Mr. Randall: Gov. Worst has a matter to present to the convention and then we will take up the question box.

Gov. Worst read the following resolutions :

THE RESOLUTIONS,

WHEREAS, The Farmers' National Congress, composed of one delegate from each Congressional District in the United States, two from each Agricultural Society, appointed and. commissioned by the governors of the various states, and established the custom of holding its animal meetings in different sections of the United States, and,

WHEREAS, It has held for the last two years its meetings in the extreme South and East, and expects to hold its meeting this year in Colorado, and,

WHEREAS, It is desirable that it shall hold its next meeting in 1901 in. the grain growing states of the Northwest;

THEREFORE, BE IT RESOLVED, By the farmers of the States of Minnesota and North and South Dakota, in convention assembled at Fargo, N. D., that the Farmers' National Congress be, and it is hereby invited to hold its meeting in 1901 in the City of Fargo, N. D.

Introduced by J. A. Johnson, Fargo,

Mr. E. E. Childs: I move the adoption of the resolutions as read.

Mr. Bushnell, of South Dakota: Mr. Chairman and gentlemen: I desire in behalf of the people of South Dakota to second the motion that has been presented before you. I always like to speak of the two Dakotas as Dakota yet.

Mr. Randall : Minnesota will take pleasure in seconding this motion.

The resolutions were adopted.

Mr. Randall: If you will look on your printed programs you will notice that Dr. Herbert J. Webber of the U. S. Department of Agriculture was to address us on the subject of "Recent Work in the Improvement of Cereals," and one from Senator Hansbrough. These gentlemen were expected here, but they could not come. They will be read to you at this time.

Gov. Worst: I have spent a good deal more time in making arrangements for this convention than I have in taking up the time of the association. J. will not take up any of your time now, but I wish to impress upon you again a matter that has already been called to your attention several times during this meeting and which every farmer should note, and that is, that nearly two-thirds of all the exports of the United States are the products of the farms, while only about one-third comes from all other sources; and yet when I read this letter, you will see how much more shabbily agriculture is treated than the other industries.

WASHINGTON, D. C, Jan. 20, 1900.

Hon. J. H. Worst, President Agricultural College, Agricultural College, N. D.

Sir: I regret to say that just as we are preparing to have Mr. Webber go to North Dakota to attend the Grain Growers' Convention we find ourselves short of funds. When we wrote some time ago we had not looked up carefully the condition of our finances and were of the belief that we had enough to spare for this trip. The expenses, we find, if

incurred will cut short our scientific and practical investigations which we are especially anxious to keep going as long as possible. I spoke with the secretary in regard to the matter and he authorized me to see if funds could be obtained anywhere else, as he was very anxious to have a representative of the department at the convention. It has been impossible so far, however, to find the funds, hence we fear Mr. Webber cannot go.

Mr. Webber has, however, prepared a paper which will be forwarded, and which we hope will be of interest. We regret very much this turn of affairs, and hope it will not interfere in any way with the convention. We are greatly interested in the work you are doing, and were very anxious to have Mr. Webber meet the people of your state in order to get their views relative to important investigations which we are planning for the future, I trust, however, that it may be possible at some early date to have him visit you.

Hoping that the paper will be received in due time and that your convention will be a success, I remain,

Very respectfully yours,

B. F. GALLOWAY,
Chief of Division.

Now I read this letter to show you the necessity for the agricultural interests of the country to stand together and see that their interests receive more attention from the Federal Government. It has only been a few years since agricultural education was established, showing that a convention like this is a step in the right direction; and yet out of the vast sums of money appropriated by congress, there is but little of this money expended to help the man on the farm to make a better living and for the better development: of the country.

Hon. H. C. Hansbrough wired Hon. J. A. Johnson as follows:

WASHINGTON, D. C, Jan. 22.

Hon. J. A. Johnson, Fargo, N. D.;

Will send brief address Tuesday morning so it will reach you Thursday. Will be glad if you have it read to convention. I greatly regret that I cannot be with you, but my many duties here prevent.

H. C. HANSBROUGH.

The address is not lengthy and I will read it.

SENATOR H. C. HANSBROUGH'S PAPER.

The subject which was assigned to me for discussion at this meeting involves the question of legislative encouragement in behalf of trade expansion in the Orient. No man can correctly predict what Congress will do in this direction. We can only reason from analogy. It is safe to assume that the Congress of the United States, which, under our system of government, is renewed every two years and is thus the instrument through which the people of the country act on all questions of this character, will take due notice of the wants of this country. During the past three or four years there has been considerable discussion in the middle western portions of this country on the question of the profitable disposal of our surplus products. The subject has not been thoroughly understood, because it was a new question coming up in consequence of the opportunity for enlarged markets in the far east. In April 1897, I intro-

duced in the Senate a bill providing for the creation of a bread foods commission. The object of this commission was to ascertain and report upon the best methods of introducing and popularizing bread foods of the United States among the people of oriental countries. Like all new measures my bill was pigeon-holed by the committee to which it was sent. It is a remarkable fact that at the time it attracted but little attention anywhere except among the people of the west and northwest. A little later, during the same session of Congress, three or four Senators from the northwestern regions took up the question of oriental trade in another form. We insisted upon the adoption of some sort of reciprocal provision in the Dingley tariff bill, which would enable our shippers to cross the Pacific with cargoes of flour and cotton and bring back oriental products that we do not grow or manufacture at home. Our effort was not wholly in vain. It was difficult to make some of our leading statesmen see the necessity for such legislation, but we finally secured the reduction of the duties that it was proposed to levy upon imports of common straw mat-tings and also a slight reduction on imports of rice. Our object was to encourage shippers to carry our surplus products across the Pacific and by lower rates of duty enable them to secure return cargoes to the United States. I am aware that as one of the advocates of this policy I have been charged with free trade tendencies, but sober second thought must convince the unprejudiced mind that this policy is not one of free trade, but simply the policy of reciprocity, one which the political party to which I have the honor to belong has always advocated.

Then came the Spanish war and the unexpected conquest of the Philippines. The Administration at Washington was not over-anxious to hold the Philippine islands. The capture of these islands was not premeditated, but Dewey had laid so firm a hand upon them that we could not let go, and the longer we held on the tighter became our grip. It is one of those things which is inexplicable at first, but which eventually solves itself. The great American people will surely do their part in solving this problem. It was not in the spirit of greed that we went to these islands, nor do we now propose to relinquish them in a spirit of philanthrophy towards any other nation. We know, to begin with, that under our guidance the Filipinos will become a better people, and while they are absorbing the lessons in civilization which we feel that we are competent to teach, we shall undertake to make the most of the bargain. If the Philippines can be used as a commercial base for this country, it is our duty to take every advantage of the situation. The question of the government of the people there is one which cannot be determined in a day. We are conscious of our good intentions. We know that it is no purpose of ours to oppress any one.

And this brings to my mind the charge of imperialism, which is laid at the door of those who are obliged to deal with this momentous question. This great republic of ours is little more than a century old. We are still in our youth—in full vigor of important action. It was only a few years ago that a while man hesitated to cross the Mississippi River towards the west. First because he was afraid of the Indians, and second because he did not want to get too far away from Boston. The present generation has seen all these fears dispelled. The tide of population has swept to the very shores of the Pacific. Great cities have there grown up, that rival in industry and art and everything else that brings happiness and national pride, the metropolitan centres of the Atlantic coast. And our own great northwest has kept pace with the progress

of all sections, until the people throughout our whole land are overflowing with the courage and hope from which spring eternally the aspirations and the virtue upon which republics are builded and without which they cannot endure, in all this wonderful history of a still more wonderful country our system of government has not changed save for the better. We have gone steadily on renewing our political life at the fountain of liberty with no intention whatever of abandoning the constitution our fathers gave us, doing our duty as its rightful interpreters, enlarging its scope as our country's needs require, and bettering the condition of mankind everywhere. Does this suggest anything that resembles imperialism? Does it look like decay?

With it ;all comes the individual desire for wealth and improvement; and if the time ever arrives when our people lose their ambition in this direction, then will they be lit subjects for the sway of imperialism; then will republican institutions decay.

Why should we not have our just proportion of the trade of the Orient? The great Pacific ocean is the highway over which we may reach and do our share in supplying one-half of the people of the world. China is no longer a distant land. Australia and India are reached in a month's sail. Japan is less than fifteen days away, while the Russian possessions are but sixty miles from the golden shores of Alaska. With our increased facilities of transportation and the great benefits of trade and commerce among the people of those countries whose shores are washed by the Pacific ocean, distances have ceased to be a matter of serious consideration.

This question of new markets is one which has come upon us as the natural consequence of the industrial growth of our country. It is not the result of accident. The war with Spain simply hastened the day when our commercial policy must be enlarged and greatly broadened. I am a believer in national destiny. The career of the individual is largely what he himself shall make it. He may become a useful citizen, or he may de-preciate in character. The great majority of men, however, go forward, in life instead of backward, and it is the majority that shapes the destinies of nations. Thus the people of the United States have progressed beneficially, and with their progress the country has gone forward by leaps and bounds. We find ourselves upon the threshold of an era that was not dreamt of by the early patriots and statesmen. We cannot avoid the responsibility which has come to us. Some small calibred individuals will find fault and complain and scold their bitter moments away like fishwives on a dull Monday, but the commerce of this country will continue In expand and new markets for our surplus products will be found and the old markets will be supplied.

What will Congress do to facilitate the March of progress? Every-thing that it is necessary to do. Congress, as I have said, is seldom slow in responding to the demands of the people, and when it is—why the people get a new congress. This is the privilege of the people of this free government. I do not say that the people cannot make a mistake in this regard. As a result of the heat of political discussion and in the turbulence of political action this country on a few occasions has been afflicted with a non-progressive congress, but it is surprising how quickly the mistake is rectified.

Now we propose to extend our trade to every part of the globe. It is the full knowledge of this fact and the actual business of such extension that has caused the great industrial activity of the past few months. Up

WHEAT PRODUCTION.

	UNITED STATES		MINNESOTA		SOUTH DAKOTA		NORTH DAKOTA		TOTAL 3 STATES	
	Bu.	Val,	Bu.	Val.	Bu.	Val.	Bu.	Val,	Bu.	Val.
1895.....	467,102,947	$237,935,998	65,584,155	$ 28,857,028	29,261,088	$11,119,213	61,057,710	$23,201,930	155,902,953	$63,178,171
1898..... ..	675,148,705	392,770,320	78,417,912	42,345,672	42,040,923	21,020,462	55,654,445	28, 363,767	176,113,280	91,749.901
1899...	547,303,843	319,545,259	68,223,580	37,522,969	37,728,339	18,864,170	51,758,630	26,396,901	157,710,549	82,784,040

EXPORTS, AND PERCENTAGE OF WHEAT PRODUCED IN THREE (3) STATES, OUT OF TOTAL EXPORTS.

	EXPORTS, DOMESTIC, Year beginning July 1.	PERCENTAGE OF TOTAL EXPORTS			
		MINNESOTA	SO DAKOTA	NO. DAKOTA	Three States Combined
1895.....	126,443,968	51.87	2314	48.29	123.30
1898.....	222,694,920	35.21	18.88	24 99	79.08

The above comparison is not intended to imply that the entire product of these states is exported, but simply to illustrate the magnitude of the interests involved.

to the time that our Pacific squadron .unfurled the emblem of our authority in Manila harbor our farmers and manufacturers seemed doomed to the provincial policy of living upon each other. We had annexed Hawaai, after the culminating events of the time practically forced it upon us, and some of our statesmen predicted the downfall of the Republic. But it was not until Dewey's guns awoke the equatorial echoes on the other side of the globe that we had the slightest realization of the momentous importance to us of commercial equality in the Pacific waters. It was the victory of our arms at Manila that will stand through all time as notice to the world that the United States at that moment took her place as a world power.

It will be recalled that about the time of this eventful affair half a dozen of the great nations were engaged in the work of establishing what has become known as the "spheres of influence" policy in China. In other words, these great nations were in the act of dismembering the ancient empire, each taking commercial control of such portion of the Flowery Kingdom as suited its purpose. The interests of the United States were not being taken into consideration. Suddenly it began to dawn upon the powers engaged in the work of commercial conquest in China that perhaps it might be well to wait until the policy of the United States with respect to the Philippines should take distinct form. So the scheme of the dismemberment of China was suspended. It was at this important juncture that the administration at Washington addressed a suggestive note to the powers. This was followed a few months ago by a polite but firm reminder from our Secretary of State that the "spheres of influence" plan was objectionable to the United States, and that we would much prefer the policy of the "open door" in the great empire of China, leaving the trade of that great country open to all the world. Thus for the first time in the history of this country we assumed by an official declaration our policy of taking some part in those affairs of the world which affect the world's civilization and the world's commerce. And what is more significant, the great powers all recognized our rights in this respect. The proposition to divide the trade of China by equal subdivisions has been abandoned, and there is a unanimous agreement that all nations shall be given the opportunity of seeking and enjoying legitimate trade privileges throughout the Chinese empire. Such a thing could not have happened two years ago. I do not believe that any representations that we might have then made with respect to the trade of the Orient would have been seriously considered for a moment by Great Britain, Germany, France or Russia.

So it must be conceded that our government has made some progress with respect to oriental trade. We prevented the commercial division of China among our trade rivals, first by reason of the fact that we had the courage to maintain in the Philippines such rights as had come to us as the result of an armed conquest, and secondly through the intelligent action of the Washington government, which, at the proper time, insisted upon our just participation in the trade of a great and friendly nation.

But I am aware, gentlemen, that your time, like my own, is very limited, and having given you as briefly as possible my views upon the relative interest of the government at Washington and the all-important question of trade expansion, I shall conclude by offering some very instructive statistics freshly compiled from official records in the Department of Agriculture. I understand that the proceedings of this meeting are to be

published in convenient reference form, and I am sure that these statistics will be considered worthy of preservation.

In connection with the prominence of the Northwest as a wheat producing region, attention is directed to some of the economic changes that have taken place in the production of wheat as between the older methods and the present ones, and a similar comparison is added for several other crops. *The facts are derived from the report of the Department of Labor on hand and machine labor.*

PRODUCTION OF CORN, WHEAT, *OATS* AND BARLEY.

UNITED STATES	1890-1899	
	Bushels	Value
Corn	18,351,164,454	$6,097,663,089
Wheat	5,030,779,150	3,298,835,913
Oats	6,981,583,884	1,894,695,535
Barley	718,001,133	311,105,825
MINNESOTA		
Corn	269,048,620	$ 77,733,095
Wheat	522,061,950	320,053,432
Oats	511,307,685	117,184,009
Barley	104,159,508	35,252,356
SOUTH DAKOTA		
Corn	197,963,846	$ 52,547,106
Wheat	272,317,736	148,367,649
Oats	159,544,860	35,619,148
Barley	25,918,150	8,142,488
NORTH DAKOTA		
Corn	5,367,526	$ 1,902,391
Wheat	397,934,902	215,346,801
Oats	139,608,750	35,209,991
Barley	47,259,244	14,544,519

The first comparison is between 1830 and 1896. In the earlier year the clumsy plow of that time was used, and seed was sown by hand, Ills top soil was pulverised and the seed covered with a brush harrow; the reaping was done with sickles, the sheaves hauled to the barn and threshed with lla.ils, and line wind did the winnowing. In the later year the plowing was done with a disc gang plow, a broad-cast seeder was used and the top soil pulverizing and covering of seed was done with a five-section harrow, after which the reaping, threshing and sacking may be done with a combined reaper and thresher. The adopted production is twenty bushels per acre and following are the averages per bushel:

The time of human labor required to produce one bushel of wheat from beginning to end in 1830, 3 hours and 3 minutes; in 1896, 10 minutes, and the cost of the human labor per bushel declined from 18 cents in 1830 to 3 1-3 cents in 1896.

The larger saving in human labor was in the harvesting, and in this operation, including threshing, the reduction in the time of human labor employed per bushel was from 2 hours and 32 minutes to 5.6 minutes, while the cost of human labor per bushel declined from 15 cents to 2 1-5 cents.

The following comparison is made for corn, 1855 with 1894:

In the earlier year the ordinary plow and harrow were used, the shovel plow for marking the check rows, and the seed was dropped from a bucket and covered by hand with hoes; the stalks were cut by hand with knives; hand pegs were used in husking; the stalks, etc., were cut into fodder by hand, and. the corn was shelled by hand, and was done before the invention of corn shellers, a frying-pan handle or shovel, perhaps, being used on which to apply the ears of corn.

These are the economic results with regard to the time and cost of human labor for entire production per bushel:

Time required in 1830, 4 hours and 34 minutes; in 1896, 41 minutes; cost of human labor per bushel in 1830, 36 cents; in 1896, *10½* cents.

As in the ease of wheat, the greater economy appears in the harvesting. In this operation, not including shelling, the average time of human labor occupied per bushel was 2 hours, 15 ½ minutes, in 1830, and 25 ½ minutes in 1896, while the cost of human labor per bushel for this opera-lion declined from 17 cents in 1830 to 7% cents in 1896.

"Cut the most remarkable economy appears in the shelling of corn: In the old fashioned way, 100 minutes were required to shell a bushel of corn, whereas at the present time a steam sheller will shell one bushel in one minute, and the cost from the earlier to the later time has declined from *12%* cents per bushel to a figure that is almost too infinitesimal to be taken into account, and this figure is three one-thousandths of one cent per bushel.

Again let attention be directed to another cereal—barley—which is prominent in Wisconsin. The comparison is between 1830 and 1896, and the implements and machines used are contrasted substantially as in the case of wheat before described. These are the results:

Time of human labor required to produce a bushel of barley from beginning to end in 1830, a hours and 7 minutes; in 1896, 4.8 minutes; and the cost of human labor per bushel was reduced from the earlier to the later year, from 12 to 2 cents.

The oat crop presents still another striking comparison, in this instance between 1830 and 1893: The time of human labor occupied in producing a bushel of oats from the beginning to the end of the process, was one hour and 39 minutes in 1830; 12 minutes in 1893, and during the same time the cost of human labor declined from 9 1-3 cents to 2 2-3 cents per bushel.

The application of machines to the making of hay is thus exemplified, the comparison being between 1850 and 1895:

In the earlier year the time of human labor required to cut the grass and perform all processes up to the placing of the hay in the mow was 21 hours and 5 minutes per ton; in 1895 the time was 4 hours, and from the earlier to the later year the decline in the cost of human labor per ton was from $1.75 to 42 cents.

Mayor Johnson: As you understand, this opera house cannot be had this afternoon, or evening, I have made arrangements for the Armory, so that you may hold a meeting there this afternoon and evening if you so desire. The weather is so bad we thought there would be no desire to do any visiting. The college is so far out and the oil mill is not running at present, but the fibre mill is running and any one desiring to visit it may have an opportunity to do so.

Mr. Randall : We will now take up the question box, the first question is: Is the disc plow a reliable agricultural implement? Mr. Shep-ard of South Dakota will answer this.

Mr. Shepard: It is one of our vocations, I take it, to look after the interests of the Farmers in every respect. It is our duty to experiment with new tools. We have been making some experiments with a disc-plow. I want to say at the start that I was prejudiced against the use of a disc plow. I thought it wouldn't work-—that it was impracticable. I was pursuaded to try one. I had three big heavy draft horses, and I wanted to find a plow that would do something. I took this Tiger plow and looked at it with a good deal of question. It didn't look like a plow, and I found it had a good many joints in it. I told my man to hitch onto it, got him started and I went along to see how it worked. I said: "I don't think that plow will plow more than seven inches deep and I have my doubts as to whether it will stand that; but it was a revelation to me.

