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POSITION OF AGRICULTURE IN THE  
UNITED STATES ECONOMY

5 April 1950

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MR. NESSEN: General Holman, gentlemen of the Industrial College, and guests: When I first visited this building some months ago, I noticed a plaque in the lobby showing that it was erected on my birthday. Sometimes I think this building is a little better preserved than I am and will outlast me. This morning I was admiring particularly its foundation as I realized how much I would have to cover to do justice to this subject in a single period of exposure.

I am going to talk on the "Position of Agriculture in the United States Economy."

There are something over 80,000 employees in the United States Department of Agriculture and many times more devoting their full time to agriculture in state and local governments and private industry, in addition to the nearly 6 million farm families who gain their livelihood from agriculture. Obviously, I could not cover all their activities in a single period even if I understood them. My purpose this morning is to add a little to your large store of knowledge but not to confuse you.

I shall explore only five aspects of this subject--charts are attached for illustration.

Let us first consider the size and importance of the farming industry. Perhaps no other industry is more basic to the economy of the United States. There is obviously no other industry which more nearly controls the lives of our population from birth to death. It is a scattered industry. There are not just a dozen or even a thousand factories, but 5.8 million independent establishments. Their combined assets last year--lands, buildings, equipment, livestock, and crops on hand--were worth over 90 billion dollars. Their production represents from 25 to 35 billion dollars each year, or about 11 percent of the total national income, whereas farm population represents about 17 percent of the total population.

One of the significant things in farming today is the trend toward farms that are bigger, more mechanized, and more productive than they were 25 years ago, or even 5 years ago. For instance, the average size of a farm in 1945 was 195 acres, compared with 175 in 1940 and 145 in 1920.

Now, please do not become alarmed because I do not plan to relate a great many statistics. I know such a plan would make a talk really dry. If you are interested, you can obtain good statistical information from the book "Agricultural Statistics" published each year by GPO for the Department of Agriculture. But I have felt that I must give you a few statistics in order for you to have a better impression of the size of what we are discussing.

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It is significant to know that 80 percent of the total farm income comes from the top one-third of the farms, or an average of about \$7,500 per farm; whereas the bottom one-third accounts for only 4 percent of the farm income, or an average of only \$400 per farm. The top 10 percent of the farms produced over one-half of the farm output; 90 percent produced the other half. The big farms, measured in acres, are in the West; measured in value of production, they are in the corn belt. (See map "Generalized Types of Farming in the United States," following page 25.)

This trend toward bigger farms has a social as well as an economic aspect. We found in the Department of Agriculture during the depression that smaller farms, particularly in the field-crop areas, were forced to sell to large operators and corporations. Fences were removed, and even the farm buildings were pushed over by bulldozers, not to make the small amount of additional ground available for crops, but so that gang plows in preparing the ground and large combines in harvesting could travel in straight lines. These low-income, farm families were on the move with only a few dollars or none at all in their pockets, looking for new opportunities. They met each other going from east to west, north to south, and vice versa. All along the way they asked local authorities for temporary relief. The Department of Agriculture, during and following the depression, spent a large sum of money to halt this trend for the sake of society as a whole.

Family-sized farms are an American tradition. I believe that one important reason for the large food production during the last was was the protection of that American tradition, because such farms were not dependent upon outside labor and did not require a great deal of additional machinery, while the opposite was true of large corporation farms.

The balance of total farm land to the population in the United States is good. In fact, the 400 million acres of cropland provide nearly 3 acres per capita. In total land area, each person could have about 15 acres. (May I suggest that, if you do not have your share, you register a complaint with somebody but not with me.)

Chart 1, page 19, will give you some idea of how the land is divided in the United States. It shows that about 60 percent of the land is in farms. The first slice of this pie represents the farm buildings, the roads, the fences, the irrigation ditches, and so on. The most important part of our farming land is cropland, which is represented by the large black slice. The other slices of land in farms represent pasture land, woodland, and so on.

The division of cropland in the United States is not uniform. The percentage of cropland varies from 1 percent in Nevada to 62 percent in Iowa.

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The amount of cropland is important, but the production capacity per acre is even more important. In the West, we judge the value of our land by the number of acres needed to support a cow. Accordingly, we could judge our land by the number of acres needed to support a person.

Throughout history, great powers with limited land and other natural resources have fallen to become second- or even third-rate powers as a result of growing populations. Japan is attempting to meet this problem by limiting its population through legalized abortion. China and India have large problems to solve in this regard, with population increasing rapidly and good land at a premium.

The remainder of this pie is largely forest land, some of it in national forest, but most of it in private forest. I will come to that later in my talk.

About 4 percent of the total represents the wasteland in the United States--deserts, marshes, swamps, and the like. Nearly 4 percent represents the amount of land used by towns and cities and factories. About 9 percent represents public grazing land, not forested.

Chart 2, page 20, tells the story graphically of where the cropland, pasture, and forests are located in the United States by regions. The difference in the size of the circles represents the difference in the acreage of the regions.

I want to point out that on the Pacific Coast, for instance, cropland is somewhat short while forest land is plentiful. Notice how little cropland there is in all the great Rocky Mountain area, which has a great deal of grazing land and considerable timberland. The northern plains are practically all cropland and grazing land. In the southern plains it is the same, with some timber, but not too much. Take notice of the corn belt states. About half the land is cropland, and in Iowa, as I mentioned previously, it is as high as 62 percent. It is significant to me--and maybe it is to you--to notice how much of our eastern coast region is covered with forests; not only the pines, particularly in the South, but also the hardwoods. Again, I want to come back to that later in my talk.

Now I would like to discuss my second point--agriculture's contribution in World War II and something of its potential.

"Food will win the war and write the Peace" was a common slogan in the States during World War II. We who worked in agriculture used that as our slogan to farmers. I don't think we needed it, however, judging from the record.

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What part food played in winning the war is controversial, but on this much I believe we will all agree: Fighting soldiers must eat, and the most successful military campaigns in history were won by armies either the best fed or at least adequately fed. The American farmer realized the importance of this during World War II. It has been stated on this platform, and I want to repeat, that the American farmers rose to new heights in food production in each successive year of the war, not only feeding our fighting men more adequately than those of our enemies or even of our allies, but doing it with poorer equipment in many cases and by far less manpower. I will dwell on the manpower problem later.

In addition, the civilian population making the ships, the tanks, the airplanes, and other war materials were supplied a diet which gave them maximum energy to accomplish their work. In fact, in some cases, they were fed more food of certain kinds than they had at the beginning of the war or prior to the war, although the number of calories per capita was about the same.

Chart 3, page 21, will give you a graphic presentation of the farm output in the United States during the last four decades. These figures are based on a 100 percent index for 1935-1939 production. You can see that since 1910, production has increased rather consistently except in the thirties when it dropped considerably. Please note what the American farmers did during World War II; how they stepped up production by leaps and bounds.

