	6.7
6	Kentucky	50,091,006	6.6
7	Tennessee	41,343,614	5.4
8	Pennsylvania	34,702,006	4.6
9	Texas	20,554,538	2.7
10	North Carolina	18,454,215	2.4

division, it will be noted, was now represented by but one State—North Carolina—in the list of the first ten. The South Central division was represented by the three States of Tennessee, Kentucky, and Texas which contributed 14.7 per cent of the whole product. The North Central division was represented by the five States of Ohio, Indiana, Illinois, Iowa, and Missouri which contributed 50.5 per cent of the nation's product. The two North Central States of Illinois and Iowa which ranked first and second respectively contributed 26.2 per cent, or a little more than one-fourth of the entire product. The center of corn production in 1869 was located at a point ninety miles southwest of Indianapolis, Indiana.²⁷

The next decade witnessed a further movement of the corn growing industry into the North Central region due to the operation of the forces already mentioned. No less

²⁶ These statistics are taken from the *Twelfth Census of the United States*, 1900, Vol. VI, p. 81.

²⁷ *Twelfth Census of the United States*, 1900, Vol. VI, p. 24.

significant was the rapid expansion in the volume of production. It will be seen by Table V showing the ten leading corn producing States in 1879 that Illinois and Iowa still continued to hold first and second place respectively. Missouri advanced from fourth to third place, while Ohio was reduced from third to fifth place. Indiana advanced from fifth to fourth place. Kansas entered the list as sixth and Kentucky dropped from sixth to seventh place. Nebraska entered the list as eighth and Tennessee dropped from seventh to ninth place. Pennsylvania dropped from eighth to tenth place. North Carolina which in 1869 held

TABLE V

TEN LEADING CORN PRODUCING STATES IN 1879 ²⁸			
RANK	STATES	BUSHEL	PER CENT OF ENTIRE CORN CROP
1	Illinois	325,792,481	18.6
2	Iowa	275,014,247	15.7
3	Missouri	202,414,413	11.5
4	Indiana	115,482,300	6.6
5	Ohio	111,877,124	6.4
6	Kansas	105,729,325	6.0
7	Kentucky	72,852,263	4.2
8	Nebraska	65,450,135	3.7
9	Tennessee	62,764,429	3.6
10	Pennsylvania	45,821,531	2.6

tenth place was dropped out altogether, while Texas which entered the list as ninth in 1869 dropped out again.

The ten leading corn producing States in 1879 contributed 78.9 per cent of the entire corn crop of the nation. Pennsylvania, the only North Atlantic State listed in the

²⁸ These statistics are taken from the *Twelfth Census of the United States*, 1900, Vol. VI, p. 80.

first ten, contributed but 2.6 per cent of the entire crop and the two South Central States of Kentucky and Tennessee contributed but 7.8 per cent of the entire product; while the seven North Central States of Ohio, Indiana, Illinois, Iowa, Missouri, Kansas, and Nebraska contributed 68.5 per cent or nearly three-fourths of the entire corn crop of the nation. The center of corn production was now located at a point thirty-six miles southeast of Springfield, Illinois.²⁹

The distribution of corn production in the United States according to the census of 1880 may be further defined as follows:

1. As to latitude. Approximately 20.2 per cent of the corn crop of the nation was produced between the fortieth and forty-first parallels of latitude, while 54.8 per cent was produced between the thirty-ninth and forty-second parallels of latitude. The remaining 45.2 per cent fell off on either side of this belt, more gradually, however, to the South.

2. According to topographical divisions. Forty-one per cent was produced in the "prairie region", while about 75 per cent was produced in the prairie region together with the divisions marked as the "Mississippi river belt, north", the "southwest central" region, and the "central and the Missouri river belt".

3. According to drainage basins. The Mississippi basin produced 83.4 per cent of the crop, while the Ohio basin produced 22.5 per cent of the entire crop.

4. According to elevation. Some 54 per cent of the entire crop was produced at an elevation of between 500 and 1000 feet above sea level; 83 per cent between 500 and

²⁹ *Twelfth Census of the United States*, 1900, Vol. VI, p. 24.

