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AUTHOR'S NOTE

Books could be written on the great changes which have taken place in Missouri agriculture during one hundred years. In this publication the attempt has been made to select the more important developments and condense them into a readable story.

The first chapter includes a brief resume' of the changes, arranged in chronological order for those interested in a simple review of agricultural developments during this hundred-year period. The other chapters cover special fields of development in greater detail, for readers interested in one or more of these aspects.

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The 1850s

A Period of Political Strife

In a discussion of a century of Missouri agriculture, it is well to go back just beyond 100 years to the early 1850s and look forward to the Civil War. Of course, the 1850s were years of great political strife, as the feelings between the North and South were growing. The rivalry between these two groups was intense, with the retention of slavery as the most important issue. Missouri, while never classed as a Southern state, was open to slavery and the feeling between the pro-slavery and the anti-slavery groups, within her borders, was running high.

Meantime, the comparatively new country was developing rather rapidly. During this decade the industrial capital of the nation, as a whole, increased from a little over $500,000,000 to over $1,000,000,000. Most of this was in the Northern states, including Missouri. The construction of railroads was going forward, and while much of this was in the East, the expansion reached into the Cornbelt. Up until this time, Missouri shipments had been mainly by steamboat, but railroads were now beginning to take these over.

Population was Growing

Population growth in Missouri was increasing rapidly during the 1850s. Most of the people were from the northeastern states or from Europe. Many of the early settlers had come in from Kentucky and Virginia, but this migration had now slowed down. Large numbers of the foreign newcomers were of German birth, more than 1,500,000 having entered the country between 1832 and 1860. Large contingents of these entered Missouri, spreading mainly along the Mississippi and Missouri Rivers with a concentration in St. Louis. Of the 1,000,000 people in Missouri by 1860, about 15 percent were of German birth but only about 6 percent of the farm popula-
The native bluestem prairie grass so common on the virgin prairies of Missouri. On the better prairies it grew as high as a horse's back.

Hog butchering day which was common on Missouri farms fifty and more years ago.

Agricultural Conditions Going Into War

Northern agriculture went into the War in pretty good condition. The 1850s had been a period when the Cornbelt was slowly coming into its own as a food producing center. The farmers were no longer interested in producing food solely for their own use, but they had begun to grow some for sale. This prepared the northern farmers for supplying food for the armies, as well as for the people in the growing towns and cities.

Some Early Farm Practices—Butchering

Something might be said about some of the early practices on Missouri farms during and before the 1870s. For instance, these were the days when butchering hogs on farms was universal. One or more neighbors usually came in to help and “butchering day” was a most interesting occasion. Water was heated in the open in large iron kettles and transferred to a barrel which was placed on an incline with the open end resting on a low platform, usually a farm sled. Each hog after “sticking” was placed on the platform and pushed into the hot water of the barrel for scalding, which “loosened the hair”, as was said. When one end had been doused in the water several times, this was repeated with the other end, or until the hair could be easily removed by scraping. The hog was then hung on some sort of scaffold, head downward and the entrails removed, after which the carcass was allowed to hang until cooled before cutting up. Such meat was usually hung in a small unheated building, called a smokehouse, and allowed to cure. The hams usually received special treatments and were smoked with a smoldering fire built in the smokehouse. They were then left for a long period of curing, often with further treatment, until they took on the wonderful taste and quality of the famous country hams. Missouri has long been famous for the production of delicious country hams. The ham and red-eye gravy breakfasts are famous throughout the state.

Soap Making

Another early practice, now almost forgotten, was the making of soft soap. The wood ashes from the kitchen stove, or the fire place, were dumped into an open-air wooden hopper with a drain at the lowest point. The rain leached the ashes and the brown liquid called “lye”, in those days, was caught in a kettle. This lye contained a considerable amount of potassium hydroxide which gave it the necessary caustic properties for “cutting” the grease and fats accumulated mainly around the kitchen. The lye was placed in an iron kettle, the grease and fats were added, after which the mass was boiled until it assumed

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the consistency of a heavy yellowish salve with the properties of soap. This was the only soap available in those early days and it was used for all purposes.

Light for farm houses was in great contrast to that of today. The tallow candle made in farm homes was for many years a standard means of providing light. These were followed by the "coal oil" or kerosene lamp with its adjustable wick and glass chimney. The oil lantern for carrying in the open came in at this same time. The lamp was the common light in farm homes from the latter part of the nineteenth century until the electric lights came into rather wide use on Missouri farms about 25 years ago. About 10 percent of Missouri farms are without electrification at this time, and lamps are still used on these farms, excepting those having small home electric plants.

Methods of Preserving Food

Early storing of fruit and vegetables was a long way from our use of canning and deep freezing methods of today. One plan, used particularly for apples and potatoes, along with such vegetables as turnips, carrots and similar root crops, was to bury them in the ground. Usually a depression several feet across was made; it was lined with straw and the fruit or vegetables piled in, with more straw for a cover. The soil which had been removed, along with some in addition, was piled on top making a layer of soil about a foot thick over the pile. This was a standard method of storage, although where basements were available, these were also used.

Canning of fruits and vegetables came in rather early. Earthen jars and tin cans were first used, sealing on the lids with a sealing wax. Later came the glass jars mostly in quart and pint sizes which are still used in farm homes although they are being replaced by the deep freezers.

Another method of preserving some fruits and vegetables, in the early days, was through drying. Corn was cut from the cob, and certain fruits such as apples and peaches were sliced and these were spread out in the sun usually covered with "mosquito bar" and dried quickly. This dried corn and fruit naturally had a flavor quite different from that of those cured or processed in other ways. Some of the older people of the present time look back with a nostalgic memory to the dried fruits and vegetables of early years.

Making Cider

Another early practice common on most farms was that of cider making. Since practically all Missouri farms in earlier times had some apple trees, cider making was common. The early "cider mills" of small size were powered by hand. The apples were ground to a fairly finely divided mass dropped directly into small wooden slatted cylinders from which the juice was squeezed by a hand press. Much of the cider was consumed fresh, some after it had fermented to the point when it "had a bead" while often some was kept until it was really "hard". Where farmers had many apples they would usually make enough cider to store in large containers from which, with due processing, they would make vinegar.

Other Early Practices

Other early practices will be remembered by older people. One of these was making apple butter in large quantities, boiling it down over an outdoor wood fire in a large copper kettle. Another was the barn raisings where most of the men of a neighborhood would gather to raise the framework of a neighbor's large barn. Another was the shoeing of horses at the old blacksmith shop which has now almost entirely disappeared. Others might be mentioned, but the various practices indicate the marked changes that have taken place in the usual activities around the early farms. Many of these lent a spirit of neighborliness which it is difficult to replace in modem times.

Improvements in Agricultural Machinery

For some years prior to 1860, work had been in progress on new types of agricultural implements. The cast iron plow had replaced the old wooden plow with a steel point. A single shovel one-horse plow was in general use for cultivating corn. This usually required two rounds for every row. Then came the famous one-horse "double-shovel" plow which required but one round to the row. For preparing a seedbed on plowed land, a drag harrow made of brush had been used, but homemade wooden-frame A harrows were introduced about this time and farmers also made log rollers and drags for crushing clods.

Before the 1850's, most grain was cut with the cradle and hay with a scythe. A good man with a cradle could cut two or three acres of wheat or oats in a long day. The same man with a scythe could cut about an equal amount of hay. Of course, these were the early times when the acreages of grain crops were small, since farmers grew grain mainly for their own use and little was sold. The cradle and scythe were still used on most farms up until the middle of the 1850's when the reaping machines of McCormick, Hussey, and some others were coming in. However, these were not much used in Missouri until after the 1860's.

Toward the end of the 1850's, threshing machines were introduced. Before this, small grain was beaten out by the old-fashioned flail, or tramped out by animals and winnowed by throwing it into the air and allowing a breeze to blow away the straw and chaff. The new threshers were driven by horse power and consisted of a cylinder with steel teeth which ran between similar teeth in a concave bar. By pushing the heads into the revolving
cylinder teeth the grain was threshed out. At first, the grain and straw were separated by sieves, or by winnowing, but later by the use of sieves and a fan.

There were other developments in farm implements and machines during this decade. Actually it represented a period when horse-propelled machinery had largely taken the place of hand labor. This meant that the agriculture of the Civil War, particularly in the northern states, increased in efficiency, even in spite of the war's destruction.

**Improvements in Crops**

The period of the 1850s was of course long before the present day methods of breeding crops were known. Hybridization in producing new strains of corn and small grains had not been attempted. However, several different varieties of corn had been developed by selection, and good farmers were selecting what they considered the best ears for planting. In a somewhat similar way some of the more interested farmers were working to develop better strains of wheat, oats, and rye. Red clover and timothy had also come into use to some extent by 1860. Those were the days when timothy was needed for horse and mule feed and clover for beef and dairy cattle. The soils were still fairly new so that both of these crops did pretty well. Probably because of the fertility and the rather large amounts of organic matter in most of the soils, the need of lime for red clover was not greatly felt.

Little effort was being made in Missouri at that time to provide anything like regular cropping systems, such as had already been adopted in Indiana, Ohio and other states to the East where the agriculture was older. In Missouri, the plan was still largely corn, three or four years, followed by oats, wheat, or grass, then back into corn again. Only the more progressive farmers were including red clover as a regular crop.

The reasons for the slower development of regular cropping systems in Missouri were that it was a newer state and it was subject to a more uncertain climate, with more drouths, than occurred in the states further east. These drouths interfered with the establishment of regular stands of grass and clover which reduced farmer interest in regular cropping or rotation systems.

**Some Attempt to Improve Livestock**

During the pre-Civil War decade, some farmers were making attempts to improve their livestock. Such attempts had begun as far back as 1830 to 1840 but they increased greatly toward the middle of the century. The most important early breed of cattle was the Shorthorn. There were a good many early Shorthorn breeders of prominence, several of them near the center of the state in Boone and Cooper counties. From these sources, Shorthorn cattle gradually spread over the state and they continued as the most important breed, well into the present century.

Men interested in good breeds of hogs became prominent later than those interested in cattle and it was well toward the end of the century when well-bred Poland Chinas became common in the state. Sheep were introduced in considerable numbers about the same time but they did not develop rapidly. Horses, of course, came in with the pioneers and some of really good quality were introduced before the middle of the century. In other words, the state was well on its way toward the production of good livestock before the Civil War.

**Early Agricultural Societies**

Mention should be made of an early interest in improved agriculture among Missouri farmers as shown by the organization of county agricultural societies, some before 1850. However, beginning about 1852, the number increased steadily and by 1858, there were 35 or 40 of them. One of the plans the managers of the societies employed to create interest, was to organize local and county fairs, where the best displays of field crops, vegetables, and animals were made. The competition of farmers at these fairs was not only educational, but it provided an incentive for the improvement of field crops, horticultural crops, and livestock.

In 1853, the Missouri State Agricultural Society was organized at Boonville, for which the Legislature provided an appropriation of $1,000. Two years later, it provided for an agricultural society in each of five districts in the state with a $1,000 appropriation to each. It was through these early, local societies and fairs, along with the new state agricultural society, that the farmers showed an early interest in agricultural education.

**First Fair 1821**

The first fair seems to have been held in St. Charles County in 1821. This was a year after Missouri was admitted to the Union. One held at Columbia in 1835 was said to have been the first of real importance in the state. It was followed by many others. The charges for admission to these early fairs were interesting. Typical charges were: one person on foot, 10 cents; a person on horseback, 20 cents; a horse and buggy with one or two persons, 30 cents; a two horse wagon with four or more persons, 40 cents; footmen, 10 cents; children under 15 and slaves, half price. What a contrast with the charges at modern fairs!

The development of a state fair required a good many years. One held at Boonville in 1853 was of course centrally located and the promoters tried to establish it as the state fair. However, there were other contenders, mainly Boone, Howard and Lafayette counties. Some thought the state fair should be rotated from year to year,
but nothing really decisive was done until 1899 when the state fair was located at Sedalia under the jurisdiction of the State Board of Agriculture, now the State Department of Agriculture.

**The 1860s and the Civil War**

Much to the displeasure of the Southern States, the bitter presidential campaign of 1860 put Abraham Lincoln in the White House. As a result, the long threatened secession of the Southern States at once began to develop. The Legislature of South Carolina led off in December of 1860 when it declared that the union of that state with the United States no longer existed. In a couple of months, six other states followed, a provisional constitution of the Confederacy was drawn up, and Jefferson Davis was chosen president. While the Northern States had attempted desperately to work out some compromise, their efforts were unavailing and the war opened on April 12, 1861.

The beginning of the war shook the nation to its foundations. Men were drawn into the armies from every walk of life, including agriculture. The conditions in Missouri became bad. The state had not recovered completely from the monetary panic of 1857 and the country was still flooded with cheap "greenback" currency. The money in circulation per capita had increased from $9.43 in 1840 to $15.81 in 1857. From the panic of that year, the dollar remained at a low value throughout most of the war period.

**Farm Labor**

In Missouri, slave holding was declining in popularity. The important slave owners were farmers, particularly those on the larger farms or plantations, along parts of the Missouri and Mississippi Rivers. To a considerable extent, however, slave holding in Missouri had become more of a mark of distinction among the large land owners than a source of farm labor. Many of the slaves were serving as house servants and coachmen. Of course, the land owners who grew large acreages of hemp and tobacco in the river counties used many slaves to advantage. Cotton growing in the Southeast Lowlands had developed to only a small extent at this time.

There was a shortage of labor on northern farms during the war period which meant that large numbers of women and children helped in the fields. However, farmers made increased use of the new types of farm machinery which were coming in. New plows, harrows and reaping machines were on the market and many farmers had sufficient funds to buy them. Machinery was replacing hand labor to a very significant extent.

Large increases in the production of wheat, livestock, and other food products took place during the 1860s. In Missouri, corn reached a production of 46,000,000 bushels by 1866, wheat, 3,500,000 bushels and oats, 3,450,000 bushels. The production continued to increase each year for the remainder of the decade and practically doubled during this time.

On the whole, the farmers of the North fared quite well during the war period, while those of the South were in serious condition. With the coming of peace, northern agriculture recovered steadily while that of the South went through a desperate series of years during the reconstruction period of President Johnson's administration.

**Homestead and Morrill Acts Passed**

Two acts of Congress, favorable to agriculture, were enacted during the War period. The first was the Homestead Act of 1862 which provided that any person 21 years of age and the head of a family could secure title to as
much as 160 acres of government land by paying ten dollars down, living on it for five years and paying such fees as were necessary to the cost of administration. This brought in a good many settlers to Missouri. However, most of this government land was in the poorly settled prairie regions further west, so that this state was largely passed by. It really had another influence on Missouri settlers. Some men who had previously acquired land on which they had considerable debt, sold their farms to neighbors or newcomers and moved west to take up new farms under the Homestead Act. This first Homestead Act was followed by others which modified the requirements somewhat. Nevertheless, these had some influence in swelling the numbers of farmers in Missouri after men were set free from the armies and wanted to relocate. The 1870 Census figures gave the total population of Missouri as 1,721,295, an increase of over 14 percent above the number in 1860.

Another legislative accomplishment beneficial to agriculture was the passage of the Morrill Act which was signed by President Lincoln on July 2, 1862. This act granted an allotment of government land to each state, from the sale of which “colleges of agriculture and mechanic arts” were to be established. Unfortunately, for Missouri, the allotted land was largely in the rougher parts of the Ozark Region where the value was rather low and it took many years to sell it. Actually, there are several thousand acres still unsold. However, over 260,000 acres have been disposed of, through the years, at an average price of $2.17 an acre. This has amounted to over $560,000, the income from which goes to the Colleges of Agriculture and Engineering that were established as separate entities within the University in February, 1870.

The work of the College of Agriculture has had an almost revolutionary influence on the state’s agriculture during the years. The College of Engineering has also had a great influence in both the industrial and engineering developments which have taken place. It is interesting to consider that in the heat of a Civil War, when the country was hard pressed for funds, Congress and President Lincoln should see fit to provide for this educational development. While wars are always exceedingly costly and people usually lose very much more than they gain, there are some developments accompanying or following most of them which are of benefit to the people. The establishment of the colleges of agriculture and of engineering throughout the country was one of these.

**A Period of Adjustment—1865 to 1875**

The remainder of the third quarter of the 19th century was a period when many adjustments were necessary, both in the North and in the South. Of course, the South had lost its slaves, so that the whole agricultural economy had been wrecked. The North had to make radical readjustments but these could not compare with those of the South.

In Missouri, the conditions were not as bad as in the South. The cotton region of the Southeast Lowlands had not developed to any extent, because most of the land was still undrained. In the poorer parts of the state, however, the conditions were rather serious. Since a good many battles had been fought south of the River some of these regions had come under the direct influence of the war. The so-called “bushwhacking” type of warfare from which Missouri suffered, as a border state, also had a very serious effect. In some places, particularly near the western border, the country was laid waste for miles. In the northern part of the state, conditions were not greatly different from those in the other northern states. On the whole, however, the situation had been more severe in Missouri and its agriculture was slower in coming back.

Missouri contributed a good many men to the war effort—about 110,000 to the Union cause and between 30,000 and 40,000 to the Confederacy. Toward the end of hostilities, about 2/5 of the ablebodied men of military age were in war service. It can be understood that this somewhat divided loyalty and the large numbers engaged in the war had serious effects on the state.
The agricultural developments in Missouri during the latter part of the 19th century were similar to those in most of the Midwestern states. They were of course affected by the political and monetary conditions which existed. However, in spite of a serious depression in the 1890s, agricultural practices were being improved and stabilized. The State Board of Agriculture was established in 1867 and later had much influence on agricultural development. Actually this quarter of the century was one of much agricultural improvement.

**Improve Farm Machinery**

One of the great developments affecting agriculture during this quarter century was the steady improvement in agricultural machinery which was later to bring about an agricultural revolution. Because of this, the return per farm worker was constantly increasing. At the beginning of this quarter century, reaping machines were already in use by many Missouri farmers and during the latter part of the century grain binders were well known.

New developments in threshing machinery followed the wide-spread use of binders. The old horse-power thresher was replaced by a large portable machine which threshed out the grain and separated it cleanly from the chaff and straw. It was driven by a portable steam engine, commonly known as a traction engine, which not only provided power for threshing but for hauling the machine from farm to farm where threshing was to be done.

Improvements in soil-working machinery came in during this period. The greatest innovation was the introduction of the hardened steel mouldboard turning plows to replace the cast iron plows formerly in use. With such a plow a man with a good team could plow from two to three acres a day. Toward the end of the century, some horse-drawn single-bottom riding plows came in but these were just being introduced at that time. It is interesting to know that as early as 1878, the College of Agriculture held a plow test at which a total of 50 plows were entered from different companies.

**Advancements in Tillage Machinery**

Developments in tillage machinery during this period were the disk harrow, the spring-tooth harrow, the steel spike-tooth drag-harrow and the steel roller. With these developments there was little reason why the good farmer should not be able to prepare good seedbeds for planting his crops.

Corn planters had come in during the Civil War, but now these had become widely distributed and new types had emerged. The grain drills of this period were largely developed about Civil War time, but they were much improved during this later period. They were built, not only to sow small grain, at proper depths, but they carried a small seed box, running the length of the drill for sowing clover and grass seeds. A few drills had been introduced in the nineties which added a third hopper for applying fertilizer in the rows with the grain.

The one-row, two-horse corn cultivator which had been introduced earlier, became very wide-spread during the latter part of this quarter-century. It was used almost everywhere in the Cornbelt by 1900. Most of these were “walking cultivators” but they were very efficient.

**Haying Made Easier**

Mowing machines with five-foot cutterbars became common during this period and some with six-foot bars were sold. While the sulky hay rake was still in wide use, the side delivery hay rakes were introduced. During this period, too, hay loaders appeared. Some of these gathered the hay from the windrow made by the hay rake and some took the hay directly from the swath. At this time, hay balers were coming in but they did not reach a very
wide distribution until the latter part of the nineties.

Another advance which affected farmers in this quarter century was the introduction of the roller flour mill, to take the place of the old grist mill. This meant an increased demand for wheat. About this time, too, town bakeries appeared, which increased the demand for bolted flour. The use of fertilizers was introduced during this time, but the number of Missouri farmers who were interested was small so that this had little effect on total crop production until much later.

**Cropping Systems Appear**

By the 1890s the cropping systems on the farms of Missouri were beginning to take on a more regular succession of crops in which clover and timothy appeared. Plans were coming in which provided for one to three years of corn, to be followed by a small grain for a year and this by grass, or clover and grass, for one to three years. However, rather few farmers had yet adopted very regular systems.

There was a rather wide variety of crops grown, the principal ones being corn, oats, wheat, hay and forage, with cotton in the Southeast Lowlands. The acreages of these, according to the 1890 Census, were corn 6,072,000, oats 1,676,000, wheat 1,946,000, hay and forage 2,870,000 and cotton 57,000.

Hemp, which was a very important crop in many counties during slavery days, had by this time practically disappeared from Missouri farms. Tobacco was also limited in acreage and was much less important than in earlier days. Some attempts to grow sugar beets had failed entirely, because the sugar content under Missouri's climate was too low. Cowpeas had become a rather important crop in some parts of the state. Improved pastures had increased with the years. Some winter oats, mostly the Red Rust Proof variety, were grown in Southeast Missouri and in some counties in the southern Ozarks.

**Livestock Improvement Continues**

Missouri farmers were continuing to develop improved livestock during this period, but the advances were not as great as those in the years following 1900. The Shorthorns, among beef cattle, were still the predominant breed, but others were coming in. The Poland Chinas continued as the most important breed of hogs. Sheep numbers were increasing but there was little change in breeds; however, they were improving in quality. Missouri was becoming well known for its good mules, but these were improved greatly after 1900.

**Boom In Industrial Development**

A most outstanding national development during the quarter century from 1875 to 1900 was of an industrial nature. However, this had a marked effect on Missouri agriculture. The war had left a great demand for domestic goods, and industry proceeded to try and fill it. The production of coal and the manufacture of steel, the two most important industrial indicators, made tremendous progress during this era. This period also saw the beginning of the oil industry along with the use of electricity and the telephone. Important technological advances were made in many fields. The number of patents granted by the Government was only about 35,000 in 1860, but there were over 400,000 by 1890. This was also the period of a great development in railroads, the mileage of which increased five times in 30 years. This is sometimes called the era of railroad development.

**Position of Farmers During the Industrial Development**

During the period of industrial development Missouri agriculture was getting completely away from the old plan of self-sufficiency, in which farmers had little to sell, to the period when they had much to sell. The increase in industrialization meant that there were many workers who needed to buy food and who had money to pay for it. Likewise, there was a demand for cotton and this was of great benefit to the South. Moreover, there was a strong export demand which helped to maintain cotton prices at a fair level.

Farming was becoming more specialized and more technical. Scientific developments were coming in. New crop varieties, new fertilizers, new farm implements, and new methods of culture contributed to a more highly productive agriculture. All of this meant increased total production. In Missouri, there were 284,000 farms by 1900 with a total farmed area of 33,990,000 acres. The production of corn was 208,800,000 bushels, of wheat 23,072,000 bushels and there was a total production of 25,500 bales of cotton.

As time had gone on, agricultural production had begun to show some surpluses. The cost of things farmers had to buy had become somewhat higher, particularly in agricultural machinery. By the end of the eighties, farm prices were declining and they reached a much lower level during the depression of the nineties. Wheat which in 1880 had been worth $1.00 a bushel declined to 63 cents and the price of corn declined from 43 cents to 30 cents during the lowest period of the depression.

**Farmers Engage in Politics**

It has been said that many times in history the producers of raw materials have risen against the burden of their debts, and therefore, their landlords. Midwest farmers were now contrasting their hard times with what they considered as the luxurious living of the businessmen of the East. As a result, they began with attempts to help themselves. The farm organization known as the Patrons of Husbandry or Grange was formed in the East in the
sixties. It spread over the Central states until by 1874 there were three quarters of a million members including about 3,500 in Missouri.

The Grange was responsible for the so-called Granger movement, which was followed by the organization of the Greenback party, whose purpose was to protest against certain deflationary influences. The party polled a million votes and elected 15 Congressmen in the election of 1878. However, it was supplanted by the Populist party in the early eighties. This group had a considerable following, particularly in the wheat regions of the North Central states. The Farmers Alliance, or Wheel, formed at this same time, worked along with the Populist party and became rather powerful in the latter part of the eighties. In the 1890 election, the combined Populist and Alliance movement was strong enough to gain the balance of power in several state legislatures.

**Free Silver Movement**

A matter which the Populist party strongly advocated, and which had been one of controversy in the country, was the free coinage of silver. This, of course, was a measure working against deflation which the government and big business had been advocating. The farmers saw their prices sliding to about half what they had been several years before and they were demanding relief. However, to most people, the gold standard was considered as a foundation stone of national security so that the controversy waxed strong.

The man who emerged at this time as a bold advocate of free silver was William Jennings Bryan of Nebraska, the "silver-tongued orator" of his state. Through his speeches and writing, he secured a very large following throughout the Middle West and was nominated for president on the Democratic ticket in the 1896 election campaign. Bryan was really a Populist at heart, but the Republicans had nominated William McKinley of old time Republican ideas and the Democrats thought they could win with Bryan. The campaign was one of the most colorful in the history of the nation, but in spite of the eloquent speeches of the Democratic candidate, he went down to defeat. During McKinley's administration, the country began to recover from the depression and the Republicans seemed, for the time, to be the party of prosperity. Bryan was nominated a second time against McKinley in 1900 but lost again.

**Poor Roads Influenced Agriculture**

One of the characteristics of Missouri up to the 20th century was the poor condition of the roads. Missouri's subsoils are naturally sticky when wet, as are many of the surface soils. Before roadbeds were properly graded and drained, the conditions during the fall, winter, and spring made travel with vehicles of most any kind almost impossible. It was often necessary to put off funerals for several days or even weeks. Temporary commonlaw marriages occasionally took the place of marriages by proper officials or clergymen. It is reported that the faculty at Central College at Fayette, at one time, petitioned the president to continue classes during the Christmas Holidays because of the uncertainty of the students' return, even if they were able to get home.

One of the first real efforts toward road improvement was through the use of what was known as the "split log drag," popularized by a very intelligent farmer of North Missouri, D. Ward King. He had learned how to improve the roads adjacent to his farm and those in his neighborhood, by going over them with a drag and smoothing them down. He became enthusiastic about the possibilities of road improvement and for several years was a staff member of the State Board of Agriculture as a lecturer. He performed a great service to road improvement in Missouri in those early days.

**Mail Service Influenced Road Improvement**

It is interesting to know that the development of Rural Free Delivery mail service had quite an influence in road improvement by the end of the century. However, there were many mail carriers who rode horseback or
used the old-fashioned sulky cart for a long period of years.

Later the road grader came in, which brought about drainage of the roadbed, and this took the place of the road drag. Once the plan of road grading became common, it was followed in the more progressive communities where creek gravel was available, by a gravel sur-

The German communities, along the Missouri and Mississippi Rivers, were particularly advanced in this type of road improvement, beginning before 1900. Along with this, went the construction of the quaint covered bridges over the creeks and small rivers, and in a few communities, these remain until the present day.

20th Century up to World War I

The opening of the 20th century ushered in a 50-year period during which American agriculture made far greater progress than it had made since the pioneers landed on the East coast. It might almost be said that this progress was greater than that in any of the countries of the entire world, extending back to the cave men.

In 1900, the country was recovering from the hard times in the nineties. The years following saw the beginnings of a period of moderate farm prosperity continuing to the first World War. Land had practically all been taken up and land prices were advancing. Railroads were lengthening their lines, and hard roads were coming in, thus improving the facilities for moving farm products to city markets and ports of export. Farmers were becoming increasingly interested in the conditions which provided them with the highest returns for their labor and investment. The industrial activity of the latter part of the last century was, to a considerable extent, extending over into this one. This activity was providing Missouri farmers with things they needed and at a time when they had fair amounts of money with which to buy.

Graph showing the changes in total Missouri population and the so-called rural population (people in towns under 2500 plus those on farms) by Census years from 1850 to 1950. The graph also shows the percent of rural population for the same years and the percent of farm population for ten-year intervals from 1920 to 1950. The Census data taken previously on percent of farm population are not comparable with years since 1920.
Rural Population Starts Decline

The influx of people from other states and countries had, by the beginning of the century, greatly slowed. This continued during the first quarter of the century, so that between 1900 and 1930 the total population increase for the state was only about 500,000. Moreover, the percentage of people in rural areas, that is, on farms and in small towns (2500 and below) was steadily declining, as shown by the Census figures in the accompanying table.

<table>
<thead>
<tr>
<th>MISSOURI POPULATION, 1900–1930</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Population</td>
</tr>
<tr>
<td>1900</td>
</tr>
<tr>
<td>1910</td>
</tr>
<tr>
<td>1920</td>
</tr>
<tr>
<td>1930</td>
</tr>
</tbody>
</table>

It will be seen from this table that the total population was increasing slowly after 1900, but the rural population was decreasing steadily. Because of opportunities in towns and cities, people were moving from the rural districts into these urban centers. This drift has greatly increased with time, as is indicated by present day figures.

Crop Production

The crops grown in Missouri during the early part of the present century were not greatly different from those grown before 1900. Moreover, the acreage of the standard crops had reached totals somewhat similar to those of the present day. Figures for the important crops, 1900 to 1915, just before the opening of World War I are given in the accompanying table.

<table>
<thead>
<tr>
<th>TOTAL ACREAGES BY FIVE YEAR PERIODS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1900</td>
</tr>
<tr>
<td>Corn</td>
</tr>
<tr>
<td>Oats</td>
</tr>
<tr>
<td>Wheat</td>
</tr>
<tr>
<td>Tame Hay</td>
</tr>
</tbody>
</table>

The cotton acreage was increasing in the Southeast Lowlands as more of the swamp land was cleared and drained. Other crops of some importance were tobacco, cowpeas (mainly in Southeast Missouri), rye, sorghum or kafr corn, and alfalfa. Neither soybeans nor lespedeza had come into use at this time.

Rapid Advances in Livestock Production

During the early part of the present century, Missouri moved forward rather rapidly in livestock production. It was in the very early years of this period that Dr. J. W. Connaway and Dr. Paul Paquin of the Missouri Experiment Station, along with Dr. Mark Francis, of the Texas Experiment Station, worked out the methods of dipping cattle for the control of the ticks which carry Texas fever. This effective control process was introduced over southern Missouri and the great cattle states of Oklahoma and Texas, as well as over the remainder of the southern states, making cattle production safe in this area.

The investigations for developing this dipping technique were carried on at Columbia and this can be given as one of the great accomplishments of the Missouri Station. The widespread use of this method, as finally carried out by the U. S. Department of Agriculture in cooperating states, has brought hundreds of millions of dollars to the beef cattle industry in the great cattle areas of Missouri, Oklahoma and Texas, with lesser returns in other states. Missouri profited greatly through this control of Texas fever, which gave a great impetus to cattle breeding. Not only were more cattle bred, but feeder cattle were brought in from Oklahoma and Texas, in large numbers.

Cholera Serum Plant Saves Hogs

It was during the early part of this century that the development of serum for the control of hog cholera came into use in Missouri. The legislature provided funds for the College of Agriculture to build a serum production plant at Columbia, which was a great stimulus to
serum use. As a result, the outbreaks of this disease, which had plagued the farmers for years, could now be pretty well controlled. This was a most important step in advancing hog production, for which Missouri is particularly well fitted.

It was during this period that much improvement was made in the quality of livestock and in the widespread introduction of important breeds. Among beef cattle, the Herefords and Angus became rather widespread. In the case of hogs, a number of breeds became prominent beside the Poland China. Mr. N. T. Gentry of Sedalia began the development of his famous herd of Berkshires. The Duroc Jerseys spread widely over the state. Among sheep, the breeds were improved and the marketing of lambs came into prominence. It was in this period, too, just before the tractor appeared, that Missouri mules were most widely known and saddle horses were at their peak in the state.