I will talk later about the mistaken idea that when people flock to the farms during a depression they greatly increase agricultural production.

Significant to me on this chart is the fact that we did not drop production after the war, as many countries did. Germany, for instance, following the war, dropped to only about 50 percent of its war production. We kept right on going up, although there is a slight drop in 1949 as compared to 1948, which is our all-time peak. In 1949 gross income was about 90 percent of 1948; net income, about 83 percent.

These trends in agricultural production will continue for some time in the future, according to estimates by the Department of Agriculture. With high employment, the trend will, perhaps, stay at a high level. With low employment, the trend will continue slightly upward at a lower level.

Because of the limitation during the war in the supply of certain kinds of food and the fact that slender waist lines were becoming more and more popular (the wives trying to develop and maintain the "athletic figure"), the American people learned they could do with less potatoes, less sugar, and less grain starches. On the other hand, they are consuming more eggs, more dairy products, and more fruits and vegetables, especial the leafy and raw types.

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Chart 4, page 22, gives us a rather good idea of the trend in eating habits since 1910. It shows the rapid rise in consumption of fruits and vegetables just prior to the war, a leveling off early in the war, and then another rise. We are still on the upgrade, but I do not think many agricultural economists expect this line to go very much higher. Rather it is expected to level off. The same is true of the fats and oils and the dairy products. The egg line shows a continuous rise in the period from just before the war up to the present time. The potatoes (including sweet potatoes) and starchy grain products lines dropped considerably. They may go down even below where they are at present. Someday it may be as popular to be fat as it is now to be slim, so it is rather difficult to predict with any degree of accuracy where these trends might end.

The enormous wartime production in agriculture is attributable, in my judgment, to three major factors, (1) favorable weather and no large insect or plant disease outbreaks, (2) patriotism, and (3) price increases. It was accomplished by (1) higher output per worker (longer hours), (2) higher production per acre and per animal unit (better methods), and (3) additional acres planted.

Chart 5, page 23, gives you an idea of the rise in output per worker. This is also based on an index of 100 percent for 1935-1939. During the first two decades, when farm employment was at its highest, total output and output per worker were rather low due largely to the lack of agricultural machinery and equipment. Just prior to World War II farm employment dropped considerably, while total output and output per worker rose rapidly and this trend continued throughout and following the war. Notice how closely the two output lines follow each other. Notice the big drop in output during the depression years, with farm employment still high.

As for output per worker, we must remember that our agricultural labor force was of a lower quality during the war. Most of the big, strong, and healthy farm boys were with you gentlemen overseas, and many of them were in the factories. The moms, wives, sisters, and sweethearts, together with old folks and youngsters, worked diligently and for long hours assuring that their loved ones would not be hungry in the fox holes and in the hospitals. This impression of mine gained from traveling in rural areas throughout the war is the reason for my earlier statement that patriotism played such a big part in this increase in agricultural production.

Next to longer hours and diligent efforts, our increased output per worker can be attributed to increased use and availability of machinery. Old tractors and planting and harvesting equipment which had not been used for years were repaired or patched up and put into use. This added to the new equipment made available was very important from an over-all standpoint.

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Chart 6, page 24, shows what has happened to our farm population since 1910 and what is estimated through 1970. You will note that the general trend in farm population has been downward since 1916 except for the depression years following World War I and the big depression in the early thirties.

Notice the rapid drop in the first part of World War II and during the middle years of the war. Observe the rapid rise since 1945. This last return to the land is not clearly understandable. I think, perhaps, the feeling throughout the country that we were likely to hit a depression has had something to do with this return, although, of course, we have not had even a serious recession. Another contributing factor is that many of the boys in the services and in some of the war industries went back to their homes on farms.

The trend is downward, and should we have a depression, the trend is expected to be downward also, but at a much higher level.

The fact that when times become tough there is a large migration to the land is probably due to the mistaken belief that a person won't starve if he has a small tract of land. Although people flocked to the land in the depression years, you will remember a previous chart which showed that production took a terrific drop at that time.

I wish I had time to tell you of the sad cases of families on relief in the rural areas all over the country in the early thirties, and what our Government did to improve their tenure on the lands, adjust their debts, provide them with feed, seed, fertilizer, livestock, and equipment to permit them to make their own living and get off relief. The result of those efforts was an important factor in the wartime accomplishments. The family-sized farms that benefited in the thirties moved into full-scale production in wartime without draining labor and critical materials from the market. On the other hand, the large corporation farms were entirely dependent on labor and new machinery.

As for the potential, assuming peace through 1960, it would seem that agricultural production in the United States might level off at something near the 1949 rates of production, which, dollarwise, is only about 90 percent gross or 83 percent net of the peak income in 1948. The Department of Agriculture estimates a further reduction in 1950.

Part of the United States increase during wartime was due to the efforts to put back in crops some of the land which, before the war, had been turned back to grassland to avert the possibility of another dust bowl. This was accomplished through such programs as that of "Enlisting Idle Acres," which I spearheaded in the Department of Agriculture during early war years. We advocated spending our soil savings on the "rainy days" (war) which were upon us. Through the grace of God, or by pure

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luck, dust storms of any magnitude did not materialize. Now efforts are again being made to divert this land back to grassland. However, such land taken out of crops likely will be offset by new lands coming under irrigation.

The return of the land to grassland is one thing that might tend to decrease production. Another factor which may tend to decrease production potential is the slacking off of exports of agricultural commodities. With foreign countries stepping up their agricultural production and ECA aid scheduled to liquidate in 1952, there will be less foreign demand for agricultural products over the next 10 years, so disappearance will be largely limited to United States consumption. The tendency seems to be that, where there is less demand, there is some slacking off in production notwithstanding the price support programs.

It would take a population of about 175 million to use the average production during the last two or three years. It is not expected that our population will increase to that extent in the next 10 years, and, under this premise it is believed that total agricultural production will either level off at or below the 1949 rates, or we will have very large surpluses.

Now in case of another emergency, it has been said by some who are in a position to know a great deal more about this than perhaps any of us in this room that, we could feed from 75 million to 100 million people more than we have in this country. That would mean, of course, shifting from a livestock diet to an almost strict grain and crop diet.

The third point I will discuss deals with the conservation of our agricultural resources.

Partly because of a liberal policy of disposing of land by our Government and thanks to the resourcefulness of the American farmer, we can safely say that the United States is the most important agricultural country in the world today. The Federal Government has a vital interest in the Nation's agricultural program. In no area is there greater cooperation among local, state, and Federal governments than in agriculture. An illustration is the Soil Conservation Act of 1936, which authorizes the Secretary of Agriculture to promote the conservation of soil and help increase the purchasing power of farmers by supplementing their voluntary actions and those of state and local governments to effect the purposes of the act.