I found that I could buy a single disc plow for two horses, a double disc for three horses and a three disc for four horses, and they are making a four-disc plow for five and six horses, but if we could only get one that would go deep enough it would be good reason for our using it.

We set it to working, and I found there was one little adjustment that was wrong; it was plowing about nine inches deep—and so I set it to seven. I went along with the man for about three hours, and finally I said to him, "Well, what do you think of it?" and he said: "Professor, it's all right." I was afraid it wouldn't- turn the stubble under, but I found it did.

Question: What kind of ground was it?

Answer: I am talking about stubble ground; they are not made for sod ground.

Q. What's the nature of your soil?

A. Its a loam soil, but it don't make any difference what kind of soil it is, it will scour anywhere; it scoured the first foot and it scoured the last foot.

I was afraid it would not cut off the rose bushes and that we would have to kill them some other way, but it cuts and turns under the stubble pretty good—weeds and also manure, providing you don't put too much of it on. When the plowing was done the ground was pretty level; it is pulverised. It was in such good shape that I did not drag it at all, so I think I saved one dragging by using it. He found that he could plow four acres a day with the three horses, weighing 1,500 pounds each, and he said: "Professor, don't get another gang plow."

We plowed between 80 and 100 acres with that plow. It cost nothing for repairs, and it would run over stones and then take right hold as soon as it got over them. You can rely on this as exact and definite. All

you have got to do if you have a large farm is to buy a larger plow.

The discs are made of soft steel. When you run onto a stone and nick the disc, just file it a little and save the blacksmith's bill. I found if I had broken a disc I could have gotten a new one for $2.50. I plowed seven inches deep.

Q. Will it plow wet ground?

A. Plow any ground.

Q. Have you had any experience in wet ground?

A. We had sonic heavy rains, and while we didn't go down there then with an ordinary plow, we took this plow and it went right through it. When the ground is fit to plow you can certainly plow with it.

Q. How does it leave the bottom of the furrow?

A. It does the nicest work in the "bottom of the furrow that any man ever saw. It leaves the bottom of the furrow rough, and it might look disappointing to a man, as it doesn't look like the ordinary. One horse walks in the furrow and the other two on the land.

Q. What does it cost?

A. About the same as an ordinary gang plow.

Q. Will the subsoil be brought to the surface?

A. I say no, it will mix it; the new mixes with the old—the most favorable condition possible for the resumption of nitrification.

Q. How is the draught?

A. The draught is about one horse easier than the ordinary gang plow.

Q. Is the furrow level or concave?

A. It is not exactly level and not as rounding as a man would expect.

Q. Does the disc cut the furrow?

A. The disc cuts the land all out, clear across the furrow.

Q. Is it all plowed to the same depth?

A, There might be a difference of half an inch or so.

Q. Can you set it to plow shallower than that if you wish?

A. Yes, sir.

Major Fleming: I am very much interested in this talk by Professor Shepard as to this disc plow. I want to make an inquiry though as to what plow he has reference to?

A. The Tiger disc plow, Stoddard Mfg. Co., of Ohio.

.Prof. Shepard: I have learned since I came on to this platform that there is a gentleman present that has had even greater experience than I have with this plow, only his experience was with the Quadruple Disc, plowing four ten-inch furrows instead of two. This gentleman is present and is the secretary of this convention. I will call Major R. E. Fleming.

Major Fleming: Mr. President and gentlemen of the convention: I have used two of the Quadruple Tiger Disc plows during the past year and find them a most satisfactory farm implement. I have on my farm the ordinary fourteen-inch gang plow and use five horses on each, plowing on an average about five acres per day with each gang. This disc plow was so large and plowed four ten-inch furrows that I added an extra horse, making six horses, and I plowed nine acres and three-fifths each day, and did it as easily as I did five with my old gang plows.

Question: What gang do you use?

Answer: I use the Oliver gang, and it does admirable work and turns under the stubble perfectly.

I instructed the boy using the gang plow to take the same team he

had been working on the ordinary gang; and add one more horse and hitch on to this Quadruple Disc and make twenty-four miles per day, when he had only been making twenty miles with the gang and observe very carefully the difference, if any, in the two plows. I was in the field all the time myself and noted the character of the work and the effect of the increased mileage on the team. This experiment was kept up two days, and this boy plowed nineteen acres quite as easily as he had plowed ten acres the two days previous with an Oliver gang.

The team was not jaded but would go to the stable at noon and night, feeling even better than before. The boy was enthusiastic, and said it was much easier for his team and infinitely easier for himself. When I started the Disc plow I was not sure it would do the work, but was anxious to get a plow that would be an improvement on the old gang and do the work with less cost. The Stoddard Mfg. Co. sent me these plows as an experiment, and they wanted me to note carefully all the changes I thought would be necessary and make report to them of my experience. I was careful to make an exact report and the work and note any mechanical changes that I thought necessary, and they made such alterations as I suggested, which were very slight. The principle is correct. I continued to use those plows during the fall and plowed about 800 acres with the two.

Question : Was the stubble well covered ?

Answer: Fairly well covered, but not as well as I could wish for.

The plow was then rebuilt on improved lines, making it a much better Dakota plow, and will be for sale this year. I saw the plow work at the factory late in November and it is complete in all its appointments and will be one of the greatest improvements on a plow that has ever been shown. I cannot say that disc plowing is better than plowing with a mould board, but it looks quite as good and is much cheaper. If it proves to be better, as some people predict, we will get a double benefit from the use of this labor-saving device.

Question: Is there any agent here for the plow?

Answer: I don't think they have any agent in the state.

The meeting adjourned until 2 p. m. in the Armory.

AFTERNOON SESSION.

Mr. Randall: This is your meeting, and as there is no program as you know, there will be a few papers read, and the rest of the session will be devoted to questions and answers. It will be necessary to make the answers as pointed and brief as possible.

There is one man who said that if he could feel when this meeting was over that he was master of the smut question, he would be fully repaid; another man who has come over 150 miles, has handed in one question. That man wants to know whether he should sow his wheat in drills five, six or eight inches apart. There is another man who wants to know how to plant potatoes. And part of the people in their questions have indicated whom they wish to have answer them; so we will call Professor Shepperd of the North Dakota School of Agriculture to the platform to answer his questions.

Mr. Shepperd : The first question says: Is it advisable to haul barn or fresh stable manure in the winter direct to the field, intended for crop in the spring to barley or corn.

Answer: There are three things that come in there. How littery is your manure? If it is very littery, it tends to make the corn drouthy. It

ought not to do much harm for the corn. I think I would do it with the corn, but I doubt the advisability with the barley.

Q. How with potatoes ?

A. Much the same as with the corn.

Q. Would it be advisable to burn it, or use it fresh in the spring?

A. It is very hard to do that, the burning causes a good deal of loss of the fertilizing nitrogen, driven off by the heat.

Q. Wouldn't you raise lots of weeds if you hauled it out in the winter?

A. That would depend upon the kind of weed seed.

Q. How long would you compost it?

A. It varies from perhaps a year to practically two years. Perhaps from six months to two years, depending on the rainfall.

Q. How do you prevent it becoming fire-fanged?

A. I have had no trouble with it. We haul it out from the barn. It is about half cow manure.

Q. Which would be the best for the land, sow it to corn in hills and cultivate it both ways, or sow it to timothy and plow it back, ready for the next year ?

A. Your corn crop keeps it clean and holds the moisture and puts it in a nice mechanical condition. I think the first crop of wheat will be the best on land that has been in corn.

Q. Which is the most profitable for the; ordinary farmer, to raise corn and feed it as it comes from the field, or to shred it or to build a silo, and feed it from there?

A. It has been found that the silo adds nothing in nitratin value to the corn. The ensilage has this advantage, it keeps the animals in good health. The shredder is an expensive machine and a thing you don't use much. The silo is an expensive thing, though it puts the food in such a condition there is little lost.

Q. How would you improve a meadow upon light soil?

A. That is one of the hardest questions you can ask. You can en-rich it with manure. I can't find anything to sow in with it to help the sod. The grasses cannot get hold.

Q. Why don't the Red River Valley farms build their own flour mills?

A. I will not attempt to answer that.

Q. What do you think of spelt for food?

A. I have worked with it some, but am not prepared to tell yet. It analizes pretty well and seems as if it might be good.

Dr. Hinebauch: I have fed spelt alone, and the animals do well upon it. I feed about three-quarters more by measure of spelt than I do of oats. I don't grind it.

Q. What is the weight of spelt a bushel?

A. The lowest about 42 to 46 pounds per bushel.

Q. How much does it average to the acre?

A. It depends on the land. I raised forty-eight bushels to the acre, and only seeded a bushel. I put it on my poorest land and got fifty bushels to the acre. You can produce from 75 to 100 bushels on your best land.

Q. What is the effect on the ground?

A. I cannot say.

Q. Is it sowed early or late?

A. I sow all my grain early, in April.

Q. How does it stand drowth?
A. It stands better than any other grain, and the wind cannot affect it.
Q- Is it as good as barley for feeding hogs?
A. I don't hardly think it is. Hogs don't seem to like it.
Q. Why do you not grind it?
A. Because it is not necessary and it costs three and a half cents per bushel to grind it. That is for horses and poultry.
Q. How long does it take to mature?
A. From five to seven days longer than barley.
Q. Is the straw valuable?
A. It has about the same value as barley straw, and the cattle like it about as well. There is too much husk for feeding to pigs.
Q. How does the spelt yield at the College farm?
Prof. Shepperd: About the same as barley—just a few pints more than barley. Ours weighs 39% per bushel.
Q. What are the results of sowing flax and wheat as a mixture?
A. Our results were not such as to give us any particular profit. I find some reports are very good and others not so good. Ours are on the poor side of the proposition.
Prof. Waldron: .If the ground is so rich that the wheat will not. stand up, then it is an advantage to sow flax with the wheat, but otherwise not.
Q. How do you know whether the wheat is going to stand up or not?
A. The man who has grown wheat can tell.
Q. If wheat, barley, flax and oats draw the same things from the soil, what is the value of rotation ?
Prof. Shepperd: There is not much value in rotating between these four. Our trials of that rotation have not shown much good from rotat-ing in that way. We should have a cultivated crop; or a grass crop, clover crop, or potatoes, before we get any benefits.
Q. Why is it that flax is only grown once in twelve years in Europe on the same land?
A. There is a plot on our station grounds which was put to wheat for three years, and then put to flax. The first year it yielded nine bushels to the acre, the second year twelve, and the third year to flax, it was twelve and a fraction. But this was only one experiment.
Q. Do you think it does not hurt to put flax on the land?
A. Some men say one way and some men say the other. It is probable that flax roots take up the moisture more completely than other roots.
Q. Does the barley root go down deeper than the flax root?
A. I would say that it does—I have not measured.
Q. Would brome grass out-grow and thus kill wild oats?
A. I think if you will leave brome grass down long it will.
Mr. Harrison: Here are three questions: Would you recommend sowing flax on summer fallow? What has been the yield from that practice? And would you advise sowing flax and wheat, and in what proportions?
I have a piece of land, forty-seven acres; it was not under cultivation until five years ago, when I broke it up and put it to wheat. I have had three crops off that and got No. 3 wheat each time. Last spring I was induced to sow it to flax and wheat with a result that it netted me $21.83 after paying all expenses.
The weeds bothered a great deal, so I began sowing wheat three

pecks to the acre on the land, and eight days after I crossed that land sowing flax twenty-five pounds to the acre—sowing the reverse way and sowing three-quarters of an inch deep, it grew beautifully and I received only one-half pound dockage on the whole lot at Duluth. I got eleven bushels of wheat and fifteen bushels and eleven pounds of flax per acre. I sold the flax for $1.12 after being cleaned. I shipped my wheat and flax together, had it separated at Duluth, and then inspected. I have known of people shipping their flax and wheat together and billing it simply as wheat. The result of that is, the flax goes in as dirt and the wheat is docked accordingly, and you have paid the freight on all of it.

Q. To what commission house do you ship?

A. Any responsible commission house will clean it for one cent a bushel.

I know of a man who got seventeen bushels of flax and twelve bushels of wheat, and he is going to repeat it this year to the extent of 200 to 250 acres.

Q. How is the crop following it?

A. These men have found just as good results.

Q. Did you ever see it tried on land worn out?

A. I have not.

Q. I have heard it claimed that flax may be sown between the rows of wheat—would it be better that way?

A. I don't know as there is any decided difference.

Q. How would you prefer flax stubble for cropping wheat? Would you fall plow it or pulverize with a disc harrow?

A. I would be inclined to fall plow. I have not had any experience with the other.

Q. What good will the Agricultural College do for the state?

Mr. Worst: It will simply do all the good it can; all the good the farmers of the state will allow it to do. We will suppose that God Almighty placed in the soil of North Dakota all the fertility there is there. It can be made to produce one hundred million dollars annually, not for the next year, and the next year, but for a hundred or a thousand years. I can look forward to a time twenty-five years hence when the greater portion of North Dakota will he cultivated, and in a way so skillful that we can get the largest possible returns from it. It should grow richer every year, and the Agricultural College will help us materially to gain this great achievement.

In regard to sowing flax with wheat. It is like getting a new whip to make your horse go faster. You simply make greater demands upon it and exhaust it sooner. If you take two farmers, one of whom is careless and only tills his land for what he can get out of it each year, without aiming to turn the land over to his children in good condition, his land will be worn out in a short time. The other man, if he is careful, and works his land skillfully and scientifically, the farm will grow better each year than it was the year before, And at the end of twenty-five years, the man who farmed his land carefully will leave a fine inheritance to his children, while the other's children will inherit an exhausted soil. Apply this comparison to the whole state and note whether posterity has any claim on us. The Agricultural Colleges will eventually revolutionize the educational influence of the rural districts and of the whole country. It will get so that if you mant a man of broad, liberal judgment, you will have to go into the country occasionally to find him.

Dr. Hinebauch: Here is a question: What is the food value of

Siberian millet as compared with other millet? Is it injurious to horses?

Answer: All millet is injurious to horses if fed as the entire food. Siberian millet is superior to any other form of millet because it will produce much more. I saw Siberian millet yielding four tons to the acre. I wouldn't feed the seed to a. horse under any circumstances.

Q. What difference is there between Siberian millet and any other?

A. The Siberian millet has three leaves where the German millet has but two, The stalk doesn't get as thick, the head is smaller and you can seed it closer.

Mr. Belts: I had 150 acres of this Siberian millet this year and didn't seed more than six quarts to the acre.

H. F. Forket, of LaMoure: My horses have done well this winter, and my hired man thinks it is due to the millet hay. I think there is nothing to the idea that you should not feed millet to horses. I keep a horse fat on four quarts of ground millet.

Q. How much seed do you get per acre?

A. I have gotten from 33 to 80 bushels to the acre.

Dr. Hinebauch: If anyone would like to read literature on feeding millet to horses, he can obtain it by addressing .President Worst, I think you will find there is danger from feeding millet to horses exclusively.

Dr. Hinebauch: The Siberian millet grows a head like the German millet only a longer head.

Prof. Bolley: If you write down to the Michigan Agricultural College on millet, they will send you a bulletin on that subject.

Q. Is millet injurious to cattle as well as horses?

A. No, sir; I have not found it so.

Q. How can these morning glories be exterminated?

A. The Tower cultivator shaves them off the same as it does rose bushes. It cuts them off and kills them.

Q. W. M. House: How do you like a disc drill?

A. I have had some experience and I think it is as much of an improvement on the shoe drill as the shoe drill is on the hoe drill, I was prejudiced at one time, but I found that the disc drill runs a great deal easier than the shoe drill with the same width, and does the work better.

Q. What kind of soil do you use the disc drill on?

A. The natural soil of the Red River Valley, the gumbo soil. I use it on others as well. My drill is the superior.

Q. Does the disc do any cultivating?

A. A little better than the shoe drill—you can use it on harder ground,

Q. Is it single or double?

A. It is a double disc drill.

Q. Will it clog when the ground is wet?]

A. No, sir; not as quick as the shoe drill.

Q. Where is your farm located?

A. Three miles from Lidgerwood.

Q. Is old ground too loose?

A. No, sir; it works about the same.

O, Have you tried it in the dry season?

A. Some of my land is quite dry.

Q. In regard to plowing, when do you plow?

A. I plow when I can, usually in the fall. I think it is better to plow in the fall. It has been said that we ought to plow early in the fall; I don't believe that is necessary. I don't see any difference.

Q. Would you seed meadows on fall plowing?
A. Yes, I would.
Q. Will it be as clean?
A. I think fully as clean.

Prof. Waldron: We have a number of questions relating to weeds. There are questions touching upon the French weed. It belongs to the mustard family, but has a pod very different from the mustard. It is a hardy annual. We have killed it on the College farm in this manner: Plow your land in the spring and keep it thoroughly cultivated through the season with a cultivator having sharp sloping teeth. You will destroy all the weeds in the upper two inches or two and one half of the earth; then sow your wheat next year on top of that ground. Do not turn it over. Underneath that two and a half inches are other seeds ready to come up if the land should be turned over. The first season they are usually killed by cultivation and by the sun and heat. After growing your crop of wheat, turn it over by plowing to a depth of about five inches; summer fallow on top of that a second time. Two crops of corn with wheat in between will almost certainly destroy the French weed, mustard and kinghead. If you put weed land down to grass, when you turn it up do not sow it to a grain crop the first year because the weed seeds will germinate on coming to the surface.

Q. How do you kill the king weed?
A. We simply grow a cultivated crop for two years and kill them that way.
Q. Do you kill mustard in the same way?
A. Yes, sir.
Q. Will wild oats sprout the same year as grown?
A. Yes.
Q. Is it a good plan to sow a crop on summer fallow and plow it under in order to free the land of weeds?
A. No, sir.
Q. Does early plowing destroy more weeds?
A. With fall plowing there are fewer weeds. The weed seeds are turned up so late that they have the action of the entire winter on them, and they will not start as abundantly as if they were turned up in the spring.

Prof. Ten Eyck: This question is asked: How deep do oat roots and wheat roots go into the ground where the ground is very hard and dry?

A, I don't know; I should say if the ground was very hard and dry, they would not go down at all.

Q. Would you roll a field after it has been plowed in the fall with a round roller, which leaves the ground rough so that it does not drift?

A. Yes, sir, that is right. The result is to hold the moisture in the soil. It also makes a firm ground in the spring with more water in it,

Q. Not with a smooth roller?
A. I do not think so.
Q. Would not harrowing be just as good as rolling?
A. I would just as soon have it. .
Q. Isn't the best roller the sub-surface packer?
A. I would not like to answer that—the corrugated roller is all right. The sub-surface roller is too expensive.
Q. Would not the Havanah press drill do the work as well?
A. I think not—it would not do the same work as the sub-surface packer does.

Q. How would the disc harrow do?
A. The disc harrow with the handle set straight up is better than any roller.
Q. How many acres can two horses do in a day?
A. Fifteen. I believe the disc harrow is all right.
Q. Would you use that in the spring before you seed?
A. Use it in the fall.
Q. Would you drag in the fall or in the spring?
A. I would drag in the fall after plowing, but I would not drag in the spring.
Q. Which is better to use, the press drill or the common shoe drill, when you follow with a heavy corrugated roller?
A. I would say use the shoe drill under those conditions.
Q. Do you recommend sub-soiling for wheat?
A. No, the expense is greater than the profit.