1500 feet; while but 44 per cent was grown above 1500 feet and about 12 per cent below 500 feet.³⁰

These facts in the westward movement of corn production in the United States show that the conditions most favorable for large corn production are a summer season of at least five months without frost, sufficient moisture during the growing period, but not too much, hot weather during this period, with cool weather following to act as a check upon the leaf and stalk growth, causing the plant to expend its strength in seed development, somewhat as the pruning of an apple tree causes the tree to produce more fruit instead of leaves.³¹ These conditions made possible the cultivation of large areas of corn with the least expenditure of hard labor in the seven North Central States of Ohio, Indiana, Illinois, Iowa, Missouri, Kansas, and Nebraska, which by 1880 had become the greatest corn belt in the world.

The corn growing industry in the United States is closely related to the production of live stock. These two lines of production are so interrelated and interdependent that any consideration of the one involves also a consideration of the other. Both lines of production had by 1880 largely become centered in the North Central States which henceforth constituted the great surplus grain and live stock producing area of the country. The relationship between grain growing and live stock production is thus described by W. H. Brewer in his *Report on the Cereal Production of the United States*:

First, in this country there is less hand-tillage for a given

³⁰ Brewer's *Report on the Cereal Production of the United States*, pp. 62-64, in the *Tenth Census of the United States*, 1880, Vol. III.

³¹ Smith's *Industrial and Commercial Geography*, pp. 82-98; Blodgett's *Relations of Population and Food Products in the United States* (United States Department of Agriculture, Division of Statistics, Bulletin No. 24), p. 21.

amount of production than in any other in the world. Its place is supplied by animal power, and animals furnish all the power used directly in our agriculture, except steam for thrashing. Steam-plowing in the United States has not been successful, at least to the extent of producing any impression whatever upon the whole agriculture of the country. All the plowing, most of the tillage, a large proportion of the reaping, and a considerable proportion of the thrashing is performed by animals. A larger proportion of each of these is done by animal power than is done in the agriculture of any other country. In this respect, then, our great cereal production is immediately dependent upon the production of animals. This is so apparent that it needs no discussion; we will only say, in passing, that horses have performed the larger part of this work as compared with cattle. Writers in the last century, and in the very early part of this, regret that in the United States horse-power is used so exclusively on farms in the place of oxen, it being claimed that oxen were the most economical. This preference for horse-power, however, led to the use of lighter machinery and greater rapidity in the performance of farming operations. Thirty years ago numerous writers expressed the belief that the extension of railroads would be detrimental to horse production in the agricultural regions of the United States. It is, however, an interesting fact that, with the introduction of railroads, has come an increase in horse production. The diminution of the use of horses in staging has been much more than met by their increased use on the farm and for the transportation that is incidental to railroads.

In the second place, by the production of animals on grain farms, a greater variety of crops may be grown with profit, and there is a better utilization of waste material. In the older states the straw forms an important element of forage for the production of beef and wool. The unmarketable portion of the grain crop, the soft corn, the screenings from other grains, are utilized in the production of animal products. This is so evident that it is only under the most favorable circumstances that the grain-grower can afford to throw away the refuse and rely for his profits merely upon the grain produced.

In the third place, and intimately related to the last, is the production of manure on the farm. This assumes especial import-

ance in a variety of ways. Grain-growing cannot be carried on indefinitely without manuring except under those rare conditions where the land receives a supply of fertilizing elements from water, either by artificial irrigation or by natural overflows. The agriculture of any country, to be permanently prosperous, is practically founded on its system of manuring. The difference between the continued fertility and increasing production of the countries of northern Europe, of England, of Holland, of Belgium, and of similar countries, where much live-stock is grown, and the exhausted fertility of the countries lying about the Mediterranean, is due to the difference in the methods of farming and of manuring. In the one case, animals are grown, and the manure which they produce has tended to keep up the fertility of the soil; in the other, which is essentially an agriculture without domestic animals, hand-tillage taking the place of animal-tillage so far as is possible, crops are carried from the soil, and regions that once produced their hundred-fold now scarcely produce five-fold. The competition with the new western states, with their rich virgin soils, however severe, cannot and does not entirely kill grain-growing in the less favored regions of the East, largely because of the greater proportion in which the grain refuse is utilized in the East by feeding and in the use of the manures so produced. . . .

