

# ADDRESS

delivered by

MR. JAMES J. HILL

at the

National Corn Exposition

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There can be no more appropriate object about which to gather an exposition of the activity of the Middle West and an assemblage of its representative thought and intelligent purpose than the grain which stands first among its staple products. Corn is one of the great gifts of this continent to the world. In quality and quantity the yield of the alluvial plains of our central valley surpasses that of any other section or any other country. Within the last generation this has become the most valuable single food product of the United States.

It is less than forty years since our corn crop reached one billion bushels. It is now well over 2,500,000,000 annually, and should shortly main-

tain itself at over three billion bushels or more. The United States furnishes nearly 80 per cent, of the corn crop of the world. While its yield has been multiplied by three, the average farm price per bushel since 1869 has but once exceeded the price in 1908. Although most foreign peoples have had to be educated to the value of American corn as a food product, it is now an important item of our foodstuff exports. For a period of five years, from 1897 to 1901, we sent abroad from 175,000,000 to 200,000,000 bushels annually. And although that export has fallen to 55,000,000 bushels in 1908 and 37,000,000 bushels in 1909, it is not because corn has lost value in other markets. It is being consumed at home more largely because it is convertible into other forms of food. It is marketable in the shape of cattle and hogs. Indirectly it furnishes to the food supply the meat ration, just as wheat gives the bread ration. The two cereals reinforce each other in any estimate of the resources of a country and its capacity to support population.

From the Alleghany Mountains to the head waters of the streams that flow into the Mississippi and the Missouri is the empire of corn. Other products the earth yields in abundance; but, from a limit that is every year being pushed further north and down to the cotton line and beyond, corn is the great staple. Nine states, stretching from Ohio to Oklahoma and from Iowa to Texas, pro-

duce two-thirds of the corn raised in the United States. The value of the nation's corn crop is more than 20 per cent, of the eight billion dollars of value created each year from the soil.

Take your own state, so fitly chosen as the seat of this celebration to King Corn. Official statistics of Nebraska give the total value of all products of every kind in the state at something over \$600,000,000. More than one-third of this consists of grain, potatoes and hay. The largest single item is corn, constituting more than 40 per cent, of the whole agricultural product. But in addition to the nearly \$90,000,000 which it represents, there were on your farms last year more than \$130,000,000 worth of live stock exclusive of sheep. A good proportion of these cattle, horses and hogs are "the indirect product of your corn fields. While these facts demonstrate the great prosperity of Nebraska and the solidity of her wealth, similar statistics may be cited from most of the states of the corn belt. Wheat, corn and cotton are the three main pillars supporting the structure of national industry and national wealth.

The whole subject of our food supply and its relation to population, industry, growth, institutions and everything that concerns our future is appropriate for this occasion. Our present duty is to consider whether we are aligning our industries to the first and most necessary occupation of man;

and how the future is likely to deal with the agricultural interest whose rise in the remote past marks the point where the steadily broadening highway of civilization branched off from the rude path of barbarism.

I want, both at the outset and throughout, to guard against a certain error of construction or interpretation among whose victims I find a surprisingly large number of well-meaning people. Whenever the relation of food supply to population, the effect of choice of occupation and trade and standards of living upon the future maintenance of the nation are considered, these people set down the investigator as an alarmist. He belongs, they say, with the followers of the dismal doctrine of Malthus, that men must some day choose between preventing the birth of additional human beings and seeing them die of starvation. Since this stupid mistake seems so easy and so common, I refer to it early and explicitly.

The true statement of the broad general fact which it is most desirable that every one should understand is this: that this country cannot feed the population which it must necessarily have within comparatively few years *if it does not change its agricultural methods*. The emphasis is all on that conditional clause. Germany, which sets the pace for the world in commercial expansion abroad and industrial activity at home, has 300 inhabitants to the square mile. There are less

than 30 per square mile in the whole United States. It could support 150 to the square mile as easily as any country in the world. Some of our states already have over twice that many. But no such population as this, none such as we must inevitably expect in the United States by the middle of the present century, can be maintained unless we improve and keep on improving our agricultural methods; unless we apply to the tilling of the soil that system of high scientific development, of intensive cultivation, of rigid economic handling that has become the rule in all other industries.

We cannot support our coining population upon the crop yield per acre that now satisfies us. We have to transform a growing decline in the value and productivity of our soil under continued cultivation into a rapid increase in both. If the crisis can be seen moving upon us now, and if it took Great Britain over half a century to raise her wheat yield from about 15 bushels to 32 bushels per acre, we have no time to lose. What has to be considered, the keynote of all present discussion, is not the difficulty but the urgency of the task. The whole argument is one not of despair, but of reassurance; provided only that we do the obvious, indispensable and feasible thing, and do it now.