Ten Eyck: We are going to try this new plow at the Experiment Station—the Tiger disc plow—and see if it will do as good work as the common plow. In a three years' trial we have discontinued the use of the John Deere disc plow. I know it runs easier than the other plow, but it will take at least three years for our Station to find out about it. I don't think it is well to buy new things until we are absolutely sure they are good.

Gov. Worst: Col. J. B. Power, chairman of the Committee on Resolutions, will now report to the convention.

The resolutions were as follows:

The Tri-State Grain Growers' Convention assembled in the second annual session at Fargo, N. D., Jan. 23-26, 1900, adopt the following resolutions :

That the addresses delivered at this second annual meeting of the Tri-State Grain Growers' Association the large attendance of farmers and their close attention, has strengthened our belief that this organization is a powerful agency for conveying scientific and practical knowledge of agriculture to the masses of farmers and producers of the Northwest, and is therefore of the greatest value as an educative institution, therefore everything should be done that is practicable to encourage it and its work.

That in line with this we favor liberal appropriations by the state legislatures of the states which this association covers, namely, Minnesota, North Dakota and South Dakota, for the support of farmers' institutes, and we especially emphasize the want of this support in North Dakota, and respectfully recommend that the candidates for the legislature be pledged as far as practicable to carry out these recommendations.

That we recognize the great want of ships on the Pacific Ocean in order to export the agricultural products of the Northwest and Pacific Coast to the people of the Orient, who would become large buyers thereof, and we demand of the National Congress such legislation as will en-courage ship owners and ship builders to put vessels on that ocean. We do not desire to take part in the contention of those who favor the Payne-Hanna bill now under consideration or with those who oppose it, but we believe that there is sufficient statesmanship in Congress that shall render substantial justice to all interests and at the same time give American shippers and sailors the right to the trade of their own country, and open up markets which will absorb the surplus agricultural products of the Northwest.

That we recognize in the co-operative creamery and co-operative insurance associations, which have developed into an effective and permanent system in the middle Northwest, a most encouraging feature of American rural life, and that we most urgently recommend that the principle of co-operation be conservatively encouraged and extended in every possible way. That this convention hereby extends its hearty thanks to the City of Fargo and its citizens for their hospitality, to Mayor J. A. Johnson and President Worst for their constant and indefatigable labors in making the convention a success and doing everything possible to administer to the pleasure and comfort of delegates and guests, to the Great Northern, Northern Pacific, Milwaukee and Soo railroad companies for a liberal reduction in passenger rates. We extend our best thanks to the daily newspapers for their very full reports of the proceedings of convention.

That we recognize and appreciate the liberal policy of the Great Northern and Northern Pacific railroad companies in giving the farmers of North Dakota free transportation to visit the state Agricultural College at Fargo, and hereby extend a hearty vote of thanks therefor.

We hope that the same liberal policy will be adopted by all the railroads, which will give opportunity to the farmers of the three states to visit their respective Agricultural Colleges and Experiment Stations.

That we recognize the growing value and power for good to agriculture of the National Department of Agriculture and recognize its efforts in introducing into this section of brome grass, new grains, fruits, and other agricultural plants from foreign countries and improving our staple crops by Breeding. We recommend that Congress should be liberal in supporting this department with money appropriations.

That we especially commend our Agricultural Colleges and Experiment Stations, and we demand of our state legislatures of the states here represented, liberal treatment of these institutions.

J. B. POWER, Chairman,
GEO. N. LAMPHERE, Secretary.
W. E. T. BUSITNELL,
CONDE HAMLIN,
T. L. BOLTON,
C. L. TAYLOR,
J. H. WORST.

Gov. Worst: I desire to have the Soo railroad included in these resolutions. They did all in their power to help the people along their lines to get here.

The resolutions and amendments were adopted.

Gov. Worst: We will meet at this place at *7:30* this evening, and the meeting is adjourned for this afternoon.

EVENING SESSION.

Mr. Randall: The stenographer not being able, to be present tonight, the time will be taken up mainly with reading papers. The first will be by Mr. Lewis Pond.

DIVERSIFIED FARMING WITH FACTS AND **FIGURES**

BY LEWIS POND.

On the 450 acre farm of the writer located near Churches Ferry, N. D., 248 acres are pasture lands, 90 acres in wheat, 30 acres in oats, 65 acres in millet, 10 acres (40 rods square) where the farm buildings, yard, garden and 10,000 trees are located, 1 ¼ acres of flax, 3 ¼ acres potatoes and two acres more of trees. The yield of wheat, on millet stubble and fall plowing, was *20½* bushels of No. 1 hard an acre; on summer fallow, 8 bushels per acre with a stand of straw that looked as though it would yield 40 bushels per acre. Oats on fall plowing gave 50 bushels per acre, weighing 42 pounds to the stroke measured bushel, oats on spring plowing gave only 30 bushels per acre, weighing 31 pounds to the measured bushel. Three acres of millet for seed gave 30 bushels per acre; millet cut for hay gave 3 tons per acre by measure. Flax gave 28 bushels per acre; potatoes about 200 bushels on ¾ of an acre. Six horses do the farm work and two of them are each expected to raise a colt every year. Garden truck and berries are raised for home use and a surplus of $30 worth was sold last season. Plymouth Rock chickens, of which 125 are kept, gave eggs and meat for home use and a surplus of $75, sold last season. Poland China pigs give fine bacon for home use and $217.50 worth of pigs sold, mostly for breeding purposes. Short-horn cattle numbering 40 head gave $40 worth of baby beef for home use, also rich milk and plenty of fresh butter for the house. Surplus butter sold for $30. Shorthorn cattle increase, for the year ending Jan. 15, 1900, sold for one thousand one hundred and nineteen dollars and fifty cents, ($1,119.50), mostly for breeding purposes. Quality is what is wanted and the Bates Short-horn cattle give a nice mess of rich milk, and fine beeves. Herds like those found at North Oaks, Browndale and Cloughdale, Minnesota, have been drawn upon for their chioce Georgianas, Wild Eyes and Kirklevingtons.

Browndale and the national herd of Poland China swine, Canton, Ill., furnished the foundation for choice Poland China pigs. Millet seed, 64 bushels, sold for the year ending Jan. 15, 1900 for $80 Quality and purity are appreciated by many farmers who are willing to pay $1.25 a bushel when the going price is 75 cents a bushel for common stuff, with the weed seeds included for good measure. The cash receipt of the farm for one year to he credited to diversified farming is $1,552. Wheat raised on the place not included. The farm is improving every year as no refuse is allowed to go to waste, but is put back on the land, right from the barn. No straw piles are going up in smoke, but used up for feed and bedding. The stock enjoy a clean soft bed as well as their owner. It makes the stockman feel good to see the animals contented. Grain, grass seed and millet hay brought from the farm, can be seen in this hall.

Itemized list of sales of livestock will cheerfully he shown to parties interested, on request of same.

A FEW PRACTICAL SUGGESTIONS ON NORTH DAKOTA FARMING.

BY R. S. LEWIS, FARGO.

What little I shall have to say to you will be in the way of a few suggestions applied to operating a North Dakota farm of several sections—the same suggestions, however, will apply to a smaller farm. To .successfully operate a farm of this size, the farmer should plan his work

so as to be able to know what land is to be seeded to wheat, oats, barley, flax and cultivated crops for two years in advance. I believe that not more than two successive crops of wheat should be taken off the same land, then it should be followed by a crop of oats, barley or flax, and these crops should be followed by summer fallow, to recuperate the soil and prevent it from becoming weedy. To get the most out of hind set aside to be summer fallowed, and at the same time reach the desired results, some of it should be planted to corn, to furnish winter feed for work stock and horn cattle. There is nothing better in the line of coarse feed than corn cut before or after it has matured. Again, seeding a bushel of oats and a peck of millet to the acre, to he cut up before either ripen, with a binder, and set up in long narrow shocks, so it will cure rapidly, excellent feed for horn cattle, but I would not advise feeding horse's exclusively on this kind of feed. The land on which such a crop has been grown should be plowed as soon as the crop can be taken off. Land handled in this way produces a good, clean crop the following year.

An excellent August pasture may be had by seeding millet or oats and millet about the middle of June. A good way to handle land to be used for this purpose is to plow around from forty to fifty acres and herd your cattle on this till it is well fed down, then transfer your stock to another piece, and plow the one vacated: continue this till you have utilized all the land set aside for this purpose. This method applies to a herd of from eighty to a hundred head. If you will try this you will find that you will not only have some good clean land for wheat the following year, but you will have your stock in excellent condition to go into winter quarters.

For bare summer fallow, I prefer to plow early, but not early enough so that wild oats will come up and mature. My experience teaches me that early summer fallowing will not be so apt to blow the following spring. Weedy land can be made practically clean by discing in the fall, harrowing in the spring about the end of wheat seeding, and again at corn planting time, and oftener if convenient. By this method many weeds will be cultivated out and the soil will be loosened up so that the foul seed will germinate. To free the soil from weeds the seed must be germinated, for many of them will not decay in years. This applies to land to be summer fallowed, and can be applied to the treatment of land where a crop of flax is to be raised.

Too much care cannot be taken in preparing a good seed-bed. Poor, shallow, late plowing encourages all varieties of weeds, and a good crop of wheat and weeds are seldom produced the same season on the same soil. One of the most important things in producing a crop is the seed. The cleanest and best soil should be set aside to produce the necessary seed for the coming crop. Save enough grain so you can clean out all the small kernels, and especially all the weed seed. Run it through your mill at least three times and oftener if necessary. Smut decreases your yield very materially and lowers your grade, consequently cheapens the price, and of course reduces your income, without in any way cutting down your operating expenses. Seed can be treated for smut at such a trifling expense that a farmer cannot afford to take any chances in having a smutty crop. There are several methods used in treating seed. I prefer the formaline treatment by sprinkling and shoveling.

Every farmer should raise some stock, and this should be the breed which will best meet all requirements. I do not refer to the cattle ranches where beef alone is the only consideration, This is a grain growers and

not a. stock growers convention, and when we refer to stock we have only in mind such stock as will best meet the requirements of the farm. We want milk and butter for farm use, and we want the best beef we can get out of our surplus. I am not here to express my preference for any breed, but whatever you do, do not raise dunghills.

If you will go on some of our large farms you will find two and three kinds of plows—the same may be said with reference to drills, binders and other farm machinery. The farmer who follows this practice of trying every new machine that is offered to the trade, is running a farm machinery experimental station, for the benefit of the manufacturers. He finds himself a very busy man when he starts his work. Instead of being able to go to one house for his repairs, and keeping a few of the most needed ones on hand, in case of a break-down, he is compelled to do business by telephone and by wire, paying a very high price for what he gets, and much of the time his machinery is idle. I would rather have one inferior line of machinery and have them all alike, than to have several kinds of a better grade to operate, in this connection I would like to suggest that much time is lost on the farm by changing from one kind of work to another; much of this is due to the fact that so many farmers make it a practice of changing their eveners and single-trees from wagons to plows, from plows to drills or harrows, and so on down the list. Keep your wagon eveners on the wagon, plow eveners on the plow, drill eveners on the drill, and so on and when you have to change from one kind of work to another there will be no loss of time.

Keep your place, especially around your buildings, looking attractive. Have a place for everything. Lay out your grounds. Have a place for wagons and racks, wagons and grain tanks. When not in use, a place for plows, drags, binders and drills. As soon as the season is over for one kind of machinery, put it back in the machinery hall where it belongs, and never have it outside out of season. If you have not already adopted this method try it, and see how much more convenient and attractive your place will he.

Labor is one of the most trying things the farmer has to contend with. For this reason I believe something should be done to attract a better class of laborers to the farms of this state. This could possibly be accomplished by providing hotter accommodations and adopting a scale of wages which would enable an intelligent, competent and willing man to receive better wages, than one who neither has the ability or the disposition to perform the average duties required. In view of the fact that our labor account and board of laborers constitute the larger proportion of our operating expenses, we should endeavor to use such machinery as will enable us to accomplish the most work with the least labor possible. To illustrate: One man with six horses will harrow as much in four days as one with four can in six, a saving of one-third in labor. Again, it costs no more for an engineer, fireman, waterman, separator expert, and straw bucker to operate a machine which has a capacity of from twenty-five hundred to three thousand bushels a day, than it would to run an outfit which would only accomplish from one-half to two-thirds as much. Much could be said along this and other lines, but I presume that many of you have had about the same experience.

FRIDAY, JANUARY 26.

MORNING SESSION.

Mr.7 Randall: The first speaker on the program this morning is Prof. E. F. Ladd of the North Dakota School of Agriculture. His subject is "How to Maintain Our Soil Fertility." I take pleasure in introducing to you Prof. Ladd.

Prof. Ladd: I shall talk to you this morning on the nature of humus and how to retain it.

MAINTAINING OUR SOIL FERTILITY.

BY E. F. LADD.
PROFESSOR OF CHEMISTRY, NORTH DAKOTA AGRICULTURAL COLLEGE.

Probably for a million years or more nature has been preparing our soil, breaking down rock, fining it and putting it in shape for the home of plants. During all this time it was only pulverized rock being ground finer and finer in nature's evolutionary mills, but long centuries ago there came a change, plants sprung up on these masses of pulverized rock, these were at first simple in nature and then followed those of a higher and higher type, replacing them until now we have our present native vegetation, growing so abundantly all over the western plateau region and especially in that portion known as the Red River Valley. How many centuries nature has been at work producing this soil, first in preparing the rock, and then in adding the organic matter and the humus and getting them all in shape for man.

Year by year the annual crop of plants have died and become mixed with the surface soil, making our soil physically better and enriching it in plant food, rendering it available for the cultivated plants—wheat, flax, corn, etc.

AMOUNT OF FERTILITY IN ONE ACRE.

Nowhere is there to be found a soil richer than that in Eastern North Dakota. Nowhere is there a soil of equal area, containing such vast deposits of fertility—nitrogen, phosphoric acid, potash and lime. An acre of soil to the depth of one foot is estimated to weigh about 3,225,000 pounds and within the first foot there is found:

	Pounds
Phosphoric acid	6.772
Potash	22.897
Lime	47.407

And as has been shown by Prof. Ten Eyck the plant roots extend downward for four feet or more. Then within the reach of the plants, there is to be found in these four feet the following amounts per acre on the Agricultural College farm.

	In four feet, lbs.
Phosphoric acid	22.806
Potash	78.044
Lime	617.296

Within the reach of the plant roots there is found enough phosphoric acid to supply the wants of 1400 annual wheat crops, and of the other

constituents even more. Of organic matter these soils contain in the first foot from 35,000 to 95,000 pounds per acre, and of nitrogen from 4500 pounds to as high as 25,000 pounds, an average for nine samples of native prairie Red River Valley soil 13,867 pounds of nitrogen to be found per acre in the first foot.

I know of no soil of equal area that contains such a wealth of nitrogen derived from organic matter.

How came our soil to have mingled with it this vast quantity of organic matter? For ages innumerable plant life, first the simpler forms, and then the higher types, have been growing upon the surface of our land, and each year the dead and wasted plant has been mixed with the pulverized rock until men came to break the virgin prairie. The land being nearly a level plateau, very little of this organic matter was washed away, as is the case upon hillsides and mountain slopes. About the only loss then, was through the continuous decay of this organic matter, and as the supply of vegetable matter from plant growth was greater than the loss by decay, we had an ever increasing deposit and an ever increasing richness of soil fertility. With the advent of civilized man there came a great change. These broad plateaus were plowed, and the native grasses, and above all the leguminous plants—members of the clover family—vetches, prairie clover, etc., were destroyed, and in their places we find growing a plant, exhausting in its nature—wheat.

HOW WE DESTROY OUR FERTILITY.

Methods of cultivation, or rather lack of methods, were employed that tended to destroy the store of organic matter, and year by year this depiction has been going on, with no supply to take the place of that lost by decay. Decay is only a slow process of burning out the organic matter from the soil. Thus gradually, year by year, this one crop system of agriculture is bringing the condition of our soil down to the same condition that prevails in the older parts of our country. Again, instead of producing ,30 to 50 bushels per acre of wheat, as should be the case in a soil as fertile as the Red River Valley, we do not average over half this yield. And yet extensive experiments by practical farmers in the state during the past year have demonstrated that the use on our soils of commercial fertilizers, as they are employed in the East, does not pay for the cost of applying them, in increased yield. It is not fertility that our soil lacks, that is, fertility in the sense of phosphoric acid, potash, and even for the present, nitrogen, but rather a keeping up of the stock of organic matter to be gradually converted into humus, so as to bring the elements of fertility into an available form for plant food, and to maintain the proper physical condition of our soil.

FERTILITY FOR 1,000 YEARS.

We have enough of the mineral fertilizing constituents in our soil to last for more than a thousand years, if they are properly husbanded and gradually rendered available, to supply nourishment to the growing plant. With us, then, agriculture is, and should be, a system of mining, but to mine successfully we must keep the condition of our soil such that these elements of fertility can he extracted by the implements which we are obliged to employ in this system of mining, namely plants. This can never be done by continuous wheat growing, and above all by such a system of wheat growing as practiced by many whose only farming is a species of

gambling with nature, in which they get the worst of it three years out of five.

The organic matter in our soil as previously stated, has been derived from the growth of plants that have died and become mixed with the earth near the surface. The gradual decay of this vegetable matter is going on at all times, and in certain stages we have come to call the partially rotted product humus. Just what the chemical composition of humus is is not known, nor neither do we know just how it is combined with the bases and acid products of the soil We do not know just what relation it holds to the potash, lime and phosphoric acid, but enough has been found out to convince us that as these mineral constituents are transformed into available plant food, they become the more intimately related to the humus. On the other hand, let the humus be lessened and the available plant food is diminished, even though the total amount remains the same.

HUMUS AND SOIL MOISTURE.

As we reduce the amount of humus and organic matter, we not only render the mineral plant food less available for growing plants, but we change wholly the physical conditions of such a soil, it becomes less retentive of moisture, a very important factor in our climate, and although the plant may not suffer severely for want of moisture since it can draw a supply from deep in the ground, yet there may be a lack of food material supplied from the region of available plant food, since there is not enough moisture present in this upper layer to dissolve and carry the food material to the growing plant.

Prof. Snyder has shown that a soil containing 3.75 per cent of humus retained 265 tons per acre of moisture, but a loss of 1.25 per cent in humus resulted in the soil retaining only 180 tons per acre in the first foot, a difference of 85 tons of water per acre. To a maturing crop of wheat this may mean the difference between a good yield or a complete failure. To the growing crop it probably may mean the difference between being well fed and half starved.

THE PROBLEM FOR THE DAKOTAS

I feel convinced then that the great problem before us here in the Dakotas is:

First, maintaining the organic matter in our soil at a high percentage to supply an abundance of humus.

Second, the maintaining of a high humus content, which means the rendering available of the stored up plant food for the growing crop.

Third. The more humus present, the more moisture the soil is able to conserve in the upper layers of the soil to be supplied to the crop in the latter period of its growth when the plant stands most in need of the moisture and the available plant food to insure the crop.

Fourth. The maintaining of such perfect physical conditions of the soil as shall ensure the greatest supply of moisture in the upper foot of the soil, in order that the plant may gather the necessary plant food to insure a perfect crop.

