

ADDRESS

DELIVERED BY

MR. JAMES J. HILL

AT THE

TWENTIETH ANNUAL COMMENCEMENT
EXERCISES

OF

THE SCHOOL OF AGRICULTURE OF
THE UNIVERSITY OF MINNESOTA

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The calendar of the farm school follows the order of nature. Other institutions of learning are looking forward at this season to a vacation three months away. Winter is the vacation of those who obtain a living from the soil. A few weeks from now their work will begin, and continue until the earth is again frost-bound. Nothing is more creditable to the sons and daughters of the farm than their willingness to devote the time between the seasons of outdoor work to education such as may be obtained here and in like institutions throughout the country. They will not miss their reward.

The agricultural school has moved up in the honor ranks of education within the last ten to twenty years. More and better instruction in the proper cultivation of the soil is more generally demanded. Not only special schools, but high

schools and common schools, are preparing to correct the errors of the past. To the next generation the agricultural school will not be a stranger or a specialized form of education, but the place where knowledge of useful methods and accurate knowledge may be obtained.

It is strange that direct education in the essentials of agriculture should take its place so late in that system of general education which the people and even governments are coming to recognize as necessary to well-being and growth. Schools have existed time out of mind; but not agricultural schools. Yet the cultivation of the soil was man's earliest occupation, and must be his mainstay as long as the human race remains upon this earth. Long before history began, man was a bread-winner. The first seats of empire were the centers of districts where the earth yielded its fruits most abundantly, when the first beast of burden was tamed and attached to a forked limb for a plow, it was an event of as great significance as the invention of the steam engine. While we are accustomed to measure material progress by wealth and luxury, the rise of factories and the development of trade, these are only leaves upon the tree. They grow there because the trunk is sturdy and has its roots planted firmly in the soil. They would wither and fall if it failed for but one season to draw their support from the unfailing earth.

The true measure of progress is the rise of the agricultural interest everywhere. The world has grown richer and better and more confident of itself as that became better established and more remunerative. Because we are beginning to realize this, education for farm life and its betterment is in the people's thoughts as it never was before. The agricultural school, the agricultural course in other institutions, have become common. Their attendance is growing each year. They are eclipsing in importance many of the institutions devoted to what are called the liberal arts. They are opening new ways of thought and larger views of life, and better opportunities to those growing-up on the farm. Their work has only begun; and, if they are true to their purpose they will bestow great blessings upon this country. They will revolutionize the condition of the most numerous and important part of our population. They will bring about such an increase in the national wealth as the imagination can scarcely realize.

After many centuries of education devoted to what were known as "polite" subjects, the advance of knowledge and its practical application in other sciences and arts, together with the low-state of agriculture everywhere, suggested its application to the farm. That the farmer should be educated for his work, and that all knowledge should be laid under tribute to raise to the maxi-

mum the productive power of man's first and last and greatest resource—the land—found acceptance in England only about one hundred and twenty years ago. It started from alarm over national agricultural decline, and sought help from a better knowledge of agricultural science, from studies in the effect of crop rotation and fertilizing on exhausted land, and such practical matters. At about the same time similar work began upon the Continent. From that period until now the progress of modern agriculture, though slow, has been constant, and increases each year in power and scope. Some practical effects of the transformations it has effected are worth noting before we come to the thought and hope of to-day.

It is an interesting fact that agricultural schools were first established in Denmark, one of the European countries that has made most progress, in 1788; at almost exactly the time when a Royal Commission of Great Britain began its efforts for the improvement of farm lands in England. This little country, of only 16,000 square miles area, is now almost a model farm for the rest of the world. The small farm is, happily for her, a necessity. There are all told only 2,000 holdings of 600 acres and upwards, while there are 70,000 smaller farms owned by peasants in freehold and 200,000 holdings of from three to eight acres each. This is a matter of course where over two and a half millions of people are crowded into so small a space.