**Improve Size and Efficiency of Machinery**

An increased use of farm machinery followed the opening of the twentieth century. All machinery was drawn by horses and mules as it had been before 1900, but the machines were increasing in size and efficiency. There were, however, few radical changes in this equipment on Missouri farms during this first quarter century, since the tractors had not yet come into use in very great numbers. By the opening of the first World War, the heavy tractors for plowing and land preparation had appeared, but it was not until the middle twenties that the smaller, general-purpose tractors were introduced which could be used for all types of farm operations. The real advancement in farm mechanization, therefore, did not take place until after 1925.

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**Agriculture Girds for World War I**

The conditions of agriculture during the First World War were those of rising farm prices. It was a period when the demands for food were enormous, primarily for supplying our soldiers at home and overseas. In fact, a supply of food was so important that the slogan "Food Will Win the War," was widely used.

In their sincere patriotism, Missouri’s farm people did many things out of the ordinary. They saved meat by providing so-called meat substitutes, in which the cheaper cuts were used, along with high protein vegetables and flours. They allowed little food to go to waste. The activities of farmers in producing larger crop yields were fairly effective. However, the removal of so many of the younger men for service in the armed forces meant that labor was scarce and the farm women and children gave maximum help in the fields and elsewhere around the farms.

It must be remembered that many of the agricultural practices we now know had not been developed at that time. Fertilizers were available only in small amounts in Missouri, and these were mostly of rather low grade. Lespedeza did not come into use until later. Hybrid corn had not been heard of by Missouri farmers. The Agricultural Extension Service was just getting its work under way, although it made itself felt strongly during the war and immediately following. However, the patriotism and resourcefulness shown by Missouri farm people during this trying period were highly commendable. The great contribution which Missouri made to active military field service would not have been possible without the efforts of the people at home. In this, the farmers played a very large part, not only in food production but in supporting the various war efforts of the people.

**Missouri Council of Defense and Food Production**

Three days after War was declared, the National Secretary of War asked every state to provide for a State Council of Defense. Within a few days, Governor Gardner of Missouri called a meeting of citizens of widely diverse interests to convene in Jefferson City. This group met and passed a resolution recommending that a Council of Defense be formed. Almost immediately, Governor Gardner appointed such a defense council with Dean F. B. Mumford of the College of Agriculture as chairman. In October, Dean Mumford was also appointed Food Administrator, under the Council, with offices in Columbia. Within a short time he had appointed county food administrators and other cooperators throughout the state.

The Missouri Food Administration proved to be most efficient. It not only exerted an influence on food production but on food marketing, processing and conservation. The whole field of foods, as related to war effort, came under its general jurisdiction.

The Council of Defense took the lead in many of the activities of the people of the state—farm and city people alike. Moreover, Governor Gardner was an excellent war executive and was active in seeing that many of the war measures were carried out. Partly at the suggestion of the council and partly on his own volition, the Governor kept the state in the forefront of war efforts and issued a number of special proclamations having to do with civilian war services. Among the more important of these were the campaigns for the Red Cross, Liberty Loan and War Savings. In connection with the Red Cross, the people responded most generously with large contribu-
tions, many becoming life members of the organization. In the case of the four Liberty Loan drives, the state overscribed its quota in every one of them. In the third, it subscribed 152 percent of its quota or $110,828,000. In the fourth, the women alone were credited with raising over $50,000,000. In all of these drives, the farmers of the state joined the city people in their patriotic efforts.

**Garden Program Thrives**

One of the most important food production projects, organized under the Food Administration was that of war gardens. In this, both farmers and city people who had land available were urged to plant gardens to supply their own vegetables. The number that responded, even among city people, was amazing. It was reported in 1918 that in St. Louis alone, 850 acres of gardens and vacant lots were turned into war gardens. Women and boys, as well as men, worked in these and great quantities of vegetables were produced for home use. In some cities and towns, municipal war gardens were planted and much of the produce was canned for winter use of the poorer people or it was supplied directly to needy citizens who had no opportunity to grow gardens. It was most interesting to see what municipalities and individuals, in towns and cities, could accomplish in food production under the stress of a war emergency.

The Selective Service Act, passed in May, 1917, was one of the most far reaching laws ever enacted. It affected every able-bodied young man of draft age, both on and off farms. With food production a vital matter, there was great pressure put on draft boards for deferring young farmers who were engaged in farming. Of course, the draft boards were in a dilemma as they had to balance the needs of the armed forces against the needs of agriculture and war industries. As it finally worked out, there were many young farm men drafted who were probably needed more on the farms.

The College of Agriculture made every effort to help farm people economize on food. The newly formed Agricultural Extension Service carried information to farmers and farmers' wives through meetings, newspaper articles and farm visits. The College published special circulars telling how to make meat substitutes and how to cut down on the use of wheat flour and other foods needed by the armed forces. As a result, people were made food conscious and they were imbued with the idea of cutting down on all food wastes. Among many people, meatless days became a regular thing, and meat substitutes were
widely used. All of these had a great influence on farm people who realized their responsibilities in the important food situation and they did all they could to meet them.

Scientific Developments
Influence the 1920s

One of the real influences on Missouri farm people in the 1920s, following the first World War, was that of improved scientific developments, as they affected power and agricultural techniques. There was a great increase in the use of cars, refrigerators, telephones, and electrical appliances during this period. Many of the articles originally thought of as luxuries, even by well-to-do people, were coming into use by the average family. The development of the automobile was having an increasingly important influence on transportation. Henry Ford’s development of the Model T, in mass production, brought this low-priced car to thousands of farms in Missouri and other states. Moreover, large federal and state expenditures on hard-surface roads were serving to put Missourians on rubber.

These inventions and developments had a real influence on Missouri farm people. Most farmers were no longer isolated and the barriers between country and city people were breaking down. Much of this had taken place in the years 1920 to 1928, following World War I. For several years, during the War and up to 1920, farmers had been buying land to add to their holdings or even buying additional farms. They were using some of the extra money coming from the sale of rather high-priced agricultural products as a result of the war, to make down payments on land, usually with significant mortgages. As a result, by 1920, land prices had practically doubled since the period preceding the War. In some places in Missouri, this increase was over 150 percent.

Difficulties with the Agricultural Economy

The principal agricultural difficulty at this time was an increase in farm surpluses. Farmers were greatly concerned about this, for fear it would depress farm prices. They were anxious to have something done about it. President Harding, who came to office in 1921, appeared to have little interest in agriculture so that the National Farm Bureau, which had been formed a short time earlier, secured the cooperation of a number of senators and representatives, mainly from the Central States, and succeeded in developing in Congress what came to be known as the Farm Bloc. Since the members of this bloc were rather equally divided between Republicans and Democrats, it had considerable influence in getting legislation enacted. Among these acts were the revival of the War Finance Corporation to assist in the exportation of surpluses, a new Grain Futures Act and an improvement of the Land Bank procedures. Later the bloc was very active in securing the passage of two versions of the celebrated McNary-Haugen bill which caused tremendous discussion in the country. However, both of these were vetoed by President Coolidge who became president after Harding’s death in office and who was elected to the presidency in 1924.

Hoover Calls Special Session on Agriculture

When Herbert Hoover became president in 1929, he called a special session of Congress, which, among other things, was to discuss the farm situation. At this session, a resolution was adopted which finally resulted in the passage of the important Agricultural Marketing Act. This Act made possible producer-owned and producer-controlled farm cooperatives which were expected to lessen costs in marketing farm products and to keep down surpluses. The plan also provided for a National Farm Board of nine members, mentioned elsewhere, one of
whom was the Secretary of Agriculture. The Board was provided with a revolving fund of a half billion dollars. In an effort to lessen the surpluses and support the market, it made very large purchases of wheat and cotton. However, as time went on, it became evident that this Board did not provide the answer to the farm problem as it incurred great losses to the government with only minor benefits. In Missouri, it had its principal influence on the cotton market.

**Depression Strikes in the Thirties**

Speculation in the stock market during 1929 increased in intensity. People lost their conservative judgment. They became frenzied and mass speculation continued to such an extent that stock market prices had little relation to actual values. Even the leading financiers seemed to have lost their perspective. Finally, people began to lose confidence and the crash followed. The real catastrophe started on October 29, 1929, when in some cases, prices dropped as much as 80 percent below their September values. No buyers at all could be found for some stocks.

The collapse of the market spread to all commodity prices, including those of agriculture. At this time, there was no adequate method of controlling farm prices, so that farmers just kept on producing. Total farm production declined only 6 percent for the country as a whole while farm prices fell to heart-breaking levels. The total farm income declined from $12,790,000,000 to $5,560,000,000, when it was at its lowest point in 1932. The purchasing power of farmers was one-half what it had been ten years earlier.

This depression was the worst in the nation’s history. By 1932 the number of unemployed was around 15 million. Many had become migrants going from area to area endeavoring to find work and places to live. This was the time when some of the jobless appeared on the street corners of the cities, selling apples. Many from the cities went back to the country to get work, the number finally reaching a half million individuals.

As a result of these difficult times, there was some interest in bringing strong socialistic principles into the government, although, people with these ideas were greatly in the minority. While most Missouri farmers were of the opinion that the federal government should do something to assist in restoring prosperity, they retained the ideals of constitutional government and free enterprise. The same was true of other states so that the country was never in real danger of civil war or a revolution.

**The Agricultural Adjustment Act**

One of the early pieces of Roosevelt’s New Deal legislation was the passage of the Agricultural Adjustment Act, (AAA), designed mainly to reduce the production of basic farm products and to raise farm prices. This act, along with the previously passed financial and loan
the first, except that it included a plan for what Henry Wallace called "the ever-normal granary," along with the so-called "parity" principle designed to hold farm prices to the "effective levels of 1910 to 1914."

Following the worst of the depression, the farmers had begun to make some gains. The use of the parity principle was partially effective. Over-production was in part held in check by the AAA and in part by the drouths of 1934 and 1936 which were very severe in Missouri. By 1937, farm prices were 80 percent higher than in 1932 and the real economic income of farmers was about like that before the depression. However, it was not until World War II that real prosperity returned to Agriculture in Missouri and the other central states.

**Some Unfortunate Aspects of the AAA Program**

Probably the most legitimate criticism of the two AAA programs was that most of the benefits went to the larger and more prosperous farmers. The thousands of impoverished tenants and share croppers were probably worse off, especially in the Cotton Belt. An example of a reaction among tenant and sharecrop cotton farmers, occurred in Southeast Missouri in 1939. The situation developed from the action of most landowners of the cotton farms of the country in diverting the payments from the AAA program to their own pockets, instead of dividing with the tenants or share croppers, which was of course the intent of the law.

In this particular instance, representatives of one of the Southern labor organizations came into Southeast Missouri and attempted to organize the share croppers and tenant farmers. The plan gained some foothold before the landowners understood the situation. When the landowners became aware of this, many of them ordered the tenants and share croppers off their farms. In this particular case, many of them told these people to be off
their farms by January 1, 1939. The labor organization took advantage of this situation and induced a rather wide-spread sit-down strike, as it was called. The plan was quietly but carefully organized and on this date and immediately thereafter, large numbers of these tenants and share croppers moved with their families to wide places in the highway right-of-way which was of course state property. While the negroes were in large numbers in these roadside groups, there were also many whites.

This action created great resentment among the land owners of the region and for a time, the situation looked very serious. However, the strikers had been thoroughly instructed to refrain from any violence in word or deed and they were Gandhi-like in their behavior. The demonstration continued for over a week with hundreds of these poor people living under temporary shelters in mid-winter. Meantime, the tempers of the landlords of the region gradually cooled and the roadside families were allowed to go back to the farms from which they came or to others.

This incident received wide publicity and was a most unfortunate one for Missouri. However, it assisted in pointing out one of the real inequities of the AAA in the cotton country of this state and in the South.

Further New Deal Legislation and Presidential Directives

The Resettlement Administration set up in 1935 helped some in the latter part of the thirties. The Farm Security Administration (FSA) went into effect in 1937. It has been continued to the present day, now under the name of the Farmers Home Administration (FHA), during which time it has been very helpful to many War veterans and others. As a result of these and the favorable influences of other agencies, the percentage of tenancy decreased. Between 1930, at the beginning of the great depression and the close of World War II, in 1945, the amount of farm tenancy in Missouri dropped from 34.8 percent to 26.8 percent.

President Roosevelt’s monetary policies during his time in office were rather sweeping, almost daring, in nature. His plan of a controlled currency, including the value of the dollar, was intended to raise prices and keep them stable. It really meant the abandonment of the gold standard and as a result, the paper dollar was de-valuated to less than 70 percent of its former worth. The dollar has remained at a low value ever since.

The Program of Public Works

At Roosevelt’s insistence, the first New Deal Congress provided large sums for public works, the first legislation for this purpose having been passed during the Hoover Administration. Two new pieces of legislation, The Public Works Administration (PWA) and the Works Progress Administration (WPA) were established at this time. These speeded up the development of public works tremendously and large sums of money were spent on these projects. They covered many lines of activity and the construction of public buildings was greatly stimulated.

A development of much importance to Missouri and other Cornbelt states was that of supplying funds for soil conservation throughout the country. This activity was a part of the TVA program but plans were soon developed for other agencies to engage in this work. The AAA had carried this as a part of its program. Another agency, the Civilian Conservation Corps, was provided in 1933, to give temporary work to young men out of employment. By 1940 it had employed, for shorter or longer periods, a total of 2,000,000 of these young men, working in various fields, but especially in soil, water and forest conservation. Other acts were passed, the intent of which was to take care of some of the unemployed or reduce the number. While there was much waste, under most of these public works programs, they provided work for many thousands of the unemployed.

While these programs helped in the emergency they cost a great deal of money. Meantime, the public debt had increased from 22 ½ to 44 billion dollars during the first seven years of the Roosevelt administrations. However, the New Deal program had benefited agriculture and labor, it had greatly decreased unemployment and it had provided some checks on big business, a matter which was of concern in those times. It had, at least temporarily assisted in regulating the economy and in providing more security for the underprivileged. These various activities extended to Missouri which received at least temporary benefits. However, the natural conservative nature of Missouri farmers resulted in somewhat less important developments than in many other states.

Conditions During and Following World War II

While in many ways the country had made substantial advances under the New Deal, the opening of World War II spurred the activities of industry and agriculture to such an extent that many of the prewar pro-
N. H. Gentry, of Sedalia, one of the best known breeders of Berkshire hogs in the country. His herd became the source of blood for almost all other Berkshire breeders. He was a splendid gentleman as well as an excellent hog breeder.

grams were forgotten. The patriotism of the people, along with the organization of industry and agriculture stimulated men and women to great efforts.

War and Agricultural Activities

The war opened in 1941 and by 1943 war materials were coming off the industrial assembly lines in large quantities. A new Selective Service Act was passed, to take care of mobilization during this war. This, with voluntary enlistments, soon brought the numbers in the armed forces to 12,000,000 men. As young men were taken from the farms, the shortage of labor on farms became severe. As in World War I, whole farm families worked in the fields or at other productive labor on the farms. However, farm machinery had made great advances and its use helped the farmers in their production efforts.

Moreover, Congress and the Director of Selective Service endeavored to keep a fair proportion of boys on the farm.

There was little increase in farm acreage during the war, but the techniques of production, developed by the Colleges of Agriculture, the U. S. Department of Agriculture and other agencies, since the first World War, had a great influence on production. Also, this war period was one of abundant rainfall in Missouri and most of the Cornbelt. As a result, agricultural production, during and immediately following the war, increased about one-third over the prewar output.

The Rise in Price Levels

As a result of the war activity, the national income rose sharply. In 1939, just before the opening of the war, it was 72 billion dollars, but by the close of the war in 1945, it had risen to 198 billions. This meant that the purchasing power of the people, from the war production activities, was much greater than the supplies provided for home use, so that consumer prices rose. As a result, the country fell back on the use of the Office of Price Stabilization (OPA), which had been set up at the beginning of the War to assist in controlling prices. The use of the provisions of this Act, along with those of the Stabilization of Cost of Living legislation and some increase in taxes, helped to keep prices pretty well in line until the end of the war when they were only 31 percent higher than in 1939, before the war opened. However, these various efforts were not sufficient to control prices indefinitely. As a result, the war boom continued into the years 1946 to 1948, when prices reached a significantly higher level. In Missouri, for instance, the price of corn at the close of the war in 1945 was $1.33 a bushel but two years later, in 1947, it was $2.24. In the same years, the price of wheat went from $1.53 to $2.23 and oats from 74 cents to $1.09 a bushel.

Total federal expenditures from 1939 to 1945 amounted to about 300 billions so that on a dollar basis, the second world war was ten times as expensive as the first. Meantime, the national debt had risen to 247 billions and the number of persons liable to income tax payments had increased greatly.

Transition to a Peace-Time Economy

The transition from a wartime to a peacetime economy following World War II proceeded under many difficulties and with some unfortunate experiences. The peace-loving character of the American people resulted in the demand for immediate demobilization of the armed forces, as soon as the war was over, so that by January,
1947, the number of men in uniform in the army, navy and air forces was greatly reduced. Moreover, as war industries shut down, or went over into the manufacture of domestic supplies, unemployment again appeared. Labor unions went on a series of strikes for higher wages and price-wage controversies developed.

By this time, President Truman was in the White House. He and the whole administration wanted to keep the OPA price controls in operation until the supply of civilian goods caught up with the demand. However, much objection was raised. It was argued by some that if these controls and restrictions were lifted and business allowed to make greater profits, the scarcities would soon disappear. Finally, Truman announced the abandonment of these price controls on industry, excepting for rents. After this, prices began a steady rise and within a comparatively short time, they had risen to a point that was higher than during the whole war period. This was the postwar period of high farm prices from 1946 to 1948. However, by 1948-9, they began to level off, only to increase again with the opening of the Korean War. It became evident that moderate inflation had come to stay and it has not decreased since.

The Postwar Boom

People had anticipated a postwar depression, following the second World War, just as had occurred following the first World War and other wars in which the United States had engaged. When a real boom developed, people did not think it could last. Actually, this boom was a continuation and expansion of the war’s economic prosperity. It was caused mainly by the pent-up demands and savings of the war years. It was accompanied by a continuation of inflationary forces which many feared might end in a collapse.

Meantime, the threat of the Soviets brought a return to large-scale defense preparations, the cold war was on and production was again booming. Soon there were very few unemployed, even with ten million service men back in civilian clothes.

Following the war and with the ending of much of the wartime legislation, surpluses continued to mount and agricultural prices began to decline. Congress then sought for some peace-time agricultural legislation that would be helpful. This, in the main, revolved around the plans to reduce acreages of basic crops and to cut down surpluses by maintaining price supports to around 90 percent of parity.

An Agricultural Act was passed in 1948, which provided for a continuation of high price supports, along with further attempts at acreage controls. This was followed by the Agricultural Act of 1949 which also provided for high but more flexible price supports under a new definition of parity.

The opening of the Korean War changed the situation considerably, but the interest of Congress still was in high price supports under the use of the modernized parity principle.

Soil Bank Emerges

The Agricultural Adjustment Act of 1954 included some of the same principles as the earlier ones, but it made it easier to provide for lower price supports through a plan of flexibility. In 1956, an act was passed providing for the so-called Soil Bank which was vetoed by President Eisenhower. However, a second one was passed in 1957 and is now in operation. It has not been very successful in controlling production which was its principal aim and it will doubtless be modified or possibly abandoned in the near future. (A more detailed discussion of these various peace-time acts is given in the Section on Economic Developments in Agriculture.)

This brief account of the developments of Missouri agriculture during the last century may deal too largely with the difficulties the farmers have encountered in reaching the conditions of the present day. In general, farmers have been at a disadvantage with industry during much of this time. Yet they have come forward rather steadily—even rapidly during recent years—in developing new ideas, new methods, and new techniques which have resulted in greatly increased production. The Midwestern States lead the world in the type of agriculture they are now following.

One can only wonder what the developments may be during the next century. If wars or very serious economic upheavals do not interfere, the developments may be just as remarkable as those of the past. However, they may be greatly different in nature. There are certain to be many new crops introduced, new developments affecting plant and animal growth, greatly improved methods of food preservation to take the place of refrigeration, and new types of foods, possibly including some of synthetic origin. One of the most important developments will doubtless be a very close relationship between agriculture and industry, the results of which cannot possibly be predicted. There may be developments in other fields which by no stretch of the imagination can be foreseen at this time, just as our forefathers of 100 years ago could not remotely imagine many of the things that were to come.
Chapter 2
The Amazing Story of Farm Mechanization

Among the revolutionary developments in Missouri agriculture during the last 100 years, that of mechanization has been most important. This has meant that not nearly so many men are needed on farms as formerly and the farm population has declined accordingly. For the United States as a whole the percent of the population on farms decreased from about 85 percent 100 years ago to 12 percent at the present time. The change is not quite so great in Missouri, but it is nearly so. This great shift of manpower from the farms to the cities and towns has made possible the great industrial developments of recent years, together with the high standard of living among the masses of the people. It is well known, too, that this small percentage of the people on farms is producing enough food, and even more than is required for the entire population.

One hundred years ago, the better farmers were using the old one-horse "double-shovel plow", as it was called, with which a man with one horse, could cultivate about three acres a day. Now, with a four-row tractor-drawn cultivator a man can cultivate 30 or more acres a day. One hundred years ago many farmers were still using the cradle for harvesting grain. One good man with such an implement could cut two or three acres in a long day, leaving it on the ground ready to be bound into sheaves and flailed out later. Today, with the usual size of combine, a man can cut and thresh, from 15 to 30 acres a day, depending on the size of the equipment. In general, it can be said that taking all farm activities together, the farm output per man has tripled since 1910.

Another interesting development is in the use of electricity on farms, which has increased 1200 percent in the last 20 years with a total use of electric current equaling 21,000,000,000 kilowatt hours. These are striking examples of the changes which have taken place in the last 100 years. These amazing developments have, of course, been brought about only through large farm expenditures. The value of the operating equipment on the farms of the country today is estimated at about 16 billion dollars. In spite of these large expenditures, however, the production cost per unit of the crops produced has been much reduced. This is the principal reason the farm-
ers are willing to make such expenditures for equipment.

The Three Eras of Missouri Agriculture

Broadly speaking American agriculture has developed through three eras—those of manpower, horsepower, and mechanical power. However, 100 years ago the era of manpower was practically over in Missouri. To be sure there were farmers still using the cradle and the scythe for cutting grain and hay, but horses and mules or sometimes oxen, were used for preparing the ground and cultivating crops. The real hardwork was so much limited by the middle of the 1850s, when this account begins, that it need not be considered.

The Horse-Power Era

The real horse power era began in Missouri about Civil War times when grain and hay harvesting machinery was coming into general use. Of course, some small farmers continued to use the cradle and the scythe until the seventies and a few thereafter, especially in the rougher parts of the state. However, most farmers were beginning to rely on the more modern methods of grain and hay harvesting. (For those interested in a rather complete story of the development of farm machinery, see Missouri Experiment Station Bulletin 596 C.)

Horse-Power Grain Harvesters

The early grain harvester included a cutter bar, with a platform behind, on which the grain was collected, and then it was raked off in sheaf-size bunches, by a man accompanying the machine. Later, a machine was developed by a man by the name of Hussey and a somewhat similar one by McCormick. These had cutter bars with triangular and serrated-edge knives, oscillating through guards which pointed into the grain. McCormick and some other men soon developed overhead rakes that could be lowered and swept across the platform to remove the piles of grain, the size of sheaves, which were then bound with straw bands by men following. These were known as self-rake reapers, a practical type of machine, which was used extensively all over the country until the self binder came in.

The first binders were machines with a revolving canvas web which elevated the grain from the cutter bar, bringing it over the drive wheel in the center of the machine and delivering it to a side platform where two men stood to bind it into sheaves. The most important of these was the Marsh harvester. A device was then introduced on these harvesters which wrapped a fine wire around sheaf-sized bundles of grain, as they came to the platform, twisted the wire into a knot, and dropped the bundles to the ground. This was known as the wire binder. However, farmers objected to the wire in the straw and it was soon replaced by twine. Twine, of course, could not be used until a tying device was perfected. Several men worked on this but the real credit goes to a man named Appleby, whose invention was finally used on all binders, and made this type of harvester practical and very popular.

The twin binder, first put out in quantities by a man named Deering, came on the market in the 1870s and became common in Missouri in the 1880s. This machine and others similar to it, continued in use from the 1880s until the 1930s, when the tractor-drawn combine came in. The binder still is used by some farmers, mainly on small farms, where the soil is fertile enough to grow small grain. One may yet see wheat or oats in shocks in these areas often occupied by farmers of German descent. It can be said, therefore, that the binder has been in use on farms in some parts of Missouri for over 70 years. This original horse-drawn machine has extended far into the mechanical age, and in the few regions where it is used today, it is usually tractor-drawn.

Corn Harvesting Machines

Corn harvesting machines were introduced during the latter part of the horse power era. The first was a one-horse sled with backward sloping knives, on either side, each of which cut a row of corn. Two men, riding on the sled, gathered the cut stalks from a row and deposited them in piles behind the sled. This was a dangerous implement which never proved popular and just before the close of this era a corn binder came into use. This machine, powered by a team of two or three horses, cut one row at a time and tied the cut stalks into bundles. These were placed in shocks for curing and the ears were
later husked out by hand. This machine continued in use into the tractor era.

**Threshing Machines**

Before the horse power era, the small grains were threshed by beating out the grain with *flails*, or by tramping it out with horses or oxen. However, in the first quarter of the 19th century simple threshers were devised and used. Such a thresher consisted of a steel cylinder, bearing steel teeth about three inches long, which ran between somewhat similar teeth set in a concave steel plate. These were at first driven by a horse treadmill and later by a sweep-power device, powered by one or more teams of horses which walked round and round in a circle, and drove a steel shaft connected to the thresher. Later, sieves and a fan were added to the thresher which then completely separated the grain from the chaff and straw.

The large portable thresher, provided with sieves, fan, and straw stacker, came into Missouri in the 1890s. This was driven by what was known as a *traction engine*, powered by steam, which not only drove the thresher but pulled it from farm to farm. This was in use in Missouri until the combines came in with the mechanical era.

**Horse-Drawn Haying Machinery**

The horse-drawn haying machinery came in with the mowing machine that supplanted the scythe. This was perfected about the same time as the reaping machines. It first had a cutter bar 5 feet long, later replaced by those of 6 feet. These were very efficient horse power machines that continued with little change into the tractor era.

Along with the early mowing machine, the dump hay rake was introduced, which made windrows of the hay after it was cured. The hay was then piled into shocks or it was pitched onto wagons by men with pitchforks and hauled to the barn or stack. In other cases, the hay in these windrows was gathered by so-called "buck rakes" and moved to stacks or ricks, in the field. At first, men pitched the hay onto the stacks but later came the field stacker, by which the hay was elevated by horse power. A little later the hay tedder was introduced, a twowheeled machine looking somewhat like the sulky rake, which stirred the hay in the swath to hasten drying.

Following the dump rake came the side delivery type which rolled the hay or the swath to one side, into a long continuous windrow. A little earlier, hay loaders had been introduced which were hitched behind a hay wagon to rake up the hay and elevate it to the wagon rack. There were two types of these, the swath loader and the windrow loader, both of which continued in use far into the mechanical age. Some are still in use. The hay balers, which came in about the same time as the hay loaders, were first powered by the use of horses and later by the tractor, as they entered the mechanical age.

**Horse-Drawn Tillage and Seeding Machinery**

The horse-drawn tillage machinery that appeared in Missouri following the advent of the steel plow, included the steel, spike-tooth drag harrow, which took the place of the old wooden A harrow, the steel roller, which succeeded the old log roller, the disk and cutaway harrows, the spring-tooth harrow, and the two-horse corn cultivator. All were in wide use in Missouri for a long period, from the 1890s to the advent of the tractor. Improvements were of course made in these, but they remained much the same until the mechanical era opened.

Along with the horse-drawn tillage implements, the various seeding machines were introduced. First, there was the one-row horse-drawn planter for putting in corn in the Central states and cotton in the South. Later came the two-row corn planters which were used for many years. These were followed by the grain drills which placed the wheat, barley or rye in drills about eight inches apart. These had a width of five to seven feet and with a good team, 10 to 12 acres could be covered in day. Later, a small hopper was added for broadcasting grass or clover seed at the time the small grain was sown. Later still, a large hopper was added for distributing fertilizer in the drills. This is the type of drill that was continued into the mechanical age, and these, mostly of large sizes, are still in use. It should be said that in the horse power era, usually oats was seeded with a broadcast seeder attached to a wagon and much of it is still seeded in that way. However, more farmers have been drilling oats in recent years.

**The Mechanical Era**

As has been indicated, the most remarkable developments in farm mechanization have been the more recent ones. During the last 25 years we have been in a very rapidly advancing mechanical agricultural era which has had a tremendous influence on the whole country, among country people and city people too.

The most far-reaching mechanical development during this period has been the widespread use of the general purpose farm tractor. The earlier tractors had been built for special purposes and they were limited in their usefulness. The general purpose tractor, especially after it was provided with rubber tires, was a real innovation. It could be handled almost as easily as an automobile and it would pull almost all of the regular types of machinery. However, there are some tractors, even today, which are built for special uses, sometimes as a part of the machine they propel.

The State Board of Agriculture reported 7200 tractors in Missouri in 1919. In 1930, the Census reported that there were about 25,000. In 1950, the number reported was 124,000 and in 1955 it was 148,000. This is an in-
crease of almost six times in about a 25 year period, 1930 to 1955.

Influence of the Tractor on Horse and Mule Power

One of the great changes in Missouri agriculture, as the result of mechanical power, was the decline in numbers of horses and mules. In 1900 the Census reported the number of these animals as 1,150,995. In 1950, it was down to 326,473 and in 1954, to 125,495. These are most remarkable figures. There are very many farms in Missouri today without a single draft animal on them. But this is not all. This decline in the numbers of these animals has released close to 20,000,000 acres of land, which formerly grew horse and mule feed but which is now used for food crops, or for meat and dairy production. This in itself has made a most interesting change in our agriculture.

Recent Developments in Tillage and Planting Machinery

Among the developments in tillage implements, the riding breaking plow with a single bottom had come in by the end of the horse power era. With the advent of the tractor these plows increased in size to two and three bottom types, which, with the extra speed of the general purpose tractors made possible a great increase in the rate of plowing. Now, a farmer may take advantage of an early period of fairly dry weather and run his plow night and day, if necessary. Such rapid work often makes the difference between a well prepared and a poorly prepared seedbed, or between a good and a poor crop.

The modern machines for seedbed preparation are larger and cover more ground than the horsepower type. There are also new designs such as the sub-surface or field cultivators which run rather deeply but leave crop stubble or other trash on the surface. These are now used over very large areas on the semi-arid wheat lands of the plains and to a certain extent in Missouri. Then there are the wide single and double disk harrows, the very wide steel-drag harrows and other large implements for preparing seedbeds.

In the case of corn planters, the four-row type is in use on many rather level farms, and there are the wide grain drills and other machines for covering the ground rapidly. All of these are, of course, tractor propelled. Among cultivators, are the two and four row corn cultivators and others which have the tractor fitted to the im-

![Graph showing the increase in the numbers of tractors in the country and the comparative decrease in the numbers of horses and mules, between 1910 and 1952. (Farm Implement News)
A combine now in general use for harvesting practically all Missouri small grain.