The problem here in the Dakotas is a different one from that of the Eastern wheat growing regions, and must be worked out upon new lines, and the conditions for the Red River Valley are not the same as for Sargent County and different soil conditions still prevail in Griggs as they do for Morton and for Williams Counties.

The principles underlying agriculture are the same everywhere, but the conditions differ and make it necessary that we study agriculture as a problem independently. While here in the valley wheat may be grown continuously for twenty, thirty or possibly forty years, yet it is done at a fearful loss of fertility, and by rendering the physical conditions less adapted to successfully meet the conditions of a region of low rainfall. Outside of the valley experience has already shown the fallacy of such a one-sided system of agriculture. Crop rotation outside of the valley and the maintaining of the highest possible humus soil content, and the best physical conditions to conserve the moisture is the only form of agriculture that will ever be a success. In the valley with our fertile soil we should have a yield of thirty to forty bushels of wheat per acre each year, instead of one-half this amount as is now the case, and under a proper system of crop rotation and the maintaining of a perfect physical condition in our soil we shall double the yield and with a less loss of fertility than is the case today, when we are losing four pounds of nitrogen out of our soil for each pound removed in the wheat crop.

THE REMEDY TO BEGIN IN OUR RURAL SCHOOLS.

The great remedy for all this will come only when we, as a people, study agriculture, when we study our soils, until we become acquainted with its properties and understand how to manage it to insure profitable results as is the case of the people of little Holland upon their land reclaimed from the sea and valued at $300 per acre or more, or as the people of Switzerland, where farm lands are often valued at $1,000 per acre.

This will not come until our public schools—our rural schools—give their pupils some acquaintance with practical things in the system of education that has come down to us along the lines that were intended to train students for life in the monastaries of the middle ages. They should have in their course of study some of those things that stimulate in the pupils a love for nature. How is this to be accomplished? By first introducing nature-study into our rural schools to awaken an interest in the minds of the young for common things, to quicken the intellect, and to train the pupils to become observers of natural phenomena everywhere about them, and to enable them to reason clearly, express themselves intelligently, and with a confidence of their own ability. Later, the introduction of the elements of agriculture into our schools will surely follow, and the farmers' sons and daughters will be taught to look nature-ward and not city-ward, from the very day they enter our public schools. North Dakota is an agricultural state, and her future wealth and prosperity must be mined from the soils. Then why should not agriculture be fostered, encouraged, considered, and treated as a profession, and the people of this state trained in our public schools to secure the greatest wealth from the soil with the least possible loss of our deposited capital—soil fertility.

If the introduction of industrial training in the public schools of our towns and great cities is a benefit to her pupils, if it means the up-building of stronger industries, then, pray, I ask, why should not the introduction of nature-study and of agriculture into her rural schools be equally helpful to the future farmers of the state—the miners of the great bulk of wealth that is to be found in the state?

WHAT IS BEING DONE ELSEWHERE IN THE SCHOOLS.

For ten years now. Ontario and all parts of Canada have been devel-

oping the rural schools to benefit the farmers of the country, training their teachers and introducing the study of agriculture. New York state has appropriated considerable sums of money for training the teachers and introducing nature-study into the rural schools preparatory to the study of agriculture, and Prof. Roberts of Cornell University, who has charge of this work, and who is doing more than any other man to help the farmers, says: "We must begin with the child." "The time to educate is when the person is young." "As the result of five years of effort and inquiry, we believe we should endeavor to help the farmer in every way possible * * * but the greatest and most persistent effort should be expended in training the rising generation." "Our conclusion is that the most efficient way of reaching the young is through what we call nature-study."

In speaking of the study of agriculture he says: "This may come in time with the older scholars; but the first thing to be taught is how to see, how to reason from what one sees, and to love and appreciate the natural world. That is, the first thing is a training natureward; later the training may be applied to specific problems, to farming."

Missouri has taken legislative steps for the introduction of agriculture in the rural schools. Pennsylvania is paving the way through the reading circles and study clubs. It is not time that the farmers of North Dakota demand that the rural schools of the state give such education and training as shall be directly helpful to the farmers and to the agriculture of the state, the source of the most of our natural wealth? Unless the farmers ask for help from the stale for the rural schools that shall benefit their sons and daughters, it will never come. If you demand that nature-study, looking toward agriculture he taught in our rural schools, as domestic science is now taught in the high schools for girls, and as woodwork, carpentry and lathe work, iron work and mechanics are now being taught in the high schools to benefit the industrial classes of the city, and to aid in developing the manufacturing industries, it will come and another generation will see a revival of our agriculture, and in place of producing an average of sixteen bushels of wheat per acre, we shall have forty and our land instead of selling for twenty dollars per acre will have a value of fifty to one hundred dollars, as it should be.

In a feeble way, I have been for some time endeavoring to awaken an interest in the improvment of our rural schools, but is remains for you as farmers to acquaint yourselves with the work that is being done along these lines, and then demand that you be given what is your dues. So important is this matter becoming that it is receiving attention from every part of the country, and at a national convention of the agricultural colleges, held in Washington, the following resolution was passed:

RESOLVED, That this convention favors the introducing into public high schools and grammar schools of the several states of nature-study and instruction in the elements of the economic sciences; and it is recommended to the colleges and other institutions concerned with agriculture and the mechanic arts that they endeavor to secure, if practical, in their respective states such legislation or other action as may be necessary to introduce into the public schools the studies above named. For the training of teachers for giving instruction in these studies it is recommended that the colleges of agriculture and mechanic arts offer, if practicable, to teachers in their summer vacations or at other appropriate times, courses of instruction in these subjects,"

NATURE STUDY FOR THE SCHOOLS.

With the introduction of nature-studies, followed by agriculture and with the training that will come to the farmers' sons, and with the improvements of another generation, country life will become the ideal life, for to repeat in a measure what I have already said elsewhere: "There is no nobler calling than that of agriculture, there is no greater happiness than that found upon the ideal farm." There is no happier home than that of the farmer who has put the same thought and energy into his calling that the successful business man has done. There are not 90 per cent of failures among the farmers, as is said to be the case in most businesses.

Agriculture is the very backbone of our national success and prosperity. Then why do we not make more of it? Why do we pattern our rural schools wholly after the old worn-out medieval system too often still in vogue in town and city? Why in our rural schools is every text book so patterned, and every teacher so trained, that the trend of thought and influence shall be always from the country toward the town and city? Why do we not deal with the problems of agriculture even in our system of rural schools? If the introduction of manual training into our city schools, if industrial education, domestic science, cookery, etc., Is to their future advantage, then why should not the farm boy have some fit training to aid him in his future calling? When this day comes we shall have solved in a great measure the problem of "How to maintain the fertility of our soil."

Prof. Ladd read his paper, and in the course of the reading these questions were asked:

Question: You say there has been a loss of four pounds of nitrogen from the soil for every pound taken up in the wheat. What has become of this lost nitrogen?

Answer: The decay of organic matter has resulted in some of it going back into the air. By nitrification nitrates have been formed and these have been washed into the rivers or down deep into the ground beyond the reach of plants. Burning straw and stubble has also destroyed a great deal.

Question: If nature-study and agriculture were to be taught in the rural schools, what text books could you recommend?

Answer: For the present I would not introduce agriculture, but nature-study should come at once. The pupil should never be allowed to use a text book in nature-study. This destroys its value. The objects themselves should be placed before the pupils, a leaf, a plant, a pebble, insect, etc., and they should be asked to examine them and describe what they see. This is the true method of nature-study.

Q. Do you think our teachers are qualified to take this work up?

A. No, sir; but they are qualified to begin the simplest phases of it. They can ask the simplest questions, leading the pupils forward and themselves growing into the work. New York is teaching it in the Normal schools, and the state is helping and encouraging the work through Cornell University.

Q. Isn't legislation necessary?

A. Legislation is one of the first essentials if we would make it a success.

Q. Wouldn't it be well to introduce it at once into the rural schools?

A. Yes, sir; that is where it would do the most good and interest

the pupils in those things concerning which they should have a knowledge.

Q. Whose duty is it to introduce it into the schools?

A. It is the farmer s duly to create the demand for it and then to support the teachers.

Q. Wouldn't it be a good idea for the committee on resolutions to see what can be done for the schools and name a committee to stand until next year?

A, It will he the duty of this committee to suggest methods of this kind for the schools and introduce them.

Prof. Hays: I like to see things incubate. Great things move slowly. I have had some experience myself—in breeding plants. You will observe how long it takes to get results from two little germs coming together; but in a few years we can get 9,000 bushels from it, and in a few years more we can get enough to plant all of Minnesota and North Dakota, from those two little germs. This small germ for agricultural education has started, as was manifested by our convention last year. This mailer of education of the masses of farmers in their agricultural pursuits takes time and money. But let us be willing to invest something; let us have a little garden with some of the different plants in it, and let us give our children instructions in regard to them. How little we know about these plants that grow right before us all the time. Let us take an interest in the schools and in the teachers, and advocate these things until they believe as we do. The teachers of the country schools reach hundreds of thousands; let's us reach them.

Mr. Childs: I like the idea of Prof. Ladd and Prof. Hays. Today farming is not a drudgery and wearisome toil, but it is the science of growing grain and stock.

President Worst: I don't wish the question put to a vote until I say a few words on the subject, because I consider Prof. Ladd and myself as pioneers in this work. I do not believe we can accomplish a revolution in a few years; it may take a generation. The Agricultural College board and the faculty have been working for the last few years to get the farmers of the state to educate their children in a literary and practical way, expecting to make of them good scholars and good farmers.

The wealth of this state must be made by labor on the farms. The foundation of all wealth is labor, and much is dependent upon agriculture. The men engaged in business and in the professions must be dependent on the soil, ultimately, for their prosperity.

In this convention we are doing much to stimulate agricultural education and place it upon the high basis it should occupy, largely that we may learn to respect the profession that we belong to. I have farmed for thirty years. I went to school as other boys, and know from experience that every influence is against rural life, as menial, as a species of drudgery, and that city occupations are held up to the bright boy as the one thing desirable.

As stated before, God placed in our soil a wonderful instrument for the production of wealth. The physical sciences radiate from the farm. It is for us to understand them. The farmer, works closer to God than any other man in any other profession. Why should he not understand his work? Why should we educate men only to enable them to get their living from the earnings of the farmer, and to grow rich at his expense? We should educate our children and make the country home prosperous and enjoyable. Nine-tenths of the girls and boys that go to the devil go from the city. No purer blood is found in humanity than in the veins of

the children from the farms, but they fall easy victims to the temptations of city life. They are less immune against them because reared in innocence.

I am not against the professions. We need them, but we can treble the wealth of this state if we can but convince our boys and girls that the road to prosperity, and along the lines of least resistance, is for them to educate themselves for the farm. They should be influenced to respect rural life and to make rural society as good and as enjoyable as they desire.

It is as Mr. Conde Hamlin says: "If these boys only knew how much competition there is in the cities they would seek rather to escape the terrible strain. Ninety-five out of one hundred who go to the city to make a fortune make a failure." Suicide and crime are the results of many of these failures and disappointments.

We want contentment; we want prosperity based on contentment. I agree with the gentlemen speaking before me, that the farmers owe it to themselves to defend their interests along educational as well as other lines. The taxes they pay for educational purposes should not be diverted, or used to poison the minds of their children against rural occupations.

I am glad the educational institutions of the country are arousing themselves to this fact. The great want of this nation and especially of this state is industrial education; something to lift all men, regardless of occupation, into social equality, so that the farmer can meet the business .and professional man on the same educational plane.

Let us look to our interests, and use, as Rev. Mooney says, our "God given sanctified good common sense," and our condition will be improved

Mr. Randall: Those in favor of the motion say "aye."

The motion prevails.

I will announce that committee this afternoon. I realize the importance of the work and would like to consult with others.

Mr. Randall: It has been suggested that a committee be appointed to meet President Hill. I will appoint on that committee Mayor Johnson, W. F. T. Bushnell of South Dakota, and Mr. Tuller of Warren, Minnesota.

We have a matter here relating to the Tri-State Drainage Canal of Minnesota, South Dakota and North Dakota, which will be read to the convention.

WAHPETON, N. D., January 25, 1900.

To the Tri-State Grain Growers' Association, in session at Fargo, North Dakota:

Gentlemen: The Tri-State Drainage and Ship Canal Association of Minnesota, North and South Dakota send greeting:

We request the co-operation of your honorable body in securing the improvement of the Minnesota River, a reservoir system at Big Stone and Lake Traverse, and dredging of the Bois De Sioux, the straightening of the Red River of the North, and dredging and locking and securing cheap transportation between foreign ports and the great interior of the United States.

We respectfully request your association to take such action as you deem necessary.

Yours respectfully,

R. C. KILSEY, Chairman,
White Rock, S. D.

Mr. Randall: This will be referred to a committee on resolutions unless otherwise directed.

We will next listen to a reading of the paper of Judge L. H. Haynes, upon "Blue Stem Wheat." Judge Haynes is unable to be here, so his paper will be read.

PEDIGREE BLUE STEM WHEAT.

BY L. H. HAYNES.

TO THE CONVENTION; Wheat being the most important cereal of the Northwest, I will briefly give the reasons for devoting the time and patience I have spent during the last sixteen years in improving the Blue Stem variety by selection, and also state the reason which led me to grow it pure and improve it. In 1882 a friend recommended Blue Stem so highly that I was induced to try it.

I procured some and grew it that year, also the year following. I was pleased with its strong growth and good product, but it was so mixed with bearded and other kinds as to render it incompatible with good farming. I resolved to grow it pure, realizing that it would require years to produce any amount. I accordingly commenced with the product of two heads in my garden in '84, hoeing it as it grew. While it was growing, reasoning from analogy, I came to the conclusion that the same laws pertaining to the animal kingdom pertained equally to the vegetable, that is, by continually growing from the best that improvement would be the result. After a year or two I learned through agricultural literature that a Major Hallett of Brighton, England, at one time pursued the same course for twenty-five years until his wheat had a world-wide reputation. Being now in my 80th year, I don't know that I can continue as long as he did, though we cannot tell what an American can do when competing with a foreigner.

Blue Stem wheat is by no means a new variety, it having been raised forty or fifty years ago in the Eastern states as a winter wheat. Since being transformed into a spring wheat it has proved to be well adapted to the hard wheat belt of the Northwest. Old Eastern circulars describe it as follows: "Heads beardless, with white velvet like chaff, and stem just below the head when green, with a beautiful blue bloom, which disappears as the Wheat ripens, when the straw assumes a bright golden color, entirely free from rust, grains hard, similar to Scotch Fife, but much more productive, of excellent milling qualities."

During the last fifteen years I have experimented in a small way with a good many kinds of wheat to ascertain if any could be produced that would excel the Blue Stem. Some kinds that seemed the most promising when growing, upon maturing proved to be unadapted here and had to be discarded. I find that only certain kinds are adapted to this locality. We are unable to tell by the looks of the berry of wheat what it will yield. Like stock, its hereditary qualities are shown in the product. As the result of sixteen years' growing by selection I have made my wheat five days earlier than formerly—have added one kernel abreast and added one-third to the length of the head, thereby greatly increasing the yield.

In such years as '91 and '95 on my trial grounds the fifth kernel abreast which I am striving to establish makes its appearance. I raise no other grain and keep it pure, and shipped to seven different states last

year. I have some clean seed for sale, a sample of which may he seen a-t my office in the Henderson Block, 62 Broadway.

In conclusion, permit me to stale that the grass seed known as Timothy which has so long been raised in this country was imported by my great grandfather (my mother's grandfather), whose name was Timothy Hurd, then residing six miles from Albany, N. Y. It is sometimes called Hurd's grass, more frequently called Kurd's grass in the Eastern states.

As yet I have taken no steps to procure a pension on account of this importation.

Mr. Randall: Major Fleming has a silo with which he has taken a great deal of pains. I will say that a description of it will appear in the next issue of The Dakota Farmer. Those of you interested will find out in that way about it.

Mr. Randall: At last year's meeting resolutions were adopted fixing the manner in which this work shall he perpetuated. These resolutions made it the duty of the chairman of each meeting to appoint a committee whose duty it shall be to select the time and place of each meeting and prepare a programme for the meeting. I have taken considerable pains with the committee and will announce it. You will understand that their duties are important and it is upon them that the perpetuation of this association depends.

I want to impress upon you the importance of the work you are accomplishing. Helpful suggestions are made. The matter does not end with us. The papers in Fargo have published these proceedings, and the dailies in St. Paul and Minneapolis have printed them. Think of the number of people who are reaping the benefit of what is being said here. The Associated Press has taken it up, and it is going all over the country. The farm papers will take it up. The farmers from these proceedings will read and talk this over. There is no end to it. It is difficult to estimate the value and extent of a gathering of this kind.

The committee is as follows:

J. K. Worst of Fargo, chairman and committeeman at large.

From Minnesota: W.M. Liggett. St. Anthony; R. D. Childs, Crooks-ton.

From South Dakota: W. F. T. Bushnell, Aberdeen; J. A. Shepard, Brookings.

From North Dakota: J. A. Johnson, Fargo; J. R. Power, Power.

Gov. Worst: We would like to have all the farmers of the state on onr bulletin list so that we may send them our bulletins. The last one issued was seven months ago, so those not receiving them will know that they have not been dropped from our mailing list. We issue them generally in the fore part of the summer. These bulletins will do a great deal of good. We would like to have every practical farmer on our books.

Prof. Hays: I would like to supplement what President Worst has said about the bulletins, by saying that the Minnesota station is glad to have your names on its list, especially those from Minnesota, and so far as we can accomodate those from North Dakota. Our director will be glad to receive your names at any time—on a postal card, that is all that is necessary. Our station is doing a great deal of good in this way and

through the newspapers and it is important in more ways than one, to get the works of these excellent men.

Mr. Sargent: It is great surprise to me that I would be called upon to stand before you this morning, for T had no intimation whatever that I should be called upon, or that any question should he presented to me to be answered.

These questions have been asked: What has been the experience of farmers with regard to following wheat with flax? What has been your experience with the John Deere Disc Plow? What has been your experience with raising potatoes?

I presume that some of you were present at the Fibre Convention held here in December. I read a short paper on rotation of crops in which the use of flax as one of the grains in rotation, was advocated. I can say from experience and from the experience of a good many of our neighbors, that we have never failed to raise a good crop of wheat following a crop of flax, and as far as my experience goes, I would like to say that we have always plowed the ground where we have raised flax to be followed by a crop of wheat.

Q. Fall or spring plowing?
A. I would prefer fall plowing.
Q. If you can sow early, would you do so?
A. I would not sow too early. I have seen flax injured by frost, but I don't believe in sowing too late. I would prefer to sow rather early than too late.
Q. About what is the average time that you usually sow?
A. About the first of May, it might be a little later.
Q. Are you working on heavy land?
A. Not the heaviest nor the lightest land. I disc it immediately before sowing flax.
Q. What experience have you had of following flax with flax?
A. I have had no experience, I never have done that?
Q. What is the average?
A. About 15 bushels.'
Q. How do you harvest your flax?
A. We harvest it with a reaper.
Q. Does it bind the flax?
A. No sir.
Q. Have you ever tried tying it?
A. Yes, we have tied it, but we do not like it so well.
Q. What amount of seed to the acre?
A. Eighteen quarts. Following the wheat crop, we usually summer fallow or plant corn.
Q. Drill or broadcast?
A. Drill.
Q. How deep?
A. About an inch to an inch and a half.
Q. Do you not think that summer fallow is the best to sow flax on?
A. Never tried it but once. There is no question but that you get a fine crop of flax on summer fallow.
Q. What is the critical stage?
A. I should say when it is an inch to two inches high. I have seen pieces damaged by frost.
Q. Have you had any experience in sowing flax and wheat together?
A. No sir.