It has resulted in a system of cultivation that produces a relatively wonderful total of national wealth.

The agricultural exports of Denmark increased from 525,000,000 in round numbers in the ten years between 1880 and 1890 to 635,000,000 for the five years between 1895 and 1900. The stock and poultry interests are important. No country in Europe surpasses Denmark in butter making. Her exports of butter to Great Britain alone are about twenty dollars *per capita*. Her exports of eggs in the five years, 1895-99, were eleven times those of the five years, 1875-79. For 1906 they were valued at \$7,450,000, or nearly three dollars *per capita*. As a part of highly developed general agriculture these figures bespeak a universal knowledge of the details of good farming, and one is not surprised at the totals when he learns that at the present time there is not a peasant in the country who has not gone through some course of training in its agricultural schools. There is no drift to the towns. Farm co-operation has reached a high development. No wonder that a recent observer sums up the present state of Denmark in these words: "Rural existence is not only possible, but means steady progress for every faithful worker."

Belgium is a small state whose interest centers in manufacturing rather than in agriculture. She

supplies each year more and more of her own food requirements. Her consumption of bread is rising steadily, being on the basis of the latest statistics about one pound of flour *per capita* for every day in the year, a higher total average than in either Great Britain or the United States. Yet her imports of wheat were about the same in 1908 as in 1906, while of flour they were only a little more than half as great. In the same two years her exports of wheat increased 50 per cent., and her exports of flour nearly 25 per cent. Equally valuable conclusions may be drawn, from a study of the advance in agriculture in Japan, in Holland, in France and Germany—in almost every country in the civilized world outside of Russia. In France there are more than 3,000 demonstration fields and farms in operation, where the effects of manures, choice of seeds and methods of cultivation upon the quality and amount of yield are shown to the eye, and become object lessons to all the farmers of a district.

It is only fifty years since agricultural education in the United States can be said to have begun. For a long time it was but a fifth wheel to the educational wagon, the agricultural school being tacked on to some more pretentious institution and having few students, little practical instruction and no reputation. Farmers derided it and their sons avoided it. They were to an extent right,

for it was only a pretence. The first experiment station was opened in 1875. By the report of the Federal Department of Agriculture there were sixty-three colleges and universities in the country in 1907 maintaining courses in agriculture, among those that received Federal assistance through acts of Congress, There were 66,193 students in the land-grant colleges and experiment stations. But the great advance has come in the broadening of the educational idea; in a new thoroughness and dignity in the work of schools devoted especially to agriculture; and in the rise and spread everywhere of a demand for such instruction, not only for the young but for the adult, as shall ensure for us without too great delay the immense advantages of better methods. There is no more reason why we should wait twenty or thirty years for this improvement than there is why we should refuse to accept the results of wireless telegraphy until the boys and girls now in the primary schools have grown up and become operators. The fifteen thousand farmers now at work who have graduated from agricultural schools are an effective missionary force. The next quarter of a century should see in this country an awakening, an expansion and an advance in the agricultural interests as great as that which our manufacturers experienced between the Civil War and the end of the last century.

You have reason to be proud of this institution

from which you are about to go back to the farm. It has only just attained its legal majority, having achieved its great success in only twenty-one years. Its infancy was not promising. To-day, because it stands on its own feet, because it is what it pretends to be and not a so-called literary or professional school where pupils are taught that life in the city is more to be desired than work on the farm; because competent men have established here a system of practical instruction and demonstration, it stands high both in results accomplished and in popular repute. Wherever education in agriculture is discussed, and newspapers and magazines are full of it now, the Minnesota Agricultural School, as it ought always to be called, refusing to ape college titles or ways, is named with respect and praise. What may it become in the future by a proper extension of its activities, and what may you do to aid in the accomplishment of a mission that is as broad as the country and concerns the entire human race?