Recent Developments in Harvesting Machinery

Probably the most important of the modern farm machines is the combine, made in many designs for harvesting small grain, soybeans, or sorghums, various legumes and more recently, the corn crop. This machine has had a powerful influence in changing our agriculture. It cuts, gathers, and threshes the grain or other seed crop at one operation. Compare this with the old plan of cutting grain with a sickle, or cradle, binding it into sheaves by hand, shocking it to cure, then flailing it out and winnowing it in the breeze. Compare it even with the use of the horse-drawn binder and the large steam-driven portable threshing machine. There was a lot of interest, even glamour, in the selfbinder harvests and the big threshing bees when the farmers of a neighborhood got together for threshing. The big dinners that went with these were highlights of the year. But the combines are faster, the cost per bushel of grain or other seed is less, and they are evidently here to stay. It is really amazing how combines are now used for harvesting all the important grain and seed crops.

The Corn Combine (Picker-Sheller)

It had been thought, until rather recently, that a corn combine would not be practical. The corn picker has been a great success, but to build a machine which would pick and shell corn at one operation had seemed impracticable. This seemed true not only because of mechanical difficulties, but because of the amount of moisture in corn when it is usually harvested. However, the corn combine was perfected mechanically a few years ago, and much improvement has been made in drying equipment on farms. It seems evident, therefore, that the corn combine is here to stay. It is amazing to see one of these combines at work, picking the ears from the stalks, shelling the corn from the cobs and delivering it to the receiving box or wagon. This seems almost the last word in combine construction and performance.

Forage Crop Harvesters

Some of the most revolutionary developments in farm machinery are those having to do with harvesting field forages. These machines for field cutting and chopping of corn, small grain and hays, all while still green, are now in wide use. The advent of the trench silo has stimulated the interest in them. Two men can harvest, chop and place such chopped forages in these silos at a very rapid rate. Sometimes, too, these forages are cut and chopped in the field and fed directly to animals in the green state, without putting them in a silo. It is difficult to say just how far these methods of handling forages may go in affecting the future of Missouri agriculture, but this may be a most important development.

Modern Hay Balers

The development in the design of hay balers is most interesting. The early balers were driven by horse power and the hay was forked into the baler from the buck rake or the wagon. The hay was pressed into tight, oblong bales and bound with baling wire for storage. Later when the gas engine provided the power, the rate and efficiency of the baling operation was improved, and it has been widely used for many years throughout the Cornbelt.

Today, many new types of field balers have appeared.
which pick up the hay from the windrow as the tractor-drawn machine moves across the field, dropping the bales on the ground or placing them on a wagon, to be hauled at once to the barn or shed for storage. With amazing rapidity these compact and powerful machines transfer the hay from the open field to the storage buildings.

Most balers still make the oblong square-end bales, but there are others which roll and the hay into rolls. Such rolls have some advantages in feeding the hay, and they dry out better should the hay be baled a little too damp. They, of course, take somewhat more space in storage.

Recent Developments

New types of agricultural machinery are constantly appearing. In fact, it is almost impossible for anyone excepting the men directly associated with farm machinery to keep abreast of the developments.

The forage harvesters have been mentioned, but they are constantly appearing in new designs. Some of these are compact and rather small with a provision for attaching a wagon which allows for a quick change.

The large land-leveling equipment which recently has appeared is designed for preparing the land for irrigation and better handling of crops. These are quite efficient.

The development in spraying equipment is phenomenal. This has been developed not only for spraying orchards, but for controlling crop insects and diseases, as well as for weed control. These are designed for spraying individual rows of crops or for broadcasting the spray in very wide strips. Equipment for spraying by airplane has also reached a high stage of development.

The present-day earth movers, as well as the bulldozers, are of much use on many farms, although these are usually operated by custom contractors. Great advances have also been made in terracing equipment. The manure loaders now on the market are of much value where large amounts of manure accumulate around barns, sheds, or feeding lots.

The cotton picker, which many thought would not be adapted to Missouri cotton farms, is now in use over much of the cotton lands of Southeast Missouri. This is a tremendous change from the historic methods of hand-picking which had come down through the years.

There have been changes in the plans and construction of farm buildings to provide for greater efficiency, and there have been modifications in building arrangement to cut down the steps in doing chores. All of these make for the saving of labor which is the real aim of all the modern developments in the mechanization of farms.

Recent Developments in Farm Appliances

The development of many smaller devices to be used around the house and barn is almost as revolutionary as that of field machinery. Much of this has been the result of the great advance in rural electrification. Around the farm buildings are modern electric motor-driven pumps, feed grinders and milking machines. In the better farm homes, electricity makes possible the household appliances of the modern city residences. The so-called deep freeze equipment has made a great change on the many farms where it is used. To a large extent, it now supplants the older and more laborious methods of preserving and canning meats, fruits and vegetables.

Farm Mechanization Does Not Reach All Farmers Alike

It should not be understood, from what has been said, that the development of farm mechanization and farm appliances has influenced all farmers alike. There are some farmers, mostly on the smaller farms, who still use horse power for farm operations. Some rent tractor drawn farm machines to do a part of their field work. Others cooperate in purchasing and using such equipment. Most of these small farmers cannot afford to buy all the home conveniences they would like and some have none. There is, therefore, a great variation among farmers in the use of farm equipment and household appliances.

The more recent figures show that 93.5 percent of Missouri farmers have electric current in the house and about the same number have radios. However, only 52.2 percent have telephones, and only 41.1 percent have running water. It is interesting to know that 31.4 percent have television sets and 25.3 percent have the deep freezers. On the whole, Missouri farmers are well advanced in the use of mechanical power on their farms, but somewhat less advanced in appliances for their homes.

<table>
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<tr>
<th>OUTPUT PER MAN-HOUR RISES</th>
<th>PRODUCTION PER MAN-HOUR</th>
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<tr>
<td>MEAT ANIMALS</td>
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<td>25%</td>
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<tr>
<td>MILK COWS</td>
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<td>1910-56</td>
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<tr>
<td>106%</td>
<td>1940-56</td>
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<tr>
<td>POULTRY</td>
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<tr>
<td>137%</td>
<td>349%</td>
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<tr>
<td>HAY AND FORAGE</td>
<td></td>
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<tr>
<td>1910-40</td>
<td></td>
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<tr>
<td>FEED GRAINS</td>
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Graph showing the percentage increase in production per man hour in different agricultural enterprises in the United States from 1910 to 1936. Note the wide spread of the increase in this production between meat animals at 25 percent and that of feed grains at 349 percent. (From data of the U.S. Department of Agriculture)
Severe surface erosion and gullying on an unprotected slope. It will require a lot of expense to get this land back into production.

Chapter 3
Conservation of Natural Resources

There is no more fundamental conception of the farmer's relation to the future of the state than his attitude toward the conservation of its natural resources. The resources of soil, water, and wildlife are very closely related to agriculture. In fact, the conservation of these resources is largely the responsibility of the man on the land.

Soil Conservation

Missouri has been a leader in certain aspects of soil conservation and on the whole, her farmers have gone a long way in the use of soil conservation practices. That the state has not gone as far as it should is a matter for which the farmers and their leaders are largely responsible.

Data are available indicating the deterioration which has taken place in Missouri soils since they were put into cultivation a hundred years ago. These data show that during this period they have lost from 30 to 40 percent of their original organic matter and nitrogen. They have also lost around 35 percent of the amount of the readily available mineral nutrients they once contained. These losses have come about by the loss of organic matter from the surface soil through tillage and erosion, and the loss of mineral nutrients through crop removal, erosion and leaching. All of these losses must now be offset by soil treatments and by supplying abundant amounts of organic matter to the soils.

The soil deterioration which has taken place in Missouri during the last 100 years has also taken place in most other Cornbelt states. In the states farther east where torrential rains are less frequent, with smaller amounts of erosion, and where older, more stable systems of agriculture are followed, the losses have not been so great. On the other hand, in the states to the southwest of Missouri, erosion has been more severe and surface soil losses have in most cases been much more serious.

Work of the College of Agriculture

The efforts toward soil conservation in Missouri began a good many years ago. Some of the men who spoke at the early Farmers Institutes, as far back as the 1890s, were advocating soil improvement measures. The Missouri College of Agriculture published its first bulletin dealing with soil improvement in 1896, entitled “Manures and Fertilizer” by H. J. Waters. The first Experiment Station Circular on this subject was one entitled “The Principles of Maintaining Soil Fertility” by M. F. Miller, in 1910. This was followed by one on the Fertility of the Soil, in 1914, and another on the Control of Soil Washing in 1915. Meantime other publications dealing with the results of soil experiments on some of the outlying experiment fields began to appear. In the 1920s several others came out and from that time forward a great many were published.

It is of interest to know that including all experiment station publications dealing with various aspects of soil science, soil improvement, soil conservation and soil treatments, a total of 147 have appeared to date. These do not include the yearly reports made on fertilizer in-
These numerous publications show that the College of Agriculture has made a large contribution to soils information in its regular bulletins and circulars, in addition to scores of articles by staff members written for scientific journals. Great numbers of newspaper articles have been written by members of the station and extension staffs, and these have multiplied with the years.

In 1917, the Missouri Station began the first measurements ever made in this country of runoff and soil erosion, under different cropping systems. The results of these measurements showed average annual soil losses from a medium slope, during a period of years, of approximately 20 tons per acre under continuous corn, 10 tons under continuous wheat and less than 3 tons for a good crop rotation system. At the same time, the loss under continuous grass was only 1/3 of a ton per acre.

These were remarkable figures. They were published in Research Bulletin 63 in 1923 and were used around the world. This same general plan of measurement was adopted by H. H. Bennett in charge of the soil conservation experiment farms, established throughout the country in the late 1920s. Missouri can therefore be said to have made an outstanding contribution to the knowledge of erosion and water losses.

The accomplishments of Missouri people in the matter of soil improvement and soil conservation would take much space to recount. However, some of the more salient features may be listed.

**Agencies Which Have Worked Toward Soil Improvement and Conservation.**

The agencies which have been assisting farmers in proper soil management practices are federal, state, and local. In some cases interested commercial concerns have assisted.

The principal federal action agencies are the Agricultural Conservation Program (ACP), the Soil Conservation Service (SCS) and the Farmers Home Administration (FHA); all of which are in the U. S. Department of Agriculture.

The work of the ACP has been far reaching in Missouri. The money paid to farmers in connection with its various soil conservation practices, has been totalling between seven and eight million dollars annually, during recent years, with around 58,000 farmers participating. This is among the top three in the cooperating states. In 1955, Missouri stood at the top in connection with the seven soil conservation practices sponsored by this agency.

The work of the Soil Conservation Service in Missouri has not been as far reaching as in many other states. However, it is assisting many farmers. The number of cooperating districts is now 33, and the number is increasing. The number of farmers who were working on soil conserving farm plans under this program in 1957 totalled 12,600. The Farmers Home Administration has served large numbers of war veterans, along with other farmers, a total of approximately 100,000 in the state. It has provided loans to participants and given them constant advice and direction in farm management, including work in soil improvement and conservation.

It will be seen that the number of farmers cooperating with these three federal agencies is very large. Of course, there are some duplicates in these lists, but the total number of individuals is high.

Among the state agencies which have worked with farmers in soil improvement and soil conservation programs are of course the College of Agriculture, which is by far the more important, and the State Conservation Commission which makes a considerable contribution.

Reference has already been made to the large numbers of publications going out from the College of Agriculture, both from the Experiment Station and the Agricultural Extension Service. These have had a great influence in developing, among farmers, new techniques and practices dealing with improved soil management. In addition the Agricultural Extension Service has been continually contacting farmers, through farm visits, office calls, meetings and tours, as well as through the press, radio and television, regarding improved soil management practices.

The teachers of vocational agriculture in about 275 high schools of the state have had a wide influence in bringing the ideas of better soil management to the farmers. The farm projects of their pupils and the adult education classes among farmers, including the on-the-
farm courses for war veterans, have had an important effect. Finally there is the local cooperating agency, the County Court, which by state law is directed to put money into the support of agricultural extension work. Some of this, of course, has gone into soil improvement and conservation.

As a result of all these activities much has been accomplished in the application of lime and fertilizers, terracing, contour farming, the use of green manure crops and other practices of better soil management. The accompanying tables show the amounts of lime and fertilizer applied during recent years, the amount of land terraced and the acreages farmed on the contour. Figures are not given which have to do with Missouri’s acreage of legumes grown in the state during recent times, but for the last half dozen years, this has been around 14,000,000 acres. Of course, much of this is lespedeza pasture.

The Use of Lime

The increase in the amount of limestone used during the last 20 years is astounding. This is largely due to the payments allowed for liming by the ACP and to the recommendations made by county agents. The decreased farm income during recent years has cut down the amount of lime applied. The increased use of fertilizer shows too that some of the money formerly used on liming has gone into the use of quick acting fertilizers. There are doubtless other reasons for this lessened use but these are important ones.

The Use of Commercial Fertilizer

The amounts of fertilizer used in Missouri for the last 30 years are shown in the accompanying table. This increase in fertilizer use is one of the most astounding of the soil improvement developments. It will be noted that beginning with the year 1918, the amount of fertilizer used in the state was only 66,274 tons while in 1956 it was 785,949 tons. In other words, the increase in its use during this 38 year period has been over 1000 percent. But this is not all. During this same period the percentage of plant nutrients in the fertilizers has approximately doubled, so that the amount of plant nutrients applied has increased over 2000 percent. These figures are almost unbelievable.

Formerly the tonnage of fertilizer used from year to year was determined largely by crop prices. When these prices were high, an application of fertilizer would pay a much higher percent on the money invested in it than when they were low. This was the main reason for the variations in yearly use during earlier years. The very low tonnage during the hard times of the early thirties were due to the low farm prices at that time. However, as prices have gone up and remained comparatively high, during recent years, fertilizer usage has remained high.

### YEARLY TONNAGE OF FERTILIZERS USED IN MISSOURI FROM 1918 TO 1956

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<td>26,572</td>
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<td>763,276</td>
</tr>
<tr>
<td>1934</td>
<td>46,873</td>
<td>1954</td>
<td>971,375</td>
</tr>
<tr>
<td>1935</td>
<td>33,913</td>
<td>1955</td>
<td>1,681,989</td>
</tr>
<tr>
<td>1936</td>
<td>47,688</td>
<td>1956</td>
<td>771,556</td>
</tr>
<tr>
<td>1937</td>
<td>67,129</td>
<td>1957</td>
<td>785,949</td>
</tr>
</tbody>
</table>

### ANNUAL TERRACING AND CONTOURING, 1946 TO 1956

<table>
<thead>
<tr>
<th>Year</th>
<th>Miles</th>
<th>Acres</th>
<th>Outlets Installed Annually</th>
<th>Acres Contoured Annually</th>
<th>Farm Ponds Installed Annually</th>
</tr>
</thead>
<tbody>
<tr>
<td>1946</td>
<td>3,392</td>
<td>63,040</td>
<td>2,903</td>
<td>204,628</td>
<td>807,329</td>
</tr>
<tr>
<td>1947</td>
<td>2,944</td>
<td>58,192</td>
<td>3,008</td>
<td>85,013</td>
<td>739,556</td>
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<tr>
<td>1948</td>
<td>3,355</td>
<td>58,621</td>
<td>3,567</td>
<td>301,154</td>
<td>759,412</td>
</tr>
<tr>
<td>1949</td>
<td>3,199</td>
<td>68,742</td>
<td>3,268</td>
<td>328,543</td>
<td>584,013</td>
</tr>
<tr>
<td>1950</td>
<td>3,324</td>
<td>69,330</td>
<td>3,344</td>
<td>499,014</td>
<td>629,458</td>
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<td>1951</td>
<td>3,021</td>
<td>64,490</td>
<td>2,340</td>
<td>331,028</td>
<td>660,877</td>
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<tr>
<td>1952</td>
<td>2,505</td>
<td>46,873</td>
<td>2,277</td>
<td>339,681</td>
<td>548,399</td>
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<tr>
<td>1953</td>
<td>1,686</td>
<td>40,277</td>
<td>1,718</td>
<td>412,655</td>
<td>757,961</td>
</tr>
<tr>
<td>1954</td>
<td>1,989</td>
<td>44,199</td>
<td>1,768</td>
<td>394,894</td>
<td>753,008</td>
</tr>
<tr>
<td>1955</td>
<td>2,735</td>
<td>57,590</td>
<td>2,323</td>
<td>440,387</td>
<td>478,490</td>
</tr>
<tr>
<td>1956</td>
<td>2,495</td>
<td>58,730</td>
<td>2,462</td>
<td>510,761</td>
<td>567,117</td>
</tr>
<tr>
<td>Total</td>
<td>30,824</td>
<td>630,004</td>
<td>28,887</td>
<td>9,902</td>
<td>78,178</td>
</tr>
</tbody>
</table>
Moreover, farmers have learned how to use fertilizers with greater efficiency and fertilizer use has remained very profitable.

**Soil Testing Laboratories**

One of the principal reasons for the continued profit from fertilizers is the use farmers are making of the county soil testing laboratories, over 100 of which are now in operation. This has been a remarkable development. Thousands of farmers are having their soils tested and they are applying fertilizer according to the needs of their soils, as shown by the tests. Missouri now stands at the top in the percentage of counties having soil testing laboratories. The way in which farmers are depending on them for determining the amounts of lime and other plant nutrients to apply has given a great impetus to soil improvement in the state. In 1936, the laboratories reported, 112,000 farmers made use of these tests which represented approximately 1,775,000 acres of land. Through the use of all the good systems of soil management, yields of corn have reached 100 bushels and more on many farms, while greatly increased yields of other crops have followed.

**Work of the State Conservation Commission**

The State Conservation Commission, an agency already mentioned, is interested in soil improvement and conservation. While the principal conservation activities of the commission are in forests and wildlife, the field workers with this organization realize that soil and wildlife production are correlated. The commission reports that the size and numbers of the animals on good soil areas are larger than on poor soil areas. The commission, through its field personnel, works with farmers, to inter-

An example of terraces which are now in use by many Missouri farmers. (Courtesy Soil Conservation Service.)
Missouri farm pond. Missouri has more farm ponds than any other state. Under the stimulus of the College of Agriculture and the State Conservation Commission the numbers have increased greatly during the past 15 years.

est them in soil improvement and conservation. The commission is also very much interested in forest conservation and it is making real progress in keeping down forest fires and in general forest improvement.

Water Conservation in Relation to Agriculture

Missouri lies in a position in which water control is a most important consideration. The Mississippi River borders the state on the east, the Missouri River forms the northern third of its west boundary and many other streams—some of large size—flow into them within the state. Separately and together they give rise to many discussions regarding water control. Few other states have as many large dams and impounding reservoirs, most of which have been built for flood control. Vast systems of levees primarily along the two major streams are designed to protect farm lands from the overflows, which are frequent.

The water control and conservation practices on farms have been extended rather widely. In general these may be listed as contour farming, terracing, the use of plant covers, and keeping the soil in a condition to absorb the rain as it falls.

Contour farming is now used on a little over 1,000,000 acres of Missouri land as shown in the table on page 30. When land is plowed, planted and cultivated across the slopes, as is common under contour farming, much more of the water enters. In the case of terracing the surface water is caught in the terrace channels where it is slowly moved to lower levels so that more of it goes into the soil. The total miles of terracing in the state is approximately 30,000 representing something over 630,000 acres.

A type of water control, as well as erosion control, known as strip cropping, which is used to a considerable extent in a few other states, is used some in Northwest Missouri, but it has never been adopted widely in the state.

The use and control of water for irrigation has not yet been developed widely. However, irrigation has been on the increase during the recent dry years. The farmers depend on flowing streams, wells and to a small extent on large ponds or lakes. Though Missouri farmers in the last 22 years have built 118,000 ponds averaging one-third acre in size, little has been done to conserve water in quantities sufficient for irrigation.

In general, it can be said that the state of Missouri has no official water control plan. A bill setting up a committee to prepare material which should go into a law on this subject has been under consideration by the legislature. As industrial plants multiply in the state, water conservation for industry is becoming more important and something must be done about it. As time goes on, industry and agriculture will be competing for usable water and any laws which are formulated must consider both.

Much Yet To Be Done

While Missouri has made very good progress in the matter of soil improvement and conservation through the years, there is still a long way to go, particularly in certain aspects of this work. In the first place, soil conservation usually requires a satisfactory cropping system, but such have not been adopted by most farmers. It is true that with recent developments, cropping systems have been changing and new ones have been coming in. However, few systems have been widely adopted with the exception of the one year rotations of small grain and lespedeza. It will doubtless be many years before satisfactory systems for the different soil areas and types of farming have been widely adopted.

In the second place, while the number of farmers
A county soil-testing laboratory. There are now over 100 of these in Missouri and farmers are making wide use of them.

Making use of the soil testing laboratories seemed large in 1956, it was only 55 percent of the total.

In the third place, the amount of cropped land terraced up to 1956 was 3 1/2 percent of the total or about one acre in thirty. Of course not all land needs terracing, but at least half of it does. On this basis the amount terraced would be one acre in fifteen needing it. In the case of contouring, about 6 percent of the cropped land was so handled in 1956, or one acre in sixteen. If one-half needs contouring, then about one acre in eight needing it was contoured.

In the fourth place, the soil treatments average much below what they should if land is to receive the optimum amounts. The amount of lime used in recent years was about 2,000,000 tons annually for the state. This was 0.11 of a ton per acre of cropped land. However, lime is usually applied about once in six years at the rate of two to three tons per acre. With applications averaging only 0.11 of a ton annually, this would be but 2/3 of a ton in six years, an amount between a third and a half the usual application.

In spite of the large increase in the use of fertilizers, the amount applied in the state in 1957 averaged around 90 pounds per acre. The optimum amount should be at least double that. In general, the amount of lime now being applied is only about one-third to one-half, and the amount of fertilizer only about one-half, of that which should be used.

It must of course be remembered that only the best farmers follow anything like complete systems of soil improvement and conservation. While no survey has been made which shows how many are in this class, it is probably safe to estimate the number as not over one-fourth of the total. Then there is another group that may be estimated at one-fourth, which follows most of the improved methods. Another group in which the farmers are still less efficient probably makes up another fourth. Finally, there is the fourth in which farmers use but a few, or even none, of the improved soil management practices.

The first and second groups are mainly the larger farmers who farm most of the land in the state. The third and fourth groups handle a fair amount of the land, but most of the smaller farmers are found in these two groups.

It is, of course, difficult to predict what the future holds regarding soil and water conservation practices. While Missouri farmers have made much progress, there are still many who are doing very little in this regard. Nevertheless, there seems to be reason for real optimism for the years ahead.

Graph showing the amount of land contoured and the amount on which terraces have been installed each year from 1946 to 1956.
Chapter 4

Development of Education Affecting Farmers

Most of the developments in agriculture during the last century may be attributed to better education among farm people. Little progress could have been made through the years if farmers had been limited to the small amount of education they had 100 years ago. Of course, education, both general and agricultural, among farm people was slow in developing and it was not until the later years of the 19th century that it got well under way. The real results in Missouri have therefore come with the general educational developments following the opening of the 20th century.

Public Schools

As early as 1853 a law was passed by the Missouri Legislature setting apart 25 percent of the state's general revenue for the use of schools. However, during most of the Civil War years the state was unable to meet its obligations in this respect. It must be remembered that there were no high schools, as such, in those days and the pupils in the rural schools often continued in attendance until they were 18 or 19 years old. However, in Missouri, as in most other states, these schools had men teachers and the courses taught were strong in the three Rs so that these pupils received a pretty good elementary working background. In some of these schools too, with no high schools available, they actually trained teachers for similar schools. Pupils would sometimes continue in school until they could pass a county examination for a teachers' certificate. In such cases, the courses taken might include higher arithmetic, higher algebra, civil government and even a simple course in psychology.

Agriculture in the Public Schools

In spite of the rather advanced work given in the better rural schools of 75 years ago, nothing was given in elementary agriculture until near the end of the century when simple instruction in this field was undertaken in some of the states farther east. However, an interest began to develop in Missouri schools soon after 1900. Mrs. M. T. Harvey, a teacher in the Northeast Missouri State Teachers College at Kirksville, began to instruct some of her students in simple agricultural and nature-study subjects. Her work was given rather wide publicity, and as a result, some of the rural teachers began such instruction in the rural schools as early as 1905. A more definite development began later (about 1930) when agriculture proper was recommended by the state superintendent of schools as a part of the rural school curriculum, to be given in the seventh or eighth grades. It has been given in these grades in many rural schools since that time and it has recently been recommended for the town and city schools.

The State Board of Agriculture

The State Board of Agriculture organized in 1864 had much influence in stimulating an interest in agricultural education in the early days. It was established for the general benefit of the state's agriculture and as early as 1883, the board was telling farmers that "the age of farming without a book had gone by." The board had much influence on farmers and while it was somewhat critical of the early work of the College of Agriculture, it was later of much help.
Agricultural Institutes

The educational activities of the State Board of Agriculture consisted of agricultural meetings, the publication of reports and bulletins for the benefit of farmers and the development of what were then known as Farmers' Institutes. These institutes were in the nature of one or two day farmers' meetings held throughout the state, usually at the county seats or towns of similar size. They were inaugurated in 1883, the first one having been held at Higginsville. The first state appropriation was made for their support in 1891 and continued until 1933 when they were abandoned. In the earliest days, the lecturers at these institutes were well informed farmers who had the ability to speak and who lectured on various agricultural subjects, usually two men travelling together to hold the meetings. Beginning soon after 1900, men from the College of Agriculture gave much time to lecturing at these institutes, continuing until the Agricultural Extension Service was organized in 1914.

One of the best known lecturers at these and other meetings of the Board of Agriculture was Sam Jordan. He was a retired school teacher and farmer, with an Abraham Lincoln type of country philosophy, a natural wit and an eloquence in speaking, which made him very popular with his audiences. During his prime as a lecturer, he probably knew more, or was known by more Missouri farmers, than any other man in the state.

Many well-known men were members of the Board through the years. Probably the most widely known in the early days was Norman J. Colman of St. Louis, Editor of Colman's Rural World. He became a member of the board when it was organized; and, during his career, he served as Lieutenant Governor of the State and was the first national Secretary of Agriculture. Another was John F. Case, who was president of the board for twelve years. He was editor of the Missouri Ruralist for over 40 years and held many important offices on state commissions and committees. He was a remarkable man and was very helpful to the board and to Missouri agriculture during his long service as board president and as editor of an important farm paper.

The deans of the College of Agriculture were, by law, ex officio members of the board and attended all meetings. The two who served during the time when the board was most active were H. J. Waters and F. B. Mumford. There were many other prominent men who were board members during the years and who made real contributions in connection with the board's activities. One of these was George B. Ellis who served as secretary in the early 1900s. Mr. Ellis was wise in the ways of country people, progressive and able. He contributed much to Missouri agriculture in those early days.

Probably the most colorful individual ever connected with the board was Jewell Mayes, of Richmond, who was its secretary for many years. He was exceedingly active and very resourceful, with a great interest in the work of the board and in agriculture of the state. He accomplished very much for Missouri agriculture during his career, continuing in office through different state political administrations.

Beginning about 1910, a number of agricultural trains were organized, with the Board of Agriculture and the College of Agriculture cooperating with the railroads. These were agricultural specials consisting of lecture and exhibit cars which were run over several lines. They drew large crowds at the stations where they were scheduled to stop and were given much publicity. In 1911, these trains covered 2,600 miles in the state and the agricultural lecturers in the cars reached 107,000 people.

The State Board of Agriculture continued with very active and fruitful services until it was replaced by the State Department of Agriculture, under a Commissioner in 1933. After the Board was discontinued and the Department was organized, this agency no longer engaged in educational activities, excepting in the case of the State Fair and some county fairs. It's time is given to overall agricultural problems and to regulatory matters, such as administering the laws dealing with commercially-handled feeds, seeds and eggs, directing the state's veterinary service, and work of the state dairy division, the state entomologist and the division of marketing.
Following the second World War, Congress provided for special agricultural instruction to be given returned war veterans on farms. Special teachers were hired, mostly graduates of the College of Agriculture who were farming in different communities and who gave this instruction. Some of these courses are still in operation. The College of Agriculture handled some of these, but most of them were carried on through the teachers of vocational agriculture throughout the State. The total number of these young farmers reached by the teachers of vocational agriculture was approximately 45,000 and by the University about 6000. In 1950 there were 220,000 Missouri farms and this program had reached over 20 percent of them.

**Work of the College of Agriculture**

The College of Agriculture and Mechanic Arts was organized as two units, within the University, the College of Agriculture and the College of Engineering in the early 1870s. It required a good many years, however, for the College of Agriculture to have an effect on the agriculture of the state. There was at first a great controversy as to its location. This was settled by the people of Columbia and Boone County who contributed $60,000 for the purchase of a farm at the edge of the town and an additional $30,000 for buildings, livestock and equipment. Later the legislature made small appropriations which provided for its earlier years.

In the development of the College, there were a good many years of trouble and disagreement for the early administrators. In its formative stages, too, the State Board of Agriculture, which had been somewhat instrumental in securing its establishment, assumed considerable authority over its management. There were other troubles of a political nature so that during the first twenty years of its existence it had many problems.

Some years ago when J. W. Sanborn, an early dean of the College, visited the University and was shown the experiment field he had established in 1888, now known as Sanborn Field, he showed little interest in the work in progress. He preferred rather to talk about the political and other troubles he had as dean during the years 1882 to 1889.

**Agriculture in the High Schools**

Agriculture was introduced into the high schools of Missouri under a law passed by the Legislature in 1910. The first agricultural publication issued for use in these high schools was a small one of 65 pages, entitled *A Unit In Agriculture*, by Professor J. D. Elliff, published in 1910. Elliff was professor of high school administration at the University at that time and also inspector of high schools. It was a very useful publication in the beginnings of high school agriculture.

A second book, this by Waters and Elliff, appeared in 1919, under the title of *Agricultural Laboratory Exercises and Home Projects Adapted to Secondary Schools*. This was a book of over 200 pages with very carefully prepared exercises and illustrations. It was a very helpful contribution to high school courses in agriculture.

**Vocational Agriculture**

The 1917 Congress passed what is known as the Smith-Hughes Act, providing for assistance to the states in developing courses in vocational agriculture, home economics and industrial arts in those high schools of the country which could meet the requirements that were proposed. The Missouri Legislature accepted the provisions of this act and a division of vocational agriculture, home economics and industrial arts was set up with the State Department of Education in Jefferson City in 1917. Professor Elliff, already mentioned as much interested in general agriculture in the schools, was given leave of absence from the University to take charge of this work until a permanent administrator could be appointed. The law provided for state participation in the expenditures for these schools and it was to have complete charge of the courses arranged and the instruction given.

The first year, three high schools participated in this program for vocational agriculture. By 1921, there were 73 such schools with 2049 pupils and in 1957, there were 276 schools with an enrollment of approximately 12,000.
The teachers of these courses in vocational agriculture are trained under a cooperative arrangement between the College of Agriculture and the College of Education at the University and all have degrees in Agriculture. The work in agriculture now given to the pupils in these high schools is practically as good as that offered in most Colleges of Agriculture at the beginning of the present century.

The whole idea of an agricultural College was new to the farmers of the state in those days. Moreover, the early administrative difficulties were not conducive to a rapid growth. It was not until the early 1900s that the College began a real development. This was largely through the activities of Dean H. J. Waters (1895 to 1909). He was able to establish the College as an important part of the University. Dr. R. H. Jesse, who was president during those years, was also very much interested in the College of Agriculture, and these two men actually put the University and the College of Agriculture on a firm foundation.

Dean Waters resigned the position of Dean of the College in 1909 to accept the presidency of Kansas State College at Manhattan. He was followed by Dean F. B. Mumford (1909 to 1938) who through his long tenure and his outstanding administrative ability carried the College to a high place among the Land Grant Colleges of the country.

(Readers interested in the complete history of the College of Agriculture from the beginning in 1870 to 1938, when Dean Mumford retired, will find it in Missouri Agricultural Experiment Station Bulletin 483, a book of 300 pages.)