Q. What do you do with the flax straw?
A. We feed the flax straw and the animals eat it very readily.
Q. How compared with hay?
A. I prefer hay.
Q. At what stage would you cut the flax, when fairly ripe or green?
A. I have always cut it when it was fairly ripe.

Mr. Sargent: I want to say one thing in connection with this rural education. I have taken a great deal of interest in this subject, and I believe it is one of the things that is going to be taken up, and it is going to revolutionize the school system in North Dakota and also in America. I am in hearty sympathy with it.

Mayor Johnson: Mr. Randall has asked me to preside for the rest of this meeting. We will now listen to a paper by Hon. G. S. Barnes of Fargo.

Mr. Barnes: There is no other member or gentleman present in this convention who has taken more interest in the farm, or more interest in its development than myself.

I have been placed in an unfortunate position during the time this convention has been held. My son, who takes care of my business during my absence has been called away during most of the time this convention has been in progress, therefore, I have been held pretty close to my office. But I have been here enough to learn that all the preparation that I have made for remarks has been riddled fore and aft by better speakers than myself. I will read to you a letter that I received from Mr. Fisher of Devils Lake. About two years ago, I was at Devils Lake and met Mr. Fisher. He is interested in quite a number of farms and being a banker is interested in all the farms, and it seems that they have had a great deal of trouble from smut. The question was asked me, what is to become of us, up in this locality, in regard to smut. I have prepared it some and have destroyed it in two different fields. In some instances I have not had any smut and my wheat graded well, while in other sections, I have had trouble and my wheat was graded down. Those were his words. I asked him what he meant by "Prepared". He said, treated with chemicals.

I wrote him a letter two or three weeks ago to find out the result of the crops for this year generally. We have received more or less wheat from Devils Lake and the freest from smut, at least what has come to our house, has come from there and that vicinity. I wrote to find out his experience or how the farmers generally were fixed this year in regard to the grade of grain. This letter, I will read to you:

MR. FISHER'S LETTER.

G. S. BARNES, ESQ., FARGO, N. D.

DEAR SIR: In reply to your letter of the 13th inst., relating to wheat: In 1898 there was no No. 1 hard at all, and very little No. 1 northern. Rains set in at threshing season and the wheat was threshed damp. There was lots of rain and lots of smut; 1899 there is a lot of No. 1 hard, and more No. 1 northern than wheat of a lesser grade. This season we had perfect weather for wheat threshing, dry the whole time. In 1898 there was but little seed treated for smut. So little that you might say none was treated. This year probably 75 per cent of the farmers treated their seed and the result is very noticeable. There is not a question of doubt but that the great reduction of smut this year over last is directly attributable to the treatment of the seed. But I do not know a farmer but thinks

that smut is greatly influenced by the weather. There is no question of doubt but that the Pure Seed Convention held at Fargo last year was a splendid thing for the whole state, and personally I have noticed that the farmers here are taking more pride in farming since the pure seed agitation. They are taking more stock in our Agricultural College. I think that a whole lot of farmers used to think that most any kind of old stuff used for seed was all right. Now you do not hear of a farmer but what gives his best attention to procuring the best seed. They clean it better, and want the very best there is. I think that the Experiment Station work should be credited in a great measure for these improvements.

Yours,
C. M. FISHER.

I think that he has a little underestimated the proportion of the poor grades of the wheat of this year and last.

Mr. Thomas: I am from up there, and I know the improvement of '99 over '98, and I can verify it and more too.

Mr. Barnes: I was under that impression from the wheat that has come from Devils Lake. A large per cent has graded one Northern, or a better grade.

WHEAT RAISING IN THE RED RIVER VALLEY.

BY G. S. BARNES.

The subject assigned me I find has been quite thoroughly touched upon by very able speakers who have been with us during the past week. These farmers conventions I consider the most important of any that are held for any purpose in this or any other state.

No one realizes or appreciates any more than I do the importance of our Agricultural College, and the good work that it is doing, and the discussions that are brought out through it and those interested in farming industries in North Dakota.

I have been a wheat raiser since 1872, and have been successful in this branch of industry. I realized a number of years ago that to continue wheat raising for an indefinite time has proved unsuccessful in all spring wheat countries, owing to the fact that after a period of from twenty to twenty-five years troubles have been brought about in the way of Hessian Fly, rust, and different diseases which forced these states to turn their attention to stock raising, and dairying as well. Consequently I feel it very important that the farmer have this in mind, and that he begin at once to turn his attention to what his neighbor states have been obliged to do, before he finds himself in their position.

The advantages of our rich prairies, the straw that we have from our wheat fields, the abundance of nutritious hay and grasses that we can raise in this state, put us in line with any state in the Union, to compete not only in wheat raising, but also in stock and dairying as well.

I now have on my farm three hundred head of Percheron colts and matured animals and about three hundred head of cattle, so that you can see that I am carrying out the ideas that I advocate, and I find that the profits from this stock, with present prices, are about equal to the profits on my wheat.

We have not raised No. 1 northern and hard varieties of wheat in

some sections of the state, which many claim is on account of smut. While this is partly true, it is mainly due, in my opinion, to foul land, therefore I think we should first keep our grounds free from foul seeds or weeds, such as wild oats, mustard, and sheperd's purse, and to do this we must learn from those experienced in fighting these weeds how to overcome the effects of the same.

As to myself, I have had little experience of this kind, as I have endeavored to farm as nearly right as my judgment and experience would teach me. We have had speakers at this convention who told us the best process that could be used to destroy the noxious weed and get at the best results, so it is not necessary for me to touch on these points any further than to say that. I do not believe it is necessary to lose the use of any land by summer-fallow.

Corn and potatoes are a profitable crop, and at the same time they bring about the result of cleaning the ground. I have also found that seeding down the ground has brought a good profit in grass and hay, and kept my ground free from weeds.

In Duluth elevators today we have some seven million bushels of wheat and about six and a half million is No. 1 northern and No. 1 hard grades. As this wheat has come from North Dakota and the extreme northern part of Minnesota, this shows that a very small percentage of low grade wheat is raised here.

Being in the commission business in Duluth and Minneapolis, I am informed as to the quality of the grain received and the cause of the lower grades going to Minneapolis.

The bulk of this low grade wheat seeks that market from the fact that it is bought by mixers and the mills, who, by using a certain percentage of higher grade wheat, bring it up to a higher level of value than could be obtained in Duluth, where a large part of our crop is shipped. A very small percentage of this off-grade wheat comes from North Dakota.

The trouble this year has been largely from other states or localities owing to rain and unsuitable weather for the maturing of the crop. I cannot say that the bulk of the damage has been caused by smutty wheat. It is largely shrunken wheat lacking weight, sprouted wheat not properly shocked, or taken care of while in the shock.

There has also been more or less wheat graded down on account of too much cockle and wild oats, but from the record of grades received I feel proud of the State of North Dakota to know that so little of the low grade has come from this state.

I might add that so valuable is our wheat that in buying wheat, which we do in large quantities, for not only mills in Minneapolis but also mills throughout the state and others which seek wheat from the Northwest, a grade has been established which is well known amongst the traders called the Klondike wheat, this being a superior quality of the grade known as No. I northern and not quite good enough to go into the No. 1 hard. Parties buying this wheat on the floor of the Chamber of Commerce in Minneapolis require it to come from stations largely in North Dakota and the extreme northern part of Minnesota. The prices will vary from one to two cents above the common grade of No. 1 northern, which may come from other parts of Minnesota and South Dakota,

This shows that we are still the *banner state* for raising the best quality of wheat, and we all realize and appreciate here at home that we want our standard and variety of wheat raised, to be kept up to the old

standard that has given us such a name throughout the world as raising the best that is to be had.

To do this we must,

First—Keep our land clean.

Second—-Secure good and clean seed, and

Third—Take care of our crop when matured by seeing that the grain is well shocked; and if a threshing machine is not immediately available, by not allowing our grain to stand in shock when waiting, and thereby take chance of damage by_ unfavorable weather but by stacking and, if possible, doing early plowing in the meantime.

As seed is one of the most important features in farming, I think if our government would send large quantities of different varieties to our Agricultural Colleges to experiment with it would bring about much better results than the present system of sending small packages to a few of our farmers.

Mayor Johnson: The next on the programme as handed to me, is some remarks by Dr. Hinebauch, who needs no introduction.

Dr. Hinebauch: Mr. Chairman, Ladies and Gentlemen: This is my paper. (Shows a chart.)

I want to call your attention to a product that converts more waste material into money than any crop that you produce in the United States. These statistics are taken from the year 1886 as there have been none compiled since.

We find that the tobacco crop of the United States to be worth $35,000,000. The potato crop, $78,000,000; the cotton crop,$163,000,000; swine, $186,000,000, and the wheat crop, which is supposed to be the great crop of this country, $237,000,000. We might say that: this convention has met here with a prospect of finding out, how we can raise more wheat. The cattle crop $259,000,000, and the most despised crop of the United States so far as the people are concerned—the poultry, crop, $290,000,000.

The chart shows how the livestock has pushed ahead on a majority of farms of the United States, but the poultry production makes a showing of $200,000,000, and yet our lands that could give us products worth more money than the wheat crop, that only produces $237,000,000 are to be put to more wheat and so keep the prices down.

We are neglecting a great thing, it seems to me.

The poultry in North Dakota, does not supply the demand of the people; their products have to be imported. You will find turkeys and possibly chickens that have been imported from Iowa, while we produce the best and cheapest food for poultry that you can find. Look at the investment of the two. Look what you put into your crops, and then look at what you would put into the poultry business. You pay no attention to the poultry. They take care of themselves, and yet we have that immense product.

I would like to introduce a resolution to bring this before the meeting-.

THE RESOLUTION.

Whereas, the North Dakota and Northern Minnesota Poultry Association proposes to hold its sixth annual exhibition in Fargo, Jan. 31 to Feb. 3, 1900, and,

Whereas, the poultry interests in the United States, according to the latest statistics, are more valuable than the combined gold and silver produced and the wool clip and sheep industries, therefore.

Resolved, that the Tri-State Grain Growers' Convention, now assembled heartily endorses the proposed poultry exhibit and commends the same to the people of the northwest. Carried unanimously.

Major Fleming: I move its adoption, which is seconded.

The resolution is adopted.

Mayor Johnson: We have another resolution to come before the meeting. (The resolution is read again pertaining to the Tri-State Drainage and Ship Canal.)

It has been found impracticable to refer this resolution to the committee on resolutions, and it has been suggested that the convention take it up.

Q. Major Fleming: I move that this convention endorse that mat-and urge Congress to give it some attention.

The resolution is adopted.

The meeting adjourned until 2 p. m.

AFTERNOON SESSION.

Mr. Randall: As stated before the convention this morning-, I will announce the committee, whose duty it is to introduce and promote, as far as possible, agricultural education in the rural schools (The committee is named.)

Following is the committee:

W. M. Hays, Chairman; Prof. E. F. Ladd, Prof, E. C. Chilcott, Chas. McKissick, Chas. H. Stowers.

Mr. Randall: I have been requested to announce, that a musical entertainment has been provided for the visitors, and all of you are invited to attend the entertainment this evening in this opera house.

So far the work of this convention has been devoted to the practical affairs of the home and farm, and the most that has been said, has been said, in reference to farm work. This afternoon we are to consider some general business matters. The gentleman who will speak to you this afternoon needs no introduction. You know the man, you know his work.

I now take pleasure in presenting to you, Mr. Hill—

SPEECH OF MR. J. J. HILL,

AT THE GRAIN GROWER'S CONVENTION, FARGO, N. D., JAN. *26, 1900,*

Mr. Chairman, Ladies and Gentlemen: It is an unexpected pleasure to me today, to be here and meet so many of you who came to hear what I may say. The pleasure is great to me, because I feel that the interest that brings you here in such great numbers, is evidence that you are desirous of helping yourselves, and I hope that I may be able to, in a way, point out ways and means that will help you when they are put in effect. Farmers coming together to consider what is for their best interests, cannot fail to have good results follow.

Last year when I was here, I went away hoping that it would not be the last meeting; hoping that the farmers of North Dakota and Northern Minnesota would keep up their interest in the work they have undertaken, and I am more than glad to be here and express to you the pleasure I have in knowing that the farmers have taken an active and intelligent interest in what must prove the means of helping them from day to day and from year to year. Better cultivation and more intelligent work on the farm is going to help you much more than you realize. Your agri-

cultural colleges and your college institutions make experiments that the individual farmer cannot afford to make, which cannot fail to help the farmers who give proper attention to these experiments. I want to express to you how pleased I am that the farmers of North Dakota took occasion last year to visit their college of agriculture, and are now taking an active interest in it. I hope that you will keep it up. I hope that you will keep that interest bright, and so far as we are concerned, I desire to extend to you the same invitation that I extended last year. If each county will give the date upon which they desire to visit the Agricultural College we will be ready as before to place a car at a convenient place where they may go down and come back in a comfortable and pleasant way.

If you are to get the good results that should follow and will follow good farming, depend upon it, you will get great assistance from your Agricultural College. A hundred years ago the people in Great Britain were leaving the land to an extent that the government appointed a commission to find out what should be done to keep the people at home.. They were coming to America and other new countries, leaving the land at home in the old country to the tenant farmers, unoccupied and unrented. That commission was made permanent and it was the foundation of what is today the Royal Agricultural Society of Great Britain. It has steadily followed the purpose of inculcating in the English farmers, better measures. While their crops—their wheat crops, if you please, were returning them an average of but from ten to fourteen bushels of wheat per acre, today, through better methods, they are getting from twenty-four to thirty bushels per acre. The former condition will come to us sooner than we would' like to see it, in our Red River Valley, with all *its* fertility unless we profit by their experience. You must consider the question of restoring the fertility to the soil which it has given up in yearly crops, one after another, for so many years. The years go by faster than we realize. It will be thirty years next spring since I first saw the Valley, and I think there were, between Abercrombie and the international boundary, three houses. I remember when the land of the Red River Valley was considered unfit for cultivation, and that was not very many years ago. But you have put it under the plow, and today I know of no sight anywhere I go that is as gratifying and pleasing as a ride through the Valley during the time when your crop is growing, or being harvested.

(Applause.)

There is an atmosphere of wealth and comfort and plenty that we don't find anywhere else, and I remember of riding from the international boundary at Neche on one occasion with a very intelligent Eastern gentleman, and he sat at the rear of the car the entire time, because he said he was not going to leave the place until he got out of the Valley. And along about sunset, the first cut where the railroad cut through a little knoll, down here about thirty miles southeast of Breckenridge, at Herman, he said he didn't believe there was another place on the American continent, if there was in any other country, where they couldn't pick up a stone large enough to kill a canary bird with.

Now if you are going to do something to refertilize your land, you must have the help of stock. You must raise cattle and hogs. The time will never come when the Red River Valley will be a corn or hominy belt, nor do we ever desire to see it become such. But you can raise a number of cows in connection with your dairy interests. You can turn a cow out with her calf and it will run during the summer, and in the

winter you can use the cow for the milk and cream, and in this way she will help you more than if she was turned out simply to raise the calf.

Now I am glad to see the raising of stock. High breeding of stock, is showing a great deal of progress here in the Northwest. Much more, possibly than you would he prepared to consider. We carried this year, probably 50,000 head more cattle over our lines East of Minot, than we did from Minot to the Pacific Ocean.

The number of hogs going over our lines has probably trebled in about rive years, and I am sure that you could treble that again without any disadvantage. The hog crop is a good one, because you can raise it in one season. If you are careful to have pigs come in the spring, and you can make them—we will say *t the first of December—weigh from 200 to 240 or 250 pounds. I am speaking from my own experience. You should take particular pains to have them come in the Spring, so you will not have to carry them over the winter. Fall pigs are not so profitable for the reason that you are apt to loose a part of them, and must incur the additional cost of keeping them growing. But the Red River Valley, will, for anything we can say, remain the wheat granary of the country, and wheat, as long as you handle the land intelligently, should and will give you good returns for your labor. Your lands are becoming more sought after and are of greater value year by year, ft is hardly necessary for me to tell you this, because you realize it in your individual neighborhood. People who have farms who settled in the states South «[us—Iowa, Southern Minnesota, Wisconsin and even Illinois—as their families grow up, want to place them on the land. They haven't land enough and a great many such people are coming up here now and buying farms, as you well know. This will continue and this land will enhance in value until it will not be an uncommon thing to sec Red River Valley Lands selling at 40 or $50 an acre, and they will be worth the money.

Now I want to go back to the subject that is of the first importance to all the farmer? in all this country, and that is, the market. If we are to raise crops, if we are to produce commodities, the value of these commodities depend upon the price that we get for them. The number of people in this country today, is somewhere in the neighborhood of seventy-seven millions or seventy-eight millions. The population of the United States has for the past one hundred years, doubled itself about every thirty years, and this is likely to continue in the same ratio, so that about 1930, we should have in this country a population of at least 150 millions of people. They cannot all be doctors or lawyers or real-estate men or college men or teachers. A large per cent, or about half the population of this country now cultivate the soil, and half the population then, should cultivate the soil. The farming population of this country in point of numbers, is equal to all the rest. In point of intelligence, in point of patriotism, it is certainly equal to the same number of all those who are not following agriculture. There has never been a time when the country has called for help that the farmers have not responded and have shown their patriotism and willingness to stand by the country, when it needed men to stand by it. And for that reason I hope the time will never come when I he country will not be strong in the broad intelligence of its agricultural population.

You on the farm have been in the habit of helping yourselves, and it id an excellent good habit. .You may have to go a little further; you may have to insist that you are not going to have your way obstructed. 1 don't think that anybody desires to obstruct the way of the farmer. I

don't think that any one in their interests, for a moment would be willing to admit that they even forgot them, because we all depend on the agricultural interests of the country. Take it here. This fair City of Fargo, what would it amount to? There would be no occasion for a city here. Not any more than there was when the Indians were here, were it not for the fertile fields in the state. The churches, the schools, the colleges, the merchants, the lawyers, everybody depends—everybody living here depends upon the prosperity of the man who follows the plow, and without his prosperity, the rest must be poor. And that is the reason why I am here today; why I am ready to go any time to any place where I can raise my voice in behalf of any venture that will help to strengthen the agricultural interests of the country. The agricultural interests are equal in point of capital invested, in point of population, in point of numbers, in every puality that goes to make good citizens—equal to all the rest, that make its wealth. I think the country is better off because of our agricultural interests prospering in it.

Now if our population is to increase, we must cultivate more lands. We must spend more hours in the cultivation of the land. It may be that in place of one man cultivating 80 acres, one man will be putting in forty acres. If that is true, we will get nearly as much return from the forty acres as from the eighty. But with the increased returns growing out of the increased number of people on the land, where are we going to market it?

Great Britain today raises enough wheat to feed her people for thirteen weeks out of the fifty-two, and for three-fourths of the time she has to feed them on bread and material to make it, which has been raised outside of her own island. Great Britain buys from 60 to 70 per cent of all that we sell. France comes next. I might say, however, that Great Britain is the only nation that does not discriminate through her tariff or her legislation, or place restriction of one kind or another against our bread. We have as free access to her market as we have to our own; or as any of her colonies has to her market. It is not so in some of the continental countries. They are willing that we should go there and buy everything they have to sell at their price, but on the other hand they don't want us to sell in their country. I think last year we sold something over twenty million bushels of wheat to France, and about fifteen millions, or may be a little less, to all the other continental countries. To England about eight millions. Our customer seems to be a reasonably good one, our one customer, and fairly well inclined to let us have access to her markets. But we ought to have more customers than one.