In the fourth place, American grain production, especially that of corn, is intimately related to meat production, and this phase of the question, although very old, is just now attracting renewed and very great attention. As early as the middle of the last century, and probably earlier, it was the custom to feed animals on corn in New York and in the New England states and ship them to the West India Islands. But it is only since the modern methods of the transportation of live and dead meat have been devised that American animal production has assumed the enormous commercial importance that it now has. The American meat product and hog product is most intimately connected with our corn production. It is safe to say that 90 per cent. of the hog production of the West is fattened on Indian corn, and pork, lard, beef, etc., are the concentrated product for transportation.³²

³² Brewer's *Report on the Cereal Production of the United States*, p. 151, in the *Tenth Census of the United States*, 1880, Vol. III.

By 1880 a great cereal and live stock kingdom had been founded in the North Central region of the United States, upon which the East and the South and the countries of Western Europe had to a large extent become dependent. These considerations help to explain the rapidity with which these two lines of production marched westward in the conquest of the great agricultural empire of the Mississippi Valley. This movement is further shown by a study of the ten leading corn producing States for the three census periods from 1880 to 1910, inclusive.

The decade of the eighties witnessed a further shifting of the area of corn production in the North Central region, especially into the West North Central section. It will be seen by Table VI showing the ten leading corn producing States in 1889 that Iowa had now advanced to first place, thus superseding Illinois which had dropped to second place. Kansas advanced from sixth to third place and

TABLE VI

TEN LEADING CORN PRODUCING STATES IN 1889 ³³			
RANK	STATES	BUSHEL	PER CENT OF ENTIRE CORN CROP
1	Iowa	313,130,782	14.8
2	Illinois	289,697,256	13.7
3	Kansas	259,574,568	12.2
4	Nebraska	215,895,996	10.2
5	Missouri	196,999,016	9.3
6	Ohio	113,892,318	5.4
7	Indiana	108,843,094	5.1
8	Kentucky	78,434,847	3.7
9	Texas	69,112,150	3.3
10	Tennessee	63,635,350	3.0

³³ These statistics are taken from the *Twelfth Census of the United States*, 1900, Vol. VI, p. 80.

Nebraska advanced from eighth to fourth place, while Missouri dropped from third to fifth place, Ohio from fifth to sixth place, Indiana from fourth to seventh place, and Kentucky from seventh to eighth place. Texas which had entered the list of the ten leading corn producing States in 1869 and then dropped out in 1879 now reentered the list as the ninth State. Tennessee dropped from ninth to tenth place, while Pennsylvania dropped out altogether.

The ten leading corn producing States in 1889 produced 80.7 per cent of the entire corn crop of the nation. The South Central States of Kentucky, Tennessee, and Texas produced 10 per cent of the crop. The East South Central States of Kentucky and Tennessee produced 6.7 per cent of the crop, while Texas produced 3.3 per cent. The seven North Central States of Ohio, Indiana, Illinois, Iowa, Missouri, Kansas, and Nebraska, properly designated as "the corn belt States", contributed 70.7 per cent of the entire crop. Whereas the three East North Central States in 1879 produced 31.6 per cent of the entire crop, in 1889 the percentage contributed by these States was reduced to 24.2 per cent, while the four West North Central States which in 1879 produced 36.9 per cent of the entire crop now contributed 46.5 per cent of the total product. The center of corn production had meanwhile moved to a point fifty-five miles southwest of Springfield, Illinois.³⁴

The westward movement of corn production in the United States was checked in the nineties. This is shown by Table VII giving the ten leading corn growing States in 1899. The list of States composing this list was the same as it was in 1889 with but one exception. Tennessee now dropped out altogether while Oklahoma was added. Nor were there any important changes in the relative

³⁴ *Twelfth Census of the United States, 1900, Vol. VI, p. 24.*

ranking of these States. Illinois forged ahead again from second to first place, the position which this State had

TABLE VII

TEN LEADING CORN PRODUCING STATES IN 1899 ³⁵			
RANK	STATES	BUSHEL	PER CENT OF ENTIRE CORN CROP
1	Illinois	398,149,140	14.9
2	Iowa	383,453,190	14.4
3	Kansas	229,937,430	8.6
4	Nebraska	210,974,740	7.9
5	Missouri	208,844,870	7.8
6	Indiana	178,967,070	6.7
7	Ohio	152,055,390	5.7
8	Texas	109,970,350	4.1
9	Kentucky	73,974,220	2.8
10	Oklahoma	68,949,300	2.6

held in 1859, 1869, and 1879, while Iowa was reduced from first to second place, the rank held by this State in 1869 and 1879. Kansas, Nebraska, and Missouri attained third, fourth, and fifth place respectively. Indiana advanced from seventh to sixth place, thus superseding Ohio which was now reduced to seventh place. Texas advanced from ninth to eighth place, thus superseding Kentucky which was reduced to ninth place. Oklahoma now entered the list as the tenth State, thus superseding Tennessee which, as already stated, dropped out of the list altogether.