Resident Instruction in the College of Agriculture

The College opened its doors to students in 1871 with 6 students enrolled, while 29 others entered during the year. However, the number of regular students increased rather slowly. In 1895, there were only 41, but in 1910 there were 321. In 1920, after home economics was included, the number reached 664. In 1957, the number excluding those in Forestry and Home Economics, was 1166, the seventh in enrollment among the Colleges of Agriculture in the country. During the years 1871 to 1956 the number on the agricultural faculty increased from less than a half dozen to over 200. The number of courses offered went up from less than twenty to slightly over 400.

Early Short Courses

In addition to the regular courses given for long-course students in the College, considerable numbers attended short courses of various kinds. In 1910, a two-year, winter short course was established. To suit the convenience of young farmers, for whom it was offered, there were two eight-week terms, the first before the Christmas Holidays and the second just following. This course proved very popular and the numbers reached a maximum of 329 in 1913-14. However, by 1921-22, the number dropped to near 200 and finally to less than 50 in 1933-34, after which the course was abandoned. The decline in numbers was primarily due to the influence of the Agricultural Extension Service, which had begun serving farmers extensively about that time, and to the opening of the departments of vocational agriculture in many high schools. However, this two-year short course during the period of its existence reached over 4300 young men in the state, most of whom continued on farms. One meets them very frequently today, at farmers' meetings throughout the state. They have made a real contribution to an improved agriculture in Missouri.

Farmers' Week

Along with the two-year winter short course, there was organized in 1910, in cooperation with the State Board of Agriculture, what was known as "Missouri Farmers' Week." The people who attended were divided into groups representing different agricultural interests and they heard lectures by members of the College faculty. This became a many-sided program at which some members of the faculty would sometimes lecture practically all day.

Farmers shared in the week's activities through the cooperation of various state agricultural organizations, so that the programs had very wide appeal. One of the most important of these organizations was the Missouri Corn Growers' Association founded in 1903. Interest in corn shows developed greatly about this time and there was great competition over what was considered the best ten, or best fifty ears of corn of different varieties. There was also competition for the best individual ears of corn.

It will interest many to know that when Waters Hall was under construction a prize was offered for the best ear of corn to be placed in the corner stone of the building. As a result, a good ear was selected from many that were sent in and it was scored according to the score card of that day. This card was then wrapped around the ear, which was placed in a copper tube and hermetically sealed. It still lies in the corner stone of the building, for the scientists, or possibly even for the archeologists of the future to puzzle over.

One evening of Farmers' Week was given over to the Farmers' Banquet, which was a special feature for many years. This was held in the University gymnasium and was sometimes attended by a thousand people. For most of the years, the preparation and arrangements for it were made by Professor P. F. Trowbridge, chairman of the Department of Agricultural Chemistry in those days. Roast beef was served from prime animals of the College beef herd. Professor Trowbridge had these prime roasts prepared, roasted in the ovens at the homes of agricultural faculty members around town, and all rushed hot
various Act which established agricultural experiment stations in forward looking

William H. Hatch, Missouri Congressman, author of the Hatch Act which established agricultural experiment stations in the various states.

to the banquet tables. At each long table an agricultural faculty man sat at one end, acting as host and carving the roast of which many second and third servings were provided. His wife sat at the other end of the table and acted as hostess. The waiters and waitresses were students of the College.

The banquet was of course accompanied by a program at which the president of the University usually spoke, along with other special speakers. Those who were privileged to attend these Farmers’ Week banquets talk about them to this day. They were very well organized, the food was excellent and they were very enjoyable. These banquets continued until 1928.

Attendance at these Farmers’ Week short courses was very large. In spite of the fact that all the early ones were held in mid-winter and before the general use of the automobile, they were very well attended. The attendance usually varied from 2,000 to 2,500. These people came to Columbia by train and lived largely in private homes for the four or five days of the activities. The largest attendance was in 1920 when the number was estimated at 3,500.

The date of Farmers’ Week was later changed to October, largely because the automobile had come in and people wanted the date set for what is usually a good weather period, which is in late October. However, the Extension Service was carrying much information to farmers directly, by that time, and in spite of the automobile the numbers declined below 2,000 and continued to decline until 1949 when the present Farm Forum on Public Policy was substituted. This forum is designed as an open discussion of farm policies as influenced by federal and state activities, resulting particularly from the effects of the two world wars.

Modern Short Courses

With the close of the two-year winter short course, other types of agricultural short courses came in. Actually these had their beginning before the two-year short course was abandoned. These modern short courses are rarely over five days in duration, more often only two or three days. They cover special fields in which there is current interest, such as milk control, cooperative marketing, soil conservation and improvement, swine breeding, seed certification and scores of others. Among the largest of these are four Livestock Days, held at different times of the year. These are conducted by the Department of Animal Husbandry and the numbers in attendance run from 500 to 2,000 farmers each.

Other farmer gatherings which are held at the College each year are the soils and crops field days, when the visitors are shown over the soils and field crops experiment station plots on the University South Farms. Several thousand farmers attend these each year.

The total number of these agricultural short courses averages about 100 each year and the yearly attendance, including the feeder and field days will usually reach a figure near 10,000.

The Agricultural Experiment Station

The great growth of the College of Agriculture, through the years, has been largely the result of the work of the agricultural experiment station, which has furnished the facts upon which the educational developments have been based. This need for experimental fact-finding was early realized and the experiment stations in the United States were established under the Hatch Act, passed by Congress in 1887. This Act, sponsored by William H. Hatch, a Missouri Congressman, provided an annual federal grant of $15,000 to each state for the work of the individual stations. The Missouri Station was established as a part of the College of Agriculture in 1888, a year after the Act passed Congress. The interest of the legislature in this project soon resulted in state appropriations to the station which have increased with the years, along with additional federal grants. However, it took some time for the station to develop a fund of information so that its real influence on Missouri agriculture did not become important until about 1900. Since that time it has provided most of the information on which the teachings of the College have been based.

The experiments that have been carried on by the station have covered a wide field. In the early days they were simple in character, such as testing different varieties of crops, testing different methods of using home-grown feeds for animals and other tests which seemed of immediate value to farmers. These were known as applied experiments. However, as time went on more intricate fundamental problems presented themselves and the num-
bers of these increased. The station projects through the last half century have therefore fallen into two categories. There are the investigations of a fundamental character which seek to determine nature's laws on which the growth of plants and animals depends. Then there are the experiments which use the findings of these fundamental studies in applying them to practical agricultural processes and methods. These are classed as applied investigations, which affect the farmer directly. However, without fundamental studies the applied experiments would be small in number. Without the applied experiments, on the other hand, the results of the fundamental studies might not reach the farmer.

The numbers of experimental projects have increased with the years. The more the agricultural scientists find out, the more complicated the whole field of agriculture is found to be. At the present time there are over 200 different experimental projects under way in the Missouri Experiment Station, some fundamental and some applied.

Some people may think that with all these experimental results, further investigations would be unnecessary at this time. As a matter of fact, the more the scientists know, the more they need to know. As a result, agricultural investigations will doubtless become more technical with the years.

**Work of the Agricultural Extension Service**

In the early days of the colleges of agriculture, including the agricultural experiment stations, the only means of reaching farmers who did not come to the institutions was through bulletins, farmer's meetings and newspapers. However, farmers throughout the nation soon demanded that more information be brought to them directly, and in a form which they could apply on their farms. Thus there was developed, at the various colleges, the idea of an extension service. Missouri began such extension work at an early day. It was one of the first states to take it up. A graduate of the College, C. M. McWilliams, was appointed county agricultural adviser in Cape Girardeau County in July, 1912 and Sam Jordan in Pettis County in 1913. Others followed in rapid succession until by September of the latter year ten had been appointed. These men were first called farm advisers, but this term did not meet with general approval and it was later changed to the title of county agent and later to county extension agent.

The federal law (Smith-Lever Act) which provided federal aid for agricultural extension in the states, was passed by Congress in 1914. The first federal grant to Missouri under this act was $10,000, which became available on July 1, of this same year. These federal appropriations had to be offset by state allotments and the first state appropriation for this purpose was for $25,000, made by the legislature soon after the plan was accepted by the state and the federal money became available.

Such was the beginning of organized extension work in Missouri. As time has gone on, both federal and state allotments have increased greatly. In recent years, by state legislative act, county courts provide additional funds for this work, largely for the county extension office expense, the amount depending on the wealth of the county. Meanwhile the numbers of county extension agents and home extension agents, as the women agents are called, have multiplied until at present there are about 265 county agents, associate and assistant agents, 110 home extension agents, along with 75 members of the state supervisory staff and subject matter specialists, or a total of about 450.

There are very many ways in which the Agricultural Extension Service has been or is being of help to farmers. One of these which was a spectacular piece of extension work, was what was known as the "Clover and Prosperity" project. This was developed in 1922 by Paul Schwegenerdt, a soils extension specialist, in cooperation with C. E. Carter, a field crops specialist and later with Ross Silkett, another soils specialist. It dealt with the whole field of soil improvement, but particularly with lime and legume crops, including clover. The work was carried on through county-wide meetings which were very well attended. Some years the attendance reached 20,000 farmers for the state. As a result of this campaign, several counties, during a series of years, won the national award for soil improvement. Follow-up meetings are still held throughout the state which shows its far reaching influence.

Another outstanding development of the Extension Service is that known as the balanced farming program which deals with complete plans for the management of the farms and the farm homes of the participants. This has been very successful and the Missouri Extension Service is known the country over for its balanced farming program.

The 4-H program among the farm youth of the state is a remarkable one. It is not only of great benefit to the 4-H youth but since it is carried on through local adult leaders it has developed great numbers of these into more useful citizens in their communities. The total number of 4-H club members in 1957 was 35,900.

Through the Extension Service, the Experiment Station and other means, the College of Agriculture is now reaching, in one or more ways, most of the farmers of the state. It must be recognized, however, that there are means, aside from the direct activities of the College of Agriculture, through which farmers secure information either directly or indirectly. The newspapers provide a very important channel, as do also the radio and more recently the television programs. However, much of the agricultural information secured by farmers comes originally from the College.
While federal agencies do not deal with agricultural education, as its name implies, Missouri farm papers have had a powerful influence on the state agriculture during the years. There has also been a great change in the character of these papers during the last century. Taking Collman's Rural World as the earliest farm paper in Missouri, it had some interesting characters. It was an excellent paper for that era and its long-time editor, Norman J. Collman, was very widely known and highly respected.

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farmers and the old-fashioned principles of soil and crop management, the care of animals and household recipes. There was always a column for the apiary, one for the veterinarian, and one or more on markets. The advertising was largely limited to one half to two inch single column spaces. Photography had not yet come in and the illustrations were the old-fashioned woodcuts.

A most remarkable thing about all the early editions of this and other early farm papers was the nature of the sketches of individual farm animals. They were shown with absolutely straight top and bottom lines with very large box-like bodies and short legs. They were actually monstrosities as compared with the real animals, since the artists exaggerated their good points beyond reason.

The editorials and stories which the paper carried represented high standards. In some ways the English was quaint, but it was of good quality, showing that the people who wrote this material were pretty well versed in their mother tongue.

As times went on the use of photography came in, providing illustrations for the papers. Moreover, as material from the agricultural experiment stations became available, reports on experimental findings began to appear, together with material regarding new techniques in agricultural practices. The farm press then came to be one of the most important sources of new agricultural information for farm people and it has remained so to this day.

The Missouri Ruralist which was owned and directed by Arthur Capper from 1908 to 1951 has been one of Missouri's most important papers. Its long-time editor was John F. Case, who assumed that position in 1913 and remained for over 40 years, or until 1955 when he retired with the title of Editor Emeritus. Mr. Case spoke the language of the farmer and had a very wide following among Missouri farm people. He was followed by Cordell Tindall, who for many years had been a field writer for the paper and who had provided excellent copy in widely diverse agricultural fields. The Ruralist is very widely known among the farm people of the state and has a high reputation for providing accurate and interesting material.

The Weekly Star Farmer, published in Kansas City, was originally known as the Weekly Kansas City Star and was published under the direction of Wm. R. Nelson. The first editor was H. J. Waters, formerly Dean of the Missouri College of Agriculture. After his death, W. A. Cechel, a graduate of the Missouri College was made editor. A short time later the name of the paper was changed to the Weekly Star Farmer, and the present editor is Roderick Turnbull. This paper has retained the general format of the early Kansas City Star, but it carries no general news. Its columns are devoted to agricultural and home economics material of high quality. Its present editor is very active and alert, so that the subject matter is up-to-date and very informative. This paper has a wide circulation both in western Missouri and in eastern Kansas and Oklahoma.

There are two other farm papers in Missouri, but these are really house organs of the two large farm organizations. The Missouri Farmer was established by William Hirth, who did the early work in founding the Missouri Farmers' Association. This paper goes to every member of the Association, a total of over 100,000. It carries much interesting and valuable material for farm people, but the main intent is to have it serve the members of the organization.

The Farm Bureau News is the house organ of the Missouri Farm Bureau Federation and it goes to the members of this organization. It carries valuable material for all farmers, but particularly for the Farm Bureau members for whom it is published.

Farm Organizations

The farm organizations of the state, while not strictly educational, have certain educational features. There are two important ones in Missouri, the larger being the Missouri Farmers Association (MFA) and the Missouri Farm Bureau Federation (MFBF) with somewhat smaller numbers. The Grange, the earliest one organized, was fairly prominent in the northeastern part of the state in the 1870s but their numbers are small at this time. The Farmers Union never had an important representation in Missouri and at present there is no state organization. The National Farmers Organization (NFU) recently organized, has a rather small Missouri membership.

The Missouri Farmers Association has developed from the early work of William Hirth who through strenuous individual efforts brought into being a large number of farm clubs throughout the state. Later these were amalgamated into the statewide organization under the present name. This Association has a very extensive program in cooperative buying and selling and in other activities of benefit to its members. In recent years, it has developed a wide field in insurance which competes successfully with the old time companies. It is affiliated with the National Council of Cooperatives.

The Farm Bureau Federation has local farm bureaus throughout the state engaged in cooperative activities in buying and selling which reach a large number of farm families. It is also engaged in handling insurance of various kinds, an activity which has reached large proportions. The Missouri Farm Bureau Federation represents the state in forming the American Farm Bureau Federation, the largest of the national organizations. The man who was most instrumental in placing the Missouri Farm Bureau on a firm foundation was R. W. "Bob" Brown of Carrollton. He became president when the organization was in considerable financial distress and remained in this capacity until it was financially sound and for some years thereafter.

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Chapter 5
Changes in Size of Farms, Types of Land Tenure
And Rural Population

There have been great changes in the size of Missouri farms, and in the types of land tenure, during the last 100 years. In connection with land tenure there has also been a very great shift in the relative numbers of rural and urban people.

One hundred years ago, Missouri was only partially settled and there was, of course, much land not yet occupied. In 1850, the number of farms was only about 54,000 and the total land in farms was about 9,500,000 acres. This meant the average size of farm was about 178 acres. This average farm size was larger than it has ever been since, excepting in the early 1860s, when more land was brought into farms and when the size was over 200 acres. This and related data are shown in the accompanying table.

By 1900 the number of farms was 284,000 or over five times what it was in 1850. The amount of land in farms was over 33,000,000 acres, or about what it is today, while the average size of farm was only about 120 acres, the smallest it has ever been.

### NUMBER, ACREAGE AND SIZE OF MISSOURI FARMS DURING THE PAST CENTURY (FROM CENSUS DATA)

<table>
<thead>
<tr>
<th></th>
<th>No. of Farms</th>
<th>Total Acreage</th>
<th>Average Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1850</td>
<td>54,458</td>
<td>9,732,670</td>
<td>178.7</td>
</tr>
<tr>
<td>1860</td>
<td>92,792</td>
<td>19,984,810</td>
<td>215.0</td>
</tr>
<tr>
<td>1870</td>
<td>148,328</td>
<td>21,707,220</td>
<td>146.0</td>
</tr>
<tr>
<td>1880</td>
<td>215,575</td>
<td>27,879,276</td>
<td>129.0</td>
</tr>
<tr>
<td>1890</td>
<td>283,043</td>
<td>30,780,290</td>
<td>129.0</td>
</tr>
<tr>
<td>1900</td>
<td>284,886</td>
<td>33,997,873</td>
<td>129.0</td>
</tr>
<tr>
<td>1910</td>
<td>277,249</td>
<td>34,591,248</td>
<td>124.8</td>
</tr>
<tr>
<td>1920</td>
<td>263,004</td>
<td>34,779,679</td>
<td>132.2</td>
</tr>
<tr>
<td>1925</td>
<td>260,473</td>
<td>32,641,893</td>
<td>125.3</td>
</tr>
<tr>
<td>1930</td>
<td>255,940</td>
<td>33,743,019</td>
<td>131.8</td>
</tr>
<tr>
<td>1935</td>
<td>278,454</td>
<td>35,054,542</td>
<td>125.0</td>
</tr>
<tr>
<td>1940</td>
<td>256,100</td>
<td>35,759,596</td>
<td>135.6</td>
</tr>
<tr>
<td>1945</td>
<td>242,934</td>
<td>35,278,251</td>
<td>145.2</td>
</tr>
<tr>
<td>1950</td>
<td>230,473</td>
<td>35,123,143</td>
<td>152.6</td>
</tr>
<tr>
<td>1955</td>
<td>201,614</td>
<td>34,195,379</td>
<td>169.6</td>
</tr>
</tbody>
</table>

### CHANGES IN POPULATION OF MISSOURI DURING THE LAST CENTURY (CENSUS DATA)

<table>
<thead>
<tr>
<th></th>
<th>Rural Population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Population (People on farms plus those in towns of 2500 or less)</td>
</tr>
<tr>
<td>1850</td>
<td>682,044</td>
</tr>
<tr>
<td>1860</td>
<td>1,182,013</td>
</tr>
<tr>
<td>1870</td>
<td>1,731,295</td>
</tr>
<tr>
<td>1880</td>
<td>2,168,380</td>
</tr>
<tr>
<td>1890</td>
<td>2,679,184</td>
</tr>
<tr>
<td>1900</td>
<td>3,106,665</td>
</tr>
<tr>
<td>1910</td>
<td>3,293,335</td>
</tr>
<tr>
<td>1920</td>
<td>3,404,055</td>
</tr>
<tr>
<td>1930</td>
<td>3,629,367</td>
</tr>
<tr>
<td>1940</td>
<td>3,784,664</td>
</tr>
<tr>
<td>1950</td>
<td>3,954,653</td>
</tr>
</tbody>
</table>

### DECLINE IN NUMBERS ON MISSOURI FARMS DURING THE LAST THIRD OF A CENTURY (CENSUS DATA)

<table>
<thead>
<tr>
<th></th>
<th>Numbers on Farms</th>
<th>Percent of Total Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1920</td>
<td>1,211,348</td>
<td>35.6</td>
</tr>
<tr>
<td>1925</td>
<td>1,094,037</td>
<td>31.0</td>
</tr>
<tr>
<td>1930</td>
<td>1,114,484</td>
<td>30.7</td>
</tr>
<tr>
<td>1935</td>
<td>1,183,499</td>
<td>31.2</td>
</tr>
<tr>
<td>1940</td>
<td>1,125,413</td>
<td>29.7</td>
</tr>
<tr>
<td>1945</td>
<td>855,020</td>
<td>24.6</td>
</tr>
<tr>
<td>1950</td>
<td>869,000</td>
<td>22.0</td>
</tr>
</tbody>
</table>
od was developing very rapidly. The second cause of the decline was a lowering of the rural birthrate. Up until 1942, the country birthrate had been higher than that in towns and cities, but at this time, it began to decline and this has continued since. The third reason was the low economic income of farmers on the small farms. The increased cost of living and the squeeze between the prices the farmers received and those they had to pay drove many of them out of business. Many of them moved to town where the husband, and often the wife, and sometimes one or more of the children, secured employment. They often sold their farms to a neighboring farmer thus increasing the size of the neighbor’s farm.

**ACRES**

**170**

**160**

**150**

**140**

**130**

**120**

**110**

**100**

**YEARS**

**1900**

**1910**

**1920**

**1930**

**1940**

**1950**

**AVERAGE SIZE OF FARMS IN MISSOURI SINCE 1900 (CENSUS DATA)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Small Less than 100 A.</th>
<th>Medium 100 to 259 A.</th>
<th>Large 260-499 A.</th>
<th>Very Large 500 A. or over</th>
</tr>
</thead>
<tbody>
<tr>
<td>1910</td>
<td>141,332</td>
<td>112,129</td>
<td>19,812</td>
<td>3,971</td>
</tr>
<tr>
<td>1920</td>
<td>125,203</td>
<td>112,798</td>
<td>19,224</td>
<td>3,710</td>
</tr>
<tr>
<td>1925</td>
<td>130,343</td>
<td>107,196</td>
<td>19,224</td>
<td>3,710</td>
</tr>
<tr>
<td>1930</td>
<td>122,009</td>
<td>107,930</td>
<td>21,558</td>
<td>4,343</td>
</tr>
<tr>
<td>1935</td>
<td>141,744</td>
<td>110,060</td>
<td>22,153</td>
<td>4,497</td>
</tr>
<tr>
<td>1940</td>
<td>124,254</td>
<td>102,226</td>
<td>23,989</td>
<td>5,829</td>
</tr>
<tr>
<td>1945</td>
<td>113,269</td>
<td>98,062</td>
<td>26,657</td>
<td>6,949</td>
</tr>
<tr>
<td>1950</td>
<td>103,350</td>
<td>91,781</td>
<td>27,557</td>
<td>7,435</td>
</tr>
<tr>
<td>1955</td>
<td>88,742</td>
<td>80,014</td>
<td>29,174</td>
<td>8,684</td>
</tr>
</tbody>
</table>

An examination of the table will show that during the last 45 years (1910-1955) the small farms (100 acres or less) have steadily decreased in numbers from 141,332 to 83,742. During the same time the medium sized farms (100-259 A.) have also declined in numbers from 112,129, to 80,014. On the other hand the next larger sized farms (260-499 A.) have increased in numbers from 19,812 to 29,174 while the very large ones (500 A. or over) have increased from 3,971 to 8,684. Actually, the family farms, say those under 500 acres, make up 95 percent of the total.

A more interesting comparison of these farms of varying sizes is the percent of the total farm land rep-

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**Total Acreage Is About Stabilized**

The increase in the average size of farms can readily be understood when it is seen that the acreage of farm land has not changed greatly in the last twenty years, but the number of farms has declined steadily. This could only mean farms of larger size. This, however, is largely through the increase in the size of the family farm. For instance, when a farmer has secured abundant equipment, often more than he really needs, he finds he can handle an additional forty or eighty acres without difficulty. He may at first rent this extra land from some farmer who is moving to town, and later, if he has sufficient funds, he may buy the land and add it to his holdings. In some cases, where a farmer has a grown son who is interested in the farm, he may rent still more land. The modern rubber-tired tractor which will run over the highways at fair speeds makes it possible for this farmer and the son to rent a good deal of additional land or even buy an extra farm and combine it with their own. It is thus largely through the adding of more land to existing family farms that the size of farms has increased; and, unless unfavorable economic conditions interfere, it will doubtless continue to increase in this way for some time to come.

Much has been said about the family-size farm and its importance to our agriculture. Some have feared that through the development of many very large commercial farms, the family farm might largely disappear. However, there seems little immediate danger of this. A family farm is one that can be handled by a farmer and his family without hiring extra labor, excepting possibly during short periods in rush seasons. With the improvement of farm machinery and reasonably good judgment, a farmer with two grown sons may expand a family farm to considerable size, even to 500 acres or more.

The accompanying table shows the numbers of farms in Missouri, according to different sizes, as recorded in the Census since 1910.

<table>
<thead>
<tr>
<th>Year</th>
<th>Small Less than 100 A.</th>
<th>Medium 100 to 259 A.</th>
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<th>Very Large 500 A. or over</th>
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</tr>
<tr>
<td>1925</td>
<td>130,343</td>
<td>107,196</td>
<td>19,224</td>
<td>3,710</td>
</tr>
<tr>
<td>1930</td>
<td>122,009</td>
<td>107,930</td>
<td>21,558</td>
<td>4,343</td>
</tr>
<tr>
<td>1935</td>
<td>141,744</td>
<td>110,060</td>
<td>22,153</td>
<td>4,497</td>
</tr>
<tr>
<td>1940</td>
<td>124,254</td>
<td>102,226</td>
<td>23,989</td>
<td>5,829</td>
</tr>
<tr>
<td>1945</td>
<td>113,269</td>
<td>98,062</td>
<td>26,657</td>
<td>6,949</td>
</tr>
<tr>
<td>1950</td>
<td>103,350</td>
<td>91,781</td>
<td>27,557</td>
<td>7,435</td>
</tr>
<tr>
<td>1955</td>
<td>88,742</td>
<td>80,014</td>
<td>29,174</td>
<td>8,684</td>
</tr>
</tbody>
</table>
Table: Percent of Total Farm Land in Farms of Different Sizes, Between the Years 1920 and 1955

<table>
<thead>
<tr>
<th>Sizes of Farms</th>
<th>1920</th>
<th>1940</th>
<th>1955</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 100 Ac.</td>
<td>19.1</td>
<td>17.1</td>
<td>11.2</td>
</tr>
<tr>
<td>100 to 259 Ac.</td>
<td>50.9</td>
<td>47.0</td>
<td>39.0</td>
</tr>
<tr>
<td>260 to 499 Ac.</td>
<td>19.9</td>
<td>23.3</td>
<td>29.3</td>
</tr>
<tr>
<td>500 to 999 Ac.</td>
<td>6.7</td>
<td>8.9</td>
<td>13.5</td>
</tr>
<tr>
<td>1000 Ac. or more</td>
<td>3.2</td>
<td>3.6</td>
<td>7.0</td>
</tr>
</tbody>
</table>

It will be noticed that the percent of land in the two groups of smaller farms (all under 260 acres) has declined sharply between 1920 and 1955. On the other hand, the percent in the three larger groups has increased.

Actually the percent in those farms of 1000 acres or over has more than doubled and about the same is true of those in the sizes of 500 to 999 acres. If the percentages of land in the two large groups, 500 acres and over, are combined, these figures for 1920, 1940, and 1955 are 9.9 percent, 12.5 percent and 20.6 percent respectively. In other words, one fifth of the farm land of the state in 1955 is now in farms of 500 acres and over.

Even with this increase in the percent of farm acreage in the large farms, there is still a question as to how far the state may go in this direction. Certainly, anything like the large Russian communal farms is beyond consideration. Moreover, it cannot be determined at this time just how far these large farms may grow in size and still remain economic units. The labor situation, whether the laborers are organized or unorganized, may present a problem. It is almost useless to attempt a prediction regarding the future of these very large farms.

**Trends in Wages for Farm Labor**

It is of value to know how the wages paid farm laborers have changed during the years. Of course, these have varied some from place to place, but the following table taken from the records of the State Board of Agriculture and the Census is of interest. These figures show the monthly wage of laborers without keep (room or board).

<table>
<thead>
<tr>
<th>Year</th>
<th>Wage $</th>
</tr>
</thead>
<tbody>
<tr>
<td>1866</td>
<td>$18.83</td>
</tr>
<tr>
<td>1875</td>
<td>18.84</td>
</tr>
<tr>
<td>1885</td>
<td>21.35</td>
</tr>
<tr>
<td>1890</td>
<td>20.25</td>
</tr>
<tr>
<td>1895</td>
<td>19.69</td>
</tr>
<tr>
<td>1902</td>
<td>21.93</td>
</tr>
<tr>
<td>1910</td>
<td>29.50</td>
</tr>
<tr>
<td>1915</td>
<td>30.10</td>
</tr>
<tr>
<td>1920</td>
<td>36.00</td>
</tr>
<tr>
<td>1925</td>
<td>49.00</td>
</tr>
<tr>
<td>1930</td>
<td>48.00</td>
</tr>
<tr>
<td>1935</td>
<td>39.50</td>
</tr>
<tr>
<td>1940</td>
<td>37.50</td>
</tr>
<tr>
<td>1945</td>
<td>101.00</td>
</tr>
<tr>
<td>1950</td>
<td>121.00</td>
</tr>
<tr>
<td>1955</td>
<td>154.00</td>
</tr>
</tbody>
</table>

It will be seen that the wage up to the 1900s was around 18 to 20 dollars, then it gained rather steadily until the hard times of the 1930s, when it dropped back sharply. As the Second World War came on, it rose appreciably, then increased enormously at the time of the war's end and thereafter.

Of course the value of the dollar changed greatly from time to time during this long period, but these figures show the wages at the different dollar values.
It might be assumed that the 1866 worker put in about 9 hours a day which for the work days of a month would amount to about 230 hours. At around $19.00 a month this would be 8 cents an hour. On the other hand, the 1955 worker would probably work about 7½ hours a day or 195 hours a month, which at $154.00 monthly pay would be 79 cents an hour.

Recent Decline in Farm Tenancy

The development of farm tenancy in Missouri, since the Census first started securing these records is very interesting. The averages for the state during this period vary quite widely, as shown in the accompanying table.

| PERCENT OF TENANT FARMERS IN MISSOURI (Census Figures Since 1880) |
|-----------------|-----------------|
| 1880 - 27.3     | 1930 - 34.8     |
| 1890 - 26.8     | 1935 - 38.8     |
| 1900 - 25.5     | 1940 - 35.6     |
| 1910 - 29.9     | 1945 - 28.8     |
| 1920 - 28.8     | 1950 - 20.2     |
| 1925 - 32.6     | 1955 - 17.8     |

It can be understood that in the early part of the century, when the state was incompletely settled, the renting of farms would not be very important. The records show that by 1880, fifteen years after the Civil War, the number of tenants was 23.7 percent of the total number of farmers. However, as time went on and agriculture became more of a business, the percentage increased, reaching its maximum about 20 years ago, when in 1935 it stood at 38.8 percent. This was during the hard times in the thirties when many farmers had lost their farms and they were taken over by banks, insurance companies and loan agencies so that many farm owners were compelled to become tenants. Just before World War II, when times began to improve, the percent of tenancy began to decline. As farmers had more money, during these good times, more of them became owners of their farms, with tenants representing only 26.8 percent of all farmers reported in 1945. The good times that followed World War II allowed more and more farmers to own farms. By 1950 only 20.2 percent of them were tenants and by 1955 this figure was reported as 17.5 percent.

There is another important factor which is determining the percentage of tenancy in Missouri and that is the high cost of owning a farm and starting a farm enterprise. The high price of land and the very high costs of farm livestock, machinery and other supplies make it more and more difficult for men to take up farming as owners. As a result the old plan of the farm ladder by which a tenant might rise to ownership is almost non-existent. So long as farmers are prosperous more of them will be owning the land they farm but with less prosperity such purchases become more difficult. Unless the farm economy improves, there would seem little chance for the numbers of owners to increase. As a result it may be that the percentage of tenancy will again increase.

There is a great difference in the percentage of tenancy in different parts of the state, the percentages at the maximum in 1935, running highest in the lowland counties of Southeast Missouri, second highest in the Jasper County wheat area, and third highest in the good cornland counties of Northwest Missouri. In the real cotton counties in Southeast Missouri the figure for this period was 80.4 percent, in the other lowland counties it was 66.3 percent, in the Jasper county area 44.3 percent and in the northwestern corn counties it was 43.1 percent. On the other hand, the areas of lowest percentage of tenancy were in parts of the Ozark Region where the figure was about 26 or 27 percent.