President Butterfield, of the Massachusetts Agricultural College, has stated the purpose of such institutions in words that could scarcely be improved: "The agricultural college, viewed in the largest way, has three distinct missions. It is an organ of research, an instructor of students, a disseminator of knowledge." It should maintain all three activities at once. In all of them

this institution has excelled. You have had experience of its direct instruction. In places in this State young men who studied here have taken run-down farms and grown prosperous by raising them to high productiveness. Every student who would not have been a failure in any other occupation has become a better fanner by what he has learned. As an organ of research it stands high. Among its publications are many that have added valuable practical farm knowledge to the common stock. This is particularly true of the bulletins exhibiting the effects of crop rotation and fertilizing as compared with soil exhaustion by single cropping. Researches into the chemical properties of soil, studies of seeds and varieties fitted to this climate, the development of plants of sturdier growth and larger yield—all these have been prosecuted with success. In Wisconsin great progress has been made. In Iowa agricultural education has taken higher rank than in almost any other of the western States.

The country has resounded with accounts of the wonders worked by Mr. Luther Burbank in the creation of new varieties of fruits and flowers by selection. But a single achievement of the agricultural experiment work in this country, the proving that ten or fifteen bushels per acre may be added to the corn crop, by choosing the best ears for seed, selecting the perfect kernels, testing them by weight, and so

in a few years enough grain of the highest quality for seed purposes, will add more to food supply and wealth in a year than the horticulture of Mr. Burbank can in a generation. Similar work has been done in relation to wheat and other crops. In France they have raised the percentage of sugar in beets from 11 in 1870 to 16 and 18 in 1908. This means something to the United States, where the value of beet sugar produced has increased 543 per cent. in nine years.

How, now, about the third function of the agricultural school as a disseminator of knowledge? Here we are still weakest, and in this branch of its work future effort must be most vigorous. We know enough now to revolutionize the whole farming business of the country if improved methods were put into practice. Were this done, the farm output of the United States would be doubled within five or ten years, and the farmers would have more money than they ever saw before. Although, therefore, we look forward to advances in the future as great as in the past in the way of discovery and improvement, it is most important to get the knowledge we have already into practice. To that all existing agencies should be devoted, and they should be supplemented and aided in all proper ways.

The agricultural school should stand in the relation of a wise parent not only to those who, like

you, get early counsel from her, but to others. The farmer on the farm has neither time nor money to make experiments. The experiment station can do, with twenty men in one year, the work that one farmer by himself could not do in a lifetime; and it can do it better and more accurately. It can help the farmer by furnishing him good seed or testing his own seed grain. On the quality of seed the amount and grade of the crop depend. Now he often sends his best grain to market, uses carelessly chosen lots for seed, or even relies, with incredible folly, upon the stuff that a paternal government furnishes him free under a congressional frank, obtained from some dealer who gets a good price for an indifferent article, and peddled about the country on the assumption that it is good on its lace in exchange for votes. To root out this hoary old abuse will be as helpful as to banish the Russian thistle and the wild mustard from our fields.

Perhaps the most indispensable enlargement of the kind of work done here is to earn it down to the individual worker. Some years ago the believers in learning organized what they called the "university extension" system. They realized that many were too old and some too poor and some too closely bound by the need of earning support for themselves and those dependent upon them to go to the university. By correspondence, by prescribed courses of study and reading, by

written examinations and by sending out traveling representatives to visit and counsel as well as to lecture to those enrolled in the classes, new regions of thought have been opened and new mental powers developed among those who could never otherwise have enjoyed any advantage of a university education. This is the sort of work that our agricultural institutions must do more largely than they ever have; but they must make it more direct, more general and more persistent. For among the people who are to be lifted out of the rut where centuries of wrong ideas and a lifetime of bad practice in farming have left them, it is the practical object-lesson, the conviction which comes from something seen and touched, something done while you are looking on, that counts.