Around New Year's Day there was a great deal of discussion, and possibly some wagering, in this College about the "Rose Bowl," "Cotton Bowl," "Orange Bowl," and many other bowls, but I do not recall that anyone mentioned the largest bowl of all, but the one with the smallest attendance. I refer, of course, to the Dust Bowl, the center of which

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is located north and west of Amarillo, Texas. It covers parts of five states and is equal to the size, approximately, of the States of New York and Pennsylvania. The history of the settlement and exploitation of this area is well written in all good books on soil conservation. The moving picture "The Plough that Broke the Plains" has been shown the world over, and the devastating effects of this exploitation bring tears to the eyes of hardened criminals.

In 1934, a brown-red dust settled on the desks of the office workers in the Empire State Building in New York. Some of it drifted into the Atlantic Ocean. Farther west the sky was dark in full daylight. Few people east of the Mississippi River realized that the topsoil of the great Dust Bowl was moving east at a terrific pace. The same thing happened to a lesser extent in 1937 and happens to some extent each year.

In addition to wind erosion, we permit the dumping of carloads of our best topsoil from the Mississippi River basin into the Gulf of Mexico by water erosion, and we allow deep gullies to form in agricultural lands, particularly in the South and other areas where flash floods are common. These have grown into ravines destroying some of our best agricultural lands in their wake.

This picture of soil erosion from wind and water is probably too simply stated to be stated at all, but the thought to be retained is that we are now conscious of this enormous waste and are doing something about it. Through the soil conservation districts, aided and advised by the Soil Conservation Service of the Department of Agriculture, landowners are organized to combat these attacks by nature. A mere reference to some of the most common methods, such as contouring, strip cropping, and terracing, should be particularly meaningful to those of you who ride the airplanes and can compare what you see now with what you saw not too many years ago; and the land layout, slope, drainage, and use of soil-moving machinery might suggest an interesting study to the engineers. However, none of us need to be agriculturalists to understand that when row crops such as corn and soybeans increase erosion as much as 1,000 times, it is obvious that clean tillage must give way to a form of cultivation that will leave plant cover between the rows to hold the soil in place, and that the land must be laid out so that moisture which falls will be encouraged to seep into the soil where it can be used by plants rather than run off in torrents, taking precious topsoil, fertilizer, and humus into the sea.

In the matter of water, we as a nation are becoming more conscious that man cannot live without water. Sixty percent of his body is composed of water, which must be constantly renewed. His food consists mainly of water, as, for example, 300 tons of rainfall are required to grow 1 ton of corn. Conservation of water must not start with that which comes out of the faucets in our homes; it must not start with the water in the river

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beds; but it must start in the accumulated trash of the forest floors, the soil water, the wells, the springs, the marshes, and the lakes.

The importance of water to food production was well illustrated during World War II when irrigation played such an important role in the achievement by farmers in meeting wartime and postwar production goals. The potential agricultural production of the Nation will hinge strongly upon the wise development of our irrigated lands, which lie fertile but unproductive because of a lack of adequate available moisture. This job calls for new dams, tunnels, canals, and other large-scale works. Irrigation farming has transformed large land areas from dry-land wheat producing and grazing to lands of utmost importance in the Nation's economy, producing a wide variety of fruits and vegetables as well as all the important types of farm animals and animal products.

Irrigation practice is confined largely to the 17 western states, representing three-fifths of the total land area, only 23 percent of the farm population, but producing one-third of our total farm output, including four-fifths of the wool, four-fifths of the food grains, two-thirds of the fruits and nuts, and three-fifths of the sugar crops.

The soil suitable for irrigation far exceeds the water available. The potential is conservatively twice the land now under irrigation. Although 76 percent of the irrigated land is financed by private interests, it is believed that future development will depend upon the degree of participation by the Federal Government, because the less profitable, difficult-to-work areas are still to be developed. The trend in future development is for multiple-purpose dams dealing also with flood control, power, navigation, wildlife, and domestic water supply.

Now let us consider my fourth point--the importance of our forest resources.

I am sure you all realize that wood enters into every nook and cranny of the United States economy; in fact, of our everyday lives, from our transportation on railroad ties, communication by telephone poles, shelter and furniture, containers and packaging for the groceries brought into our homes, to the paper we write upon and the books we read. Wood is so common to all of us that we sometimes forget that life practically could not exist without it. Those countries with limited wood resources typically have poor living standards, and, conversely, countries with plentiful wood resources enjoy the highest living standards. This is illustrated by contrasting China or India with the United States, or with Germany before the war.

Each person in the United States uses about 800 pounds of wood each year. In Europe, the average is 250 pounds; for Africa, 125.

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Some of you may wonder why forests and wood products are considered as a part of agriculture. The best reason I know is that the tree is a plant grown commercially and is fast becoming a rotation crop. It cannot be grown in a single year like corn. The Douglas fir on the west coast requires nearly 150 years for maturity. Thus, rotations involving Douglas fir and many other species run over a period involving generations of families or large companies whose perpetuity is not in doubt. This fact, coupled with the human quality of selfishness, makes it difficult to maintain our forests as a liquid enterprise.

While we talk of surpluses in the case of many of our food crops, we must talk of deficiencies in the case of wood. Our forests are operating in the red. Our total annual growth of saw timber is about 35 billion board feet, while our drain in 1944 was 54 billion feet, which is nearly 10 billion feet below the drain of the peak war year. True, considering all wood growth, there is a near balance, but 80 percent of our drain is in saw timber. As a nation, we have shrunk our total supply from about 8 trillion board feet to 1.5 trillion feet. Approximately one-third of this source of supply is in national forests which are uneconomic to log due to the terrain. This leaves the forest situation in a full-scale dilemma, nationally.

There are one or two bright spots in the picture. One is that we have plenty of forest land, as I pointed out on the first chart-- about one-third of the total land and about two-thirds of the original forest area. Another is that it is believed education is making progress in the elimination of waste, in both logging and the manufacturing processes. We have a long way to go because total waste is still about two-thirds of the original wood growth. It may become necessary for the Government to establish controls putting all cuttings on a sustained-yield basis. Under such a plan, the small private ownerships offer the greatest problem.

The United States, for 30 years, has imported more wood products than it has exported. Most of its softwood imports are from Canada. Wood imports represent 10 percent of the total United States imports.

The forest situation is of concern to the military forces. Practically every operation of a war is dependent upon wood. Every freighter that leaves the port with war supplies carries some 10 carloads of dunnage to pack and stabilize its cargo. For every man sent overseas, it takes 300 board feet to box and crate his initial supplies and 50 board feet per month to keep him there. Approximately 80 percent of our drain during the war was by the military forces.

We had many miscalculated directives requiring the use of wood in World War II. I trust our record would be better in another emergency.

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My last point concerns technology in agriculture.