The wheat product of the world is about 25 hundred million bushels. In this country we consume about five and a half bushels per capita. The average of the world who use wheat for bread is about four and one half or a little less than four and one half bushels per capita. About one-third the population of the world eat wheat and bread; about 515 millions of people use wheat for bread and food, and about 1,000 million do not. Now we ought to be able to reach a great many of these one thousand million, whom we do not reach at present. In a small way the people of China and Japan have begun to buy our flour. Last year I think 357 thousand tons, which would be in the neighborhood of 3,600,000 barrels of flour—or what would represent 12 million bushels of wheat found a market in China and Japan. But there has been in the last twelve months, difficulty in finding ships to carry but one-fourth, and I might almost say one-eighth of what would sell, or what the western millers had orders

for. A Western miller in Seattle told me that he could have sold twelve hundred barrels a day if he could have found room on ships to carry the stuff to market. But he couldn't find room, on the average, for a hundred barrels a day.

Now, I have given the matter a great deal of attention and I know that at the present time, the people in the Orient, who are using flour, can only get enough for making pastry, and haven't enough to supply the people who want it. Actually considering the number of people there are there, it is difficult for us to comprehend the extent to which their wants would carry them or the quantity of food they eat. If in place of the four bushels and a half, which is the average of the wheat consuming people of the world; if in place of the four and a half bushels, per annum, per capita, those Chinamen would only take one bushel—that would only give them about three-quarters of a pound of flour a week—it would take four hundred million bushels of wheat to supply them, and we would have to go back to rye and Indian every day in the month except Sunday morning.

(Applause.)

Now rye and Indian was good food in New England at the commencement of the century, and let me tell you that three-fourths of the food eaten in New England—three-fourths of the bread prior to 1815, was rye and Indian. They didn't use wheat there. They couldn't afford it.

Now I have been asked this question in regard to Chinamen. "How can people working at from ten to thirty cents a day—how can they buy flour? How can they afford to buy flour and eat it as food?" There are four hundred millions of people. If they should spend per capita one cent a day, it would take four million dollars per day to pay the bill, or nearly fifteen hundred millions a year, and we couldn't find the stuff to supply them. We couldn't produce it. We couldn't produce enough food to sell to give them equal to one cent per day per capita. Now that is a market that is capable of expansion. That market may be expanded. This country has expanded from the beginning. I don't want to take anybody's country from him. I don't want to play the Arab and camel in his tent. I don't want to put my head in for shelter from the storm and drive everybody else out. But this world will go on and the people in it will improve. They always have and they always will. We must at least keep up with the procession. We are responsible for our own people and to find a way to make them broad, intelligent and prosperous, and to enable them to live as intelligent citizens of a free country ought to live.

(Applause.)

Now what is necessary to give us the benefit of that eastern market? I answer you, there is nothing necessary except to provide the means to carry our products to that market at a fair price. Nothing more.

Last year, we did not carry on ships under the American flag, quite one per cent of that trade. We have been very busy as a nation helping the men who make iron and steel, and the man who uses wool, tin, lead, and in fact everything except the man who is on the farm. A great many people without thinking deeply or strongly enough about it, will tell you that if you help the iron man, the tin man, the wool man, and the leather man, if we help them all, we are helping the farmer, and that is the way to make a market. But remember we have so many people in this country. No matter what they are engaged in doing, they will take what they want and they won't take any more. Now we have that market at whatever

it is worth, and we always will have it as long as we can supply it for less than they can get supplies from elsewhere, and we will always be compelled to supply it as long as good old mother earth yields her returns to the husbandman.

I will not question the intentions of anyone who is trying to work up our industries. It is not necessary. And I am glad to call attention to this fact, that the farmer, as long as his supplies of bread has to be sent to a market outside of this country and sold in competition with the man who cultivates the soil in France, in Russia and in Australia, the purchaser will never ask where it was produced or where it came from, if the quality suits him. And that surplus which is sold in the markets of Europe today, the export surplus, makes the price of our entire product. It always has, and it always will, and whatever the price may be in that country, you can deduct the freights and cost of handling, and that will be the cost in North Dakota. You might assume that if you could ship your grain from the farm to Liverpool for nothing, that it would make a permanent advance in prices of your wheat. Let me say that if you shipped your grain from here to New York, or from here to Liverpool for absolutely nothing, in less than twelve months, you would have simply put the price of grain that much lower in Liverpool; and Liverpool would mark down the price of Australian wheat in their mar-kets, because they could buy it from America, at a much lower rate.

You must, therefore, look to other means to advance the price of your grain. We must make it scarce. We must make other people ask to buy it because they want it to eat. When we have done that, we will advance the price of wheat to where I think it should be and to where it would pay you better returns, but you will be forced to take what you can get, unless we can expand that market.

In 1897, I think, we had a demand for 3,300,000,000 bushels and 2,230,-000,000 bushels to supply it with. For that shortage in the suppply of the world, 70,000,000 of bushels—the price advanced 20 cents a bushel. Now, when we have offered from 150,000,000 to 200,000,000 more than the world calls for, the buyer is not so anxious to get his supply taken care of. He knows that there is enough to go around, and he is willing to take his chances that he can get it whenever he wants it. For the past three years the Argentine Republic has given us very little trouble. Last year, I think, Australia bought about three and a half million bushels of our grain. This month the Argentine Republic has harvested a crop that is estimated to give them 65,000,000 bushels to sell for export, and Australia, it is expected, will export from 8,000,000 to 10,000,000 bushels, making about 75,000,000 bushels of wheat in sight from sources that a year ago furnished practically nothing. For that reason, unless a marked or unforseen condition will advance the price, you may find yourselves where you were in 1894 or 1895, having to expect lower prices.

I hope that lower prices will not come, but the conditions are in sight that will bring them unless something occurs that will make a demand for wheat in some way that we do not now see.

Coming back two years ago from the Pacific coast, noting there what-might be done towards getting rid of our surplus grain in the Orient, and while passing through the valley and seeing the fields covered with shocks of grain, the market price less than it ought to be, I felt that we as a country were not doing what we should to mend that situation. The great, broad, agricultural interests of the country were not receiving the attention they should at the hands of our public men. I began to look and

see if I was doing them an injustice. I inquired to see what had been done to help the farmer, and 1 didn't find anything. 'I did not find anybody who was ready to help him. They were all anxious to be his special champion, but when the time came to actually help the farmer, I couldn't find anywhere on the statute books anything that had been done to advance the price of commodities that he sells. I began also to investigate the extent to which our Oriental markets might be increased. I can say that I believe we ought to export half of what we raise. Now we export only about one-fourth, without making a surplus there. To do that, we must have the means simply to carry the grain across the Pacific ocean to that immense; horde of people. They have the means to pay us.

They have an ability to hold their own with any other class in all commercial enterprises. If their government was what we call a modern good government, and would protect the individual, and the tax-payer was not squeezed as long as there is anything to be squeezed, these people would progress as the Japanese have done, and our market would practically force itself there.

We don't begin to supply it, and I don't see that there is any substantial reason for supposing that we will reach the limit for fifty years.

There is a bill in Congress "To Promote the Commerce and Increase the Foreign Trade of the United States." They propose in that bill to appropriate nine million dollars to aid American ships; the money is to be paid on the measurement of the ship—the gross tonnage—regardless of what she caries, or to what port she sails, ro whether she carries American goods or not. The bounty is to be paid on her outward trip and her return trip—regardless of whether she carries one pound of American product, or whether she carries it with ballast, or whether she comes back with the productions of other countries for us to pay for. She gets the same subsidy. There is nothing in that bill that would compel her to carry one ton of American products.

The origin of the bill largely came out of a short talk I gave the people in St. Paul on the subject of opening our Oriental market. And a gentleman from another state, a prominent politician, thought it was right and policy to do it. When he began to talk it up, he found that the iron and steel manufacturers would be greatly benefited. A year ago pig iron sold for $6.50, now it is selling for $18 and $20. It didn't need so much help, it could pay its own bills. A keg of nails a year ago could be bought for $1.25, now it costs from $3.25 to $3.50, and so on with everything you have to buy. How was it when you came to sell your stuff? You have to take whatever it will bring in the market of the world in competition with everybody, everywhere. Your production is not protected. We can tax the steel goods and woolen goods and all these articles to an extent to keep them out, but nobody wants to bring wheat to this country. We might put a tax on foreign wheat, but it would do you no good. You are sending it out to sell and no tax of that kind can help you any. Your surplus is sold outside of your country, and that surplus will continue to make the price for your entire crop.

We have under the American flag steamships of ten thousand tons and upwards. Of the four steamers, New York, Paris, St. Louis and St. Paul—two were "built in Glasgow and two in Philadelphia. At the present time they receive under the mail subsidy $4 a mile on their outward bound trip, which makes a little over $14,000 from New York to Southampton—a little more than $2,000 a day. Under this bill as proposed they would get $1,755,000 premium for the four ships. And the

reason the government subsidizes ships of that class, leaving out speed, is that they would be valuable in time of war. I am afraid there is a great big woodchuck under that pile of rocks. (Cheers.) Do you want any more ships for fast cruising? Remember they are very delicate and a comparatively small gun would punch them full of holes. You would not feel safe to go to sea in one of them as a cruiser unless you had a better cruiser to take care of her. One million and a quarter will build an excellent cruiser every year, and the government wouldn't be required to send along another cruiser to take care of it.

We have about 800 sailing ships that would be eligible under this proposed bill. We have 800 sailing ships with something over 700,000 tons capacity, which, under the bill, would receive something over $1,800,000. We have of steamers, including the four speed vessels, 594, with a total tonnage of 940,000 tons. Of this, 800,000 tons would be eligible to receive this bonus. The bill proposes to pay that at the rate of one cent per ton for every hundred miles, which from New York to Liverpool and back would be 85 cents per ton. It would give that bonus whether the cargo contained one ton of American product, or whether it contained nothing. Take these three classes, the four large ships, the steamers now constructing, and the sailing vessels eligible to receive bounty under this bill, would absorb $7,700,000, leaving $1,300,000 to apply to the building of new ships. But I am surprised sometimes in discussing with our Washington representatives to find that they have not considered that it is of no use to encourage the building of new ships by this bill, but as a matter of fact all the $1,300,000 is already devoted to ships in existence, it making no difference whether they carry American products or whether they never carry them.

I have a circular letter that I prepared, had printed, and sent to the committee and to our senators in Washington. I will read you part of it, because it will be briefer than anything that I might say otherwise.

Your agricultural products exported annually amount to about nine million tons. If we had to pay a dollar on every ton of agricultural commodity exported on American ships, the nine million dollars would more than carry it. As it is, we do not carry but about 12½ per cent, of our exports. I do not think all the Oriental exports that were carried were one per cent. These four fast mail steamers receive $226,944 each today as mail subsidy from the government, and it is proposed to increase that to over $430,000 a year for each ship. To build a ship new would cost about four year's, or four and a half year's subsidy. This bill doesn't insure any increase in our export trade. It doesn't require any ship to carry our products, and I am sure that, any measure that subsidizes our ships to run to other parts without carrying our products hardly has a right to be called a hill to increase our export trade.

For a measure truly hearing out that title, there would surely be necessity for something of this kind:

THE PAYNE BILL.

The shipping bill introduced by Mr. Payne, house file 64, declares that it is intended "to promote the commerce and increase the foreign trade of the United States."

What are the grounds for thinking it will meet the present needs of the country in this regard? The official list of merchant vessels of the United States for 1899 contains the names of thirty-seven ships of modern commercial type, viz., built of metal, having a gross tonnage of 4,000 tons and upwards, and propelled by steam.

Among the thirty-seven are the four American liners, having an aggregate gross tonnage of 44,600 tons. The five next largest have a measurement of slightly over 5,000 tons, and all belong to New York ex-cept one. The remaining twenty-eight, have measurements between 4,000 and 5,000 tons each. Six are sea-going and belong to New York. The other twenty-two run on the Great Lakes and are in the domestic trade.

This shows a total of fifteen modern commercial ships, carrying an American flag so placed as to run in the foreign trade if desired. Their aggregate close tonnage is 97,682 tons. Of course, there are more ships, both sail and steam, able to carry cargoes abroad, but all are below the mark of first-class merchant vessels of today. The practical non-existence of an American modern commercial marine for the foreign trade has not been caused by any lack of tonnage to be carried.

Of the products of our farms alone we are yearly sending abroad about 9,000,000 net tons divided nearly as follows: Cotton, 1,200,000 tons; wheat and flour, 3,250,000 tons; corn, 3,000,000 tons; oats, 230,000 tons; rye, 30,000 tons; provisions, 825,000 tons; animals, 350,000 tons; fruits, 40,000 tons; total, 8,925,000 tons.

It would need ninety ships each carrying 10,000 net tons of cargo at a trip, and making ten trips yearly, to handle this one branch of our export trade, and so far we have not succeeded in getting under the American flag more than seventeen ships able to carry as much as 6,000 or 7,000 net tons each per trip, on this average. Our present exports of farm products are much less than they should be to give the farmers of the country the measure of prosperity they should have.

THREE FEATURES OF THE BILL.

The following features of the bill are specially noticeable:

First—Speed is unduly favored. The four big American liners have a speed of about twenty-one knots, an aggregate gross tonnage of 44,600 tons, according to the official register. Each ship is easily able to make sixteen round trips per year to Europe and back. To do so they will have to be on the sea less than thirty-two weeks in the year. Assuming the length of a round trip at 7,100 nautical miles, these four ships alone would be allowed $1,754,600, or nearly one-fifth of the whole, appropriation made. Of sailing vessels alone there stand upon the American registers about 725 of 500 gross tons and upwards, and having an average gross tonnage of 726,000 tons. Of steam vessels of 1,000 gross tons and upwards there are registered 504, including the four big American liners. Nearly all this numerous fleet of sailing and steam vessels are fit to run in the foreign trade, and most of them would be so if subsidized, yet they would receive only about three times as much subsidy money is the four American liners. The latter are not, to any considerable extent, carriers of the country's products. Their interiors are mostly taken up with fuel, machinery and passenger accommodations. Any one of 100 sail ships under our flag could carry abroad a larger cargo of corn or cotton than would be carried by either of the four big American liners. Such ships are of little value for the export trade. They are useful for the mails and for travelers who do not need any additional assistance from the government. As mail carriers the swift liners are already largely subsidized. This ought to be sufficient encouragement for vessels of that class. As they are useful to the general public solely as mail carriers, why should they not be kept on the mail subsidy list, where they are so well provided for and leave the new measure of aid for the cargo carriers, that,

so far, have been struggling in the foreign trade unassisted against the world?

Second—Owners will not build new tonnage for foreign trade unless some fairly true estimate; of what the trade will bring can be made beforehand. But this act makes an offer to every one of the 1,400 or 1,500 vessels already under the flag and few for the foreign trade. How many will accept the offer? No one can tell.

Third—The bill does not insure any increase in our export trade. It does not require any ship receiving the aid to carry abroad a ton of our products. She may sail outward in ballast and inward laden with foreign merchandise, if her owners please, and her share of bounty will equal that of another ship of like gross tonnage, which, at the risk of somebody, takes out an American cargo to places that never bought nor used American produce before. A bill that subsidizes our ships to run to foreign ports without requiring an ounce of American produce to be carried in them, hardly has a right to be entitled "a bill to promote the commerce and increase the foreign trade of the United States."

WHAT IS NEEDED.

For a measure truly bearing out that title, there is much need. Some of its necessary features would be these:

It should insure the stimulation of our export trade by making the quantity of our products actually carried and not the mere gross tonnage of the ship, the; measurement of aid, That is the kind of a subsidy the country can always afford to pay, because it will pay in exact proportion to benefit had. In other words, instead of offering a subsidy for so much space, whether full or empty, and whether available for cargo or taken up with machinery and passenger cabins, there should be offered a certain sum per ton for each 100 miles American produce is in fact carried. Such a system would be sure to increase the number of tons carried, abroad, and such an increase could not be made unless the market required it. Under such a system, the rapid consumption of our growing agricultural surplus might be expected with all confidence. So many more people than now would have a direct concern in sending off our products. All of our people who produce the materials for making ships and all of them engaged in making and raising the things that are carried in ships, would be helped at the same time by the same outlay. It may be suggested that granting the superiority in itself of such a system of aid it would amount to a bounty on exports and conflict with some existing foreign treaties. To this objection it may be answered:

First—That the identity of such aids with bounties upon exported goods, covered by the treaties in question, is by no means clear. Fairly considered, the bounties meant by these treaties are premiums paid on the goods themselves, to their owners, in consideration of export. In any event, the treaties could easily be modified to meet the changed situation. There is undoubtedly a large preponderance of opinion that some prac-tical step should be immediately taken for a large increase of our export trade, and with it and incidental to it, of our shipping in that trade. The point has been reached where we are not able to command more than a trifling fraction of our foreign carrying trade, and we have not for a generation even thought of competing in Europe for the foreign carrying trade. The treaties all date back to a time when .such competition actually existed. But that has long since passed, and with it passed the utility to ourselves of such stipulations. The advantage of them now all lies with

the foreigner. Why, therefore, should we hesitate to withdraw from them if withdrawal be demanded by regard for our own high interests?

Second—The products affording this measure of aid should be those of our farmers. American manufacturers now enjoy all the assistance from the government they can justly expect. By the aid of law the home market is assured to them. Why should they hesitate to leave to the farming class the large part of whatever help in securing a foreign market a moderate subsidy will give?

Third—Considered as a measure to promote the increase of our merchant marine, the subsidy may, after the lapse of the first few years, wisely he limited to vessels of the modern type, namely, having metal hulls and a gross tonnage of not less than 5,000 tons or a carrying capacity of not less than 6,000 net tons of grain or cotton. Such conditions would stimulate the production of ships of a much better and more valuable type than the average of our present marine. It would also greatly stimulate ship-building because of the fewness of vessels of that type now afloat.

Fourth—It is believed that, by a yearly expenditure not exceeding the sum named, made along lines suggested, a large increase in exports and a complete change in the conditions of American shipping interests, now so prostrate, would surely result. A premium averaging $1 per ton of American farm products exported might be relied on to attract to American bottoms the bulk of that trade, as stated before, already amounting to nearly 9,000,000 tons and sure with assistance to swell rapidly.

I have met your representatives, and know they are zealous. I know that your representative in Congress who lives here in Fargo is not only zealous, but anxious to do anything he can do. I know that your senators, too, are interested in the matter, as are most of our Northwestern senators. One of your senators has introduced a bill providing for a commission to visit the Oriental countries and see what is necessary for our government to do. The first subject is to secure transportation from our coast to other cities at a fair price. Today it is impossible to get such transportation.