The ten leading corn producing States in 1899 contributed 75.5 per cent of the entire corn crop of the nation. This was 5.2 per cent less than the proportion contributed by these States in 1889. The three South Central States of Kentucky, Oklahoma, and Texas contributed 9.5 per

³⁵ These statistics are taken from the *Thirteenth Census of the United States*, 1910, Vol. V, pp. 582, 583. Oklahoma includes Indian Territory.

cent of the entire crop, while the seven North Central States of Ohio, Indiana, Illinois, Iowa, Missouri, Kansas, and Nebraska contributed 66 per cent of the entire crop. This was 4.7 per cent less than the proportion contributed by these States in 1889. The three East North Central States of Ohio, Indiana, and Illinois produced 27.3 per cent of the entire crop, which represented 3.1 per cent more than the proportion which they contributed in 1889, while the four West North Central States of Iowa, Missouri, Kansas, and Nebraska produced 38.7 per cent of the entire crop, which represented 7.8 per cent less than the proportion which they contributed in 1889. The decrease in the percentage of corn produced by the West North Central States in 1899 was due to the partial failure of the corn crop in the States of Iowa, Missouri, and Kansas, which in turn explains in part the fact that the center of corn production remained practically stationary, being located at a point fifty-four miles southwest of Springfield, Illinois, which was one mile east of the location of this point in 1889.³⁶

During the fifty year period from 1849 to 1899 the center of corn production had moved north from 39° 14' 54" to 39° 19' 33" north latitude—a difference of 4' 39" which amounted to a distance of five miles, while the center of production had moved westward 81° 43' 38" to 90° 27' and 6" west longitude—a difference of 8° 43' 28" which amounted to a distance of practically 480 miles.³⁷ It will, therefore, be seen that the center of production had moved almost directly westward to a point near the Mississippi River not far from the geographic center of the great agricultural empire of the Mississippi Valley.

The center of corn production had become practically

³⁶ *Twelfth Census of the United States*, 1900, Vol. VI, p. 24.

³⁷ *Twelfth Census of the United States*, 1900, Vol. VI, p. 24.

fixed by the close of the century. This is shown by Table VIII giving the ten leading corn growing States in 1909. It will be noted that the States comprising the list of the first ten were the same as at the previous census period, though there were several significant changes in the relative importance of these States. Illinois and Iowa still held first and second places respectively, while Indiana

TABLE VIII

TEN LEADING CORN PRODUCING STATES IN 1909 ³⁸			
RANK	STATES	BUSHEL	PER CENT OF ENTIRE CORN CROP
1	Illinois	390,218,676	15.3
2	Iowa	341,750,460	13.4
3	Indiana	195,496,433	7.7
4	Missouri	191,427,087	7.5
5	Nebraska	180,132,807	7.1
6	Ohio	157,513,300	6.2
7	Kansas	154,657,103	6.1
8	Oklahoma	94,283,407	3.7
9	Kentucky	83,348,024	3.3
10	Texas	75,498,695	3.0

advanced from sixth to third place thus superseding Kansas which dropped to seventh place. Missouri advanced from fifth to fourth place, while Nebraska dropped from fourth to fifth place. Ohio advanced from seventh to sixth place. Kansas as already noted dropped from third to seventh place, while Oklahoma advanced from tenth to eighth place. Kentucky retained ninth place. Texas dropped from eighth to tenth place.

The ten leading corn growing States in 1909 constituted

³⁸ These statistics are taken from the *Thirteenth Census of the United States*, 1910, Vol. V, pp. 582, 583.