The problem can be stated simply, in the three terms that it involves: population, occupation and food supply. These cover the whole of it.

The population of the United States is now not far from 90,000,000. For convenience we may use that figure. It increases by from 2,000,000 to 2,250,000 annually, according to prosperity and immigration. With a practically fixed birth rate of 1.56 of course the additions from that source grow annually numerically; while immigration has brought us from three-quarters of a million to a million, and a quarter of new inhabitants every year since 1902. This will not decline permanently while the United States maintains its high wage rate. Hence it is probable that our population will reach the 200,000,000 mark somewhere near the middle of the century. The exact date is immaterial, since the event is sure. National history will not follow the lines of its past unless the population is equally well fed. What is the outlook for that?

A reliable estimate may be expressed in terms of wheat, the great food staple of the highly civilized races. It presents the same aspect and runs to the same conclusion whether one uses wheat or corn or meat or any other staple food product. This country raised 664,000,000 bushels of wheat in 1908. The average for the last ten years has been about 640,000,000. Our consumption per capita has been about six and one-half bushels. It is increasing, with the rising standard of living and of comfort throughout the whole country. There is good authority for saying that it is probably

now not far from seven bushels. If that be true, wheat production and consumption, on the average, are just about balanced in the United States today. If that be true, in a little more than a generation, even though higher prices should raise our total product above the present figure, we shall be looking abroad to see where we can buy, and pondering at home how we are to pay for it.

The demand, in the shape of increased population, is reasonably definite. The supply, in the form of food products, depends upon two factors; land and labor. It may be increased so as to meet these needs of the future if the area or the product per acre of the land can be increased. There is no other possible solution.

Area is inelastic. Our public lands are mainly exhausted. A few more years will see the last of them. And, lest they should not be squandered quickly enough, we not only offer them to everybody under conditions that invite and reward fraud, but when the government finds itself burdened with a particularly choice and valuable tract of farm land it holds a lottery and distributes it among Tom, Dick and Harry, no matter whether farmers or speculators, after they have been collected from distant parts of the country by appealing to the passion for gambling. The areas to be obtained by reclamation work would not, all told, take care of our increase for two



years. So there are final limits already in sight to the quantity of tillable land.

The productivity of the soil and the food supply as compared with acreage and with population both decline. Our total agricultural product has been growing so rapidly and so immensely that we find it hard to realize that this may be entirely consistent with failure, at the same time, to keep pace with the growth of national needs.

The public is impressed by the statement that the increase in the value of farm products in the eight years from 1899 to 1907 was from \$4,717,000,000 to \$7,412,000,000, or 57 per cent; and that from 1897 to 1907 the strictly agricultural crops—corn, hay, wheat, cotton, oats, potatoes, barley, and rye—increased in value nearly two billion dollars, or 95 per cent. These are facts that strike the imagination; and the increase last year alone of \$370,-000,000 in the value of farm products is encouraging. Yet it is neither wise nor safe to take these conclusions at their face value and declare without further inquiry that everything is going to come out for the best in this best of all possible worlds without, any forethought, care or direction, on our part; and it is only ordinary business sense and sanity to analyze the returns and see where we stand with reference to the future. Fluctuations in prices may change totals expressed in dollars into something very different when they are expressed in bushels or pounds. Wealth- aggregates

may be swollen by marking up goods as well as by adding to stock on hand. Congratulations upon prosperity are all right; but it is still better to make sure that the prosperity is real and that it will remain.

There are ten states in the Union in which the wheat crop was less in 1908 than it was in 1888. Twenty years have cut this staple food product, in many cases more than one-half. They are not all the oldest and poorest soils originally. Both the total crop of this country and its yield per acre have been maintained by resort to new soils not yet robbed of their fertility. The agricultural area cannot be expanded indefinitely, most of the best land having been already appropriated and much of that reduced to lower fertility. The yield per acre, with singularly few exceptions, is falling in ordinary years. Consumption per capita tends to increase, and new population adds from thirteen to fifteen million bushels every year to the demand. This is not a prophecy of disaster, but a plain statement of fact that any man can verify for himself. The figures are all drawn' from the official publications of the United States government. The situation is in no sense desperate, because we know exactly how it can be met; but if we are intelligent men, we will face it fairly and inquire what we ought to do.