It might be said that it will not help you to take the wheat crop to the Orient, because California and Oregon and Washington will supply China, and it will not do North Dakota any good. I want to say that it will; because if you can take that forty millions of grain to that country you will advance the price of your grain. It is not at all impossible that we can carry the farm products from here with a proper rate on the ocean —carry it from here and from all the Northwestern states, over the Pacific ocean to the Orient. I know it has been said that we cannot do it, but suppose we take from Dakota and Minnesota 10,000,000 bushels— take it off the market—what effect would it have on the price of the remainder? You may go on cultivating the land with all the intelligence you may possess, but until you have expanded the market, you will pay whatever price the conditions of the over-supplied market will give you. Until you have made your products scarce, it will be accomplished no other way. The law of supply and demand is as certain in its working as the law of gravitation. You will have to go to a broader market with your stuff before your prices will advance, or you will have to reduce the area. If the country at large would reduce the wheat area 10 per cent, of course that would reduce the product, and a reduction of 25,000,000 on 225,000,000 bushels would go very far toward making the prices advance themselves. The fact that you do not cultivate that 10 per cent as wheat

wouldn't prevent you from raising grass upon it; and the time may come when you may have to do that; and also remember that we have 75,000,-000 or 80,000,000 of people and that one-half cultivate the land, and it in thirty years we have 150,000,000, more than one-half of them will cultivate and till the land. They will raise more grain, and while there will be more people to consume it, there will also be a larger surplus; and unless there is some way found, the numbers will not take any particular change in the conditions.

Next week the committee will probably report. I hurried this brief statement and sent it to our representatives in order that they may see that in place of building new ships and opening new markets, they should subsidize to the extent of $7,500,000 the present ships and leave a million and a half for the new ships. Six real first-class built ships would carry at the lowest 78,000 or 20,000 tons. These would take the entire million and a half. I wouldn't take a ship on any such basis. I wouldn't buy her for the commodities she carries, until our farmers' interests were practically on a parity as regards the subsidies from the general government with their interests. I would give that entire subsidy to agriculture, because up to this time, they have not received anything, but the privilege of paying higher prices for everything they buy. We have the privilege of paying $35 a ton for steel rails. If we were to advance our rates, if we were not able to go on without advancing our rates to meet the increase cost of material, which amounts to $200 to $300 per month—where would you have to put the burden? Practically on your shoulders, already bearing more than you can bear and more than you ought to hear.

This nine million dollars might be taken out of the river and harbor bill and you wouldn't notice it.

A commission of 10 per cent on the woodchucks.

Surely the great agricultural interests of this nation are entitled to it.

I want to impress upon you and to urge your people—they don't need urging in the ordinary sense of the word, but stand together and stand for your interests, for if you do not, depend upon it, the people who live on the other side of the Allegheny Mountains will get the best of you.

SOME POINTS IN WHEAT DEVELOPMENT.

C. B. WALDRON.

North Dakota Agricultural College.

There is no language so old that it does not contain mention of wheat.

The earliest records, too, of the different peoples refer to it under different names, indicating even then that the thing itself was known so long before, that its original name had been changed into as many different forms as there were leading languages. In all these years the species itself has changed quite as much as the name. This is to be expected, when we consider over what a wide range it has been cultivated and that, too from remotest times.

The variations include differences in habit of growth, chemical composition, and periods of development. Wheat may be hard, soft, bearded, bald, red, white, winter or spring. Of course, it is always wheat, but some of the differences are so decided and yet conflicting as to constitute quite a puzzle to one who would trace their relationships past what the

original form of the wheat was is a question for botanists rather than grain growers. For the latter it is enough to know that wheat is very variable and responds quickly to changes in environment. Winter wheat may be changed to spring wheat and vice versa in a very few seasons, yet at first neither is at all adapted to the other's mode of living. The other characters of the species are quite as variable, and may be changed in many directions. These changes, so readily induced, are the results of different soils, climates mid varying methods of culture, chiefly the latter.

All regions tend to produce certain peculiarities in plants. There are regions where tobacco grows having no nicotine or aconite, without poison. So regions like this one will habitually produce hard, highly colored and heavy wheat as compared with localities further south. .This does not mean that one living in Nebraska, for instance, might not, by careful selection, get a better sort of wheat than indifferent selection would give here. It does mean, however, that the same care and attention applied here would give better returns than when applied there. Let's see just how the laws connected with plant improvement operate.

It has been found on more than one occasion that a wild type of wheat known as *Aegilops ovate*, by a certain course of treatment, may he made to produce a fair type of wheat after only eight years' cultivation and selection. When it is remembered that this wild wheat, under difficult natural surroundings, produces but a single grain to the head and never more than ten or twelve, it will be seen what this means, and it will also be conjectured that the plants were not grown under just ordinary conditions while the transformation was taking place. They were really given the best attention possible in a carefully kept garden. Now, by reversing the conditions, the results, too, would be reversed and the inferior or wild wheat obtained from the improved in equally short time.

This is because there are certain types adapted to wild or natural conditions, and if the conditions are made like those found in nature where plants struggle with other plants, then the time must come when the wild type will again assert itself. Generally speaking, wild types are not profitable. Their mission is fulfilled when they reproduce themselves. They don't store up more food than their own necessity demands. Their business is not to provide for man or any other species. Generosity is no part of their working program. Hard conditions enforce a selfishness upon them.

Cultivation is simply setting a plant free from conditions that force it to assume practically one type. Thus set free it tends to vary. If these variations are useful we preserve them by selection. Cultivation and intelligent selection are both necessary to establish improved types or to retain them. Through neglect of either of these elements the improved type may degenerate or run out regardless of how favorable the natural conditions of soil and climate may be. A climate may be so unfavorable for a particular species that no amount of care in cultivation and selection will keep it from deteriorating. In such instances it is necessary to obtain seed from a more favorable locality, perhaps not every year, but occasion-ally. Enterprising seed growers always strive to obtain their stock seed from the regions that tend to produce such qualities in the plant as they wish to perpetuate. If this seed is very valuable the returns from the first crop are not sold, but kept to grow a supply for the general market. While such seed might be good enough for the trade, it would be considered too degenerate by that time to be used as stock seed and a new supply from the favored locality would be obtained. Such pains and expense are

unnecessary for the grain grower in the Northwest, for the qualities he desires are naturally produced here. At the same time intelligent effort in seed selection will bring its reward even though nature has done much for us.

In Germany, where the percentage of sugar in sugar beets is high, they deem it necessary to adopt the following plan to improve the standard. Ten thousand beets say, all perfect are selected from a field where the choicest strain was sown and carefully tended. A small section is from each beet and tested to determine the percentage of sugar it contains. The hundred beets of the highest quality are selected and planted the next season for seed. The seed from these is, of course, very valuable, representing hundreds of dollars worth of work, and it is used simply for growing seed beets. From the seed beets thus grown only one hundred of the best are again selected as stock to grow seed beets from, while the rest of the 10,000, though grown from the same strain of seed, are considered only good enough for growing seed for the man who raises sugar, and not sugar beet seed.

It will be understood that the theory in all this work is this—that seed which is good enough for growing beets for seed is much too valuable to use in growing beets for sugar, and, of course, ordinary seed isn't considered good enough to grow seed beets from.

This practice is based upon well established laws of plant breeding, and it is safe to say that there is no danger of choice varieties running out when thus guarded and where every ounce of seed is worth many dollars there is no very desperate effort made to secure a change of seed.

Just how far this rigorous principle of selection can be practically and profitably applied in the matter of obtaining good seed wheat is a most important question. This much is certain—the man who thinks that anything is good enough to breed from is committing a grievious and costly error.

Any experiment station can furnish illustrations of two strains of wheat alike to all outward appearances, in which one will habitually yield three bushels more to the acre than the other.

We will suppose that a man has a few bushels of the best strain to be obtained. Let him select the best spot on his farm where the soil is deep and strong and free from weeds. Sow the seed there and give the wheat the best opportunity possible to develop to perfection. If he obtains a hundred bushels this should be run through a seed separator and the very best, that with the large, heavy grains kept by itself. Perhaps-only ten bushels of the hundred will meet the requirements. The rest of the hundred bushels will grow seed good enough for market wheat, but only the best ten bushels will grow wheat good enough for seed. The viding the wheat each time and keeping only the perfect wheat to be sown on this seed plot.

If the large, heavy grains come from the strong and productive plants, as is most probable, then the method is rational and will succeed. A more scientific way of course would be to go through this seed plot a few days before harvest, picking out the largest and most vigorous plants with large, uniform and well filled heads and setting a stake by each plant. These could be secured separately at harvest time and the seed from these would give the stock seed for the seed plot. Of course it would not pay to select seed in this way for the general crop, neither would it pay to raise sugar from beet seed worth a hundred dollars a pound, but growing wheat for seed and wheat for market should be considered as two very different

propositions and the man who fails to recognize the fact will soon have just cause to complain of his wheat running out and will be advocating, the right thing when he clamors for a change of seed.

Plant improvement lies only along the lines set forth and no intelligent man who has given the subject any attention will hope for success to come in any different way.

Mr. Randall: We will ask your attention for a few moments only. You have been kept very busy now, through a four day's session. Your interest has been intense and well sustained, more so than any gathering of this kind that I ever heard or saw. Very many things have been said, of benefit to us and that will help us, and as indicated this morning, it will also help the people who read of your work. It will get the farmers to take an interest in their work. For the present our work is well nigh accomplished.

Your Congressman is present with us, and has a few words to say to you.

Mr. Spalding: I did not come here to make a speech nor did I expect to be called upon, but I came here to listen to Mr. Hill, as I concluded he had something of value to say to us. I have heard him say something of the same thing before, and I only respond at this time for the purpose of saying that he has stated to you this matter of subsidizing ships, substantially as it is now before both houses of Congress, and without doubt being considered—or will be considered next week, by the proper committees to which this bill has been referred.

Of necessity, you will see at once, that we are not all experts, who have been honored with seats in our National Congress, in the line of the carrying trade, and we must take our information on such subjects from those who are experts, if we can get it.

The people who are interested and who will be directly benefitted are, I suppose, before these committees urging their claims, and setting forth arguments why it should become a law.

Through and with the best outline obtainable in the whole country, if we find that that bill or something of that nature is not what the people and the farmers of the Northwest want, then we must try and amend the bill so that it will meet their requirements, and give them the same benefit, equal to the benefits derived by the manufacturers of the East. The only way to do this is to make yourselves heard, and secure the services of somebody who is also an expert, to present your claims to the com-mittee. That is the way to get at Congress through a committee. And I believe that if Mr. Hill could find time to devote to the subject and go there himself and spend a week or ten days before these committees, he would make a greater impression than any other man within the limits of the country.

Now I am not a prophet, nor a son of a prophet, and I cannot say what the talk will be, but I can say the delegates from this state will do everything that is possible for them to do to protect your interests. Without doubt the result will be a compromise measure of some kind. No two men have the same ideas, and very likely the bill and its amendments will not represent the ideas or ideals of any man who votes for it. There will be 357 men in the house, each one with what he thinks are ideas on the subject, and each will try to have his say and the result will very likely be a compromise measure; probably the best for the country and all the interests involved. So you must not be disappointed if it does not come up to your ideas of what you think it ought to be.

Now gentleman, I want to call your attention to one thing. You have been here four days to discuss practical farming and how to get more money for your work and better results. Now the Federal Government is doing considerable in that line. You know yourself what it is doing in your Agricultural Colleges and Experiment Stations. Besides this, there is a great department in Washington, that is employing experts to send to foreign countries to investigate their methods of agri-culture, and what products from those countries can be raised to advantage in this country, and to ascertain how the products from this country can be best shipped to meet the demands of foreign countries. They are also employing men to investigate the industry of cattle, horses, sheep, chickens, turkeys, hogs and nil these different things. The result of these different investigations is compiled by the agricultural department in the form of agricultural bulletins.

I want to send these bulletins out, but it is difficult for me to know what kind each man wants. Some of the bulletins are very valuable, and they are on all these different subjects, ten thousand of them, and probably a half or two-thirds are adapted to this part of the country and to the South. I am sending them out as fast as I can. I have about 5,000 this year. I shall be glad to send them to any of you, who are interested and want to investigate these matters. If you will drop me a line and tell me on what subject you would like a bulletin sent, I will send it as soon as I can.

In this wa ythe department is doing a good work for the farmers of this country, if they will take the time to read the results of these experiments.

I have a great many other things of interest to talk to you about, but I must not take any more of your time. I thank you for your attention, and only wish I could have said something in the time of more value to you.

Mayor Johnson followed with an expression of thanks, on behalf of the City of Fargo, to the delegates for their presence and appreciation felt for the great enthusiasm shown and interest taken in the proceedings. The mayor said further: "I have never seen a convention where so much interest has been so generally shown. Each session showed more interest that the preceding one. No convention can have a more far-reaching influence than this one."

President Randall read the following resolution presented by Mr. Thos. Bolton of Park River, N. D.:

Resolved, that the Tri-State Grain Growers Convention respectfully requests Mr. J. J. Hill to appear before the committee of the United States Congress to urge such legislation upon the ship subsidy bill as will prove beneficial to the Grain Growers' interests of the United States.

The resolution was adopted unanimously.

In adjourning the session Mr. Randall announced the complimentary concert to be given in the evening.

J. H WORST, Chairman at Large, Fargo, N. D.
W, M. HAYS, St. Anthony Park, Minn.
E. D. Childs, Crookston, Minn.
J. A. JOHNSON, Fargo, N. D.
J. B. POWER, Power, N. P.
W, F. T. BUSHNELL, Aberdeen, S. D.
J. H. SHEPARD, Brookings, S. D.
Executive Committee for **1900.**

APPENDIX

On the pages following will be found a number of articles On subjects touched upon at the convention, but which were not compiled in season to be arranged in the proceedings under the proper dates.

Some Hints on Growing' Potatoes.

HEREDITY IN POTATOES.

BY PROFESSOR H. L. BOLLEY,

Botanist North Dakota Agricultural College Experiment Station.

The potato is a native of America. It was not grown in Europe until after its discovery in this country. But what a poor, poisonous thing the native wild potato is—not larger than a quail's egg. During this time and from the natural plants have been developed all of the different varieties now upon the market. The plant may be propagated either from seeds or from the enlarged underground stems, called tubers. The different varieties have probably all arisen from selections made from plants grown from the seeds, but improvement of these have undoubtedly arisen by way of selections made through crop methods in growing the plants from the tubers.

No wild plant in its native heath puts on any extra qualities like those represented in the plump, starchy tuber—for mother nature is always too hard upon it, cautioning with a restraining hand, so that the plant under this watchful care keeps always the even development of those hard, tough qualities which befit it for its every day fights with its trying conditions.

Man found that when plants were relieved somewhat from this hard fight, cultivated and given extra food—good soil, that the plants often vary much. This allowed him to select certain ones which were better than others for food purposes. The potato has yielded most graciously to this kindly care, until today we have them of all colors and shapes and of various sizes and worth in quality.

Experience has shown that a variety may deteriorate rapidly under poor systems of cultivation.

Our experience indicates, however, that even in improved varieties heredity is quite strong. The crop does not quickly lose the valuable character of the parent vine. Thus if one is careful to select his seed tubers, even poor methods of cultivation will not "run out" the stock.

This is the meat of the "small" and "large" tuber controversy. After six years careful tests of the matter I feel sure that ounce for ounce a small tuber is as good as a large tuber provided they are from the same parent vine and equally mature at date of harvest. However, as no two buds upon a tree may ever give exactly the same growth, so there may be infinitely small natural variations from the different buds of a potato plant, stem or tuber. Be this as it may, there actually do arise many strains of potatoes within a variety—some vines of which tend to produce many small tubers, others of which variety tend to produce, perhaps, only a few tubers of large form and so on, as to matters of color, shape, etc. Thus it may be affirmed with reasonable certainty that a potato tuber tends quite strongly, regardless of methods of cultivation, to reproduce a vine like its late or more immediate parental vines. For this reason, if one selects potatoes as he digs the hills in the fields, keeping the tubers from different hills separate for use as seed he will find that he can grow crops of nearly any shaped tubers he may desire.

_The teaching of these facts, then, is that, if one wishes to improve a variety of potatoes, he should select his seed, tubers from the vines

which grow the number, form, shape and quality of tubers nearest to the ideal form desired.

[For further details see Bulletin 30, N. D. Experiment Station.] Selecting tubers miscellaneously from the bin is a hap-hazard method of seed selection, and even if only large tubers are chosen the crop will tend to "run out"—to run into an uneven lot, some hills producing a lot of inferior potatoes. If only small potatoes are selected from the bin, the largest proportion of the seed tubers will be taken from vines which habitually raise such tubers. This is easily seen to be a poor principle of breeding to follow.

SEED POTATOES FOR SOUTHERN MARKETS.

Quite a large number of our farmers are finding profit in the production of potatoes to be sold in the Southern states for seed purposes. Southern potato raisers have found much difficulty in keeping potatoes for seed purposes in such condition that they may raise a good crop. Northern grown seed gives them very much greater yields than home-grown tubers. The result is that a farmer in this region can, if he will, arrange for a good, high priced market for his crop. To get and hold such a market one must produce good tubers free from disease. Selection from the vines will allow him to breed up a good standard crop of any desired variety, and a simple treatment of the potatoes before planting will do away with the common disease known as scab.

TREATMENTS FOR POTATO SCAB.

(1.) Use one ounce of pulverized corrosive sublimate to six gallons of water. After it is thoroughly dissolved, immerse the tubers one and one half hours, cut and plant as usual.

(2.) Soak the potatoes one and one-half hours in a solution of formaldehyde of a strength of one pound of formaldehyde to thirty gallons of water.

RAISING POTATOES FOR MARKET.

BY JAMES HOLES,
Fargo, N. D.

Plow the land in the fall six or eight inches deep so as to get the stubble out of the way. Disk in the spring as soon as the soil will work well, then just before planting disk again to destroy any weeds that may have started, and put the land in condition for the planter. Plant only the best potatoes you have, taking out all the small and rough ones, then treat the seed before cutting with corrosive sublimate, about as follows:

Have the druggist put the sublimate up in eight ounce packages; put one of these packages in a common iron cooking kettle, and pour on about one gallon of boiling water. Stir and crush the sublimate till dissolved. Handle this mixture carefully as it is deadly poison. After the sublimate is thoroughly dissolved pour it into a kerosene barrel that contains about forty-seven gallons of water. Keep this mixture well stirred. Then put it in a tank with sloping ends that will hold as many potatoes as you wish to treat at one time. Leave the potatoes in this solution for one hour, or a little longer will do no harm. The tank should be of such a length that a man will be able to reach from one end to the middle of it with a potato shovel. After the potatoes have been in the mixture for one hour shovel onto drip boards, which should be made in such a manner that the

liquid will run back into the tank. Cut the seed and plant as soon as possible with an Aspinwall planter with double disk coverers, or any other good planter, I prefer to have the rows about three feet and seven inches apart, and the potatoes about fifteen to eighteen inches in the row. After planting I do nothing to them till the weeds start, then I drag them crossways with a light slanting tooth harrow. I then leave them till the weeds again start, when I harrow again, this time going lengthways with the same kind of harrow. I sometimes harrow them three times before I commence to cultivate. The last time the potatoes are up so that I am able to straddle the rows with the horses. As soon after the last harrowing as I discover the weeds have started I commence cultivating with a riding corn cultivator, working as near to the potatoes as possible, the turning the soil towards them, sometimes covering the plants up entirely. The next time I cultivate I widen out the shovels so as not to work so near the plants, but again turn soil towards the plants. The third time I widen out the shovels again and turn the soil towards the plants as before. After the third cultivation I use a cultivator that only works the ground about one inch deep, using this as long as I am able to get through, or till the harvesting of oats or wheat commences. In digging, I use the Dowdon four-horse digger, which lays the potatoes on the top of the ground fairly well. They are then picked up into wire baskets, emptied into large baskets, the large baskets are then lifted onto racks made for that purpose, which hold forty-five one and one-half bushel baskets. From the field they are hauled directly to the cars and shipped in refrigerators to market. No person should raise potatoes for market if they have to be hauled more than two and one-half miles to a railroad station, as competition is so strong that the person who can only make one or two trips a day cannot make it pay.