For generations the farm interest of Ireland has been notorious the world over for its poverty and misery. Landlordism, furious political dissensions and neglect or ruinous methods of cultivation were the rule, until the condition of the Irish farmer and the state of his industry both became pitiable. It is an ideal country for dairying. Abundance of pasture, a moist, cool climate, the nearness of an unlimited market for dairy and meat products across the Channel, all suggested a remedy. But how to apply it? The Irish peasant is ultra conservative. So a movement was organized for what might be called a "dairy extension" course. Sir Horace Plunkett and others

interested put a dairy on wheels and sent it about the country, showing the people everywhere how the work should be done, and explaining; at the same time how it would create prosperity. Results were immediate. The people caught on, the new ideas spread, co-operative effort was introduced, and a visitor to Ireland as it is now says that "this dense population on a poor soil is undergoing such economic organization as to promise a revolution in method and in efficiency."

In our own country the need is different, but it exists. This institution and others like it will go on, increasing the student list, making discoveries, contributing each year to the success of the farmer. That work cannot be spared. But its base may be broadened.

The influence of the modern idea, which means the adoption in agriculture of principles already worked out and tested, must spread everywhere. As the Federal Government assists the experiment stations in the various States, so there seems to be no good reason why the activity of the state agricultural school should not be extended by authority to the counties. Something is now⁷ done by institutes, and through agents sent out to investigate methods of culture. More can be done by carrying- demonstration work to the farmer, giving him facts and figures and ideas and actual records of production and profit, until he gives up his antiquated ways and falls into

line. With a number of model farms in various parts of each State, the transformation would be rapid. If the farmers earnestly ask for these things they will get them.

The farmer's life is the most independent in the world. You know that agriculture may be as dignified as any of the so-called learned professions, because if properly pursued it must be relatively as learned as any of them. You know that it is, in the long run, the most dependable. Most of the elements of risk may easily be foreseen and avoided. It is becoming, with the social development continually taking place, by means of improved farm machinery, better roads, trolley lines, good schools, rural mail delivery, buildings as comfortable and sanitary as those of cities, the telephone and the low-priced automobile, as pleasant as another. It has the additional advantages of pure air and water, good health, and that closer contact with nature which man needs for the development of all that is best in him. There is slower recognition of the fact that it is also one of the most profitable, and by all odds the most important occupation in this country and in the world. There were 1,449,000 farms in the United States in 1850. There were 5,740,000 in 1900. The number has increased a million in the last ten years. The value of all farm products in 1900 was \$4,717,000,000. In 1908 it was \$7,800,000,000. The next census will probably show that it has

doubled in ten years. If farm methods can be improved as methods have in other industries, if waste can be cut down and product increased without adding to cost—and the opportunity is much greater—there is scarcely any limit to the benefits that may be conferred and the increase that may be made in the world's wealth.

This is what better education and special education, working upon the human mind in contact with its daily tasks, has done for other industries. This is what it has begun to do for the farm. But it is not easy to appreciate the full extent of the gains that may be made. Without repeating familiar details, it is enough to say that the annual yield of farm products may be doubled. It requires no visionary process or impossible standard, but only that the farmers of the country should do what is being done by those of other countries with inferior material; with older and naturally poorer soil, with less favorable climates and harder conditions of life. To raise the production per acre of the great staples of the United States to the figure constantly maintained by England and Germany would do it. It is worth working for, since the American farmer even now creates \$15,000 of wealth every minute in the year.

Let us begin at home—for the moral can be pointed forcibly in this State in which you live and where you are, I hope—to become forces in

bringing about changed conditions for the better. The dairy interests of Minnesota raised the value of their products from five to thirty million dollars in the last fifteen years. Denmark, with less than one-fifth the area of Minnesota and only 80 per cent, of it productive, sent \$48,000,000 worth of butter to Great Britain alone in 1906. On how many of our farms is the quality of stock and its value for dairy or market purposes a matter of study? On how many of them is any stock kept at all except what may be actually necessary to do the farm work and feed the farm people? You have come from the country and know your neighborhoods. Look around when you go home at the possibilities of stock raising, and you will realize that we have not made a beginning. Millions will be gained in this State when it appreciates the importance of the stock interest. The value of farm animals sold and slaughtered and of animal products at the farm in the United States in 1908 was about three-eighths of the total value of farm products, or nearly three billion dollars. It is as easy to add to that as to plant a cutting in the ground and grow a tree. And at the same time the grain-growing power of the soil will be increased or restored by the natural fertilizer thus provided.