Technological progress in agriculture dates back to a very early time. The story of Silas Marner, the weaver, and of his plight after the weaving mills were invented is one which has been duplicated thousands of times in everyday life. In this country, we are familiar with the story of the cotton gin, James Watt's steam engine, and Ben Franklin's electricity practically revolutionizing agricultural methods at the time each came into the picture. From steam to the gasoline engine to the electric motor, there were significant changes in the agricultural use of the cream separator, milking machines, and other farm, power-driven machinery.

Chart 7, page 25, illustrates the most significant change, that is, the replacement of horses and mules by tractors. The extent of this replacement is phenomenal, as shown by this chart. To say that tractors are on the increase in this country does not mean too much to anybody until he sees a line something like the one for tractors on this chart. To say that we are having fewer horses does not mean so much until he sees a line that goes down something like the one for horses and mules.

This is basic to our previous discussion regarding the trend toward larger farms and to a great extent the increased production per farm. To be able to plant and harvest at the correct time by faster methods accounts certainly, in a measure, for more and better products, not to mention the saving by elimination of waste. Add to this the millions (approximately 65) of acres of crops no longer needed to feed work stock, and you account for considerably more products available for human consumption from the same farm land.

Possibly less significant but very important was the evolution from the sickle to the grain binder, from the flail to the threshing machine, and then the combine, which is rapidly replacing both binder and threshing machine. Then we must mention the corn planters; corn harvesters; the gang plows, covering 20 or more acres per day, compared with the old horse plow, which utilized the energy of a team and driver to plow one acre per day; and, finally, the cotton planters and cotton pickers used in the long-staple cotton areas in western Texas. They are only a few of the many labor-saving machines which have reduced manpower and horsepower and at the same time stepped up agricultural production.

In the field of preservation, we understand the Department of Agriculture is perfecting a new preservative which may revolutionize the present distribution system for fresh milk. A harmless substance called subtilin can be put in fresh milk with no harm to its quality even after it has been on the shelves of grocery stores for months. I can visualize a few years hence that milk produced in New Jersey could

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be bought from grocery shelves in Chicago several months later. This would have a great potential for war in saving manpower, gasoline, tires, and trucks.

It is believed now that varnish can be successfully made from surplus potatoes, and clothing is already being manufactured commercially from corn fiber, which produces a cloth lighter than wool, wrinkleproof, and moth-resistant.

In forestry, successful experiments have been made in growing hybrid pine which may do as much for the American forests as hybrid corn has done for the farmer. It is claimed a hybrid seedling will outgrow the parent tree by 100 to 300 percent in a given time.

In the forest products laboratories, impregnated, compressed, and laminated wood products have been developed along with plastics, molasses, ethyl alcohol, and sugar. Laminated wood is particularly important to us in making "big ones out of little ones." It is unfortunate that someone does not develop a way to do the same thing with the fish catch you bring home from a trip.

This is a sample of laminated wood [exhibiting]. It is a ship's keel. If you want to look at it as you leave the auditorium, you will see that it is made out of very small pieces and put together with waterproof glue.

This is what we call sandwich construction [exhibiting]. It is made of corrugated paper layers in the center and plywood on the outside. This is becoming, and someday will be, a way of using small pieces and making big things. It is used for floors in some planes. It is also used in construction. It is very light and well insulated.

In the field of nature, we have claims of successful rain making. The originator of the research, Dr. Schafer, says that the cloud seeding method of producing precipitation has an optimistic potential. However, Dr. Wexler of the United States Weather Bureau says that cloud seeding will not produce a significant amount of precipitation. You can take your choice.

I have discussed only the highlights of (1) the relative size and importance of the farming industry in the United States, (2) agriculture's contribution in World War II and its potential, (3) conservation of agricultural resources, (4) the importance of our forest resources, and (5) technological progress in agriculture.

It is quite evident that this audience, in key military positions in the field of logistics, will be most responsible for conserving or wasting available wood products should we become engaged in a future war. I trust that, with the background of this College, you will be ever cognizant of the need for making the best use of a limited supply.

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Perhaps no person has done more to make us appreciate the importance of forest conservation than Joyce Kilmer, with his immortal words:

"I think that I shall never see  
A poem lovely as a tree.

"A tree whose hungry mouth is prest  
Against the earth's sweet flowing breast;

"A tree that looks at God all day,  
And lifts her leafy arms to pray;

"A tree that may in summer wear  
A nest of robins in her hair;

"Upon whose bosom snow has lain;  
Who intimately lives with rain.

"Poems are made by fools like me,  
But only God can make a tree."

COLONEL HICKEY: Gentlemen, we are ready for your questions.

QUESTION: Would you say something about the degree to which agriculture may be depleting the soil? I am not referring to erosion but to the consumption of the mineral and organic constituents of the soil that may not be replaced.

MR. NESSEN: Of course, we know that, with the millions of bushels of wheat and other products that go outside this country each year, there is bound to be some depletion of minerals. On the other hand, I do not believe that the agriculturalists in this country are too much concerned about it. For the most part we have minerals in the ground which, if applied to the soil, will easily replace any of those taken away.

The three important plant elements, as you know, are nitrogen, phosphorus, and potassium. Sulphur and lime are also important as soil conditioners. I think we have an adequate supply of all. It is true that we import some of each but the amounts are not important, comparatively.

As for the traces of boron, calcium, sulphur, iron, copper, manganese, and the like which are used by plants, I think we have nothing to worry about. Most of our agricultural soils contain sufficient quantities of these for plant growth.

QUESTION: I was thinking especially about a lot of soil that does not require any fertilizer, or at least it has not and won't for a long time; but are we going to reach a time when, in order to use our soil, we must spend a lot of money and effort putting fertilizer into it?

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MR. NESSEN: Many writers have a defeatist attitude toward soil management. Personally, I think that more of our agricultural land will become better rather than worse, although I agree we must use more money to buy fertilizers and we must make every effort to maintain or improve the land. Improved practices such as crop rotation are paying large dividends, particularly in some areas.

QUESTION: I need a great deal of help in trying to understand this continued subsidy of the farmer by the Government. There are two approaches. On the one hand, the Government continues to buy the surplus crops and to insure the farmer against lower prices by a guaranteed price for wheat, corn, and so forth. On the other hand, there is an increase in production here, and the crops in foreign countries are going to increase. So we are presumably going to continue to have a surplus in this country. Furthermore, farming today is pretty big business from an investment point of view alone. Investment in good farm land today is worth an income of between 10 and 12 percent; for a farmer who owns and operates his own farm, it is good for about 25 percent. I don't see how we can compensate those two approaches.

MR. NESSEN: You were here for our seminar on price supports. I am afraid that most anything I say on that subject would be an anticlimax to the statements made by Messrs. Trigg and Wells.

I am not attempting to defend Congress' position on surpluses, but let us be sure we understand all the factors involved. I know that we all wonder why one group of our economy is subsidized directly and certain other groups are not. On the other hand, there are many different kinds of subsidies, and sometimes it is difficult to find out who is not subsidized by the Government.