For purposes of comparison two five year periods, twenty-five years apart, the first covering the

Years 1879-1883 and the second the years 1904-1908, may be taken. In this interval between them the population of the United States increased 64—1/2 per cent. The average total consumption of wheat and flour between the first period and the last increased from 293,728,518 bushels to 536,706,866 bushels, or 82.7 per cent. This great change comes from an increase both in population and in consumption per capita. The latter rose in these twenty-five years from 5.7 bushels to 6.4 bushels, according to the government's figures. The total wheat product of the country in the same time increased but 45 per cent.; and the difference between that figure and the increase of 64.5 per cent, in population and 82.7 per cent, in consumption is so wide that it presents in vivid outlines the national problem.

In this same time our exports of wheat and flour dwindled from an average of 157,366,381 bushels to 114,438,724 bushels, or over 27 per cent. The percentage of our total domestic product of wheat and wheat flour exported was, for the first five years, 34.90 and for the last five 17.33, just half as much. It needs no prophet to tell that these exports must shortly cease altogether if existing conditions remain unchanged. For the last year millers have been buying wheat at high prices, in some cases grain intended for export having been shipped back to the interior. The warehouses at Galveston, with a total capacity of 4,500,000 bush-

els, held recently only 30,000 bushels. Similar conditions exist at all the Gulf ports.

Naturally, this fall in exports is continuous, and at last the authorities begin to take cognizance of it. A circular of the federal bureau of statistics shows that, in the first nine months of 1909, wheat exports were 27,768,901 bushels as against 68,178,935 bushels in the same months of 1908; and flour exports 6,288,283 barrels as against 9,428,347. Between the five years ended with 1904 and the five ended with 1909, the decrease in wheat exports "was over 40 per cent. The tide is running out swiftly. The editor of the London Statist published a month ago his reasons for thinking that the increased quantity of American bills of credit in London represented not speculative investment but a trade balance against the United States due to this very cause. He said: "Although the American people have bought foreign goods freely this year, the sales of their own products to other countries were relatively small, and in the first nine months of the current year the exports of the United States have barely exceeded the imports. Here, then, we have the explanation for the large amount of American finance bills. The exports of produce from the United States have been below the normal amount and the imports of merchandise have been above the normal."

There are no available statistics of live stock raised for food purposes in this country. The ex-

ports, however, couple with an increase of 64.5, per cent in population an increase in the number of swine on the farms of only 33.7 per cent. The flesh of the hog enters into the daily food of a larger number of people than any other animal, and is therefore the best test of how far these secondary products of the soil that supply the meat ration of the national diet are falling behind. In this case the increase is scarcely more than half as great as that of population. Except of late years the federal record of cattle on our farms shows no separation of those used for work from those fattened for the market. The only comparison of any value to be made here shows that increase of production has been less than increase of population in the last twenty years. And while, in the five years ending with 1909, there were exported from this country over 63,927,784 pounds of hides and skins, the imports in the same time were nearly 1,861,387,102 pounds. Nobody is surprised, therefore, to learn that in these five years there has been an increase in the price of hides of every variety at Chicago, ranging from 14.29 per cent to 31.71 per cent according to grade.

The official government figures show that the percentage of exports of agricultural products from the United States has been falling for thirty years. It was 79.2 per cent for the five years 1876-1880 and 61.4 for the five years 1901-1905, and every five year period between the two showed a de-

dine from the preceding. Since 1905 the same tendency has been pronounced. Of course the rapid disappearance of the national food surplus is also reflected in high prices at home. The average price of beef steak in 1907 was 20.4 per cent higher than it was ten years before; bacon was 61.5 per cent higher, butter 37.1 per cent, eggs 50.7 per cent and mutton 30.6 per cent. Since then every housekeeper has had painful proof that the upward slant of prices continues. That this is due rather to decreased supply than to increased demand appears to be indicated by the fact that commodities obtained from abroad show no such striking changes. The price of sugar in 1907 was but 4.1 per cent, more than in 1897; that of tea 6.9 per cent and of coffee but four-tenths of one per cent. Summarizing the lesson of all these coincident facts, it seems clear that something must be done to advance the agricultural interest. The country, unless there shall be a change, is approaching the time when it must import wheat to meet home needs. Other food products also lag behind the constant new demand. Since that demand cannot be escaped, and since not to meet it means want or a lowering of the standard of life and comfort in this country which no American would wish to see, there is but one course before the nation. That is to increase the productiveness of the farm so that the earth's gifts may year by year equal or exceed the people's requirements.