Graph showing the percentage of tenant farmers in Missouri, by Census figures, from 1880 to 1950. It will be seen to have increased greatly as a result of the depression years preceding, during and following the 1930s and then declined to less than 20 percent in the good times following World War II.
Chapter 6

Natural Disasters Have Affected Missouri Agriculture

The location of Missouri on the borders of the plains to the west and near the center of the country, north and south, has made it subject to marked climatic changes. These have not only affected the amount and distribution of rainfall, but they have brought about sudden and great changes in temperature and in many cases, the development of severe storms. Moreover, the state is located within the valleys of two great rivers which are subject to frequent, and sometimes very disastrous floods. On the whole, therefore, Missouri has long been subject to greater natural hazards than most Cornbelt states.

Disasters from natural causes usually have a serious influence on agriculture. They are often beyond human control and they may be very devastating. An earthquake which occurred in 1820 over much of the lowlands of Southeast Missouri and Eastern Tennessee was very severe. However, it was when agriculture was just getting started in a simple way and not many people were affected. It of course took place beyond the period of 100 years which is the era under consideration.

Floods

Missouri has probably had more damage from floods than any other state. The two great rivers and the many rather large streams flowing into them, have always been subject to floods. The water in the two streams comes not only from the far north and west, but from heavy rains which often fall in those parts of the drainage basins that lie within the state.

Floods doubtless occurred in the Missouri River basin for centuries, when the country was completely covered with timber or prairie grass. The statement is sometimes made that the development of agriculture in the country has caused an increase in floods. This is doubtless true to a certain extent, particularly along the smaller streams, but it is questionable if agriculture has had much influence on the great floods of the Mississippi and Missouri Rivers.

Serious Missouri River Floods

There are records of early Missouri River floods in the years 1785, 1828, 1858, and 1881, but these records are so fragmentary that they cannot be reported with accuracy. There are pretty good records of a flood in the summer of 1844 which was one of the largest known. It is estimated that the flow of the Missouri at
Herman may have been as much as 600,000 cubic feet per second, which is an enormous flow. This flood was probably due to melting snow in the north and west, along with heavy rains over the southern part of the Missouri basin. This was before any levees were built along the Missouri so that all the bottom lands must have been completely covered. If such a flood had come in recent years, since agriculture has been well advanced and after the levees had been built, it is almost certain that most of these would have been breached. As a result, the crops grown on Missouri River bottoms, might have been wiped out.

The first flood of importance in the present century was in 1903. Much of this water came from high water in the rivers of eastern Kansas. It resulted in the loss of around 100 lives and estimated damages of 40 million dollars. In considering damages from floods, it must be remembered that these statements commonly refer to those along the bottoms, while in many cases the erosion and crop damage on the uplands may also be very great.

A very disastrous flood in the Missouri basin occurred in May, 1935, which came mainly from the basin of the Republican River in Kansas. It was due to the most severe storms ever observed in the interior of the United States, the rain falling mainly on the plains of Nebraska and eastern Kansas. The loss of life in this area was given at 110 with a damage equalling 28 million dollars. However, the flood had no very great influence on the Missouri below Kansas City and it cannot be classed as a serious Missouri disaster.

The flood of 1943 was an important one. It was the fifth highest at both Kansas City and St. Louis since the Weather Bureau began reporting on flood stages of the Missouri and Mississippi Rivers. Much of the water in the lower reaches of the Missouri came from floods on the Grand and Osage Rivers which were at high flood stage.

In 1944 a flood which was due mainly to snow melting in the upper tributaries of the Missouri and from a general rain of from one to three inches over most of the Missouri basin, caused much damage. It was first in importance at Kansas City, fifth at Boonville, fifth at Herman and fourth at St. Louis. Missouri was the state which suffered the greatest damage from this flood. There was a flood in March and April, 1945, due to snow melting in the upper reaches of the river. This, however, was among the less important of large floods.

In June, 1947, a flood in the lower stretches of the Missouri did much damage. It was the third highest in Weather Bureau records at Boonville, second highest at Herman and third highest at St. Louis.

The flood of 1951 was the highest of official record, from Kansas City to St. Louis, with a maximum flow at Herman of 600,000 cubic feet per second. It was due to heavy rainsstorms along the Kansas, Kaw and Neosho Rivers, in Kansas and the Osage in Missouri. The main damage was in the Kaw and nearby valleys and in the Missouri Valley near Kansas City. The country in this eastern part of Kansas had been flooded with rain in June and this was followed by very heavy downpours in early July, which gave these valleys and the adjoining Missouri valley the most damaging flood in history. The loss was estimated at 935 million dollars and 28 lives were lost. This flood illustrated what torrential rains can do, even over a rather small area, and how difficult it is for man to protect himself against such a disaster. This was the worst since this area had been occupied and a flood of this severity may not occur again within a century. On the other hand there is the possibility of such a disaster taking place somewhere in the valley next year.

In April, 1952, a year after the 1951 disastrous flood, one occurred in the upper Missouri basin from Bismarck, North Dakota, to St. Joseph, Missouri. It was caused by rapidly melting snows and a breakup of ice in the river and its nearby tributaries, which produced a peak flood at Bismarck of 500,000 cubic feet per second which was nearly twice as great as the previous record there in 1943. The damage was estimated at 179 million dollars. In Missouri, the flood was of importance mainly at St. Joseph and above.

**Missouri Floods Along the Mississippi River**

The floods along the Mississippi River have never caused as widespread damage as those along the Missouri. North of St. Louis they scarcely need mentioning. South of St. Louis, and down to Cape Girardeau, there have been some damaging ones, but not many. Moreover, the bottoms are rather narrow on the Missouri side and it is not until the lowlands of Southeast Missouri are reached that damage has been widespread. This lowland region was mostly in swamp, at the beginning of the century. As it was gradually cleared, levee construction was carried out along the Mississippi, and this has given much protection to that wide area. Frequent floods of importance from the streams in the Ozark Region have inundated considerable areas in the western and central lowlands, but as the country has been drained by large ditches these floods have been largely prevented.

The Little River drainage area which was the last important one to be drained, has a huge main ditch that takes care of much of the flood water on the west side and in the central lowlands. There is also a large diversion ditch just below Cape Girardeau which carries away much of the Ozark hill water. The east side is protected by a large levee along the Mississippi. However, the engineers expected that this levee would not take care of all peak floods and a break in it might flood very large areas of the east bottoms. As a result, they put in a set-back levee, in the thirties, placing it about as far west as
An example of drought-stricken corn, taken at a time when rainfall was very deficient and the temperature high, as indicated by the rolled blades.

Charleston. The land between these two levees is under normal cultivation, but when a flood of great severity comes, an opening in the river levee may be blasted out near its upper end, allowing flooding of land back to the setback levee. This, however, is only a fraction of the bottom that would be flooded if the set-back levee were not in place. This levee was built in the thirties and it has been necessary to flood this outer bottom only once since that time. Meantime, the great levee along the Mississippi has been greatly strengthened and the land east of the back-set levee may never again be flooded.

The building of levees along many Missouri streams was the first attempt at flood control. As time has gone on, these have increased in number and height. They have proved quite efficient in protecting farm lands during most floods. It has been during the very large floods, or the result of very heavy local rains that they have failed. The most extreme example of local floods were those which occurred during 1957 in Southeast Missouri where several rains occurred, each of seven or eight inches within one or two days. These repeated downpours so flooded parts of the lower Lowlands that most of the year’s crops were ruined. It is interesting to note that the total rainfall for the year at Kennett was over 80 inches, while that a Portageville was over 85 inches.

**Missouri Drouths**

A wise man once said that drouths are normal during Missouri summers. There is enough of truth in this statement to make it interesting. It is certainly true that at some time during most Missouri summers, crops suffer severely from lack of water, or a lack of water and accompanying high temperatures.

It is rather difficult to define the term drouth. Meteorologists often avoid it by using the term dry period. One of the difficulties is that dry summer weather is often accompanied by high temperatures so that when crops begin to wilt it is often difficult to be sure which is the more important, the lack of moisture in the soil or the high temperature of the air. Very commonly both of these may be operating, to cause the wilting and drying of crops, generally attributed to the condition of so-called drouth.

There are of course seasons when the rainfall is insufficient for maximum crop growth even during the spring or fall, when the actual temperatures are low. If the deficiency is great enough, at such times, the period may still be referred to as one of drouth. However, it is when dry soil and high heat combine that the greatest damage is done.

There have been about 20 individual years since the Weather Bureau was established in Missouri when the rainfall was so deficient, over the major portions of the state, that these might be called drouth years. There are some others almost as deficient in rainfall, particularly in parts of the state, but those generally classed as drouth years, beginning in 1870, are as follows: 1870, 1871, 1873, 1874, 1886, 1887, 1890, 1894, 1901, 1911, 1913, 1916, 1918, 1930, 1934, 1936, 1953, 1954, and 1956. It would be a tedious procedure to attempt to describe the conditions during each of these dry years. Attention will therefore be called only to a few of them which were generally considered as most devastating.

The drouth of 1870 was a severe one. It came only a few years after the close of the Civil War when Missouri was still suffering from the disruptions of that con-

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The effects of a tornado on a country home. This is a case of complete destruction. Undoubtedly some of the timbers were scattered over several miles. (Courtesy of Wayne Decker).
flict and this made the drouth more difficult to endure. This is the principal reason for mentioning it among the severe ones. However, August and October were the only months of that year with good rains.

The next drouth which was of great severity was the one of 1901. This was one of the most disastrous in the history of Missouri. It covered almost the entire state and the heat and dry weather were terrific. The drouth really began in December of 1900 and continued through all of 1901 with only 28 inches of rainfall for the state during the period of 13 months. The temperatures occasionally went above 110 degrees, in much of the state and almost all crops were a complete failure. It is interesting to know, however, that the next year, 1902, brought the largest yields ever recorded up to that time. This was doubtless due, not only to abundant and well distributed rains, but to the fact that the unused available plant nutrients of 1901, along with those the soil supplied for 1902, gave a very abundant supply for crops.

The next drouth that might be given special mention was that of 1930 which was state-wide and especially severe in July and August. This 60-day period during the heat of summer was extremely dry and almost ruinous to the corn crop.

The drouth of 1934 was almost as severe as that of 1901. It was one of the driest and hottest of the last 100 years. It was especially dry during April, May and July and the heat of the three summer months, June, July and August was very high. The records at Columbia showed 13 days over 105°, 26 over 100° and 61 days over 90°. Corn yields and those of other summer crops were very low. Farmers considered this year almost a parallel to 1901 and they did not expect another for a long time. However, it was almost unbelievable that another of almost equal severity should strike only two years later.

The drouth of 1936 was one with records very close to those of 1934. The rainfall was about as scanty during the summer months and the drouth was about as widespread. At Columbia, there were 15 days over 105°, 39 days over 100°, and 64 days above 90°. These temperature figures are actually somewhat higher than those of 1934. After this year, however, the farmers hoped were realized and there were no very serious drouths for over 15 years. The dry year 1950 ushered in a series of eight years when the rainfall averaged much below normal with the exception of 1951. These dry years did much damage throughout the state with the exception of the Southeast Lowlands and some adjoining territory.

An agitation for federal aid for drouth relief for farmers started in 1954. This was strongly recommended by the two Missouri senators and the governor. A drouth relief committee was set up with the State Commissioner of Agriculture as chairman. After considerable negotiation with the Department of Agriculture, a federal allotment was made for the purpose of paying the freight on hay shipped into the state from areas where it was abundant. As a result, great quantities of hay were shipped in, mostly from states to the north, going to those parts of the state where the drouth had been most severe.

Later, in the recent dry years, further agitation developed for federal aid to drouth stricken counties. However, the farmers had learned much from the earlier dry years and many had made special provisions for meeting drouth conditions. There was a great development of trench silos, particularly in southwestern Missouri, where the weather had been very dry. Farmers also used fertilizer to stimulate hay and other forage crops, they planted more kafir corn, which is more drouth resistant than corn, and many planted Sudan grass for summer pasture. As a result most of the better farmers took care of this drouth situation pretty well, although an agitation for federal aid continued. This whole agitation for federal aid for agriculture under drouth conditions has probably been overdone. The state of Missouri has provided a fund for some aid to farmers under very serious conditions and it could expand this aid when needed.

Storns

Mention has been made of some of the heavy rains and rainstorms which were responsible for the large floods. There are other types of storms which, while very limited in the areas covered, are extremely devastating.

Hailstorms

Hailstorms are frequent in Missouri, mainly during spring and summer months. These are usually accompanied by very heavy thunder storms and for a given farm or area they may last for only a short time. The strips of country which they cover may be less than a mile or they may be several miles wide and the damage is dependent upon the size and numbers of the hailstones and the length of time during which the hail falls. At times they may completely ruin the crops on a farm. Of course, there are insurance companies covering hail damage and many farmers carry hail insurance, especially in areas where hail is most prevalent. Hail may also do severe damage to the roofs of farm buildings and hail insurance is sometimes carried in the policies covering fires.

Tornadoes

The tornado is the most devastating of all Missouri storms in the area it covers. Most people know something about tornadoes, but they are so infrequent that few people have ever seen one. As most everyone knows, tornadoes consist of a whirling mass of air which takes on a shape somewhat like a funnel, reaching from a black thunderstorm cloud down to the earth. The speed of the whirl is terrific and every building or tree in its path may be blown down. Actually building timbers are sometimes
scattered for miles. However, the width of the funnel where it contacts the ground is usually only 300 to 400 yards, although it occasionally may be much wider. The length of these tornado paths is usually between 10 and 40 miles and they move across country with speeds averaging 25 to 40 miles per hour.

In the open country, tornadoes will ruin crops and buildings in their paths. It is of course in those cases when they strike towns or cities that the greatest damage takes place and the losses of life are highest. Nevertheless, where they strike a set of farm buildings, if these are close enough together to fall within the funnel's path, they will usually be completely demolished.

Tornadoes are most common in the west central states and those to the south and southwest. During a 70-year record, the total number of tornadoes reported in Missouri and the surrounding states has been given as follows: Kansas 500, Iowa 333, Arkansas 221, Missouri 217, Nebraska 183, Illinois 178, Tennessee 116, and Kentucky 62. It must be remembered that the size of the state influences the total number and Missouri is one of the larger states in this group. However, there has been a difference in the methods through which the data have been secured in these states, and this may have greatly influenced the accuracy of these comparative figures.

The numbers of tornadoes which occurred by months in Missouri for an average of the six years 1951 to 1956 are as follows: March-26, April-25, May-22, June-4, July-10 and August-6. The most likely hours for their occurrence are from 4 to 7 p.m. but they may occur between 2 and 4 p.m. and between 7 p.m. and 12 midnight.

The Weather Bureau is now issuing tornado warnings through radio and television stations. When the weather conditions are favorable for tornadoes (which usually occur along storm squall lines) these warnings indicate the times and areas within a state when conditions are regarded as favorable for tornado formation. This does not mean that a tornado, or more than one, will occur within these areas at these times, but that conditions are favorable for their occurrence so that one or
more may develop.

The loss of life resulting from tornadoes in Missouri usually runs from none to two or three for each storm. However, the tornado which passed through the suburbs of Kansas City in 1957 resulted in tremendous damage to buildings, with a loss of 40 lives. The most disastrous tornado which occurred in Missouri during the last century was one in St. Louis and East St. Louis in 1896, when a loss of 131 lives was reported with a tremendous property damage.

**Farm Insect Scourges in Missouri**

Insect scourges have long been common to Missouri agriculture. While these have often been in localized areas, they have sometimes covered almost the entire state.

**Grasshoppers**

Considering the state as a whole, the grasshopper has probably caused most devastation through the years. These insects, formerly known as locusts, are mentioned in much ancient literature. In this country they attacked the scanty crops of the Massachusetts Colony in 1740 and the pioneers tried to drive them into the sea. In 1870 they interfered with the movements of the covered wagons going across the Plains.

It is interesting to note that grasshoppers have been used as human food for centuries. The North American Indians formerly ate them. They are so used today even among some civilized peoples. Dr. C. V. Riley, State Entomologist for Missouri for many years, a man who wrote voluminously, endeavored to popularize grasshoppers as food among Missouri people in the 1870s. He reported that he frequently ate them and found them good. He once said "I was most agreeably surprised to find that the insects were quite palatable in whatever way prepared . . . fried in their own oil, with the addition of a little salt, they are by no means unpleasant eating and have quite a nutty flavor." There is no record that Riley's recommendations were ever taken seriously by Missouri people.

It may be said about grasshopper scourges during the last century that the most important ones were during the years of 1857, 1866, 1869, 1873, 1874, 1875, 1885, 1894, 1936 and 1954. The worst of the early ones was in 1875. During that year the government allotted funds for the control of the insects, in a federal-state cooperative program. A state committee was set up by the governor. The county agents worked through county committees in developing the control program, which consisted of the distribution and use of poisoned bran mash. The work did not get under way quite soon enough, however, and over 1,000,000 acres of corn and other crops were largely stripped of their leaves. Farmers who used the mash early enough, saved enough feed to carry their animals through the winter, but many others were compelled to sell some or all of their animals. It was actually necessary to set up a relief plan to help families who were destitute.

The outbreak of 1954 was sufficiently serious that the county agents and local committees were again called into action. By this time some of the newer insecticides, such as the chloronated hydrocarbons, were used and these were sometimes applied by airplane. A total of 96 counties used these control measures, dusting or spraying 250,000 acres.

**Chinch Bugs**

The chinch bug has been a menace in Missouri for over 75 years. In the early days, before Civil War time, crops were not grown in sufficient concentration at any point to provide for much chinch bug development. However, as more land was farmed these insects increased, especially during dry years. In most cases they developed in small grain fields or grass lands, particularly wheat fields, and after the wheat was harvested, they moved into any nearby corn field. They injured the wheat materially and if the infestation was bad, they covered and completely destroyed the green corn for a long distance into the field. Sometimes an entire field was ruined.

The old plan of protecting the corn against chinch bugs was to make a dust mulch along the edge of the field, if the weather was dry enough. As a rule, a furrow was made and then a log, drawn by a horse, was dragged back and forth in the furrow each day as long as the dry weather continued. The bugs crawled or fell into the fur-
A corn field in which chinch bugs, moving in from adjoining wheat, are ruining every stalk.

row and since they had difficulty climbing out, they were killed by the log as it was dragged back and forth. Of course, this was only a moderately effective barrier but it was used by many farmers. A plan more commonly used was to run a barrier of coal tar or creosote along the edge of the corn field into which the bugs were moving, renewing this when necessary.

The first serious chinch bug outbreak recorded in the state was in 1871 when the state entomologist, at that time, estimated the damage at $19,000,000. Since then there have been outbreaks, of greater or less extent, during dry periods, the worst ones occurring in 1891, 1901, 1902, 1913, 1921 and 1934. The one in 1934 resulted in the use of 1,000,000 gallons of creosote for controlling them.

It was known in the early days, that moist weather would keep down chinch bug numbers. It was thought that this came about through a disease due to the growth of a fungus on the bugs. As a result the experiment station brought in considerable quantities of the bugs from the fields and mixed them with bugs which were supposed to have the disease. After a time these were distributed to farmers in small lots for scattering in their fields. It was later found that this plan was ineffective since the fungus would appear in moist seasons whether the supposedly diseased bugs were distributed or not. Present-day control measures include the use of the newer types of insecticides applied to the bugs in the wheat fields or as barriers as they migrate into the corn.

The European Corn Borer

The European corn borer was first reported in this country in the northeastern states during 1917. It gradually worked south and westward and was found in northeastern Missouri in 1942. It has gradually spread until it has reached every county excepting two in the Ozark Region where little corn is grown. It was found in the northern part of the Southeast Lowland counties in 1948 and by 1953 it had spread throughout this lowland area. As time has gone on the numbers have multiplied and damage has increased until in some seasons and in certain fields, the damage is very serious.

Much work is being done on this comparatively new insect in Missouri and other Cornbelt states, usually in cooperation with the U. S. Department of Agriculture, which has spent large sums on control methods. The most promising of these methods include the use of insecticides, the spread of parasites which attack the borer in the larval stage, the proper timing of corn planting and the use of the more resistant corn hybrids. It seems probable that by the use of one or more of these methods, farmers will learn to live with the corn borer just as the farmers of the South have learned to live with the cotton boll weevil.

Army Worms

The army worm has long been common in Missouri and its activities in certain localities sometimes take on the characteristics of a real menace. These activities are usually not very widespread, but they may cause much damage where they occur. When abundant, the worms move across fields, consuming all green vegetation in their path, sometimes ruining crops over a neighborhood or several neighborhoods together. The use of poisoned bran bait, such as has been used for grasshoppers, was the standard method of control until the newer insecticides came in. Like grasshoppers or chinch bugs, these worms tend to reappear from time to time as climatic conditions favor them.

The Hessian Fly

The Hessian fly in its maggot stage, is the wheat growers’ greatest insect menace. It came to America in Revolutionary War days in the straw bedding for the Hessian soldiers’ horses, from whence came its name. It is found in all parts of the country, but by spraying wheat at the proper date in the fall it can be controlled. An outbreak in 1916 was the state’s worst one when millions of dollars worth of wheat was destroyed.

The Corn Ear Worm

The corn ear worm probably does the greatest total damage, in dollars, of any insect of the state. It occurs mainly in the ears of corn, at roasting ear time, but it also attacks cotton, soybeans and garden crops. Since it occurs every year and since there are still no satisfactory means of wide-spread control, the amount of damage through the years is very large. Its activities might be classed as a continuing catastrophe.
Chapter 7

Development of Special Crops and New Varieties

One of the greatest of the advancements which have taken place in Missouri Agriculture is the development of new crops and crop varieties or hybrids. These have gone a long way in changing the type of Missouri agriculture and in assisting in the agricultural revolution that has taken place.

The first significant improvements that were worth mentioning took place about the middle of the last century, in the 1850s, when new varieties of field corn and wheat were brought into Missouri from the eastern states and new varieties of tobacco and cotton came in, mostly from the South.

The improvement of corn varieties took on real significance in the early 1890s when the local fairs featured corn and other agricultural products. As time went on, the regulations regarding the types of corn on which prizes were offered became better defined. Soon score cards were developed by which the corn could be judged. These called for good-sized ears with straight, uniform rows and well filled tips. The samples were usually of ten ears and the attempt was made to get all ten ears as uniform as possible.

In Missouri, these shows began in the early part of the present century as part of local fair exhibits, later at local corn shows, county corn exhibits and the Missouri State Corn Show which was first held at Columbia in 1904. These shows attracted wide attention up till about 1920 which was the time they reached their peak of interest.

A good crop of soybeans on the Northeast Missouri prairie. This crop has had a very great influence on Missouri agriculture during the last two decades.

Famous Varieties of the Past

Among the more interesting or important varieties exhibited at these Missouri corn shows were Reid's Yellow Dent, the most widely grown corn in the state, at that time; the Boone County White, a large, rather late-maturing white variety; the St. Charles White, a red-cobbed white corn; the Johnson County White, a large, white, late corn; the Cartner corn, a beautiful yellow corn with very deep kernels; and Iowa Silver Mine, a very early corn, often used for replanting after floods. A few ears of Reid's Yellow Dent which was the most popular variety in the Cornbelt in those early days, selected by Mr. Reid himself, are still preserved in the College Agricultural trophy room.

A very interesting situation which developed during the early part of the present century in connection with the talks which men from the College of Agriculture made over the state, was the farmers' interest in the feeding value of yellow and white corn. Farmers had generally insisted that yellow corn fed better than white. However, the College had analyzed both white and yellow varieties for their feeding value and could find no difference. The college speakers, therefore, insisted that the feeding value was the same regardless of color. It was not until much later, when the influence of vitamins became known, that it was found that the farmers were right all the time. The yellow corn contained much more Vitamin A than did the white corn, so that it actually did feed
better. Of course, men of the Missouri College of Agriculture were not the only ones who were making this error as it was the general belief among the men in all Land Grant Colleges. However, it taught most college men to be rather slow in discounting a long-established belief among practical farmers.

**Growers Association Started in 1903**

The Missouri Corn Growers Association, organized under the sponsorship of a few agricultural students in 1903, fostered the corn shows, as well as good practices in corn production. This association grew rapidly into a farm service organization, operated by farmer members and guided by the College of Agriculture. During the mid-twenties, as the interest in corn shows began to disappear, there was an increasing demand for a pure seed program on other farm seeds. As a result the Corn Growers Association was changed into the Missouri Seed Improvement Association in 1916. This organization has two principal functions. First, it maintains a fresh stream of clean, strong, productive seed. Second, it is the basic means of increasing and distributing the seed of new crops and crop varieties discovered or bred by the Missouri Agricultural Experiment Station. It carries on a seed certification program serving farmers who are interested in quality seeds and it fills a most important place in Missouri agriculture.

To aid in the overall program for improving farm crops, a seed testing laboratory is maintained. Farm seeds are extensively tested for such qualities as germination and purity. This laboratory handles thousands of samples annually and is a vital part in the overall crop improvement program.

**Hybrid Corn Revolutionizes Production**

The development of hybrid corn has had a revolutionary influence on corn production in Missouri as well as in other Cornbelt states. The inbreeding and crossing principles through which modern seed corn is produced were first worked out by Shull of the University of Chicago and East of Harvard University. These men were simply interested in the principles of corn hybridization which later provided the basis for hybrid corn production. These principles were applied by their students, H. K. Hayes and D. F. Jones. Later, Jones at the Connecticut Experiment Station produced the first practical corn hybrids which were distributed to Connecticut farms in 1920. The first commercial company putting out hybrid seed corn was organized by Henry A. Wallace, in 1926.

The Missouri Experiment Station made the first in-breeding and crossing experiments with corn in 1922. It took eleven years to develop enough seed of improved hybrids to send out to farmers, but in 1933 one pound samples of certain hybrids were sent to 100 farmers for trial. Farmers took up the growing of such hybrids rather slowly at first, but in 1938, their use was well underway. From then on, the use of corn hybrids increased rapidly and by 1945, the amount grown in the state was 88 percent of the total corn acreage. By 1949, this percentage was 96.5% and at present, it stands at about 99 percent. The increase in yields of corn from the use of good hybrids is generally given as between 20 and 40 percent. The cost of hybrid seed for planting an acre is small and with an increase of around 10 bushel per acre, the net return, at usual corn prices, is high. Moreover, the hybrids are of good quality and uniform in the height of ears on the stalks, so that they lend themselves well to the use of the present day corn pickers or the new corn combines. Many commercial concerns and farmers are now producing hybrid corn for sale so that the supply is plentiful.

The Missouri Station is continually testing the corn hybrids which it produces, as well as those from other states and it is recommending those best adapted for different parts of Missouri. Certainly the introduction and general use of hybrid corn has been a most noteworthy agricultural development in the state.

**The Development of Soybeans**

A half century ago the soybean was unknown in Missouri. It was not introduced into the Experiment Station test plots until 1909, when seed of several varieties was received from the U. S. Department of Agriculture. The early tests showed poor growth of the crop with little seed production, probably because no inoculating organisms were in Missouri soils. Most other legume crops had the same type of inoculating organisms as found on some of the wild legumes in the state, so that they usually picked up inoculation from the soil. But the soybean was an Oriental plant, and the inoculating organisms had to be brought in. These were introduced later, but it took several years to develop them in sufficient amounts to give the soybean a satisfactory growth.

Intensive work with soybeans was not started by the Missouri Experiment Station until about 1920, when Professors W. C. Etheridge and C. A. Helm began to carry on more careful investigations with the crop. They found certain varieties that did well both in forage and seed production and they began to distribute these to farmers. Soon they were selecting for the development of improved varieties to be supplied farmers for planting and the culture of the crop increased steadily in the state.

At first the soybean was recommended for hay, more than for seed, but when the techniques of seed production were worked out, seed production became the important phase of soybean growing. The increase in soybean acreage and production then moved forward rapidly. In 1936, the total area planted to soybeans in the state was 45,000 acres, with a total production of 225,000 bushels.
This graph shows the acreages and production of soybeans in Missouri during the years from 1935 to 1955. The increases have been enormous. (Data from Federal-State Statistician, Columbia.)

In connection with soybean production, considerable numbers of processing plants have been built in the last 20 years and some, such as those at Mexico, are of large size. The principal products coming from these plants are soybean oil and soybean cake. The oil is, of course, the product of principal value but the cake is used as a high protein feed or it is used in combination with other concentrates in the manufacture of commercial mixed feeds. Many new products, such as plastics, are also coming from soybeans and the future of the crop in Missouri seems assured.

Lespedeza’s Colorful History

One of the most remarkable crops ever introduced into Missouri is Korean lespedeza. The story of its introduction and wide use is a most interesting one. An American missionary, Ralph Mills, in Korea, about 45 years ago, was an observing man. He saw this strain of lespedeza growing in Korea and doing well. Since the climate of Korea is not greatly different from that of our own central states, he decided to bring some of the seed of the plant to this country. He sent some of it to the U. S. Department of Agriculture for test, and their men decided it had real possibilities. In 1921, the Department sent an ounce of the seed to each of several experiment stations, including Missouri.

The tests at Columbia were very encouraging and in 1925 Professors Etheridge and Helm began concentrated work on the crop. After they had accumulated some seed, they sent samples to selected farmers throughout the state for trial.

One of the most interested farmers was Ed Jamison of Fulton who began to advocate the growing of lespedeza very strongly and thus did a great deal in popularizing its use among central Missouri farmers.

The interest of farmers in this new crop was phenomenal and as a result the seed, which was very scarce in those earlier days, increased in price to around a dollar a pound. This, however, simply increased the interest and many farmers began to grow seed. As a result the price dropped rapidly and the acreages increased. By 1940 almost a million acres were cut for hay and 27,500 acres for seed. By 1951, the hay area was 1,749,000 acres, and it remained at about that acreage until the drouth years of the early fifties, when it dropped sharply. However, it has been as a pasture crop that Korean lespedeza has made its greatest contribution and in the early forties, along with the hay and seed crops, the total land in this crop was around 10,000,000 acres.

Korean lespedeza became well distributed at just the time it was needed, when farmers were attempting to re-
Alfalfa acreage is increasing in Missouri. It requires considerable soil treatment on many soils but it is one of the high-type legumes of good quality and high acre yields.

cover from the hard times of the thirties. Since it was a crop that would produce pasture and hay on average soils, without much treatment, it was a godsend to the farmers who were in straightened circumstances.

Professors Etheridge and Helm were very active in working out new systems of cropping in which lespedeza occurred. Doubtless the most valuable and interesting of these systems was what they called a "one-year rotation" with small grain and lespedeza grown the same year. The lespedeza was sown in the small grain in the spring and after the grain crop was taken off, this new legume would come on and make pasture, or hay, and sometimes seed. In the case of wheat, barley or rye, the lespedeza and small grain stubble could be worked up without plowing and re-sown to small grain. Usually, after a year or two of such a one-year double-cropping system the lespedeza would reseed itself so that it was not necessary to seed thereafter. Sometimes, where the small grain was fertilized liberally, such a plan could be continued for a good many years, especially under pasturage. In 1940, county agents reported that 95,000 Missouri farmers were using these rotation systems.

The returns to Missouri farmers, during about 20 years when lespedeza was in widest use, was estimated at between 15 and 20 million dollars annually. When those amounts are multiplied by the number of years when the crop was at its best, the total is a sum around twenty times that supplied to the experiment station since its founding in 1888.

It should be said of the use of lespedeza in Missouri that it really was somewhat in the nature of an excellent stop gap to assist the farmer in some of his more difficult years. While it is still widely used, it has been partially supplanted by the larger and higher-type legumes, such as alfalfa, the regular clovers, sweet clover and soybeans. The production of these is made possible

Graph showing the acreage of lespedeza cut for hay and the tons harvested, in Missouri from 1940 to 1955, by Census years. The drought years greatly reduced both acreage and production. Much less of the crop was cut for hay during those years. (Data from Federal-State Statistician, Columbia.)
Cotton ready for picking in Southeast Missouri. This is a good crop which will make more than a bale per acre.

by the heavy use of lime and fertilizers, along with the higher quality seeds which have come in. Just how far these other legumes, or still newer ones, will supplant or restrict the use of lespedeza to special conditions, only the future will tell. Nevertheless, the contribution which this crop made, during a time of great need, is one of the most interesting developments in connection with the agriculture of Missouri.