73.3 per cent of the nation's entire product. This was 2.2 per cent less than the proportion contributed by these States in 1899. The three South Central States of Kentucky, Oklahoma, and Texas contributed 10 per cent of the entire crop, or one-half of one per cent more than the percentage which they produced in 1899. The seven North Central States of Ohio, Indiana, Illinois, Iowa, Missouri, Kansas, and Nebraska contributed 63.3 per cent of the entire crop, or 2.7 per cent less than the proportion which they contributed in 1899. The three East North Central States of Ohio, Indiana, and Illinois furnished 34.1 per cent of the entire crop. The three East North Central States, therefore, constituted 1.9 per cent more of the total corn crop of the nation in 1909 than in 1899, while the four West North Central States contributed 4.6 per cent less than the proportion which they furnished at the previous census period.

The westward movement of corn production in the United States during the half century from 1859 to 1909 is further explained by the fact that whereas the West North Central States in 1859 contributed but 14.9 per cent of the entire crop of the nation, in 1909 these States contributed 39 per cent of the entire product; and whereas the West South Central States in 1859 contributed but 6.1 per cent of the whole crop, in 1909 these States contributed 9.1 per cent of the entire product. The New England, Middle Atlantic, South Atlantic, and East South Central divisions, on the other hand, each showed a substantial decline in their share of the total production of corn in 1909 as compared with 1859, while the East North Central division remained practically unchanged for it contributed about one-third of the entire product at each census period.³⁹

³⁹ *Twelfth Census of the United States, 1900, Vol. VI, p. 81; Thirteenth Census of the United States, 1910, Vol. V, pp. 582, 583.*

Finally, the geographic distribution of corn production in 1909 is shown by Table IX, giving the total volume of production and the per cent of the entire product contributed by each of the several divisions of the country. This shows that the West North Central States ranked first with 996,359,000 bushels, or 39 per cent of the entire product. The East North Central section ranked second with 845,298,000 bushels, or 33.1 per cent of the entire product. The West South Central States ranked third with 233,402,000 bushels, or 9.1 per cent of the entire crop. The East South Central States ranked fourth with 210,155,000 bushels, or 8.2 per cent of the entire product. The South Atlantic States ranked fifth with 179,512,000 bushels, or 7 per cent of the whole product. The Middle Atlantic States ranked sixth with 69,611,000 bushels, or 2.7 per cent of the entire crop. The New England States ranked seventh with 8,239,000 bushels or 0.5 per cent of the entire

TABLE IX

GEOGRAPHIC DISTRIBUTION OF CORN PRODUCTION IN THE UNITED STATES IN 1909 ⁴⁰		
DIVISION	BUSHEL	PER CENT OF THE ENTIRE CROP
New England	8,238,394	0.5
Middle Atlantic	69,610,602	2.7
East North Central	845,298,285	33.1
West North Central	996,358,997	39.0
South Atlantic	179,511,702	7.0
East South Central	210,154,917	8.2
West South Central	233,402,007	9.1
Mountain	7,326,043	0.3
Pacific	2,288,683	0.1
United States	2,552,189,630	100.

⁴⁰ These statistics are taken from the *Thirteenth Census of the United States*, 1910, Vol. V, pp. 582, 583.

crop. The Mountain States ranked eighth with 7,326,000 bushels, or 0.3 per cent of the entire crop. The Pacific States ranked ninth with 2,289,000 bushels, or 0.1 per cent of the entire product.

Further analysis of the returns for 1909 shows that the two North Central sections together contributed 1,841,657,000 bushels which represented 72.1 per cent of the entire corn crop of the nation, while the Southern Central sections together contributed 443,557,000 bushels which represented 17.3 per cent of the entire product. The North and South Central divisions together known as the Central division contributed about 2,285,214,000 bushels, which represented 89.4 per cent of the entire corn crop of the nation. Of the remaining 10.6 per cent, the Atlantic Coast States contributed 10.2 per cent, while the Mountain and Pacific States contributed only four-tenths of one per cent. The Central division had thus become a great corn kingdom furnishing the huge volume of food required for the live stock, dairy, and poultry industries which were developed in this region, not to mention the growing surplus which found its way to the markets of the East and the countries of Europe, which since 1850 had become, to an ever increasing extent, dependent upon the great agricultural empire of the Mississippi Valley for the cereals and animal products which were required to fill the deficits in the home supplies.

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