It is the more necessary because the great bulk of our foreign trade is made up of these commodities. Foodstuffs and articles but one remove from the soil are the currency with which we have paid for what we bought abroad. What we have to do in this country is to apply to farming the scientific knowledge, shaped now to practical uses, that will raise our average product per acre to something like that of countries which lack many of our advantages of soil and climate. When Great Britain, in what her own people regard as an age of agricultural decline, can produce over 32 bushels of wheat per acre, and other grains in proportion, while the United States calls it a big crop when its average rises to 14, it argues mere want of intelligence on the part of this country; a failure to grasp the simple reasons for coming hardship and its obvious and natural remedy.

All that is needed to turn an impending national food deficit into a surplus, to support in plenty 150 or more persons to the square mile in the United States, is the use instead of the abuse of the soil; the practice of that knowledge which agricultural schools and experiment stations have already formulated and are daily putting before the people. It is almost as much an exact science as the building of a railroad or a sky-scraper or any other bit of engineering. To double the volume of the products of the soil, at present representing an income of over \$8,000,000,000 annually, becomes,

in the light of ascertained fact and repeated experience, as simple as building a house.

It has been stated that Great Britain more than doubled her wheat product per acre by the adoption of better farming methods. The same increase may be made here. At this moment Montana raises more wheat per acre than any other state, her average for the last ten years being 26.3 bushels. This is nothing extraordinary. It comes from a soil as yet unexhausted by continued single cropping. It can be duplicated or exceeded in a few years by good cultivation. Indeed, in a few of the very oldest states, where agriculture has of necessity been greatly improved once more by the growth of neighboring market centers that encourage intensive cultivation, the wheat product per acre has been nearly doubled. Maine gets 23.5 bushels per acre from the little area that she sows. This simply proves that where necessity drives man can achieve. Intensive farming, the natural policy in a populous community where markets are near and demand urgent; the small farm with every foot cultivated and adapted as carefully to the crop produced as cotton staple is to the kind of fabric desired, can increase the product of the soil to limits which have not yet even been set. It is literally true that no man in the world knows just how much, in either quantity or value, a single acre may be made to produce by industry and ap-



proved methods. What has actually been done, however, is very interesting.

The population of Holland in 1907 was 454 to the square mile. No state in the Union is so crowded as that, while it exceeds the average for this whole country by more than fifteen to one. But this teeming population is little dependent upon outside support. In 1907 its imports of food products were but 6.8 per cent larger than its exports. Yet it has less than 6,000,000 cultivated acres; an area of not 10,000 square miles, about the size of New Hampshire. Where so many people are crowded within so small a space, a larger town population and a more rapid increase in it are to be expected. There are in this little country twenty-four towns of more than 20,000 people each, Amsterdam having nearly 600,000. Yet these towns had, in 1869, but 26.1 per cent of the whole population; while in the United States the urban population in 1870 was 52.64 per cent. In 1890 only 37.7 per cent of our population employed in gainful occupations, and in 1900 but 35.7 per cent, was working on the soil. Probably not a third of the whole are now so engaged. In Holland there were, in 1889, outside of these towns with 20,000 population each, 68.7 per cent, and in 1907, 62.5 per cent. The drift all over the world has been from country to city; but, like all other movements, this one has proceeded with accelerated velocity in our restless and changing society. It has

affected us out of all proportion to the density of our population. Contrast with the distribution of population shown above in the United States and Holland the difference that follows naturally in the reward won by labor from the earth. The following table gives the average product per acre of the principal crops in Holland and the United States for the last three years available:

	Holland.			United States.		
	<u>1905</u>	<u>1906</u>	<u>1907</u>	<u>1905</u>	<u>1906</u>	<u>1907</u>
Wheat	32.6	34.2	38.4	14.5	15.5	14.
Rye	24.6	25.	25.7	16.5	16.7	16.4
Barley	44.5	43.	48.9	26.8	28.3	23.8
Oats	47.7	53.1	58.9	34.	31.2	23.7
Potatoes	212.	232.	234.	87.	102.2	95.4

Not only is the per acre average of Holland more than twice that of this country, but even these generous figures show a constant and marked upward tendency. The harder the soil is pressed, provided it be done properly, the more surely it responds to the spur. It is, of course, clear at a glance that if agriculture in the United States were on anything like the same plane as that of Holland, it could provide for every future contingency and also make the world its debtor for food products to the amount of eight or ten billion dollars additional every year, instead of seeing the export of breadstuffs decline.