Alfalfa

Alfalfa is really a special crop for Missouri agriculture. When it is properly grown it produces very large yields of most nutritious hay. However, it requires special conditions for its satisfactory growth. It demands a fertile, well-drained soil with an abundance of lime in it. In Missouri such conditions are most common on the well-drained bottoms where it was first grown in considerable acreages. Many farmers have failed with it on uplands because the soil has not met the necessary requirements. However, on the fertile upland soils, where the need for lime is met, it will succeed. It can be grown too, on rather infertile uplands if enough manure, fertilizer and lime is applied. The amount of alfalfa has been increasing in Missouri in recent years, and it now totals around 500,000 acres.

Cotton a Leading Crop

People do not generally know that the cash value of the cotton crop now competes with the cash value of soybeans in Missouri. After the early settlement on the lower end of what is now known as the Sikeston Ridge, cotton was soon introduced. However, the acreage increased slowly as these bottom lands were cleared and drained. The 1880 census reported 32,116 acres, the 1900 report gave 45,590 acres, for 1950 it was 590,149. The acreage decreased somewhat in 1955 owing to the curtailment under federal controls. The production in bales was 20,318 in 1880, 25,576 in 1900, 443,196 in 1940 and 472,043 bales in 1950, with a recent decline under curtailed acreages.

In general the acre yield of cotton in Missouri is greater than in any of the cotton states of the South. The reason of course, is that it is grown on the alluvial bottom lands of Southeast Missouri. It is only in the irrigated areas of Arizona and California that acre yields are higher.

Cotton is really a most interesting Missouri crop. When one considers that its production is confined to a half dozen counties in the state, and when it is one of the highest in total value among the crops grown, the situation is an amazing one. However, with the federal controls on crop acreages its importance in the state has lessened somewhat, even in spite of improved varieties and cultural practices. The trend in the cotton states, as well as in the far Southwest, is to confine cotton more
This graph shows the prices of the more important Missouri crops from 1900 to 1955. (From records of the Federal-State Agricultural Statistician, Columbia.)

and more to the good level lands where it can be grown and harvested largely by the use of improved machinery. In this development, Missouri should be able to hold her own.

**Improvement of Small Grains**

While a small grain cannot be considered a special crop, some remarkable developments have taken place in the production of new varieties. The original wheat varieties grown in Missouri were those brought in from states to the east. They included such varieties as Fultz, Mediterranean and Fulcaster. Among oats the earlier varieties came from states to the north and northeast. It was the practice of many farmers to bring in seed oats from the north, of whatever varieties they could get, since they yielded better and were of higher quality than those that were home-grown. Barley was grown in such small acreages in the earlier days that it was scarcely worth mentioning as a crop during those times.

The Missouri Experiment Station began work on the improvement of small grains early, with some work getting under way by 1910. As time went on, real progress was made and the Station began to supply improved varieties to farmers. The first wheat variety sent out in quantity was the Missouri Early Premium, a soft winter wheat which was exceptionally well adapted to Missouri conditions. It had a wide popularity in the state for a good many years but was finally replaced by other improved varieties. The first oats variety that was developed and distributed was the Columbia. By 1940, it was said to represent three quarters of the total oats acreage of the state. The first and most popular barley that was developed was the Early Beardless. It was used largely for an early spring pasture. Missouri has never grown winter barley to any extent, as the state lies too far south to produce winter barley of good quality. Spring barley, however, with better production practices, has been increasing rather rapidly.

During the years, a number of improved small grains have been developed by the Station, and some have been brought from other states. Some of the more recent developments are given numbers instead of names.

A few of the small grain varieties now recommended from Missouri and other states are such as these:

- **Soft Wheat** Vermillion, Knox, Vigo and Clarkan
- **Hard Wheat** Pawnee and Triumph
- **Oats** Mo. O205, and Andrew
- **Barley** Mo. B 475 and Mo. B 400
- **Rye** Balbo

There are other varieties but these are representative. It should be said that practically every small grain variety that is grown extensively, sooner or later is attacked by some new disease or insect and has to be replaced by a resistant one. The development of new varieties is therefore a continuing process.
Chapter 8

Advancements in Animal Husbandry

One of the most interesting developments in Missouri agriculture during the past 100 years has been that of livestock production. Beginning in the first quarter of last century, when poor animals were the usual kinds, well bred animals were gradually coming in. Improvements in livestock breeding and management have continued through the years until Missouri is now one of the foremost livestock states in the Union. It has many herds of purebred animals, and the total income from animals and animal products is far greater than from the sale of crops.

Beginning in the middle fifties, or 100 years ago, a good beginning had been made in livestock improvement, especially in beef cattle. Before that time, however, men like Dr. Anthony W. Rollins of Boone County, had already brought in good Shorthorn cattle. He reported purebred Shorthorns for sale as early as 1834. Dr. Rollins sons, James and John, followed their father and were good Shorthorn breeders. James became well known in the state as a representative in Congress and as the man largely responsible for establishing the University at Columbia.

Early Leaders in Cattle Improvement

Theodore Jenkins, also of Boone County, one of the most influential early agricultural leaders, probably did as much as any other man in those times to popularize Shorthorn cattle. Nathaniel Leonard of Cooper County was also an outstanding leader in early cattle improvement. In 1838, he began the development of what he called Ravenswood Farm near Bunceton, and established a Shorthorn herd from which he produced some of the world's best animals. The farm has continued as a livestock center to the present day and the animals bred there have had a very great influence on Shorthorn cattle in Missouri as well as in other states. Henry Larimore of Callaway County was also a most influential Shorthorn breeders in those early days and was often called the "Cattle King of Central Missouri."

These were some of the most prominent early breeders of cattle in Missouri, of which the Shorthorn was the first breed to be introduced in numbers and quality. It is interesting to observe that most of these men were in the central part of the state, and from here these cattle spread to all parts of Missouri. Men in other counties took up the breeding of Shorthorns and Missouri has been one of the leading states in the production of these cattle. Many prizes have been won by Missouri Shorthorn breeders at the International Livestock Exposition. Other breeds came in later.

Pioneer Hog Breeders

Hog breeders did not attract attention to the same degree as the cattle breeders but many men also began hog improvement at an early date. The hogs first introduced into the Ozark Region, where there were no fences, soon began to run wild and some deteriorated into what has been known as the Ozark razorbacks, the hogs with such long snouts that when picked up by the ears they were said to tip forward. One of the farmers in the Ozarks, even as late as the beginning of the present century, when asked how much corn he fed his hogs replied, "Oh, just enough to keep them at home."

But in spite of the disparagement cast upon hogs in the very early days, men soon began to improve them. Among these were such men as Edwin M. Parker, of Boone County, John Nichols of Marion County, John...
Nathaniel Leonard, one of the earliest and most successful of the early breeders of Shorthorn cattle in Missouri. He established Ravenswood Farm, near Bunceton in Cooper County in 1825. He began breeding Shorthorns in 1839 and produced some of the best of this breed which were widely distributed in Missouri and other states. The farm has continued as a Shorthorn center under his son's and grandson's direction.

Dr. Anthony W. Rollins (center) began breeding Shorthorns in 1834. He was one of the very early breeders of these cattle in Central Missouri just thirteen years after Missouri was admitted as a State. James S. Rollins, of Columbia, son of Dr. Anthony Rollins, followed in his father's footsteps as a Shorthorn breeder. He also had much to do in having the University founded at Columbia.

O. Forman of Ralls County and Claiborne F. Jackson of Howard County. For many years the Poland Chinas, or Poland China crosses, were the principal hogs in Missouri.

Early Sheep and Horse Advancements

Good sheep did not come in as early as good cattle but somewhat earlier than good hogs. Among the early sheep breeders were A. H. F. Pogue, G. W. Breckenridge and John and H. Foley. Pogue was said to have brought 700 good Saxony sheep from Virginia to Missouri, all in one flock. In those days these may have been driven part way and possibly came the remainder of the way by boat.

In the late 1850s, many light horses were brought to Missouri. These were of the saddle horse and harness horse type, most of them coming from Kentucky. They formed the foundation of the large development of saddle horses in Missouri, particularly in Boone, Callaway and Audrain counties. Many rather heavy work horses were brought to the state in the fifties and sixties. These formed the basis for the production of the large mules for which Missouri was long famous.

Later Developments of Purebred Livestock

Brief mention has been made of some of the beginnings of livestock breeding in Missouri. The developments in the last 75 years have been outstanding. Today, Missouri breeders are well known, for the breeding of most of the important types of livestock common to the country.

Missouri stands fourth among the states in the value of livestock marketed, and 50 to 60 percent of the gross agricultural income is from beef cattle, hogs and sheep. Moreover, the state stands at the top in available livestock markets. It has 1,000,000 producing beef cows, purebreds and grades. It usually stands about fifth in numbers of cattle, fourth in hogs and around thirteenth in sheep.

Beef Cattle

The Shorthorn cattle which were the important ones before the beginning of this century have gradually been surpassed in numbers by the Herefords and Angus. Each of these two breeds now has in excess of 20,000 purebred animals in the state. Considering registered cattle only, Missouri ranks sixth among the states in numbers of purebred Herefords.

Among the foremost breeders of Hereford cattle in the country was the firm of Hudgell and Simpson of Independence, Missouri. Their herd, established in the early part of the century, was long recognized over the country for the numbers and quality of its Hereford cattle. The owners have bred hundreds of these, many going to the
western ranges where they have been a powerful factor in building up those great western herds. Many other breeders of purebred Hereford animals are found in Missouri, and the numbers of steers of this breed which are fed out annually has increased greatly. The Polled Herefords have become more important in Missouri in recent times. They now number about 25 percent of the total. Both the regular and the Polled Hereford Associations have headquarters in Kansas City.

The Angus cattle have made good progress in Missouri during the last 25 years. Standing at the top in numbers of Angus breeders and in the numbers of registered Angus cattle, the state is now an outstanding producer of these animals. The association's headquarters is now in St. Joseph. Noted Angus breeders in the early day were Wallace Estill near Boonville, who won the grand championship in Chicago in 1887, the first such recognition for the breed in the country. Other early Missouri breeders were men like Matthews and Elliott, along with Gudgell and Simpson, who later disposed of their Angus herd and went into the breeding of Herefords.

Roughly speaking, the beef cattle industry brings in around one fourth of the gross income of Missouri farmers. Some raise their own feeder cattle and others buy them and feed them out. The great pastures of the state make Missouri a natural breeding and feeding ground for beef cattle. Moreover, the average Missourian prefers beef to other red meats and this has been a great stimulus to beef cattle production.

In the 1920s, the plan of marketing beef at a younger age took hold among farmers and the so-called baby beef type became common on the markets. Such animals, or something a little larger, became general throughout the state. The large beef animals thus gave way to those which could be finished earlier. This led to the plan now generally followed of using good bulls on grade cows and thus producing good quality feeding steers. This plan was given great impetus by W. R. Nelson, former owner of the Kansas City Star and of the celebrated Sni-A-Bar Farm east of Kansas City. He made a specialty of producing feeder cattle in this way and, of course, gave much publicity to the plan in the press.

As time has gone on, it has been found, largely through the leadership of the Experiment Station, that cattle can be brought to a fairly satisfactory sales condition through the use of pasture and roughage with just a little corn at the end to give the animals some finish. At the same time, the retail demand, under high meat prices, has gone toward the more lean type of meat and the less marbled type of steaks. This has led to a greater interest in pasture farming with the production of less corn, a condition to which the state finds itself well adapted today, particularly in the less productive areas. Along with this has come the development of farm equipment for field chopping of forages, and—on many farms—the adoption of the pit silo for cheaper handling of silage.

Hogs

There are now eight well known breeds of hogs in Missouri; Poland Chinas, Spotted Polands, Duroc Jerseys, Berkshires, Hampshires, Chester Whites, Yorkshires and Tamworths. A recently introduced lean-type breed which is increasing in numbers, is the Landrace.

The Poland China hogs have been a well known breed since the beginning of this century. The breed originated in the Miami Valley in southwestern Ohio through several crosses. In 1879, the breed had been introduced into Iowa and the first volume of the Poland China Record was published at Cedar Rapids, in that year. By 1920, the number of registered Polands in Missouri was 74,000, with Illinois first and Iowa second in numbers. These hogs have had a long and illustrious history in Missouri. However, other breeds have come in and they now stand well down the line in numbers of registered animals.

The Duroc Jersey breed was for many years second to the Poland Chinas in Missouri. This breed originated in New York and New Jersey and was introduced into the Cornbelt states about 1875. It spread to Missouri during the early part of this century. By 1920, the number of registered Durocs in the state was listed as 47,900, the state thus ranking fourth in numbers. In recent years the
An excellent example of a modern Poland China hog. This breed was the earliest to be established in the state and it has continued as an important breed until the present time.

Durocs have increased in popularity. They now rank second in numbers of registered animals and are widely distributed over the state.

The breed of hogs for which Missouri was quite famous a third of a century ago was the Berkshire, which had been brought from England into this country in 1823. The real improvement of the breed in the United States may be largely attributed to N. H. Gentry of Sedalia, Missouri. "His herd became the source of blood for other leading herds and most present-day Berkshires in this country." Today nearly all American-bred Berkshires trace time and again to noted sires and dams bred by Mr. Gentry. However, the Berkshires have gradually been outnumbered by some other breeds since Mr. Gentry's time.

The hogs which have been gaining in prominence in recent years are the Hampshires. The breed seems to have originated in Kentucky, but they have been greatly improved by many crosses. They have become generally known in the country only since about 1910 and were introduced into Missouri in small numbers about 1915. In 1920, Iowa was first in numbers of breeders while Missouri stood seventh. However, the Hampshires have increased rapidly until they now stand first in total numbers among the various breeds in the state.

In recent years, a considerable interest has developed in Missouri in the bacon-type hogs, such as the Yorkshire and the Tamworth. This interest has come mainly through the widespread interest in the so-called meat-type hogs.

The Landrace breed, used in developing meat-type hogs, was brought into prominence through some hybrids produced by the use of these animals in the cooperative federal-state hog breeding program initiated among the Midwest experiment stations in the thirties and still in operation. The Missouri station has cooperated in this long-time experiment.

Sheep in Missouri

Missouri is not known as a leading sheep state but it usually stands fairly well up in sheep production. Sheep were introduced into the state before the middle of last century. They have never developed in very large numbers, excepting in certain sections, such as the region in and around Mercer County which has long been an important sheep center. The numbers have run around 1,250,000 to 1,750,000 head, during most of the recent years.

Of the nine breeds of sheep produced in Missouri, four are most important; the Hampshire, the Corriedale, the Shropshire and the Suffolk. Missouri leads the states in the numbers of registered Hampshires, it is second in Corriedales, ninth in Shropshires and sixth in Suffolks.

Missouri produces a fair number of lambs for the market, most of them going to St. Louis, Kansas City and St. Joseph where they usually bring high prices. The quality is generally good and they are the principal source of revenue for the sheep grower, usually bringing more return than wool or mutton.

Horses and Mules

The heavy horses which were so common in Missouri for most of the past century have been rapidly declining in numbers since the advent of the all purpose tractor about twenty-five years ago. The Percherons were by far the most common in the state and it was mainly from the mares of this breed, bred to large jacks, that the large mules were produced for which Missouri was long famous. The jacks were produced by a comparatively few farmers. The best known of these was L. M. Monsees of Smithton who was the best known jack grower in the country. For years, Mr. Monsees won practically all the big prizes on jacks where he showed them in Missouri and other states.

The decline in the number of horses and mules since the beginning of this century has been from about 1,150,000 to 125,000 in 1955. This has meant a tremendous change in horse and mule production. While there are some good horse breeders in the state, the tractor has practically taken over.

Saddle horse production in the latter part of last century was very flourishing in the counties of Little Dixie as well as in some other parts of the state. Some of the best blood in saddle horse production was in Missouri. Rex McDonald, the most famous saddle stallion of the breed was bred in Missouri but was taken to Kentucky in 1894 where he remained for four years and was then returned. He passed through the hands of a half dozen owners, but finally became the property of B. R. Middle-
A fine example of a large Missouri mule team, harnessed and ready for work.

L. M. Monses of Smithton became the best known jack breeder in the country. For years he won most of the prizes at the big shows. He specialized in the production of large, high-quality jacks which, when bred to large mares, made Missouri mules famous for size and quality.

in the volume of the animal husbandry industry by glancing at the value and numbers of all livestock in Missouri during the Census years since 1850, by looking at these at 20-year intervals.

It will be seen from these figures that the total value of meat animals; beef, hogs, and sheep, went up from $19,870,000 in 1850 to $493,408,000 in 1950. This is a gain of over 2300 percent. A part of this gain is of course due to the increase in the market prices of these animals during this long period.

| CENSUS REPORTS ON THE AVERAGE VALUE OF ALL LIVESTOCK ON MISSOURI FARMS |
|-----------------------------|-----------------------------|-----------------------------|
|                             | 1850                        | 1870                        | 1890                        |
|                             | $19,870,000                 | $84,285,000                 | $138,701,000                |
|                             | $285,839,000                | $257,855,000                | $493,408,000                |

<table>
<thead>
<tr>
<th>Total Numbers of Livestock (Meat Animals)</th>
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<tr>
<td></td>
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<tr>
<td>1850</td>
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<tr>
<td>Beef Cattle</td>
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<tr>
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<tr>
<td>Sheep</td>
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<tr>
<td>Sheep</td>
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<tr>
<td>1910</td>
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<tr>
<td>1930</td>
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<tr>
<td>1950</td>
</tr>
<tr>
<td>Beef Cattle</td>
</tr>
<tr>
<td>Hogs</td>
</tr>
<tr>
<td>Sheep</td>
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</tbody>
</table>

Overall Developments in Animal Husbandry

Missouri, along with the other Cornbelt states, has made great developments in animal production during the last century. Most of these have come about during the years since 1900. One can well visualize the increase in Missouri where he remained until his death at the age of twenty-three. Very many of the best saddle horses have been bred and owned in Missouri, but with the automobile age they have become less popular. Nevertheless, Missouri still has each year a number of high-class horse shows, at which saddle horses as well as harness horses are shown.

It is interesting to know that ponies which for many years were produced in small numbers in Missouri and other states, have recently come into much greater popularity. They have undergone considerable improvement in breeding, some of them, the Hackneys, now having the conformation and style of good saddle or harness horses. Along with this improvement in quality, the demand has so increased that some of these are selling at fabulously high prices.

The changes in the situation among horses, mules and ponies in Missouri, since the height of the horse power age in the early 1900s, have been almost unbelievable. Such changes could not possibly have been visualized 60 or 70 year ago.

Total Numbers of Livestock (Meat Animals)

- Beef Cattle
- Hogs
- Sheep
The celebrated saddle horse Rex McDonald, bred and owned in Missouri. Generally acknowledged to have been the best saddle stallion of the breed. He was buried on the Mexico Fairgrounds with an appropriate monument.

Commercial Feed Developments

A very interesting development has been taking place in recent years in connection with commercial industries interested in agriculture such as those producing feeds, vitamins, antibiotics, and hormones. Many of these companies have their own research departments and farms where they are carrying on much research which is closely akin to that of the agricultural experiment stations. They have also kept well up-to-date with other research in progress and have attempted to take advantage of the latest knowledge in the preparation of their products. They keep in touch with farmers through their sales agencies and other types of publicity and they are selling large quantities of their products in Missouri, as well as in other states.

Present Status of Livestock Management

While great progress has been made in meat animal production during the century, most of it in the last 50 years, it is possible that the changes in the next 50 years will be just as important. Many Missouri farmers are still far behind the best ones in livestock management practices, and new practices are being introduced every year. Probably not over one-fourth the farmers in the state are following all or practically all of the most efficient livestock managerial practices. There is probably another fourth that have adopted only a very few of these, while the intermediate half are following good practices with varying degrees of efficiency.

Another thing in which the meat producers have been rather slow to inform themselves is the real attitude of the consuming public regarding its preferences in meats and meat products. More information along this line is needed by farm people.

Many farmers have been lax in connection with disease control. It is true that great strides have been made in controlling the diseases which were common 100 years ago, as well as those that have become important during the last 50 years. Yet new ones are coming in and some of the older ones, particularly hog cholera and brucellosis, still cause much loss. However, progress is being made toward the eradication, rather than the simple control, of these two diseases, and practical eradication will doubtless come about in years not too far ahead.

Graph from Census data showing the numbers of hogs, cattle, sheep, horses and mules and milk cows by five-year periods from 1870 to 1950.
Chapter 9

Improvements in Dairying

The use of milk from domestic animals goes back thousands of years when it was supplied to the ancients from camels, goats and cows. Dairying as a farm enterprise was well developed in western Europe three centuries ago. Dairy cattle were brought into the United States by the very early settlers. It is said that those early colonists on the East Coast who did not bring cows with them were those who perished. The pioneers who settled Missouri usually led one or more cows as they migrated here in their covered wagons.

Most of the cows brought in during the early days were of nondescript characteristics, largely of the beef type; others were crosses with dairy breeds. Of course, these early cows were used to supply milk for the immediate farm family, and little attention was given to high milk production. Most of them were used for the dual purpose of supplying both milk and meat. Some of their offspring were also used as oxen in the early days.

The first well-bred dairy cattle introduced into the United States came in during the last quarter of the 19th Century. An importation of 10,000 head of Holsteins was brought in between 1875 and 1885 and many of the animals of this breed in the country today trace back to this importation. The first Jerseys were imported in considerable numbers between 1868 and 1890. Other breeds such as the Guernsey, Ayrshire and Brown Swiss came in somewhat later.

Shorthorns Used for Milk at First

The various dairy breeds did not reach Missouri in any great numbers until after the opening of the present century. However, the Shorthorn cattle were used for milk in Missouri and other states up to the 1900s, and a milking type of Shorthorn was gradually developed which is used by many farmers today.

Actually, the number of dairy cattle in Missouri increased slowly during the first half of the past 100 years. By five-year periods for most of the century, these statistics are shown in the accompanying table. It should be understood that most of the animals listed as dairy cattle during the first thirty years were really grades of beef cattle, mostly Shorthorns. Few were real dairy cattle.

<table>
<thead>
<tr>
<th>Year</th>
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<tbody>
<tr>
<td>1870</td>
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</tr>
<tr>
<td>1875</td>
<td>512,000</td>
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<td>1885</td>
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<td>1890</td>
<td>710,000</td>
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<tr>
<td>1895</td>
<td>650,000</td>
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<tr>
<td>1900</td>
<td>740,000</td>
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<tr>
<td>1905</td>
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<td>1910</td>
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<td>1920</td>
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<td>835,000</td>
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<tr>
<td>1930</td>
<td>930,000</td>
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<tr>
<td>1935</td>
<td>1,017,000</td>
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<tr>
<td>1940</td>
<td>926,000</td>
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<tr>
<td>1945</td>
<td>1,115,000</td>
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<tr>
<td>1950</td>
<td>1,034,000</td>
</tr>
<tr>
<td>1955</td>
<td>1,054,000</td>
</tr>
</tbody>
</table>

It will be observed that it was 1910 before the numbers of dairy cattle reached 800,000, but from 1920 on they increased gradually to over 1,000,000 in 1935 and just a little beyond that in 1955.

The rank of the various breeds in numbers in the state in recent years stands with the Jerseys first, the Holsteins second, and with the Guernseys, Brown Swiss and Ayrshires following in order.

Big Advance in Last 30 Years

The developments in the whole dairy industry during the last 30 years have been remarkable. Missouri's climate has been shown to be well adapted to dairying, and great strides have been made in new techniques of production and processing. A large development of the industry has centered in the Springfield region with other
important production areas mainly in the neighborhoods of the large cities.

Missouri has an active State Dairy Association which has accomplished a great deal. The state has complied with the U. S. Public Health Service recommendations for Grade A milk since 1924, and 97 percent of the market milk is now pasteurized. The state is also on the T. B. accredited list, and in 1955 only 93 reactors were reported out of 174,500 animals tested. Some progress is also being made in the fight against brucellosis. Of all herds tested in 1953-4, close to 38 percent contained one or more reactors to the ring test. Tested again in 1954-5, these same herds were found to include only 23 percent with one or more reactors.

In connection with milk production and processing, the developments in the dairy industry since 1925 have been outstanding as shown by the following data.

Total milk production in 1925 was 2,639,000,000 pounds compared to 4,134,000,000 in 1955. This places Missouri eighth among the states. The annual milk production per cow, during this same period, increased from 3161 pounds to 4730 pounds, or approximately 50 percent. This is a remarkable gain which shows the improvement in the quality of the animals and the better methods of feeding and of management during that time.

**Gain in Dairy Manufacturing**

In butter production the gain was from 55,953,000 pounds in 1925 to 57,487,000 pounds in 1953, in spite of the competition of oleo. This placed Missouri in fifth place among the states in butter production.

In ice cream, production was 5,962,000 gallons in 1925 and 16,568,000 gallons in 1955, a very large increase. In the production of Cheddar cheese the state has made great advancement. The production increased from 257,000 pounds (8½ carloads) in 1925 to 90,281,000 pounds (300 carloads) in 1955. Missouri is now second among the dairy states in Cheddar cheese manufacture.

Some of the very large dairy increases during recent years have been in the production of special milk products. The amount of evaporated milk increased from 10,109,000 pounds in 1925 to 18,750,000 pounds in 1955. In condensed whole milk there was an increase from 126,000 pounds in 1926 to 18,750,000 pounds in 1949. The increase in dry skim milk was from 729,000 pounds in 1928 to 37,748,000 pounds in 1955. Other figures might be given but these show some of the developments in dairy manufacture and processing during the period of about 25 to 30 years. Much of this processing and manufacturing of dairy products is done in Southwest Missouri, where at Springfield the largest milk processing plant in the world is located.

**Great Changes in Milk Handling**

In the matter of milk handling, much progress has been made. Instead of the old-time cow stables of our fathers, who did the milking by hand, the modern dairy farmers of Missouri have milking machines located in small clean sheds, or milking parlors. In these, one group of cows after another is brought in for milking, after which the milk goes to clean milk rooms, where it is cooled before it is hauled to the market or processing plant. Many farmers are now adopting the farm bulk tanks for transporting the milk, and this also is a long step in advance. This is a rather new plan and the number of farmer-owned tanks in Missouri on January 1, 1956 was only 84. However, by January 1, 1957, or one year later, the number was 839 or about ten times as many.

One of the real developments in dairy production in Missouri is the increasing use of artificial insemination. Missouri was one of the first states to inaugurate a program of this kind, the first association having been organized in Pettis County in 1938. At that time service was provided for about 500 cows on farms near Hughesville. This association was discontinued in 1944 but there are now two large associations operating in the state. One of these is the MFA Dairy Breeders Association at Springfield, which provides service for about 75,000 cows annually. The other is the Eastern Missouri Artificial Breeders Association at O’Fallon, and it serves about 15,000 cows a year. This means a total number of cows served annually of approximately 90,000.

**College Has Role in Advancement**

The Department of Dairy Husbandry of the Missouri College of Agriculture is the leader in developing the new dairy techniques and production projects in the state. The department has done a very large amount of research in the fields of dairy breeding, dairy feeding and
in the care of dairy animals. It has carried on special investigations in the matter of milk secretion, the influence of hormones on dairy cattle, studies in artificial insemination, the influence of climatic factors on milk production, and a number of studies in nutrition. It is also carrying on extensive investigations in the production of dairy products, such as ice cream and the various cheeses.

The Dairy Department has large herds of Holsteins and Jerseys at the University, and recently received as a gift from Mr. J. C. Penney a very large herd of Guernseys developed on his farm in the state of New York. Containing nearly 300 animals, this herd is kept at a new modern plant on a farm about six miles west of Columbia. It is known as the Foremost Guernsey Herd, the name given it by Mr. Penney many years ago when the herd was located on his New York farm. This is one of the largest Guernsey herds in the state. It is used for research in production problems, a purpose for which it is ideally suited. This means a great advance for Missouri, Mr. Penney's native state, in the fields of dairy research and production.

**Dairy Goats**

There were practically no dairy goats in Missouri until after the opening of the present century, but the numbers have been increasing in recent years. The milk is of primary importance for babies and invalids. The breed that is most important in the state is the Toggenberg, but others are the Nubian, the Saanan and the French Alpine.

The American Goat Journal is published in Columbia and it is endeavoring to increase the interest in milk goats and the numbers of milk goats in the state. The Missouri Milk Goat Breeders Association also has headquarters in Columbia and it is doing much in furthering the interest in dairy goats.

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**Penney. It is a herd in which, for many years, Mr. Penney has brought in the best blood available.**

**Mr. Penney and one of the best cows in the Foremost Guernsey Farm herd.**
Chapter 10

Transformations in

Poultry Husbandry

The developments in poultry production in the last century have been amazing. There is little relation between the methods of handling poultry in the early days and those of modern times. A century ago, the poultry on farms ran wild, mainly in the lots around the house and barn. Distinct breeds of chickens were uncommon as most farmers had only mixed breeds. A few had guineas, some had small numbers of turkeys, geese or ducks. On most farms, the chickens and turkeys found most of their own food. Simple poultry houses or sheds were coming in before Civil War time particularly for chickens, but for many years, the turkeys continued to roost in the trees.

Chickens were grown for such meat and eggs as could be secured from them. Fried chicken, mainly in the summer months, was a favorite food, just as it has always been further south. Turkeys were grown for eating on special occasions such as Thanksgiving and Christmas. The few ducks and geese that were grown had special care and feed.

Era of Fancy Breeds and Shows

As time went on, some people, not always farmers, became interested in special breeds of chickens or other types of poultry. These growers were mostly interested in fancy breeds and they sponsored the first shows. These were the people who took poultry growing out of the barnyards in the early part of the present century and gave it special care. Of course, they carried the fancy poultry business to great extremes, just as some farmers went to great extremes in showing fancy samples of corn at corn shows, at about this same time. The score cards of the poultry fanciers and those of the fancy corn growers had much in common. The peak seemed to have been reached in Missouri about 1911 when the State Poultry Show was held in Kansas City. It was one of the largest ever held in the country.

As time went on, farmers became interested in what was termed utility chickens for producing more meat and eggs so that meat strains and laying strains were developed. From this has grown this country's present tremendous poultry industry, in which Missouri has long been a leader. This interest in production, as well as in breeds, developed very rapidly and special poultry farms were set up in the state. It was easy for a man to figure himself rich in the poultry business. However, the difficulties in controlling disease in large flocks and the incomplete knowledge regarding care and feeding in those times caused many of these poultry farms to fail. Nevertheless, some very superior poultry stock was developed on these farms, and they formed the basis for the poultry industry we have today.

Developments in Incubation

One of the greatest developments in poultry production has come through improvements in incubation. In the early days, as is well known, the eggs were incubated by "setting hens." When these hens were unmolested, they did a pretty good job. The country women, who almost universally handled the farm chickens in those days, often became disgusted with the old hens which were broody and wanted to "set." Actually, this meant a cessation in egg laying and a loss of pin money to the farmer's wife. As a consequence, she would often pen them up to break them of broodiness. Most of these early farm women "knew their eggs" under the old poultry system, but their methods could not be compared with the modern hatchery and brooder systems.

The first incubators which came in, soon after 1900, were of the small box type, heated by a kerosene lamp. They held from 50 to 100 eggs and if they gave satisfactory service they had to be tended very carefully. Later, the size increased, electric incubators came in, and the
modern hatcheries gradually developed with great batteries of egg trays, which handle on the average about 100,000 eggs. However, a few Missouri hatcheries will now incubate as many as a million eggs at a time, which is certainly big business.