The point, however, is that we as a nation, particularly with a war threat, need to have some surpluses. We are rather fortunate that we had some the last time. Take lumber, for example. We had nearly 17 billion feet of lumber in our yards at the beginning of the war. At the end of the war we had none. We were fortunate also to have had surplus wheat, corn, and cotton which were largely used up during the war.

A short while back I was talking with the Under Secretary of Agriculture in his office. He said, "Nessen, why couldn't you people over there figure out how big our grain reserves should be? I think the military people ought to tell us what might be needed in another emergency. We don't know. We can control that, you know. We can control the six basic crops." I replied that it would not be the group of people here in the College, but it would be, perhaps, the Munitions Board or the National Security Resources board which should advise you.

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It is significant that the Department of Agriculture is wondering how much surplus grain we should have from a military standpoint.

We talk about all this money used for price support. Yet the wheat surplus, when the new crop comes in about next July, will be only around 400 million bushels. If we keep up these big years of production, maybe we will produce 1.2 billion bushels, or what we did in 1948, and approximately the same in 1949. In corn, we will have only about 800 million bushels reserve out of an annual crop of 3.6 billion bushels. In cotton, we will have about a half year's supply, approximately 7 million bales against a production, possibly, of as high as 14 million bales. However, I agree with you that the accumulation of agricultural surpluses is of concern to every taxpayer, whether he is military minded or "something else minded." It is a real concern to all of us.

I think we agree, though, that we could not remove price supports from all our agricultural products immediately and maintain a stable economy. So I believe it is a question of the kind of program, the rates of payments, and the amounts of reserves, which are advisable.

QUESTION: I have become fascinated with the arguments raging between the two schools of thought on fertilizer. I cannot find the truth. I have asked some of the people from the Department of Agriculture who have come here. They don't take a middle road at all. Those who say we can bring the land back and keep it up with inorganic fertilizer, that is, chemical fertilizers, won't even admit that the organic boys have a point, or vice versa. I would like some guidance on that.

MR. NESSEN: That is a good question, all right. Probably this type of question is one reason why I was worried about my own foundation this morning when I looked at this building. I have found in my lifetime that I cannot be a specialist in every field.

I am not worried about the continued application of inorganic fertilizers. As you have mentioned, there are experts who disagree with that opinion and there are experts who agree. If you read "Road to Survival" by William Vogt, you might think this whole world is going to pieces; the first thing we know, we will have so many people and so little land--all our topsoil will be blown or washed out to sea--eventually we will all starve to death. If you read "The Road to Plenty" by William F. Foster, you find the opinion, which apparently I share, that we are not going to fall to pieces in agriculture.

I think, with the educational program that has been going on here for years, people are becoming conscious of the importance of green manure crops and other ways of applying organic matter to the soil. My confidence in man's ability to meet such problems is unshaken. I think the American people will meet this problem, if it is a problem.

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QUESTION: You have been talking about saving the soil, but you have failed to mention hydroponics at any time.

MR. NESSEN: That is right. I thought it would probably come up in this discussion. I am glad you mentioned it.

First of all, you know what we are talking about, I presume--the growing of plants by soilless culture, supplying the minerals and the moisture artificially.

Considerable attention is being given to hydroponics, mostly on an experimental basis. The experiments have been carried on mostly in greenhouses, under glass. There may be a very few places in the world where it is being practiced on a commercial basis. During the recent war an unsuccessful attempt was made to use this practice on a large scale in northeastern Canada.

So long as we have adequate land to grow the crops we need, I do not think that this type of "factory" can successfully compete with nature's method.

QUESTION: I would like to discuss the trend toward large farms you mentioned and how it affects the social life of the people who have been living on these small farms; also, the way the Department of Agriculture controls how many people you can have on your farm by telling you how many acres of cotton, tobacco, or this crop or that, you can plant. To me, it is quite an alarming situation, particularly in the South. For instance, because of the recent reduction in cotton acreage, a good many of the tenant farmers have had to be closed down. The small tenant farmers have no place to go except on relief or to the cotton mills, which mills are rapidly catching up in the industry.

Production is being cut, in one way, by controlling acreage. Now, in a depression you said there is a flocking of people to the farms. What can these people plant when they go to the farms? That is what I would like to know.

MR. NESSEN: The answer to this question is a long story, as you know. It again gets back to the price-support program.

It is true that the Department of Agriculture controls the number of acres that may be planted of the 6 "basic" crops which are under price support. We cannot be critical, however, of our legislation both ways. We cannot be critical of having surpluses and also be critical of someone telling us, "You can't plant any more of these crops because the surpluses are too big already."

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I think the problem is the inequity in the acreage allotments. From my reading on that problem, I am under the impression the Department of Agriculture is not entirely in agreement with Congress in the way acreage allotments have to be set. I think the Department of Agriculture would suggest a somewhat different method of allotments. Cotton is one of the big problems. Most of us think that 7 million bales surplus out of an annual crop of 14 million bales is more of a surplus than we need. I believe the Department of Agriculture will try to reduce cotton acreage, but the way the law must be administered frequently makes it rather difficult for some farmers.

Your question also involves several social problems. I don't know what the answer to the "small farm versus big farm" question is going to be. I am personally of the opinion that a better balanced economy would result if we have as many people on the land as we have now, or a few more. The only way we will keep them there is to legislate against the large corporation farms in this country and encourage the family-sized farms. Possibly limiting the amount that one farmer could receive from price-support payments would do it. I would like to see the southern sharecroppers with at least 5- or 10-year leases on their land so that they would stay there and contribute to our total national production by doing the things they can do and do well.

I have a minute to tell you one of the several stories along that line, about the plight of the poor sharecroppers in the South. One of these families had done a particularly tedious job one year and, in some way or other, got a little more cotton off the little block of land they farmed than they had expected or the landowner had expected. At the end of the year they came in to settle up with the landowner, who said, "Let's see, now, you produced four bales, and I have them in my warehouse. Here is your bill; let's go over it." Groceries, so much; this, so much; and so on. He said, "That's a peculiar thing. It happens that you come out just exactly even. The four bales of cotton you grew just exactly balance your charges." The sharecropper made the mistake of saying, "I am surely glad to hear that. It means I am all settled up and can sell the extra bale I have over in the shed." The landowner immediately took out his pencil and started refiguring. Of course he found some items he said he had failed to include in his bill so again the account exactly balanced. Well, historically, they always come out even.

So long as we have that type of economy, I think we are going to have social problems. On the other hand, if we know we were going to have war, I would say let the farms get bigger and bigger, provided we have plenty of steel to put into tractors and other equipment, because then we would likely get a higher production.

COLONEL HICKEY: I am afraid our time has run out. Thank you, Mr. Nessen.

(27 Apr. 1950--350)S.