Denmark is one of the wonders of Europe and of the world by reason of her progress along similar lines. This little country, with 167 persons to the square mile, sticks to the soil. Sixty per cent, of her people remain in rural life. She has elevated agriculture to the rank of first national interest. Her butter and eggs and bacon help to feed the people of England and Germany. In 1906 she exported one hundred and seventy-six million pounds of pork and one hundred and seventy-five million pounds of butter. Her agricultural instruction is famous; and men from twenty to sixty years of age attend the night schools to learn new details and improved methods. Some Danes are even carrying their methods to England and giving object lessons in advanced agriculture there. With all her density of population, her trade in 1907 shows that she exported more than twice as much value in food substances as she imported. This kind of trade balance means something; for every dollar of it comes from the earth, and will come again and again for all time if that permanent source of wealth is properly conserved and utilized.

Bring the average of our soil production up to that of Great Britain or Germany or Holland, and there will be food for all the coming millions. Prosperity will be abundant and universally diffused. To bring this about it is necessary only to put into effect everywhere a system of farming

even now as well systematized and understood as the system of electric traction. Practically it can all be summed up in a few directions to the farmer.

Cultivate only as much land as can be tilled so thoroughly that it will produce to its highest capacity.

Study first the conservation of the soil. Aim, even before trying to secure a big crop return, to leave the ground each season better fitted for production than it was before. This can be done by a proper rotation of crops, by fertilization where land has been partially exhausted, and best of all by keeping some live stock on every tract, no matter how small, and restoring every particle of manure to the soil.

Adapt both the crop to be raised and the method of cultivation to the nature of the soil. This is just as important as it is that a corporation should not try to make high grade steel out of ores containing an excess of phosphorus. An agricultural chemist can give directions and should always be consulted. There is at least one in every state whose services are at the command of the people through the agricultural schools. A sick soil may present as critical a case as a sick man.

Select all seed with the utmost care. The difference between using the best quality of grain for seed and planting an inferior sort may be and usually is the difference between getting a first class yield and one barely worth harvesting. In farm-

ing, the law of heredity is inflexible. Cattle for breeding and grain for planting should be chosen as intelligently as an investment into which a man's whole fortune is put.

Finally, every crop must be treated like what it is—a living thing; sensitive to comfort and to hardship, and returning to the cultivator a yield measured by the kind and quantity of care bestowed upon it, from the time of planting to the day of harvesting.

These simple principles of correct farming are probably less generally considered and applied among the people of the United States than in any other part of the civilized world. They bring prosperity and independence wherever they are observed. By teaching them and securing their adoption by a considerable number of farmers, the University of Wisconsin, one of the leaders of agricultural reform in this country, has added more than \$20,000,000 a year to the profits of the farmers of the state. The same work can be done everywhere. But first the rules of the game, easy though they are, have to be mastered and practiced by several millions of the most hesitating and conservative people in the United States; the people now on its farms. They must also be made as familiar as the multiplication table to the coming generation.

Therefore the work of the present must be educative. The future of this nation, political and mor-

al as well as financial, is bound up with the future of the farm. By that will our character and our institutions be tried. By it, in the long run, all wealth is measured, conditioned and supported. The work of education has been begun, but it must be enlarged, supplemented and advocated all the time. The institutions that are doing most for the country to-day are the agricultural colleges. They should grow in number, in attendance, and above all in the expert knowledge and freedom from all political or other influence of their chiefs and instructors. You can help see to that.

The number of agricultural schools should be multiplied, and in every country school of every sort there might be a course in agriculture, including laboratory work by the pupils themselves on experiment tracts. You can help to bring that about. These aids will bring up the average of farm knowledge and practice for the next generation.

But the country cannot wait for that. Increased consumption and declining food exports urge a more immediate remedy. There is need of public instructors who should go to every neighborhood, point out the mistakes, supply good seed, give an example to follow by cultivating properly a small tract alongside the big, slovenly field, and letting the farmer make the comparison. And this each one of you can urge and go far toward securing for

your own state, your own county, your own neighborhood.

Much has been accomplished within the past few years. The people are awakening. Farm life, more attractive and more remunerative than ever before, is beginning to be sought more for its own sake. Intelligence is being applied to farming as it has been to mechanics, discovering an even larger and more delightful field for its range and a reward as ample. The campaign is well forward. If each of you will do his share toward familiarizing the public with what is at once the alarming need and the comforting reassurance of the hour, will carry on the good work by repeating facts well established and the inferences that follow naturally from them, the next ten years may see work done for the regeneration of agriculture and the increase of its returns worth more than imperial extensions of territory or revenue; a pledge of prosperity and peace and all that can make a nation either able or worthy to realize the dream of perpetual happiness and perennial youth.