Take another illustration: The yield of wheat in Minnesota in 1908 averaged 12.8 bushels per acre, from soil once as rich as any in the world.

I will not compare this with the yield of other countries, nor with States like Washington and Oregon, where they raise an average of 23 or 24 bushels to the acre, though that would not be unfair, but with the average of the whole United States, slovenly and wasteful as its agriculture is. The average yield of the acreage sown to spring wheat in this country in 1908 was 13.2 bushels per acre. With our natural advantages we might easily have doubled that. We might certainly have equalled the average of 15.5 obtained in Iowa or the 17.5 in Wisconsin. If we had it would have put many millions in our pockets. But if we had raised the average in Minnesota, even the little four-tenths of a bushel necessary to lift it to the low national level, it would have added over \$2,000,000 to the wealth of the State. If we had done as well as our neighbor State on the east, we should have been gainers by over \$20,000,000. The average for oats in Minnesota last year was 22 bushels, and in the United States 25 bushels. Wisconsin produced 31.1 bushels, more than 40 per cent, above us. Again, the difference between the national average and that of this State represented a cash value of nearly three and a half million dollars. In few other States do potatoes grow in such abundance and of so fine quality. The average product per acre in the nation, about what other countries would consider a partial crop failure, was 85.7 bushels last year. Minnesota's

average was 76 bushels. The difference amounts to more than three-quarters of a million dollars. Taking; these three crops only, with whose care our farmers are well acquainted and which respond readily to ordinary cultivation, and having as a standard the small average of the country as a whole, Minnesota's loss in 1908 was over six and a quarter million dollars. If comparison were made with what might have been done by the best farm methods, the figures would almost pass belief. A dollar lost by neglect is lost just as much as if it were taken away by force. Yet were any one to propose a tax of six or seven million dollars annually on the farmers of the State, it would rightly provoke them to fierce resistance.

I do not wish to be understood as stating these facts, all of them drawn from the advance report of the Federal Department of Agriculture, in a mere spirit of fault-finding. I use them because they show so plainly what is the matter; how immense is the gap between the farmer's opportunity and his actual condition. I draw a moral from this State because it is that in which we live and labor. Therefore it will be part of your life work to rectify these mistakes in your own persons and to show the better way to others. To learn how to do this has been one chief purpose of your life here. You have the energy, the strength and the hope. You take away the necessary knowledge. You will be false to your opportunities and to

yourselves if you do not help to change this showing before many years have passed.

In the meantime this institution should not be content until it has, as far as within it lies, supplied a want by carrying to every county demonstrations of the best methods of soil treatment, of crop rotation, of seed selection, of cultivation; and of the combination on each farm of grain growing, the raising of root and fodder crops, stock raising, poultry culture and all the minor interests that belong to high grade modern farming. Only in this way will it cover all the ground staked out in the definition of an agricultural school as I have quoted it. Only so will it be doing its duty by those who have made it and are proud of it; those by whom it is supported and those whom it aspires to serve. It is a noble office, a commanding work. The future of this nation rests in the same hands that fashioned its past. The man on the farm made it and he must preserve it. The most encouraging and inspiring sign of the times is that their Interests are awakening. Now they themselves must make an effort, respond to new forces, and earn and take their own. Upon the life on the land and the intelligent care it receives, upon the steady inflow of strength which comes from that union, our fortunes, our greatness, our mental and moral development, our very national existence will depend.