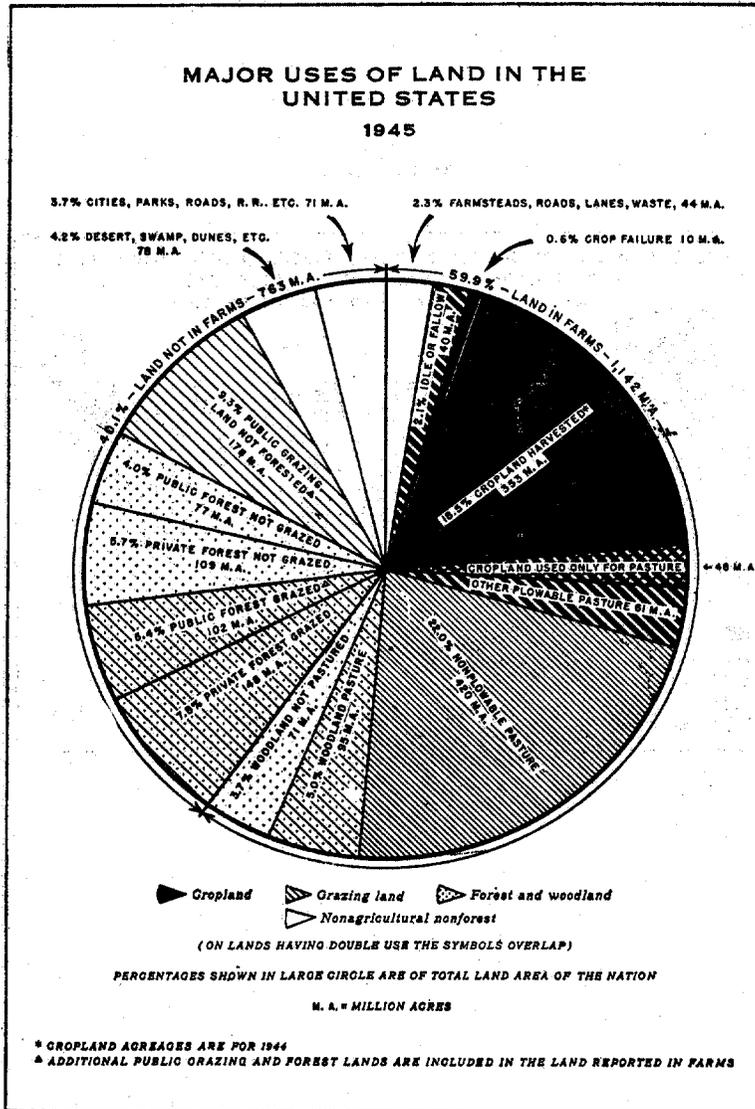
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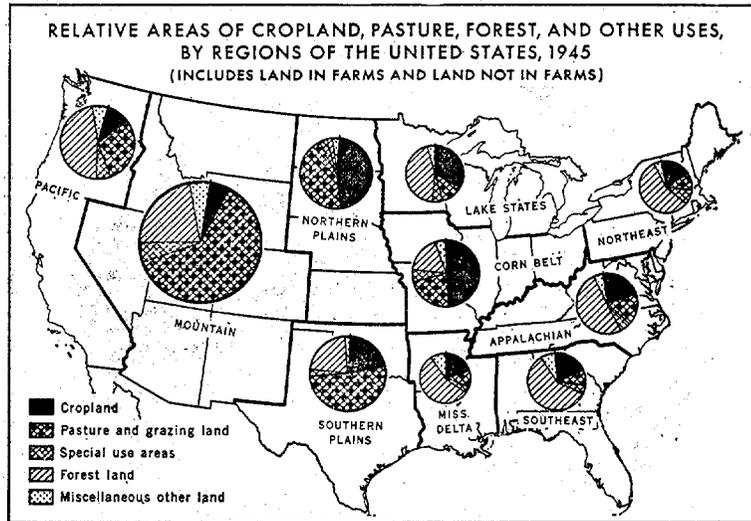
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Chart 1



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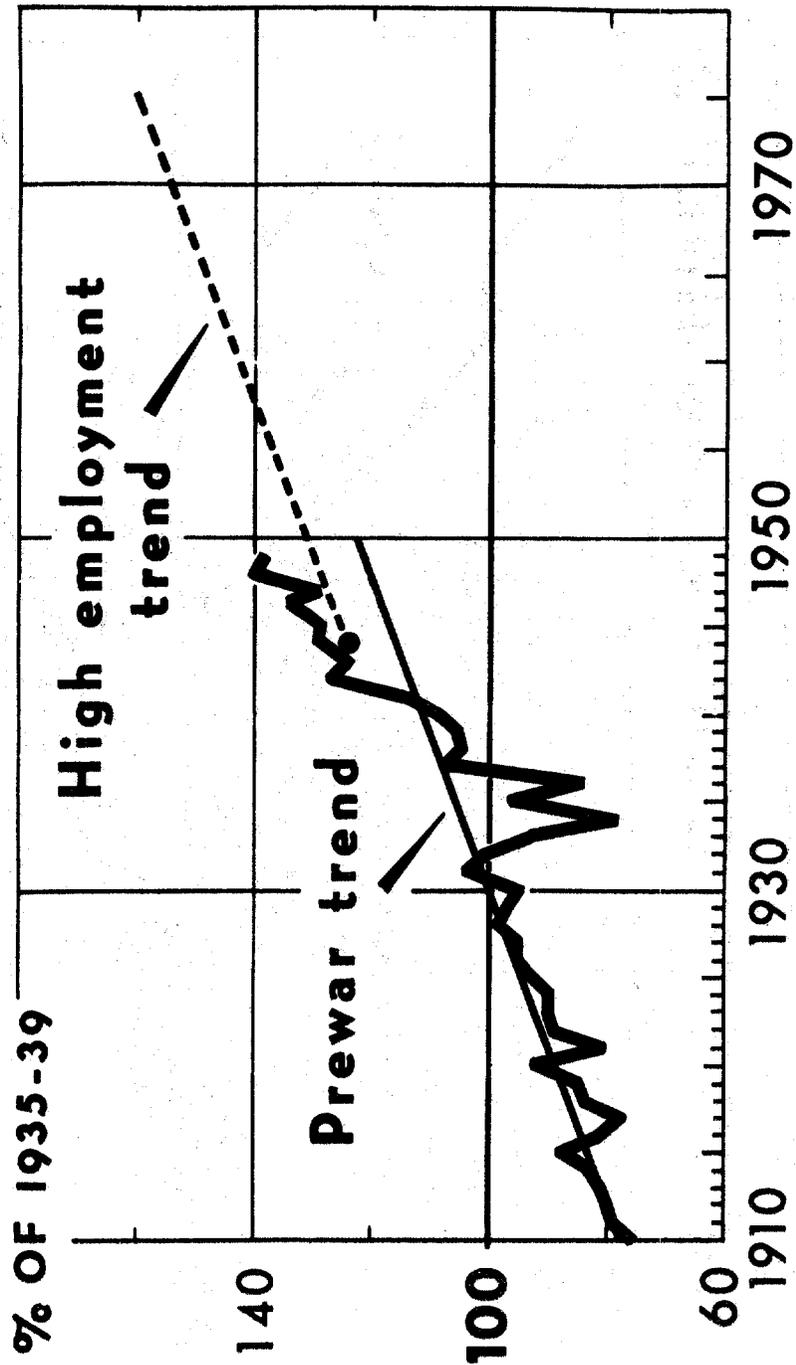
Chart 2