Missouri has long been at or near the top in the number of hatcheries and the number of baby chicks produced. In recent years, there have been around 400 hatcheries in operation and the number of baby chicks produced has been close to 100,000,000 each year. This is now a great industry, in which Missouri in recent years has stood near the top.

In selecting eggs for incubation, most hatcheries now contract with farmers who specialize in one or another of the modern breeds or in cross-breds or hybrids. In general the principal utility breeds now raised in Missouri include White Leghorn, White Plymouth Rocks, New Hampshires, Rhode Island Reds, and Inbred Hybrids. There are of course others, which are less prominent. In selecting eggs for the hatcheries, it is important to secure eggs from flocks free of communicable disease, particularly pullorum disease, which formerly caused so much loss among poultry flocks. Through the years the hatchery business has had much influence in bringing good quality chickens to farm flocks. As a result most of the 85 percent of farmers who now grow poultry have good purebreds or hybrids and the old mixed types have largely disappeared.

The development of brooders to take the place of the hen, came in along with the improvements in incubators. The earliest brooders were small boxes kept in a warm place. They were followed by somewhat similar brooders heated with an exterior lamp from which heat was transmitted to the interior. Then came the more modern brooders with electric and gas heat. These have increased in size and complexity to the great battery brooders of the present day.

One of the developments in the poultry industry came into prominence about 1910 when feeding stations were introduced by the poultry packing plants. Market chickens were put in crates and fed soft foods usually mixed with buttermilk and these were known as "milkfed" birds. Such feeding produced rapid gains, uniform finish and high quality. These chickens gained a good reputation and sold at fancy prices. Such feeding stations were continued until about 1925, when disease became serious among them and made the plan unprofitable. This, however, was a most interesting development of the poultry industry.

**Egg Production**

In egg production, Missouri farmers have made good progress. The College of Agriculture has worked out proper rations and methods for egg production and these have been widely adopted. Feed manufacturers have improved the feed they put on the market. Improvement in egg production has also been aided by a plan of poultry record keeping, in which hens are trap-nested and each bird’s production recorded. This has not only been of great help to the breeders in culling out the poor layers, but it has increased interest in better methods among all poultry raisers.

The first seven years work of record-keeping on farms, supervised by the University Poultry Department, showed an increase in eggs per hen from 122 to 170 a year. Thus it was found that two hens of this selected type produced what three hens did in the early twenties.

The better growers of the state are now able to produce nearly 600 more eggs from a thousand pounds of feed than was possible in 1925. This is due to better chickens, better feeds and better management practices. It has been said that "we now know more about the nutritional requirements of chicks than any other animal, including man." Actually the annual egg production has doubled over what it was in 1920 with only 12 percent more hens. People are now consuming 365 eggs per person a year against 299 eggs, 25 years ago.

**Developments in Egg Grading**

One of the most difficult problems the poultry industry has had to face is that of securing proper egg grades for the great mass of eggs marketed. In the early 1890s, when there was little interest among poultry raisers as to the grades of eggs, the situation was very bad. Eggs came in which were not only irregular in size and color, but many were dirty, almost all had been unprotected from heat and many spoiled before they reached the market. A rather recent study by Experiment Stations of the North Central states including Missouri, showed that a third of the eggs delivered from the farmers to the market still ranked below Grade A. It was estimated that if the grower had delivered only Grade A eggs, he would have received seven percent more cash for them. Unfortunately for Missouri poultrymen, other states have outdistanced this state in the development of better market grades, and as a consequence Missouri eggs have been discriminated against in the large markets. In some cities, Missouri has lost the markets almost entirely.

It has taken 50 years for Missouri poultrymen to become aware of the real importance of marketing high grade eggs. A law was passed by the legislature in 1955 setting up market grades and providing for its administration through the State Department of Agriculture. However, it is probably going to take considerable time to get the law into full operation so as to interest the majority of egg producers in marketing eggs of high grade. Some revisions may also be necessary before the law will meet the full needs of poultry raisers and marketmen, but the egg-marketing situation is certainly improving.
Rise of Broiler Production

One of the very great advances in poultry production in the last 50 years is in the growing of broilers. Beginning with small and rather simple sheds for broiler production, the industry has made tremendous strides. It is now a highly technical business in which thousands of young chickens are grown to a size of about three pounds by the use of large houses with controlled heat and technical plans of feeding. Using the best known methods of production and disease control, the industry has met with great success in Missouri and a number of other states, Arkansas being one of the leaders. However, many of these broiler plants are now financed by the companies which supply the feed. They have really become commercialized.

The young broilers are slaughtered, dressed and packed for the market in modern packing houses. They are packed in different types of containers and marketed under refrigeration. These are the chickens that are found in the food stores packed in cellophane covered containers, either whole or in pieces. The difference between this modern type of marketing poultry and the old way is very great. In earlier days chickens were shipped alive by rail from the small town centers to cities, in poultry cars sometimes containing as many as 5,000 birds with a feeder in charge. There was a time in those days when 25 percent of the live chickens reaching New York were from Missouri growers. Then came the time when chickens were shipped undrawn and with the head and feet still left on. It has only been during the last 20 years that the new developments in dressing chickens and marketing have taken place.

Turkey Production

Turkey production is not as important in Missouri as in some other Cornbelt states. In the early days, turkeys ran free over the few farms where they were grown. In the Ozark Region they occasionally crossed with the wild turkey and became wild. As time went on, special turkey farms were set up which have increased in size and numbers with special buildings and fenced enclosures. Methods of feeding and disease control have been worked out until thousands can be grown on a single farm.

The principal breeds of turkeys are the Bronze, White Holland and Beltsville. The first two are large breeds and make up about 90 percent of the turkeys in the state. The last named has been developed by the U. S. Department of Agriculture to meet a growing demand among modern city families living in apartments with small families who want smaller turkeys. There is also a tendency among growers of all three of these breeds to develop what is known as the broad-brested type of turkey, which housewives prefer. It is interesting to note that with the marketing of the smaller turkeys or "turkey by the piece" as is now common, they are eaten the year round, whereas in early days they were eaten mainly at Thanksgiving and Christmas seasons.

Overall Developments

The number of chickens in Missouri during very recent years has not increased. In 1940, 18,768,281 were reported, in 1950 there were 16,825,741 and in 1954 the total was 14,249,049. In the case of turkeys there were 1,277,433 reported in 1940, there were 1,238,821 in 1950 and 2,394,903 in 1954. Prices have of course varied greatly from the early part of this century to the present.

It can be said in general, regarding the poultry industry in Missouri, that it has made amazing developments, particularly during the last fifty years. It has become a specialized business, even on the general farms that have farm flocks. The quality of the utility birds has been greatly improved and the production increased. The matter of egg grading among the masses of poultry producers is still far from satisfactory but the situation is improving and in the rather near future many of the egg marketing problems will doubtless be solved.

The economic return from poultry production naturally varies with conditions from year to year. Prices of both eggs and birds have been rather unsatisfactory in recent years, but in general, the poultry industry in Missouri, with the exception of eggs, has been holding its own. With the new techniques in poultry production and with the advances in marketing, it should have a bright future.
Chapter 11

Developments in Fruit Growing

One hundred years ago, the farmers in Missouri had already begun to plant apples, peaches and other fruits. Much interest was shown in fruit growing in those times since the Missouri fruit Growers Association, later known as the Missouri State Horticultural Society, was organized in 1859, ninety-nine years ago. It seems almost incredible to think that an organization of this kind should have come into being at such an early time. This, however, demonstrates the fact that fruit growers are more alert in their business than the general farmers.

Norman J. Colman, the celebrated agricultural editor of early days once made a comparison of general agriculture and fruit growing. He said that "fruit growing is the higher branch of agriculture. One is more rugged, the other the more refined or delicate pursuit. Like the man and the woman, they should be united, walking hand in hand, each exerting a salutary influence on the other."

It is interesting to know that Governor Colman, as he was commonly called, was elected president of the new fruit growers association and George C. Swallow, Professor of Geology and Agriculture in the University, was a member of the board. Colman at the time was editor of the Valley Farmer, and later became editor of Colman's Rural World, which became known as one of the leading agricultural papers of the country. In addition to his duties as an agricultural editor he was an agriculturalist and later became a state legislator and Lieutenant Governor of Missouri. He also served as the first national Secretary of Agriculture. He was much interested in the welfare of the University and for 16 years was a member of the Board of Curators.

The early meetings of the Association dealt largely with varieties of fruit, mostly apples. A good many varieties had already been introduced as was indicated in a recommendation made at a January meeting in 1861 that for an orchard of 1,000 trees, lists of 6 to 20 different varieties might be used.

Early Advocates of Specialists

Another interesting early development was the recommendation, by the Association, that a "state entomologist and ornithologist" be appointed. This was in advance of such an interest by general farmers. Actually the State Board of Agriculture was not established until 1864. However, the legislature did not act on the appointment of a state entomologist until 1869, when Dr. C. V. Riley was appointed, under the jurisdiction of the State Board of Agriculture. He also served as "lecturer in entomology" in the University from 1869 to 1875. He was a very active man and wrote voluminously on insects and insect controls for both horticultural and agricultural crops.

The codling moth had made its appearance in orchards by the late sixties and a very interesting early recommendation for its control was as follows: "The first brood may be caught by lights placed in dishes of water. A strong decoction of nicotine may be thrown into the trees to kill the moth. If an old cloth is placed in the crotch of the tree, the worms will crawl under this or between the folds to make their cocoons, after which they may be destroyed." Another statement made at this same time regarding codling moth control was that "hogs are the best protection in the orchard. They eat up the fallen fruit and destroy the insects." It's certainly a far cry from the early appearance of this insect and the early attempts at control, to its enormous increase in numbers and the terrific all-season fight that must now be waged with sprays.
Development of Horticultural Society

In 1871, the legislature made its first appropriation to the Missouri State Horticultural Society, as it was then called, to the amount of $1,000. It was a new thing for the Society and a statement was made that “it was hard for the Society to decide just where to apply it for the greatest returns.”

The Horticultural Society had many difficulties to overcome during the latter part of last century and the early part of the present one. The question of the legality of receiving legislative appropriations was questioned and a State Horticultural Board was appointed, through which funds could be handled without question. However, this did not prove very satisfactory so that the Board ceased to function and finally it was later abolished by the legislature. In 1921, the Board of Agriculture became the sponsor of the Society and appropriations were made through this board under the designation of “Promotion of Horticulture.” Still later the appropriations for Promotion of Horticulture were made through the College of Agriculture.

The early members of the Horticultural Society, as well as those in the State Board of Agriculture, took a great interest in the beginning work of the College of Agriculture. They were sometimes quite critical but on the whole, they were helpful. An interesting statement from the Horticultural Society meeting in 1874 was as follows: “We claim our right, in the name of the great body of producers, to have as much prominence and inherent working power in the institution that represents our interests as have those institutions where men are taught to be lawyers and clergymen.” At this same meeting, a request was made for the governor to appoint two members from the society to the University Board of Curators. This was of course getting somewhat into politics, but it illustrates the interest of this organization in the field of education.

Early Fruit Displays

It is important to mention the early fruit displays put on by the Horticultural Society. It had an exhibition of Missouri fruit at the meeting of the American Pomological Society meeting at Rochester, New York in 1879, at which time the Missouri Society received awards on apples, as well as on grapes and pears. Similar exhibits were made at the meetings of this same Society at Grand Rapids, Michigan in 1885. In 1883, there were five varieties of Missouri fruits exhibited at the meeting of the Mississippi Valley Horticultural Society at New Orleans. The Missouri Society had a huge exhibit at the Chicago World’s Fair in 1893, and later at the expositions in Paris and Amsterdam and at the St. Louis Exposition in 1904. Other such exhibits have been held throughout the years and these have aided greatly in calling attention to fruit growing in Missouri.

Early Production of Apples in Missouri

Some of the best known early varieties of apples grown in Missouri were the Ben Davis, Maiden Blush, Willow Twig, Jonathan, Janet, and Smith Cider. It has been reported that in 1889, Louisiana shipped 30,000 bushels of apples, Hannibal 25,000 and Clarksville 20,000 bushels. At that time also, a center of heavy production was in Bates, Vernon, Barton and Jasper counties where apples sold for 75 cents to $1.00 a bushel.

In 1890 the value of the total fruit crops was reported to average about 10 million dollars annually. While this was probably an optimistic statement, the production of fruit in Missouri before the end of the 19th century was a very important industry.

The planting of apples over the state was well along by the end of the century. A special interest had been developed in Ozark plantings and these were greatly extended in later years. These plantings began as early as the 1880s at which time a large company known as the Olden Fruit Company was organized and it began plantings in Howell County. In 1884 it planted 20,000 apple and peach trees along with some other fruits. By 1889 it was reported to have had for sale 15,000 bushels of peaches and 1,000 bushels of berries. The company continued its plantings of apple, peach, pear and cherry trees along with berries for several years. It became the show place in Missouri for fruit growing and had a great influence in developing the Ozark fruit area, principally of apples.

In the early times orchards were planted without much regard to soil, and orchard sites were usually selected on the higher lands. For a couple of decades these orchards did quite well and insects were not yet so widespread as to require much attention. Hardy varieties of apples were often used, such as the Ben Davis, Ingram and others of somewhat similar nature. As a result, Missouri became widely known as the “Land of the Big Red Apple.”

As time went on orchard insects increased. Moreover, most of these orchards were on soils unfit for the long life of apple trees so that they began to die out. While some were replanted it became evident that the ridge-land soils on which these orchards had been planted so widely were not apple soils, with the result that orchards largely disappeared from this type of Ozark lands. They now occupy Ozark soils more suitable to apples, particularly in Southwest Missouri.

There has long been an interest in the “brown loess” hill land along the Missouri River, and some along the Mississippi to which the apple is particularly adapted. It is on such soils, mainly from Central Missouri to St.
Edward L. Beale, a very prominent Missouri horticulturist in the early part of the present century. He was very active in the Missouri Horticultural Society and had an important influence in fruit production throughout the South Central States.

Joseph and eastward in St. Louis, Pike and Ralls Counties that the bulk of Missouri's commercial apples are now produced.

The peak of fruit production in the state, mostly apples, was in the year 1906 when the state ranked fourth in the value of its fruit crop, with only New York, Michigan, and Illinois ranking higher. However, its ranking has declined since that time particularly in the last couple of decades.

Later Developments in Apple Production

According to the 1920 Census the number of bearing trees in the state was 5,162,000, in 1930 it was 3,647,000, in 1940 it was 1,900,000, and in 1954 it was only 439,400. Likewise, the value of the apple crop in these same years as given by the Census was $9,434,000, $2,838,000, $2,020,000 and $1,754,000.

As the number of apple trees and the total production have gone down in the last 20 years, the yield per tree has gone up. What has happened is that commercial orchards have declined in number, but the individual grower produces more apples per tree and they have been selling for a higher price. Where 20 years ago they sold for around a dollar a bushel now they bring two and a half to three or even four dollars. The real returns are now received mainly from seasonal varieties such as the Jonathan and Red Delicious. Missouri growers are usually sold out on these varieties before the apples from other states come in. However, the higher costs of production are such that real returns are received only by the best orchardists.

Another very interesting development is the use of irrigation on orchards. During the years 1955 and 1956 from 1/3 to 1/2 of the commercial apples were grown under irrigation. However, this means that the most successful orchardists today who are practicing irrigation, have close to $1,000 an acre invested in their plantings.

Another development in apple production is the improvement in marketing. Most apples are now carefully graded and packaged, and this gives them much more sales appeal than formerly. They are largely distributed by trucks in quick runs to the mid-continent markets from the Gulf to Canada. Most of them are sold at harvest time since Missouri apples are earlier than those of the heavy producing areas along the Lakes and in the Pacific Northwest.

The decline in the apple industry in Missouri has been due to various causes. There is first the competition with citrus and other fruits from Florida, Texas and California. These are now shipped into the state in refrigerator cars and placed on Missouri markets in very successful competition with Missouri apples. Second, the cost of production is such that only comparatively few men with rather large orchards have been able to meet this expense and market their apples at a satisfactory profit. As a result, the small grower is going out. Third, the present costs of establishing young orchards and getting them into bearing is such that few young men are attempting to go into the apple business. If irrigation is necessary for the most satisfactory returns, still fewer young men will have the funds and a supply of irrigation water sufficient to make the venture.

Production of Peaches Declines

The story of peach production in Missouri is somewhat similar to that of apple production. The plantings began at about the same time, over widely scattered areas in Missouri, mainly for home use and local markets. Later a market-peach growing area was established along the Frisco Railroad southeast of Springfield. The peach orchards were most numerous in Howell and Oregon counties where 6,000,000 trees were reported in 1905. The town of Koshkonong became the center of this industry and at one time it was reported that peaches were harvested from 5,000 acres in that area. These were marketed
in 6-basket carriers in the principal cities of the eastern half of the country. However, the peach industry was never a large one, and it began to decline soon after 1906. This was due partly to improper care of the orchards and partly to the frequency of late killing frosts in the Ozark Region.

In recent years a peach growing area has developed on Crowley's Ridge in Southeast Missouri near Campbell. This soil is a brown loess deposit, well adapted to peach growing and the orchards are planted just above the level of the bottoms so that air drainage lessens the frequency of killing frosts. This planted area is small but it has proved quite satisfactory. There is another area that has developed rather recently on the loess soils near Kansas City. This area seems to be rather free of serious frost damage. There is also an area near Cape Girardeau that has been quite successful. However, these commercial areas are not large and in the main, they cater to nearby markets. Peaches for home use, of course, are grown on farms where a failure from frost is not an important financial loss, and such plantings may continue for home use of fresh peaches and for home canning.

**Strawberries A Prominent Crop**

Missouri has long been known as a strawberry state. While it has declined in importance in recent years, the crop still has commercial importance. The early development took place during the latter part of last century and was centered in the area around Sarcoxie, in Jasper County. In 1903, the Ozark Fruit Growers Association was organized and a year later it was reported that 2,000 carloads of strawberries were shipped. The present area includes plantings in six Southwest Missouri counties, McDonald having the largest acreage. One reason for the decline of strawberries in the Ozark Region is the scarcity of labor for picking, and another is the many drouth years during the 1950s. However, there is a considerable recent development of market strawberries in St. Louis and Jefferson counties, and this movement may expand.

Other berries are not very important commercially in Missouri. It is of interest to know, however, that on particularly favorable years for wild blackberries, rather large quantities of these are picked and shipped from some of the Ozark counties.

Two very prominent early fruit growers deserve special mention in this account.

Edward L. Beale was very active in fruit growing and in the Horticultural Society in the early part of the present century. He made himself felt in the interest of fruit growing throughout the South Central States.

Squire Shederick Connett was the leading apple grower in the St. Joseph area in the early days of the apple industry there. He was very active in the improvement in apple grading and packing. He was also widely known in the early development of the good roads movement in the state and in other enterprises.

**Truck Crops Chiefly Near Cities**

Missouri has never been important in the production of truck crops excepting in the neighborhood of the two largest cities, St. Louis and Kansas City. Here these crops have been produced for local markets with practically none shipped out. Several years ago, an important potato growing center was developed along the Missouri River bottoms east of Kansas City, mostly near the town of Orrick, but this has been largely abandoned because of competition from potatoes shipped into the state, many from California and Idaho.

Formerly there was a development of canning tomatoes in Southwest Missouri near the Arkansas line, with many small canneries. However, the quality of these tomatoes was never very good and the product of the canneries has not met with too much favor, so this industry has declined.
Chapter 12

Advancements in the Use of Agricultural Techniques

The great advancements made in American agricultural production during the last half century have been the result of mechanization on farms and the adoption of many new scientific techniques in the handling of soils, crops and animals. These have greatly reduced the man hours of labor on farms, and have also increased production.

Soil Management

Considered from the standpoint of man's future, it would seem that good methods of soil management may be most fundamental. Without them, soil productivity would decline until land abandonment would result over wide acreages, and food production would drop to a plane at which the population would be near the starvation level.

In the section on maintaining natural resources, mention was made of the great increases in the use of lime and fertilizers in Missouri during the last three decades. These have also been accompanied by new methods of handling and applying these materials. Formerly, lime was applied by broadcasting it and working it into the soil. While most lime is still applied in this way, it has been found that for certain legumes it is better to work it in deeply by special implements, so as to bring its influence to a deeper layer of soil. It has been found, too, that in Missouri some soils are now in need of magnesium as well as calcium. In such cases, some dolomitic limestone, which contains a good deal of magnesium should be used. Fortunately, however, most Missouri soils are not seriously in need of this element. On farms underlain by dolomitic limestone, which outcrops over much of the Ozark Region, soils may contain an excess of magnesium. It is important, therefore, that the farmer know the needs of his soil before lime is applied.

The methods of using fertilizers in Missouri have undergone great change. Many farmers are applying two or three times as much as they did a few years ago. When based on the recommendations of the Department of Soils, the methods now provide for a rather heavy use of...
phosphatic fertilizer and rather liberal amounts of potassium as a basic treatment. The idea is to provide a supply of these materials to be used by the crops through one or more round of the cropping system and then apply a somewhat smaller amount at the time each individual crop is, planted, using it as a starter or as a maintenance application. Rather large amounts of nitrogen fertilizer are then applied at various times in the cropping system. In some cases, too, particularly where the land is plowed deeply, fertilizers may be applied at greater depths than formerly. Experimental work is under way for determining other methods of fertilizer application that may be still more satisfactory.

One of the most remarkable developments in Missouri, in connection with soil treatments, is the use of the soil testing laboratories, mentioned elsewhere, through which the farmer, working with the county agent, can determine the proper amounts and kinds of fertilizer and lime to be applied. This is having a very great influence on soil treatments in the state. It is certainly a remarkable development.

There have been most interesting developments in the kinds of nitrogen fertilizer used. It is now on the market in much more concentrated salts than formerly. One of these, which is widely used, is ammonium nitrate with 35 percent of nitrogen. Nitrogen is also used in liquid form in which some of the concentrated salts are dissolved in water and applied. A most interesting form is that of pure anhydrous ammonia containing 82 percent of nitrogen. This is condensed to liquid form in which it is shipped in tanks. It is applied through nozzles that run into the loosened soil where the liquid expands into a gas which the soil absorbs almost instantly, with very little loss. This is a development beyond the dreams of soil scientists and fertilizer men less than a generation ago.

A most interesting new development is the preparation of complete fertilizer in liquid form. Such liquids are so compounded as to give desired amounts of nitrogen, phosphorus and potassium in one solution and they are applied through nozzles from implements carrying tanks.

It is in connection with the use of these various new techniques in soil management, along with the use of properly adapted and thickly planted strains of hybrid corn, that 100 bushels and more of corn can now be secured. These same techniques, somewhat modified in their application, are used by many good farmers in bringing large increases in yields of other crops.

New Interest in Irrigation

New interest and considerable progress has recently come about in farm irrigation. While this interest has been stimulated by the recent years of dry weather over the state, more men are using it than ever before, and some remarkable returns have been secured. A study of the situation indicates that this practice on uplands will always be limited by the water supply, but there is room for considerable expansion at this time. Bottom lands are close to a source of water either from the stream or from wells supplying ground water and it is here that much of the irrigation will probably develop.

Another interesting development is that the recent drouths have stimulated many farmers to learn "to live with dry weather" as they have never done before. They have become interested in the crops that are most drought resistant, such as grain sorghums for grain and roughage, and Sudan grass for auxiliary summer pasture. This is an important development.

Special Techniques in Field Crop Management

Some of the developments in crop production were mentioned under the section on field crops, but there are others. The development of new systems of cropping with lespedeza is a most remarkable one. Other systems are under experiment.

The cropping systems which provide more feed for livestock are very important. To extend these systems, new varieties of crops adapted to different parts of the state are under test. These include new corn hybrids, new varieties of small grain, and new types or strains of legumes. No doubt new crops from other countries will also be finding a place in Missouri agriculture. Most of the crops now grown in Missouri came originally from other lands, excepting corn and tobacco. More are certain to come in.

The new methods of weed control through sprays and other treatments have made quite an impression on the farmers of Missouri. The U. S. Department of Agriculture has a regional laboratory studying weed control, in cooperation with the Missouri Experiment Station at Columbia.

Weed control methods have gone through a long period of evolution. When the prairies of North Missouri and of Southwest Missouri were first plowed, weeds were not a serious problem. About all the settlers had to do, in growing corn, was to chop gashes with an axe into the overturned tough sod, plant a few kernels of corn in each gash and let the corn go without cultivation. In the new, rich soil fairly good corn crops were raised with little further attention.

Later, as agriculture advanced, many weeds came westward and they became real pests. It was then that cultivators were introduced to keep them down. A good job of cultivation will keep the weeds out of corn and other cultivated crops, while proper cropping systems will also go a long way in weed control. However, the new weed sprays make control still easier. This matter of spraying for weed control is still under experiment, but
enough has been done to have demonstrated its possibilities. It may finally eliminate all cultivation of row crops and largely control weeds in small grains and in pastures.

**Important Techniques in Livestock Production**

In livestock production many valuable techniques have come into use. One of the most far-reaching is the plan which goes back 25 or 30 years, of using especially good purebred bulls and grade cows for producing high quality feeder calves. Another is the wide use of protein supplements beginning still further back. A newer one, adapted particularly to the less productive parts of the cattle raising areas of the state, is the use of more pasture and roughage with less corn in feeding steers. Then there is the use of antibiotics in the production of thrifty animals and more recently the use of certain hormones in cattle feeding.

In the breeding of cattle a method has been developed at the Experiment Station for detecting dwarfism which is an inherited characteristic in cattle. By using this method of detection, dwarfism may be eliminated from a herd by discarding the animals which transmit it.

In the field of hog breeding certain lean types of hogs have been developed which are of superior quality from the standpoint of consumer preference. Another new technique in hog breeding is the use of the farrowing crate for sows and the electrically heated and improved types of brooders for young pigs, which result in larger numbers of pigs saved and more rapid early growth.

A method of hog feeding that is being tried in some parts of the state is that of battery production, something like broiler production with poultry. When proper quarters are provided, diseases controlled, and the hogs fed special feeds, hogs seem to do very well without any range whatever. Although further experimentation with this plan is needed, it may be the way in which great numbers of hogs will be fed in the future. Similar systems may develop for feeding cattle.

**New Developments in Fruit Growing**

In fruit growing, the tendency toward larger commercial orchards has brought in heavier and larger equipment. One man with a large spraying outfit can now take care of most of the spraying on 100 acres of apple orchard. This has developed largely because almost constant spraying is necessary during the growing season, in order to control codling moth and some other insects.

Chemical sprays have come into use that were unknown only a few years ago and new ones are constantly appearing. The use of hormones has been developed to keep apples from dropping off in some instances and for thinning the stands in others. The orchardist says "we stick 'em on and we take 'em off with hormones." The experimental work with hormones is still going on but methods already in use are quite effective. Orchardists are using antibiotics just as are the animal husbandry men. Pear blight can be largely controlled by these antibiotic sprays and they are coming in for other uses.

The recent developments in apple growing in Missouri indicate that for a man to make real profits in the future, irrigation is very advantageous, or even necessary. Almost all of the larger growers are now using irrigation. A new horticultural farm of the University has been provided with permanent irrigation piping to allow complete irrigation of the orchards. Fortunately an abundant water supply is available.

**Poultry Techniques**

Some of the modern techniques in the poultry industry have been mentioned in the poultry section. However, the poultry business is becoming more and more a specialized industry, in which the birds are confined to small areas and diseases are controlled by intensive care, including the use of vitamins and antibiotics. In the broiler business, for instance, the chicks are brought in from one or more of the hatcheries and placed in the broiler sheds; while the feed and sometimes the chicks,
Where green feed is desired, it may be fed as a chick­
ens and eggs produced in the usual way or with the whole egg or their whites.

various cake mixes are prepared which include processed products. Eggs are now dried and sold under the name of egg solids. This name has been adopted because of the stigma that was attached to dried eggs during the last World War. Sometimes the eggs and yolks are dried separately for specific uses. Whole chickens may be cooked and packed in cans, needing only heating to prepare them for the table. Today, pieces of fried or baked chicken are placed in containers with vegetables, potatoes, and other foods, making up a fully prepared meal, requiring only warming up before it is ready to serve. Then there are chicken and turkey pies, already cooked, and finally various cake mixes are prepared which include processed whole eggs or their whites.

There are, of course, many farmers who market chickens and eggs produced in the usual way or with the more advanced methods. It is from these that many chickens and eggs reach the market. Just how long this type of production will last under the competition with battery-type production is, of course, unknown. The battery type of production may never replace it entirely.

New Techniques in Dairy Farming

The modern techniques in dairying include many innovations, some of which were mentioned in the section on dairy farming.

The milking parlors and loafing sheds represent a most interesting development. These have been adopted by many farmers. The modern milking machines have many improvements built into them and they are very efficient. The techniques of cleaning the cow’s body and the udder offer much in the way of greater sanitation in milk handling.

The so-called pipe-line milking equipment which carries the milk directly from the cow to the cooler is an innovation coming into wide use. It greatly improves milk quality and it saves labor.

Improvements in dairy feeding for maximum production have become widespread, through the years and new developments are constantly appearing.

New Ideas in Agricultural Engineering

Some of the new techniques in agricultural engineering have been mentioned, such as the corn combine (picker-sheller), just coming into use, and the drying equipment which accompanies it. This is one of the most far-reaching of recent developments. In connection with the use of drying equipment, chopped green forage from the field choppers may be blown into the drier from the wagons. Then air is blown through it for drying it completely. This gives a high quality of dried forage handled with a minimum of labor and not subjected to rain damage in the field.

Electricity is playing an increasingly important role in farm operations as new appliances are constantly coming into use.

A recent field development is the building and use of good farm ponds to supply water for irrigation and domestic use. Some ponds are already used for irrigation and plans are well under way for filtering and treating pond water to make it safe for domestic purposes.

New designs have been worked out for farm terraces, through which it is possible to make them less crooked and even parallel, on parts of a farm. Such layouts make it much easier to farm the land and there is less ponding of water in terrace channels.

Developments in Agricultural Economics

As agriculture has assumed greater complexity, it has become more and more important that the farmer study the economic situations as they affect him. One of the great advances in economics in Missouri is the regular
issuance of the so-called Farm Outlook by the Department of Agricultural Economics of the College of Agriculture. This publication is based on a careful study of all market data and other economic factors, enabling the farmer to make much better judgments regarding his weekly, monthly, and yearly plans than he could do otherwise.

Studies in marketing have made it possible to carry to farmers and marketing agencies much information of immediate value. This is done through publications, radio talks, television programs, and through such special meetings as grain grading and livestock grading schools throughout the state. There is also a considerable amount of work carried on by agricultural and home economics specialists in the cities and larger towns to assist consumers in food purchasing.

The encouragement of farmers in keeping careful records of all farm operations and business transactions is a very important development. Farmers who follow such record keeping are at a very great advantage. These records are almost essential to success.

The future possibilities through the use of these various new techniques in soil and crop management, in farm mechanization, livestock and dairy management and in economic adjustments are very great. There is good reason to expect that through such means, agricultural production will keep ahead of population increase until the population curve flattens out, or even declines, as it may do during the next 50 years.

Chapter 13

Changes in Rural Living

There have been great changes in rural living in the last 100 years. In the 1850s most farm homes were of plain construction, often with only two or three rooms, some with two rooms upstairs and two rooms down, often with a chimney at either end. Usually in addition to the two lower rooms there was a kitchen built on. Many people in the poorer sections lived in log cabins.

Southern People in Missouri.

In the better sections of the state where the soil was good, particularly where settled by Southern families, there were some large houses of the old Southern style. These were found mainly on the richer farm uplands along the Mississippi River north of St. Louis and along the Missouri River from Boone County west to Kansas City. These were built in the earlier days and the owners were well-to-do farmers who owned slaves. The slave cabins were built near the houses, or mansions, as they were often called. These old homes were usually set back from the existing dirt roads, as there were no hard surfaced roads in those days.