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Chart 8

# RISE IN FARM OUTPUT 1910-49, and Estimated 1955-75



● 1942-46 AVERAGE OUTPUT, ADJUSTED FOR ABOVE AVERAGE WEATHER

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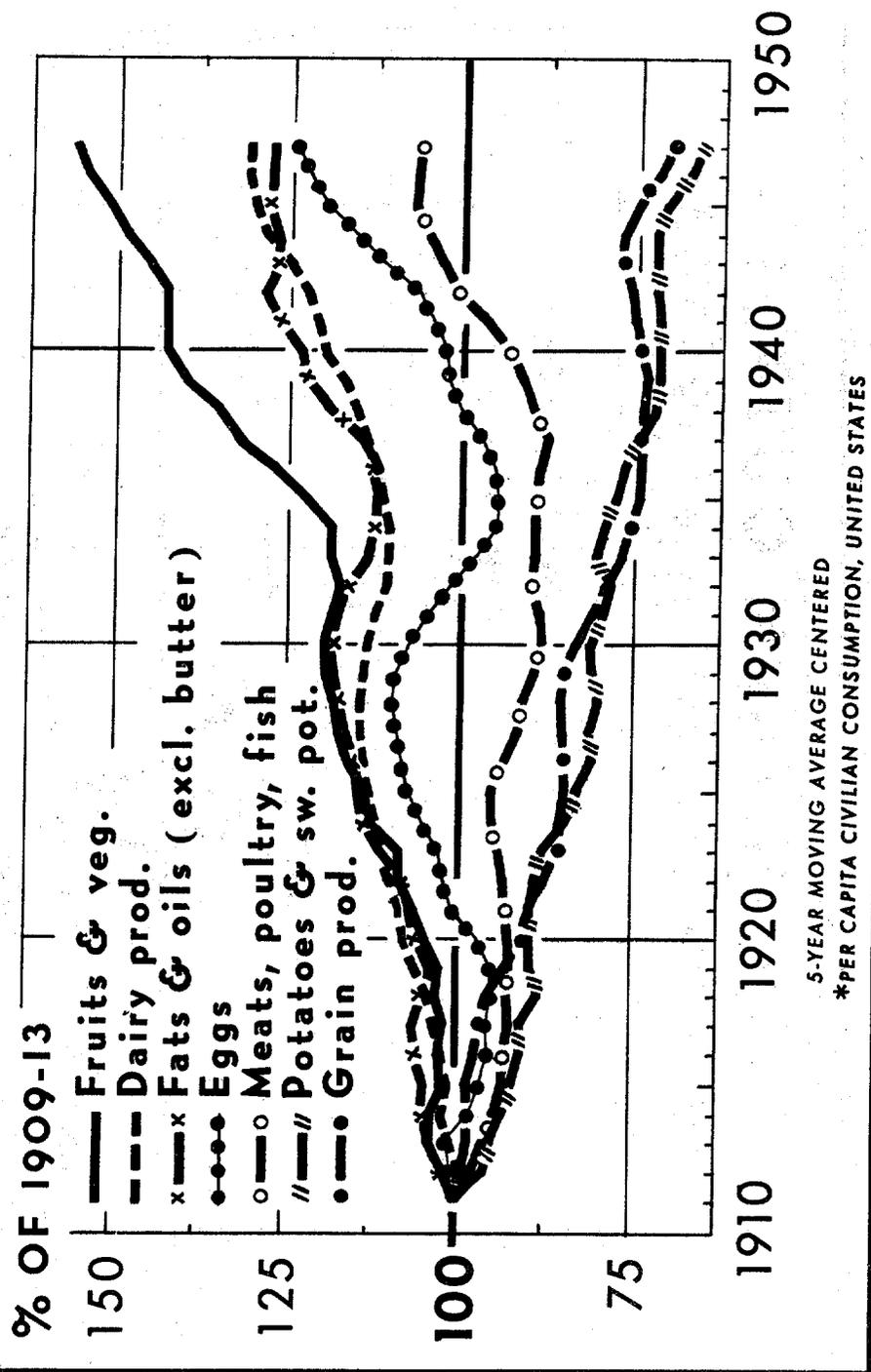
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Chart 4

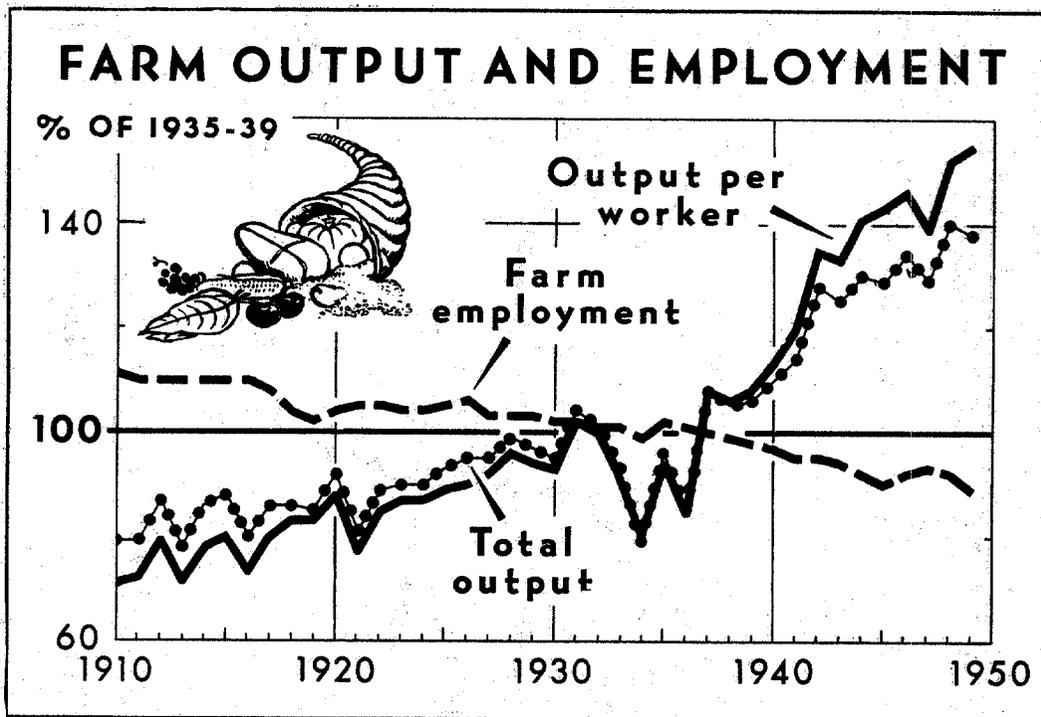
# TRENDS IN OUR EATING HABITS\*



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Chart 5



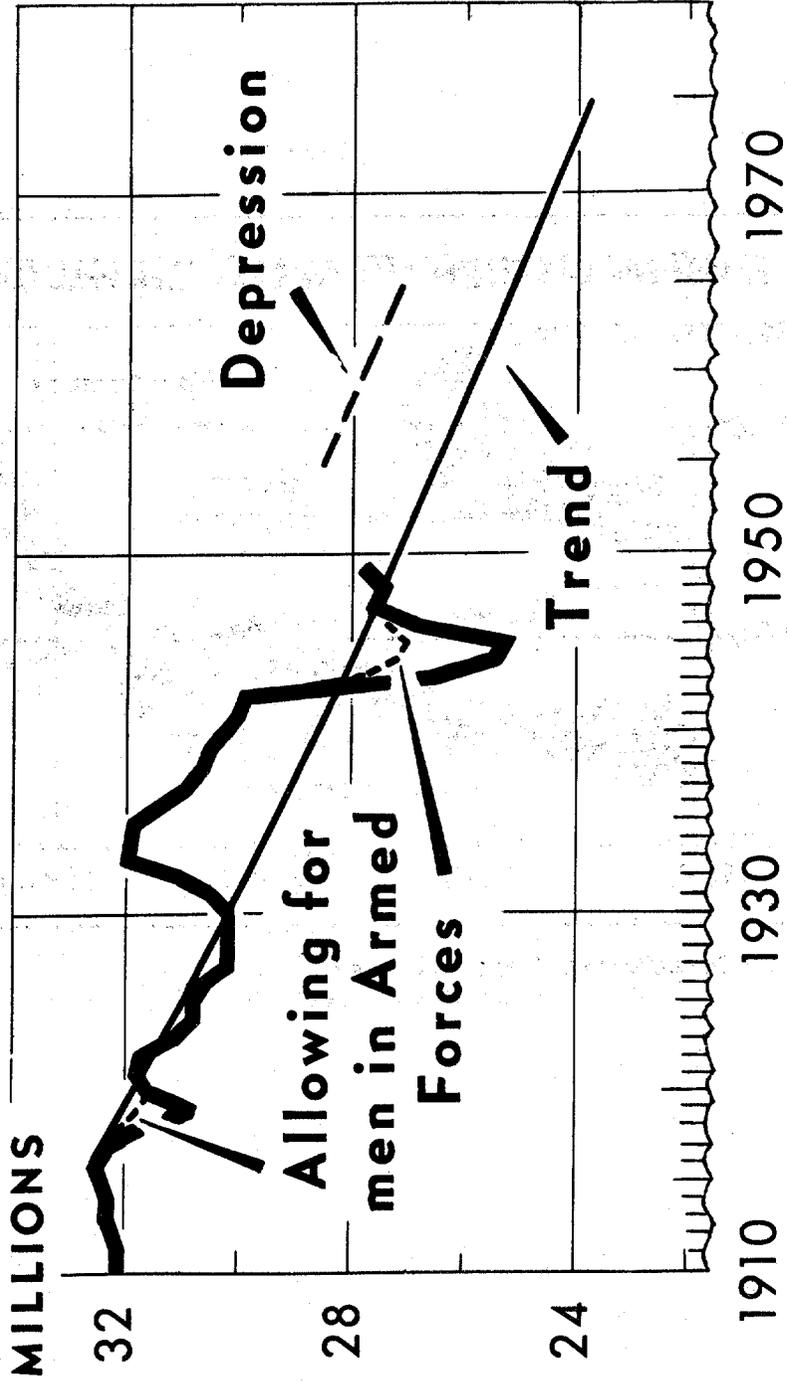
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Chart 6

# DECLINE IN FARM POPULATION 1910-49, and Estimated 1955-75

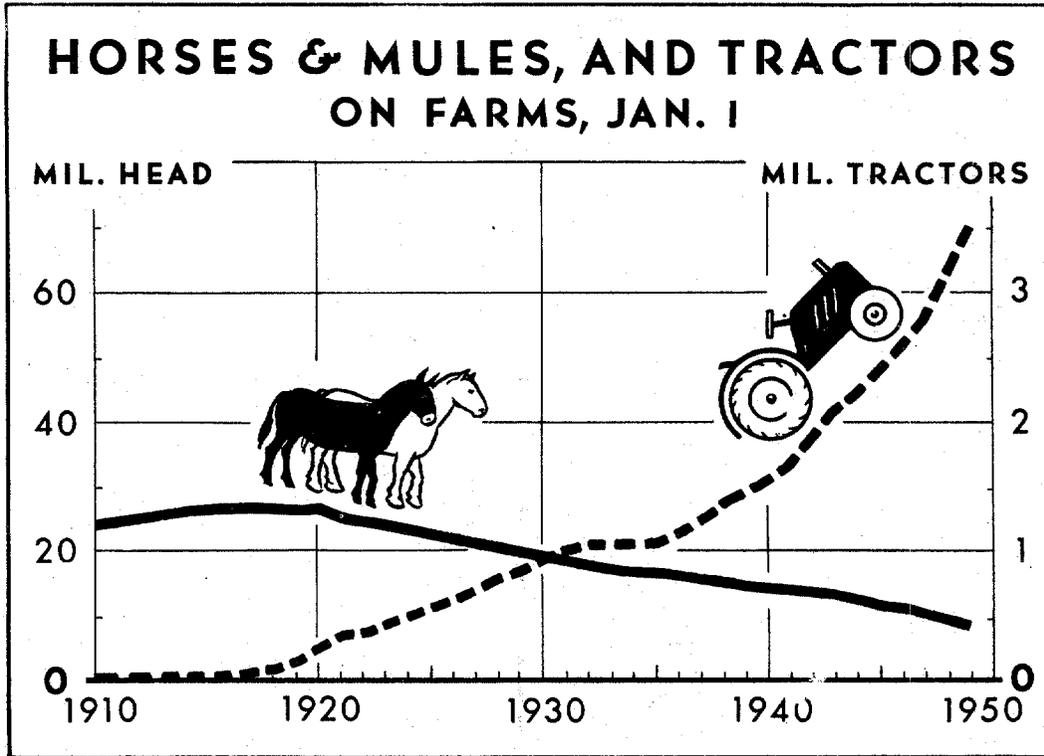


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Chart 7



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