Most of the families who occupied these large homes had the social graces of the Southern planters. In some parts of the state, as in Howard County, the Southern people determined the characteristics of the county. People with much Southern blood also occupied, to a large extent, the counties of Boone, Audrain, Monroe and Callaway, generally known as Little Dixie. However, the

A very good set of farm buildings in the early 1900s, including a large barn for hay storage. Windmills for pumping water were very common in those days.
soil in these counties was not good enough to provide for the construction of so many fine homes and they were less numerous there.

Missouri is of course, classed as Northern territory, but during the Civil War it was known as a border state. However, the large number of Southern people gave the state some distinctly southern sentiments. In 1860, the records show that of the 1,182,000 total population of Missouri, Kentucky had supplied 99,000, Tennessee 73,000, Virginia 53,000, and North Carolina 20,000. This was a total from these four southern states of 245,000 or about 21 percent. There were of course considerable numbers from other southern states so that the numbers of native southern people at that time must have been close to 25 percent of the total. These people were loyal to the deep-seated southern traditions and they had a greater influence on the state than might have been expected.

As people have come into the state, from the north and northeast, and as the time following the Civil War has lengthened, the sentiment has gradually declined. It is interesting to remember that 25 to 30 years ago, at every University of Missouri football game, the band played Dixie at some time during the contest, which brought the crowd to its feet with loud cheers. Today Dixie is played much less frequently and the interest in the old southern song has diminished. Nevertheless, the influence of the southern people in the state, many of them with much culture, has been most interesting and it has been helpful.

As time has gone on, following the Civil War, the influx of northern people has far exceeded those from the southern states so that today Missouri is far more northern in its sentiments than ever before. However, people of southern blood are generally politically mind-
ed and they still have much influence on the political situation within the state.

There is much of truth in the statement that Missouritans "must be shown." This is particularly true of rural people who are traditionally conservative. In a way, this is a good trait. Few people have better overall judgment than experienced farmers. They can usually be depended upon as a stabilizing element in community affairs. On national problems their judgment is often better than that of the average city man on a weekly payroll.

The Farm People in Different Parts of the State

The people of the Ozark Region of Missouri have a varied ancestry. There were at first the French on the far eastern border, who came in seeking iron and lead and, later, agricultural locations. Following the French, American settlers came in and settled the remainder of the eastern as well as the northern border of the Ozarks. Some of these people were also interested in mining, although most of them took up farms.

The western border of the Ozark Region was settled much later than the eastern, beginning at first in the Springfield Plain. These people were mostly from the rough lands of Tennessee and Kentucky, largely of Republican ancestors, so that to this day, Southwest Missouri inclines to be Republican in sentiment. They at first engaged in hunting and fishing, some in mining, but most of them later took up lumbering and farming.

The Ozark Center was settled mainly by pioneer hunters, coming from the mountainous regions of the states to the east. They were not particularly interested in fertile soil. As a result, agriculture was slow in developing and it was confined largely to the valleys, as it is today. Later, lumbering removed most of the good timber, mainly pine and oak, after which much of this cutover country produced a profuse growth of oak and hickory sprouts.

As time went on, practically all the good timber of the Ozarks was logged off and farming increased. This was mostly in the valleys of the region, but in the Border Ozarks and the Ozark Plateau cattle raising became more common and remains so today. The counties in the Border Ozarks gradually developed a much improved agriculture and the Springfield area is now the most important dairy region of the state. The rest of the Ozark Border has also developed a rather good type of general agriculture, during the years.

An influx of German farmers came to the Border Ozarks during the 1850's settling mainly on the better soils in Cooper, Mounteau, Perry, St. Genevieve and St. Louis Counties. Still earlier, German farmers had settled in Warren, Osage, Gasconade and Washington counties so that there were large numbers of Germans in the
Ozark Border counties by the end of the 1890s. These farmers have always been better grain farmers than livestock farmers, but in the main, they have cared for their soils quite well and have added much to the agricultural production of Missouri.

The farmers of the Northern part of the state are mostly from the states to the north and east, although as has been indicated, there are areas where many farmers are of Southern stock, such as in Little Dixie and along the Mississippi River north of St. Louis. The North Missouri prairie farmers and those on the better prairies of southwest Missouri, include most of the well-to-do upland farmers of the state. These are the ones who supply the bulk of the upland agricultural products sold on the markets. They are the farmers who have good homes, most of the home conveniences, and much farm machinery. The majority of them are livestock men.

The bottom land farmers of the state fall into two general categories, those in the lowland counties of Southeast Missouri and those on the other bottom lands of the state.

**Agricultural Developments in Southeast Missouri**

The farmers and the agriculture of Southeast Missouri warrant much greater space than can be given them in this type of publication. Actually the six counties of this great region represent "a place apart" as compared with the uplands of the state. This area is actually the northern end of the great Delta Region extending northward from the Gulf. Most of this country in Missouri is more like the South than the North. In fact those Missouri counties, where cotton is a principal crop, might be classed as Southern.

This great Delta country in Missouri was originally covered, almost entirely, with solid timber growing in a swampy area. The settlers first came in on the broad ridges which were a few feet above the general level of the bottoms. On the lower end of Sikeston Ridge where it reaches the Mississippi River was the location of one of the earliest settlements. This settlement was named New Madrid, a name which it has preserved until the present day.

With the broad area of timbered swamp land covering the six counties, drainage and lumbering went forward rather slowly. However, settlements and farms followed the clearing and drainage until today practically the entire area is in farms. There are only a few small undrained areas remaining and this vast region of alluvial land is an agricultural empire, where corn, cotton, soybeans and wheat are the principal crops. It is a region with a great agricultural future.

In reclaiming this great area, mostly of good land, the work was naturally done by well-to-do men, many of whom came into extensive holdings. The ownership of the land is still largely in the hands of large farmers most of whom live in town and have their land handled by managers, tenants, or share croppers. In the strictly cotton counties about four-fifths of the owners live in towns, but where cotton is not so important the number is about two-thirds.

These land owners keep in close touch with their managers or tenants and have a very strong influence on the agriculture of the region. Their social life is about the same as that of town people who are in other businesses. The tenants and share croppers, on the other hand, have a very different outlook and social standing. Formerly, many of the sharecroppers were negroes, but very many of these have left Southeast Missouri for the factories of the cities. In fact, so many have gone that at times, a labor shortage exists, particularly in the cotton areas. Many land owners are therefore bringing in transient labor for those periods. This is certainly a long step from the conditions 25 years ago when there was a large population of laborers.

In most of the lowland areas where there is no assured flood protection, there are few permanent homes in the bottoms. The tenants live on the nearby uplands and go to the bottom land farms daily. Where farmers live in the bottom lands their homes are rarely very good, excepting on the high bottoms where overflow is very rare. On such high bottoms very large homes are often built. On the whole, lowland farms are worked largely by tenants, share croppers, or hired laborers, whose tenure on an individual farm is rarely very long. Consequently the social status and educational standards of these people are likely to be rather low.

Taking the farm people of Missouri as a whole, it will be seen that they vary a great deal in their economic and social standing. They run from those of high financial status to the tenants, share croppers and poor small farmers who have very little in the way of worldly goods and very little education. They vary also from the well-to-do farmers who have fine homes with all the modern appliances to those with very poor homes and practically no conveniences.

**Influence of Modern Methods of Transportation**

As the tractor has revolutionized farm operations, the development of automobiles and trucks, along with good roads, has greatly influenced the lives of country people. One hundred years ago, there were no hard surfaced roads in Missouri, unless short stretches of the old corduroy roads across wet land might be so classified. People went to town, to church or to the homes of neighbors, by horse and buggy, by horses and wagon, on horseback or on foot. At times, in bad weather, it was only the riding horse or foot travel that would get one over the very sticky, unimproved roads. These conditions continued until the farmers began to build roads which they sur-
faced with creek gravel. Later came the macadam roads, surfaced with crushed limestone. For years these were the leading types of hard road in the state. After this, in 1921, the Missouri Highway Commission was organized through legislative enactment. This commission, from the beginning had good leadership. The people had already (in 1916) voted $60,000,000 worth of bonds for road construction, and the era of real highway construction began. It is generally conceded that the Missouri Highway Commission has done an excellent job in the construction of the state’s highway system.

In the early days, with no satisfactory means of transportation, for either people or products, living was necessarily rugged and simple. Farm families were compelled to live largely off their own produce. Most of them really lived well, in so far as a supply of food was concerned, although they knew nothing of the proper balance of foods as related to carbohydrates, proteins, fats, minerals and vitamins. However, most country women in those early days knew that fruits and vegetables were “good for you.” The home-cured meats and the home-made breads and pastries were usually supplied in abundance, and the people fared very well.

As good roads increased, the whole picture of rural living changed. Main highways, first of macadam, then of concrete and blacktop, linked the larger cities and towns. Then came the farm to market roads, largely of macadam, reaching to the smaller towns and rural districts.

The development of this road improvement plan changed the way of living and the point of view of farmers very greatly. While it is true that not every farm is on a hard surfaced road, more and more of them are being reached each year. The Highway Commission states that, on the average, each farm home is now within two miles of a state maintained road. This means that most farmers now own automobiles and are free to move long distances at high speeds. In an hour, most of them can go to the county seat or other town 30 or 40 miles away. With this they have become more dependent on the stores, they wear better clothes, they make use of the newly processed and packaged foods, of citrus fruits and others brought in from long distances. They are limited only by the pocketbook as to what they may buy. This represents an almost unbelievable change from the rural conditions of even 50 years ago.

**Influence on Rural Schools**

Road improvement has changed the picture regarding rural schools. A century ago farmers had only the one-room rural school leading to the completion of the seventh or possibly the eighth grade. There were no high schools. Children walked to school, sometimes across fields. There were here and there private academies, giving work similar to that of high schools, where some pupils had to get rooms and stay during the week. In the latter part of last century, when high schools began to develop in Missouri, rural children either failed to get to them, or they rode horseback or sometimes they stayed with relatives near the school. A few, who were near enough, walked back and forth each day.

With the coming of the automobile and good roads, a few consolidated schools were formed, giving country children the benefits of high school instruction. This development was slow, however, until more roads were built, opening the way for more consolidations. The real impetus to this came in the late 1940s, when the State Legislature passed a law making it simple for districts to enlarge through consolidation. This development, along with the widespread use of school buses, has almost revolutionized the rural school situation.

At the beginning of 1957 there were only 3192 one-room country schools in the state as against 8422 when this law went into effect. A good many counties now have complete or almost complete consolidation, and the movement is continuing. It is only a question of a comparatively short time until the one-room rural school will be practically obsolete in Missouri, as it is in some of the states farther east. The pupils in many rural schools are now so few that such schools are very costly to maintain.

This complete change in the rural school situation is having a marked influence on rural children. The one-room school had certain values that are not found under consolidation. In general, children developed a degree of self reliance and originality that is difficult to duplicate in the larger consolidated schools, although these schools of course have many offsetting advantages.

**The Rural Church is Changing**

Few changes in rural living during the last century have been greater than those associated with the rural church. A century ago rural churches had been established in most neighborhoods in Missouri. Farm people were generally religious and they wanted a church not too far from their farms. As a result, great numbers of these churches were built, sometimes of logs, but generally of sawed timber, and the numbers in Missouri at the close of the Civil War was near 10,000. The number today is only about 6,500.

There are several reasons for this decline in the numbers of country churches. The first is the declining numbers of people on farms. The second is the good roads which have made it possible for farm people to go where they please to church, or to some place other than to church, on Sundays. There are other reasons but these are two which are self-evident. As the membership declined in most rural churches, many reached the point when the church could not be properly supported. In many neigh-
borhoods, the people could employ a minister to hold services only every other Sunday or every fourth Sunday until finally no minister at all could be employed. As a result, the church closed its doors. Many of these closed churches have been turned to other uses, some even into hay barns and many have been torn down. Some, however, have been developed into community centers for which the buildings could be adapted.

There are two denominations that have not been greatly influenced by the general trend, the Lutherans and the Catholics. These groups have maintained their numbers better, partly by bringing families into their communities and partly by the use of the automobile which allows them to reach larger territories.

In a number of communities, the decline in the number of rural churches has meant a realignment whereby two churches of different denominations have combined their congregations into one. In other cases, community churches have been developed, bringing several denominations into one church building. In some cases, where the rural church was originally a strong one, these have persisted, and the automobile has brought in people of the same denomination from a wider territory, thus forming a fine type of country church. Then there is the case of realignment whereby people from the rural churches transfer their memberships into congregations of the same denomination in the nearby villages and towns. Much of this has been done, and it is continuing.

It can be seen that considering all of these realignments the country church is not dead. The Missouri School of Religion located at Columbia, has developed a seminary and it is now training ministers for rural churches. Most students take some courses in the College of Agriculture and during their enrollment in the School of Religion Seminary they fill the pulpits of rural churches within driving distance. They thus become part-time ministers who help struggling rural churches while they secure rural church experience.

There is another organization in the state, designed to give special training for ministerial students in the fields of agriculture and rural problems. This is the Roanridge Institute located on a large farm, with buildings, near Parkville. It was organized and endowed by Dr. and Mrs. W. A. Cochel of Kansas City. Dr. Cochel was a graduate of the College of Agriculture and Editor of the Kansas City Star. He died in 1934. This Institute is sponsored and directed by the national body of the Episcopal Church but the training is open to students of all denominations. Thus far the work has been confined largely to special summer courses, but there is a limited all-year program.

**Changes in Social Conditions**

One hundred years ago was about the end of farm pioneering in Missouri. Farming as a self-sufficient enterprise was giving way to that where cash returns for products was interesting farm people. Birth rates among farm people were high with many families consisting of six or more. The schools and churches formed the social centers for the people, although many of the social gatherings were similar to those of pioneer days.

Early in the 20th century, many changes were taking place. The number of people on farms was beginning to decline. By 1910, road improvements were going forward, farming was becoming more mechanized and farm communities were expanding. While formerly they were confined to small areas, such as school or church districts, expansion was becoming possible. Farm people were becoming less dependent on nearby neighbors, and village centers were in many cases taking the place of the churches or schools as social centers.

World War I upset the normal balance of the country. Many country boys went into the Army and were sent overseas. Those who came back to their communities had a broader view of life. Where there were several of these in a community, this had a marked influence.

Things had begun to readjust socially and economically, and there was some real farm prosperity during and immediately following World War I. Then came the economic crash and the great depression of the thirties which set things back again. However, with the opening of World War II prosperity returned and, for the people as a whole, it has continued since, with only agriculture suffering. During the two wars and the interim of depres-
sion, matters were changing. Good roads were developing rapidly, farms were becoming electrified and the small community social areas had largely disappeared. The radio and other improved means of communication took away much of the isolation formerly felt by farm families. The villages and towns were becoming more and more the centers of social activities. It is of course true that some communities have established community centers in the open country, sometimes in special buildings, sometimes in churches, or in consolidated school centers. Meantime, too, very many country homes have installed most of the city conveniences, so that rural living is much more like city or town living than ever before.

Another change which is affecting the lives of people, is the lengthening of the life span so that there are many more persons over 65 years of age than ever before. The average life span for people in Missouri is now 65 years for men and 72 years for women. The rural population, just like the city population, is aging. Along with this there has developed, first among city and town people and then among farmers, the federal plan for social security, reaching those of advanced ages. This is having, or will have, a pronounced influence on country people as many of the older ones will, to a certain extent, become wards of the government.

There is another development taking place in Missouri, as in most states where there are many industrial developments and that is the movement of industrial workers to homes in the country. This is going on along all good roads near cities and towns where there is much industry. These people usually buy a small tract of land where they can produce some of their own food and have the enjoyment of country living, while their main income is from the city. Then there are the farmers on fairly large farms with one or two sons, who continue to run the farm at the same time they have a full-time industrial job or other type of work in town. The social life among all these people, who secure a part of their living from the land, is undergoing marked changes. Some adhere to city or town social centers and others to those of the country. Just how this will finally work out is of course unknown.

Along with all these changes, the several farm organizations have developed and these are having much influence on country living. They direct large cooperatives in which the farmers work together and they have some of their own social and educational centers that are having much influence on the lives of farm people.

A development that is affecting the lives of many Missouri families is that of balanced farming, sponsored by the Agricultural Extension Service. Since the plans for these farms include the development of the farm home, as well as the farm, they make possible better country living educationally, socially and religiously. These developments are affecting thousands of Missouri farmers. Truly it can be said that Missouri agriculture, which has been in a state of far-reaching adjustments during recent times, is also seeing a great change in the social life of farm people.
Great changes in the farm price structure and in the economics of Missouri agriculture have taken place during the last 100 years. A century ago the farmer was concerned primarily with growing products for the use of his family; only a small percent was sold. But, as the country went into the Civil War there was a demand for foodstuffs for the armies and an increased sale of these from farms. However, just preceding the war, the panic of 1857 had naturally had a marked influence on farm prices. It of course affected the whole price structure during the early part of the war period.

As hostilities opened, Salmon P. Chase, who was Secretary of the Treasury, at that time, considered various means of financing the War, of which the Legal Tender Acts, passed by Congress, were best known. These provided for a form of cheap currency ("greenbacks") resulting in a considerable degree of inflation, which influenced the prices of farm products just appearing on the market.

While great disruptions to agriculture took place during the war, those Missouri farmers who remained on the land did not fare so badly. The increased demand for food for the northern armies was of course, a great incentive to production. Farm labor was scarce, but improved farm implements were coming in and the farmers made such use of them as they could.

In the Southern States, somewhat similar conditions prevailed in the early part of the war, but cotton was the money crop which occupied much of the land that would have been planted in food and feed crops in the North. As a result, the agricultural conditions in the South were not as well suited to fighting a war as were those in the North, so that southern agriculture suffered greatly. Missouri as a border state had many southern sympathizers and farms were raided by men from both sides. As a result, the agriculture suffered more than it did in the states farther north.

**Economic Conditions Immediately Following the Civil War**

It was anticipated by the Secretary of the Treasury that the greenback currency notes would be withdrawn when the war closed. However, they made up more than half of the money in circulation at that time, so that this was difficult to do. While most eastern people were favoring a return to sound money, "where a paper dollar was worth a dollar in gold," most farmers, including those in Missouri, joined other groups in a demand for the continuation of the greenback currency. Yet, in spite of the efforts of a Greenback Party which had come into existence, the Resumption Act of 1875 a few years later provided for their recall.

Once the greenback controversy was settled, the farmers and others turned to silver as a source of cheaper money. As a result, the Bland-Allison Act passed by Congress in 1878 provided for silver currency on the basis of 16 grains of silver as equal in value to one grain of gold. For twenty years, the silver issue was in the foreground and the Populist Party was organized, largely because of this situation. Even the Sherman Silver Purchase Act of 1890 failed to stop the downward trend in prices. However, after its repeal in 1893 and the failure of Bryan's great Democratic campaign in 1896, a conservative Republican, McKinley, was elected, and the finances of the country gradually improved.

**Special Developments Important to the Agricultural Economy**

During the latter part of the 19th century, business was experiencing a great uplift. The effects of the Civil War were largely past but the country needed many things and business took advantage of the situation. Manufacturing and trade expanded rapidly. At this same time, farmers were becoming more aware of their own problems and were organizing to meet them. They were showing more interest in education for farmers, in new types of machinery, better animals and more advanced agricultural practices. The Colleges of Agriculture founded during Lincoln's administration were making progress. The Hatch Act of 1887, provided for an agricultural experiment station in every state. In 1889, the Commissioner of the United States Department of Agriculture, Norman J. Colman of Missouri, was made Secretary of Agriculture and given cabinet status.

President Theodore Roosevelt who came into office in 1901 was much interested in the conservation of natural resources. Gifford Pinchot, a noted forester and
conservationist, was brought into the cabinet and helped to develop ideas regarding conservation. Vast tracts of land were set aside as national forests. The Reclamation Act of 1902 changed government policy in the reclamation of arid lands. The Country Life Commission was set up with L. H. Bailey of Cornell University as its chairman. The recommendations of this Commission had far-reaching influences on the thinking of farm people.

Under the Wilson administration, beginning in 1913, many developments took place. Wilson was a highly trained educator and not a politician. He held out for reforms in the legislative program which had far-reaching influences among the people, including those in agriculture.

One of Wilson's special interests was in securing a decrease in the tariff rates, many of which were high. He worked hard to get the approval of Congress, against the strong opposition of many Republicans. However, during 1913 the Underwood Tariff Act was passed, providing for very drastic reductions on most items, including many agricultural products. It was known far and wide as a famous low-tariff act.

A very important piece of legislation in 1913 was the creation of the Federal Reserve Banking System through the Federal Reserve Act of 1913. The general principles contained in this law had been worked out by a previously appointed National Monetary Commission. It provided for 12 regional banks throughout the country, in the general management of which agriculture was to be represented. These went into operation in 1914.

An important matter for consideration at this time was the problem of rural credit, which had been one of the weakest links in agricultural development. After very much Congressional discussion the Hollis-Berkeley Act was passed, but so much objection arose that a compromise bill was finally enacted in 1916. This law provided for 12 federal land banks which were to be cooperative credit agencies, including a system of joint stock land banks to be organized with private capital. These banks meant a great deal to the farmers of Missouri, and they have served agriculture well.

Federal Regulations During the First World War

The American entry into the First World War in 1917 found the United States largely unprepared. Under presidential authority, Wilson designated Herbert Hoover, who was already head of the United States Food Administration, to take the necessary steps for conserving and distributing the nation's food supply. A Food and Fuel Control Act was passed in 1916, which Hoover was also asked to administer. The country was thus in position to give efficient efforts to food production and conservation, and under Hoover's guidance it made good progress.

Although farm prices had begun to rise before war...
was declared, the opening of hostilities naturally had a great influence on them. Using as an index the 1914 prices as 100, they rose to 118 in 1916, to 208 soon after the country entered the conflict in 1917, and 221 at the time the war was over in 1919, a rise of over 100 percent.

It is interesting to note that the rise in prices continued until 1920, a year after the war's close. Farmers had expected that immediately after the War ended, prices would drop sharply, but since they remained high, most farmers seemed to feel that this condition would continue indefinitely. Bankers also continued to be optimistic, and the Federal Reserve Board allowed credit to remain on easy terms.

Up to this time, the country had been a debtor nation. Large quantities of farm products had been sent to Great Britain, Holland and some other creditor countries to meet interest payments. But now, the United States had become a creditor nation so that exports of agricultural products were cut down. Surpluses began to accumulate and farm prices declined. The price index which had stood at 221 in 1919 dropped to 124 by 1921. This meant that most farmers were in financial difficulty. If they had bought much land during and immediately following the War, they were in very serious trouble. These conditions had much influence on Missouri farmers.

Federal Aid Programs

Congress has always given consideration to the problems of the farmer. Some attempts were made in this field before the Civil War, or over 100 years ago, particularly in the field of tariffs. However, the most far-reaching attempts were those which were inaugurated at the close of the First World War. Of course, all of these laws and regulations applied to the United States as a whole; therefore the situation must be considered as a national, or more particularly, a Cornbelt development, in which Missouri farmers shared.

It must be remembered that since 1920, aside from the time of the Second World War, farm surpluses had influenced farm prices. In other words, the supplies of agricultural products had been greater than the market would absorb at prices acceptable to the farmer. "Most studies indicate that when total agricultural production is varied one percent, farm prices change at least two to four percent in the opposite direction. Thus a small change in the aggregate or total output has an important influence on price or income."

It can readily be understood that with unfavorable farm prices and with a rather dreary outlook, Congress looked to the future with apprehension. It was at this period, therefore, that it undertook serious and rather sweeping changes in agricultural laws which it hoped would better the situation.

Important Features of Federal Aids to Agriculture

The most significant of the attempted federal aids to agriculture have been through the commodity control programs. These have been grouped into three categories. First, there are the programs which have been stimulated by deep depressions with heavy excess production and very low prices, including acute farm distress. Second, there are those of the war periods when agricultural production and prices are excessively high and inflation is of concern. Third, there are the programs, mainly following the second World War, when production in agriculture greatly outran consumption, so that very large surpluses accumulated.

In general, the measures that have been applied in efforts to improve the economics of agriculture, have included attempts to improve the marketing system through farm cooperatives; holding operations, designed to stabilize the flow of non-perishable products into the markets; attempts to reduce production in order to bring supplies and demand into adjustment at existing or higher prices; attempts to develop marketing agreements in order to stabilize supply and demand and thus strengthen prices; and attempts to hold prices at high levels by means of federal loans and purchases. These have also included certain supplementary programs, such as provisions for export subsidies, the food stamp plan, the school lunch plan and soil conservation payments. For some commodities, several of these devices have been used, for others only one or two. For many, such as livestock and perishables, no important over-all programs have been undertaken.

Major Attempts To Aid Agriculture

The low prices in 1921 stimulated the Secretary of Agriculture at that time, Henry C. Wallace, to call a national agricultural conference to consider the broad agricultural problems. This conference which was held in 1922 went on record as favoring higher tariffs and the encouragement of exports. It also favored the development of means for better agricultural adjustments on a voluntary basis and price stabilization through cooperatives.

Based largely on the principles developed by the agricultural conference, measures were introduced in Congress which came to be known as the McNary-Haugen bills. The important features embodied in these bills were first, the establishment of cooperatives for handling the basic agricultural products for taking surpluses off the market and selling them abroad at whatever prices they would bring. Second, the government was to recoup losses on the exported surpluses by levying a fee or tax as the products passed through the channels of trade. These bills caused as much discussion as any agricultural measures ever considered by Congress. Two of them were
finally passed but they were vetoed by Coolidge who became president in 1925.

During the latter part of the 1920s great speculation appeared on the stock market which in 1929 culminated in the famous market crash with an almost unbelievable drop in stock market prices. Farm prices followed, and based on 1926 with an index of 100, they went down to 88.3 by 1930, to 64.8 by 1931 and to 48.2 by 1932.

President Hoover came into office in 1929, just as the break was coming. The same year, Congress passed an Agricultural Marketing Act, which it hoped would be very helpful. It embodied the idea of an orderly marketing system by taking into account the usual seasonal price variations and handling the products through cooperatives. It also provided for a Federal Farm Board which was supplied with a $500,000,000 revolving fund to take critical products off the market when necessary. However, the great price decline made the work of the Board ineffective. As a result, a large amount of money was expended without significant effects. The Board finally decided that the voluntary controls under which it operated were not workable and the plan was abandoned. However, about $400,000,000 was expended in this useless effort.

President Hoover tried other expedients for bolstering the economic situation and while some were helpful, they had no great influence. The summer of 1930 was one of severe drought in Missouri and some other mid-western states so that real relief programs were inaugurated. However, it was not until 1932 that the situation became acute and the government participated in widespread relief activities. At this time, Congress established the Reconstruction Finance Corporation (RFC), which made possible a greatly expanded relief program. During the first year of its existence relief expenditures reached 9 billion dollars, and these expenditures were greatly increased in the years following.

Franklin D. Roosevelt came in as President in 1933 and he was very sympathetic to aid for agriculture. Within a short time, the first Agricultural Adjustment Act (AAA) was passed. This was a most interesting measure. It set up plans for farmer contracts looking toward the curtailment of acreages of basic crops, which it was thought would reduce production and thus raise the price of the products. However, the Act remained in operation until 1936 when it was declared illegal by the Supreme Court.

Soil Conservation and Domestic Allotment Act

Almost immediately after the Supreme Court had nullified the activities of the AAA, a measure known as the Soil Conservation and Domestic Allotment Act was passed by Congress. This act ignored acreage contracts which had been inaugurated by the AAA and classified crops into those which were soil depleting, mainly grains and cotton, and those which were soil conserving, such as legumes and grasses. Farmers were partially reimbursed for taking land out of depleting crops and placing it in one of the conserving crops. It was argued that the acreages of the basic crops which were mostly in the depleting class would be replaced by the conserving crops thus cutting down surpluses of the grain crops and introducing soil conserving measures. This Act is still in operation and Missouri farmers have received large money returns from it. However, in actually cutting down the production of basic crops it had had little influence.

As time went on, Congress became interested in a more permanent program for the benefit of farmers. As a result, a modified Agricultural Adjustment Act was passed in 1938. This new law continued conservation and allotment provisions with the plan of attempting to hold farm prices between 52 and 75 percent of parity. It also included a plan for setting up large federal regional research laboratories looking toward the development of new uses of farm products. Finally, it incorporated Secretary H. A. Wallace's ever normal granary plan which proposed the storage of excess products during years of abundance to be available in times of short production.

War Brings Price Control Act

The beginning of the European War in 1939 had a tremendous influence on world economy but American agriculture was not greatly affected until the Japanese attack on Pearl Harbor in 1941. This put the United States into World War II. The situation characteristic of the thirties was reversed and prices began to rise. Moreover, as the country worked feverishly to produce war materials, unemployment was no longer a problem.

With full employment giving the people increased buying power and with an increased demand for food for our armies, farmers went on a full program of production, which was supported by the famous Steagall Amendment of 1941. However, Congress continued to be concerned about prices and passed the Price Control Act of 1942. Later changes were made in the Steagall Amendment legislation which provided for the support of prices on basic agricultural commodities at 90 percent parity for two years following the official ending of the War. However, with the removal of federal price controls in 1946, farm prices began to rise and these did not level off entirely until the early 1950s.

With the ending of wartime legislation, Congress began to make plans for a peacetime agricultural program of adjustment. The Agricultural Adjustment Act of 1948, which was to become effective in 1950, was somewhat more lenient regarding price fixing than those which had preceded it. This Act provided for a modernized parity, bringing it more nearly up to date, along with flexible
price supports of 60 to 90 percent of parity. The idea was that when surpluses increased, the support prices could be lowered and when they went down, support prices could be increased.

When Truman came into office for his second term in 1949, with a Democratic Congress, the Adjustment Act of that year was passed. This retained the flexible price supports with a range of between 75 and 90 percent of the modernized parity.

The outbreak of the Korean War in 1950 muddied the water some, but support prices continued at about 90 percent of parity until the Adjustment Act of 1954. This Act continued the plan of flexible price supports for 1955 as suggested in the legislation of 1949, but with the exception that it provided for direct payments to wool growers at 90 percent of parity.

**Soil Bank Plan**

A law embracing what is known as the Soil Bank plan was passed in 1956 but it was vetoed by President Eisenhower. A second one, known as the Soil Bank Act or Public Law 540, of the 84th Congress, went into effect in May 1957. This Act operates under two programs. The first, or the crop acreage plan, provides for taking out of cultivation for a year or more, a certain acreage of basic crops such as corn or wheat and leaving the land unused, or seeding it to grass. The government then pays the farmer a fair rental on the land. The second, is the so-called conservation or reserve plan under which land is taken out of basic crops and placed in what may be termed permanent plantings such as grass or timber for a considerable period of time. The farmer then receives a fair rental on this reserve in grass or timber for the years the plan is continued. This reserve program is of particular interest to foresters and wildlife men.

For 1957, the amount of land placed under the crop acreage plan in Missouri was 682,000 acres and under the conservation reserve plan, it was 78,000 acres, or about ¾ of a million acres in all. In the country at large, this Soil Bank plan has not functioned very well in taking land out of basic crops; and, as a consequence, it will doubtless be subjected to further modifications, or it may even be abandoned.

As the situation has developed during the years, the various farm programs have done little to limit production and control surpluses. The support prices have, of course, given farmers aid during the recent price decline which has been of immediate help. While there have been some political activities in connection with the programs, most Congressmen have been interested in preserving at least a fair level of prosperity among farm people. This interest has doubtless been due, in part, to the fear that a serious agricultural slump might precipitate a nationwide depression. There is little doubt that efforts in behalf of agriculture will continue, but it is impossible to tell just what direction these may take.
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