Again I wish to caution all persons in the use of corrosive sublimate, as it is a deadly poison till diluted at the rate of one ounce to six gallons of water, when it is not likely to hurt any person unless drank in quite large quantities.

GROWING POTATOES FOR HOME USE,

BY D. I,. WELLMAN,
Frazee, Minn.

Mr. Holes has given us an interesting and instructive talk on how to raise potatoes on a large scale for market, but it is of more importance to the many small farmers to know how to raise the crop for family use, with a few to sell—when the price is good—so I will give my plan on that line.

I always plant potatoes on a part of the corn field that is marked out three and one-half feet each way—new ground is the best—but as we cannot, always have the new ground fields near at hand, the next best place is on sod land that has been in pasture. This should be well manured before plowing, which is done as soon as possible after the spring seeding is done and harrowed down smooth and compact at once, so as to germinate all the weed seeds possible before planting time. Fall plowing is better than spring plowing if you have the manure at hand in the fall to put on it.

A week or ten days after the first harrowing you are quite sure to find a good crop of weed seeds started over the field, which should all be destroyed by harrowing two or three times over, A warm dry day

with good sunshine is the time to harrow corn and potato ground to kill the weeds. Every harrowing of the sod ground from plowing to planting, done a week or ten days apart, will be beneficial to the corn and potatoes. When you get ready to plant harrow again, and the last harrowing should be in the opposite direction from what the marker is to be run that the rows or crosses may show plainer for planting. We now have our field— of say three acres— ready to plant to corn and potatoes. Too many farm-ers would plant it one half of each, but I would plant it one half to three fourths of an acre to potatoes and the rest to corn, and would calculate to do my work on a small area, so well and carefully that I am quite sure to gather as many bushels as is usually done on twice the area where the work is indifferently done,

I hold that the ordinary small farmer should do his work on a small area on the intensified plan, with his own help, and not be satisfied with the plan or results of the large farmer who does all the work with much careless hired help.

Any time after the 15th of May, when the soil is in condition, is the time to do the planting. The corn should be planted with the plunger "hand planter, and each hill stepped on so that the corn will have strong root-hold in solid soil, and so that later harrowings cannot pull it up, as it will do if the roots have only loose soil to cling to. The potato ground having been manured, plowed and harrowed it should be marked with the corn marker at 3½ or *4x* x3½ feet, which is better for the corn and no worse for the potatoes. The soil should be in proper condition to work, loose and friable.

With the corner of the hoe I dig holes not over three inches deep at the lowest point—two rows at a time—leaving the dirt in a pile at the edge so that it can be conveniently used to fill the hole again with the hoe when going the opposite way from which the holes were dug. After the potatoes are dropped and each hill is covered it should be stepped on, solid enough to compact the soil as deep as it was plowed to give it connection with the moisture below, and not compel the roots to pass a dead air space in the downward growth, as was shown on the screen by Prof. Ten Eyck. Digging holes, cutting seed, dropping and covering is usually all going on at the same time, but one man can do it all on one-half acre in one day; and one day is not too much time to spend at planting to secure potatoes enough for the ordinary family for one year—say from 100 to 150 bushels. It requires less work to raise them from planting, working, killing bugs to digging, than it does to go over twice and three times the amount of ground.

My potatoes this year, on over one-half of the tract, gave me a bushel for every eight hills, planted 3½x4 feet, and that figured out shows a yield of over 200 bushels to one-half an acre,

When ready to plant I take the seed from the dryest and warmest part of the bin, and pour them on the ground, in good light, so as to select only the smooth and perfect ones. I take the largest ones if they are perfect, but a small one the size of a hen's egg cut lengthwise into quarters is as good as is necessary. When bright and perfect I cut them the same as the large ones.

With the medium and large ones I commence at the stem end and cut, or try to cut, one eye on a piece, handling the knife so as to pass the center of the potato for each piece, for the eyes are the branches of a minature tree, and the heart is the trunk of the tree. After cutting off from four to eight pieces, according to the size of the potato, I halve or

quarter the seed end, and there you have from eight to twelve pieces to plant, one piece or one eye in a hill. I have never planted any more seed than that in the twenty-five years that I have farmed it at Frazee, Minn. I took my first lesson in potato raising with Early Rose when it was scarce and valuable, and I have raised the Early Rose every year since— and they do not run out for me. I often try other varieties, but the Rose is my stand-by.

Ten days after planting, when you find the weeds starting, harrow both ways, and repeat when you see that one-half of the hills have come up, and in a week you will have a field of strong, healthy plants, with broad leaves making a vigorous growth each day because they have a good foot-hold in the soil.

In the hole that you dug only three inches deep, when the potato is covered and stepped on, the piece will be only from 1½ to 2 inches deep, and will come up a week or ten days sooner than if planted from four to six inches deep, so you gain that much time towards having new potatoes and green peas for dinner on the Fourth of July.

In talking with Delegate Tuller from Marshall County, Minn., he tells me that the best and earliest potatoes that he ever raised were planted so shallow that some of the pieces had their noses sticking out of the ground. Shallow planting with Mr. Tuller and my twenty-five years' experience shows that shallow planting is not detrimental to the crop. Dr. Hinebauch showed us that shallow cultivation is a good thing, for he raised a good crop by using only the Boss harrow, as long as he dared to, which was all the cultivation it got. Prof. Ten Eyck's screen work showed the roots close at the top of the ground as well as four feet below.

The doctor will have to explain how he used twenty-seven bushels of seed on one acre, when I cannot use but two bushels and one-half per acre.

Question: Is it a good plan to plow corn and potato ground for small grains?

Answer: No; I would not have it plowed if someone would do it for nothing and board himself, for it has the compactness necessary to grow the best of small grains, and is just a good place to get a catch for all kinds of tame grasses.

Q. Are four or five inch drills better than six inch drills, or is cross drilling with one-half the seed each way of benefit?

A. Mr. Wellman: No, for I have raised wheat at the rate of thirty bushels per acre with eighteen-inch rows, sowed with a garden drill. This was on new ground and had no cultivation with hoe or hand cultivator.

THE HISTORY OF WHEAT RAISING IN THE RED RIVER VALLEY.

BV GEORGE N. LAMPHERE.

The Red River Valley, as this term is commonly used, is a broad and flat prairie plain reaching ten to twenty miles on each side of the Red River of the North, having thus about half of its expanse in Minnesota and the other half in North Dakota. It extends three hundred miles from south to north, continuing in Manitoba to lake Winnipeg. Inclosed by the higher land on each side, and pent in at the north by the barrier of the receding ice-sheet at the end of the Glacial period, this valley

plain was covered in that geological epoch by a vast lake, which, with the complete disappearance of the ice-sheet, was drained away to Hudson bay. To this glacial lake Mr. Upham has given the name of Lake, Agas-siz. ; and its survey and description are the subject of a volume prepared by him and published by the United States Geological Survey. The closing chapters of that work should be consulted by any who seek information concerning the general agricultural capabilities of this very fertile district, or concerning its water supply and its hundreds of artesian wells.

The beginning of wheat raising in the Red River Valley was in the Selkirk Settlement north of the boundary line, near Fort Garry, now Winnipeg.

In 1811 the Earl of Selkirk purchased from the Hudson Bay Company a vast tract of land in Manitoba, including' the land afterwards occupied by the Selkirk settlement. The purchase was subject to the Indian claim to its title. About the time of this purchase there was a compulsory exodus of the inhabitants of the county of Sutherland, Scotland, from the estates of the Duchess of Sutherland; and Lord Selkirk took a large number of these evicted persons under his protection and forwarded them to settle on the land he had purchased on the Red River. They arrived on the bay in the fall of the year, and spent the winter at Churchill, on the western shore of the bay. In the following spring they advanced inland, crossed Lake Winnipeg, and descended the Red River of the North.

They intended to make their home at the confluence of the Assinna-boine and the Red, but on arriving there found that the X. Y and the Northwest Companies of Canada, which were opponents of the Hudson's Bay Company, regarded them as invaders and also as proteges of the latter. The Indians also objected to the cultivation of their hunting grounds, and were instigated to hostile proceedings against the new comers by the representations of the Canadian companies. The year 1812 passed without any satisfactory progress being made toward settlement, and the immigrants spent the following winter in great distress at Pem-bina, whither they were driven by the Indians. By some means, however, they were able to mollify their opponents and were permitted to return in the spring. They built log houses and began the cultivation of the land on the bank of the river. Within a year they were attacked by the partisans of the companies, who burnt their houses and killed some of their number. Afterwards, being reinforced by a company of additional immigrants from Scotland, the settlers returned to the places from which they had been driven, and recommenced their labors. The hostility of the companies towards these poor immigrants was continued, their prop-erty was destroyed and men were captured and killed. At length, on June 19, 1816, the adherents of the two parties met at Seven Oaks, in the center of the settlement, under such circumstances that a small battle occurred, in which about twenty men, among whom was Governor Semple, were killed.

In 1817 Lord Selkirk came over and visited the settlement. Besides' having a desire to see how the settlers were prospering, he desired to negotiate for the extinguishment of the Indian title to the land he had purchased. After much difficulty he negotiated a treaty with the Chip-pewas and Crees, which treaty was signed July :8, 1817. The consideration was the annual payment of 200 pounds of tobacco, half to the Chippewas and half to the Crees. The conditions in the territory at this time were so wretched that the Canadian government interfered and appointed a commissioner to make investigation, who recommended an amicable settlement and a union of interests by the companies, which

had been reduced to the verge of bankruptcy, It was a long time, however, before action was taken. Lord Selkirk died in 1821, and the Right Hon, Edward Ellice succeeded to his rights. He was one of the principle stockholders of the Northwest Company, and the Canadian-government consulted with him and under its auspices he instituted negotiations which, after many difficulties, resulted in a harmonious union between Hudson's Bay Company and the Northwest Company. The latter having before combined with the X. Y. Company. This agreement went into effect in 1821, and from this date the opposition to the settlers was withdrawn.

Lord Selkirk on his arrival in 1817 had provided the settlers with agricultural implements, seed grain and other necessaries, but the .season was so far advanced that little produce was grown in 1817 and a famine ensued. The people again returned to Pembina, where they passed the winter, subsisting as best they could on the produce of the chase. The next spring they went back to their lands, ploughed and seeded them, and entertained high hopes for a bountiful harvest, but were to be sorely disappointed, as an army of locusts made its appearance and in one night destroyed every vestige of verdure in the fields. The locusts left their eggs and in 1819 were more numerous than in the preceding year, making agriculture impossible. The settlers again took refuge at Pembina, and Lord Selkirk imported 250 bushels of seed grain from the United States at: an expense of £1,OOO, and this which was sown in the spring of 1820, produced a plentiful crop in the autumn of that year. Thus it may be said that the first wheat that was ever successfully grown and harvested in the Red River valley was in the season of 1820 by the Selkirkers. *

The seed wheat was purchased at Prairie du Chien, Michigan, and shipped on a Mackinaw boat, which was a boat built sharp at both ends, with a narrow treadway on each side for the men to walk on as they propelled the boat by poles when possible, but had a mast ready for sail whenever favorable wind offered, also oars were provided for deep water rowing. This boat and cargo of wheat, oats, barley, etc. were taken through by water the entire distance going up the Minnesota river, then called the St. Peters to Big Stone Lake. Fortunately there was water enough on the divide between Big Stone and Lake Traverse to float the boat and the larger part of the cargo, thence into the Bois de Sioux and Red River of the North, down which the boat was sailed to the Selkirk Settlement near Fort Garry. This seed wheat we are informed by good authority was Scotch fife and is probably the parent of our famous No, 1 hard.

I am principally indebted for the facts as above set forth to the book entitled "Red River," by J. J. Hargrave, printed by John Lovell, Montreal.

The methods of cultivation in the Selkirk Settlement were rude and primitive. Their plow was English or Scotch, made all of iron from the tip of the beam to the end of the handles, and was ten or twelve feet long. Its share was shaped like a mason's trowel. With this drawn by one horse, enough ground was scratched every spring to raise sufficient wheat to feed all the blackbirds and pigeons in the Red River Valley, and leave a surplus large enough to meet the wants of the people of the settlement; also to sell to the Hudson's Bay Company all they needed for their outposts in the British Northwest posessions, and still leave a surplus sufficient for food and seed for two years, which was stored up to be used in case of emergency or failure of crop in the coming sea-son. The grain was cut with sickles, the bundles tied with willow withes,

stacked in the 'barnyard, to be flailed out during the winter and cleaned by the winds, men, women and children all giving a helping hand in this work.

In August, 1851 Charles Cavalier arrived at Pembina. At that date the Red River Valley, except the Selkirk Settlement, was a howling waste throughout its whole, length and breadth. Then there were only four white men in that section, namely, N. W. Kittson, Joseph Rolette, "George Morrison and Charles Cavalier. There were 1800 to 2,000 half-breeds and Mr. Cavalier says as he was born among the Wyandotte In-dians in Ohio and brought up near them the Indians at Pembina were not much of a curiosity to him, but the half-breed was a new phase of the genus, and to this day, says he, "I have not fully made up my mind whether the cross between the white man and the red man was much of an improvement, as with but few exceptions the Indian blood predominates."

In those earlier days bread was a rarity, and pemmican, dried buffalo meat, fish and a few potatoes constituted the food supply. Charles Cavalier and Com. N. W. Kittson planned a trip to the Selkirk Settlement, where they were told they would find bread in abundance. They set out in the same year (1851) and in a day and a half's sail down the river in a canoe reached Fort Garry and St. Boniface where they received a hospitable welcome from Vereck Marion, Mr. Kittson's father-in-law. They visited the Roman Catholic bishops and clergy and found them pleasant and agreeable gentlemen. They also visited the sisters of charity at the hospital who gave them a warm welcome and showed them through the whole establishment. Kittson having returned to Pembina, Mr. Cavalier in company with Mr. Marion, visited the office of the Hudson's Bay Company, where they met also Major Campbell, who was in command of a company of British troops stationed near Fort Garry. With Marion, who was an old settler and acquainted with everyone. Cavalier went on a tour of inspection and gathered all the information possible in his limited time in order to tell his friends on his return about this isolated, almost unheard-of community, and how they made life endurable in their frigid northern climate.

From Fort Garry to Lower Fort the two men called at almost every house, and found a happy, prosperous, English-speaking people, mostly of Scotch descent from the immigrants sent over by Lord Selkirk. A few of other nationalities were also there. They were very kindly and hospitable people. The two men called upon Bishop Anderson of the English church, and found him to be a "fine old English gentleman all of the olden time." With him they visited the colleges one for males and the other for females, where the youth received a classical education, and which institutions are still in existence. Here Mr. Cavalier first met Donald Murray, one of the original Selkirk settlers, who had once settled at South Pembina, and there remained until it was determined to be south of the international boundary line, and whose daughter is now Mr. Cavalier's wife. Mr. Cavalier somewhat enthusiastically says that his impression at that time was that he had never seen a more prosperous community in the states than was the Selkirk Settlement. There was not a family that was not well off as to all the wants of life. The latch string of every door hung on the outside, and any who called were welcome to the best the larder contained, and when leaving were asked to come again. Sectarianism was unknown' among them, there being only one church, the Episcopal. While the Scotch were mostly Presbyterians, yet when Dalton Black settled among them and an Episcopal church was

built for them, there was no ill feeling shown on either side. Their houses were all built of logs and built for comfort, convenience and warmth. Many of them are yet occupied, but the changes caused by Canadian immigration have had a large influence in changing their manner of life. However, they are today the same good people and live up to their religion.

The half-breeds of the Selkirk Settlement, speaking English, are not nomads like those of French extraction, but take to the ways of their fathers and are workers and tillers of the soil. Nearly all have homes and lands of their own, educate their children, and have something laid by for a rainy day; while the French half-breeds, who are mostly of the Roman Catholic faith, believe that "sufficient unto the day is the evil thereof."

As the harvest of that season (1851) was nearly finished and the .barnyards were filled with large and bountiful stacks of wheat and bar-ley, and a stack or two of oats and peas, it was a rich sight, and there was no fear of starvation for two or more years, even should the crops fail. The land system, which gave a strip of land six chains wide fronting on the Red River, and extending back two miles, gave the settlement the appearance of a long, strangling village along the road from Fort Garry to the Lower Fort, and as dwellings, barns and stock were in close-view all the way, the picture was a most beautiful and interesting one, and not seen in the states and rarely even in old Europe.

The Selkirkers generally had large families and old and young worked together on the homesteads. While like other farmers they suffered from drouth, grasshoppers and frosts, yet they usually secured good crops, and waved a reserve for two or three years, an amount for seed, and sold the surplus to the Hudson's Bay Company. Occasionally they would have poor crops and perhaps be compelled to use their reserve and even to borrow from the Hudson's Bay Company for seed and food. The company, whose interest it was to be liberal, as they depended upon these farmers for their supplies of wheat for their support, loaned willingly, but required the payment from the succeeding crop. A government never existed, , in the opinion of Mr. Cavalier, that got on better with settlers than the much abused Hudson's Bay Company.

At that time, as before noted, all grain was cut with sickles and bound with willow withes by the women and children. Wheat, barley and oats were threshed on a barn floor with a flail during the winter season, and were winnowed with a large wind scoop resting on the breast, and it was remarkable how fast, with a good wind it could be cleaned. The wheat was ground in large wind mills, bolted fine and clean, and made-excellent bread. The flour was not like the flour of these days, and modern cooks would probably turn up their noses at it, but it was to the taste as good as our best.

Mr. Cavalier in his rambles on that trip counted fifteen windmills, all grinding out flour at a lively rate, which at that time sold for eight or ten shillings per hundred weight.

The old settlers told of a grasshopper scourge at a date forgotten by them, that made a clean sweep of every growing thing, and that grasshoppers were piled up by the winds and waves four feet deep on the shores of Lake Manitoba and Shoal lake. They stated that after the grasshoppers had done all the damage they could, as every thing was eaten, the Catholic clergy got up a procession and said prayers, and on the next day the-hoppers quit hopping, took to their wings and flew away to the northward and were seen no more,

Mr. Cavalier says the first time he saw grasshoppers was in 1854. He was in camp one night on White Bear Lake, now Lake Whipple, and took, an early start toward St. Cloud. It had rained during the night and all were wet, so at 9 o'clock they turned out on the bank of Long Lake and spread their clothes and other things to dry. They made a fire to cook breakfast. Mr. Cavalier on looking around for his blankets, etc., saw nothing but a squirming mass of grasshoppers, all as busy as if they had struck a bonanza. They were not able to get out of that mass of grasshoppers until they had traveled about twenty miles. On the return they struck them at St. Cloud, and they had cleaned the country quite thoroughly on their flight east. On crossing the Red River and between that and Wild Rice they struck the forerunners of another cloud of grasshoppers, and did not get clear of them until they arrived home at St. Joseph, now Walhalla. For gluttony the hopper takes the cake, Mr. Cavalier says, and relates that they ate the seat of his saddle and the tops of his boots. He threw a plug of tobacco to them, and within an hour they had eaten that.

In 1870 another visitation of grasshoppers appeared and in that year and the year following their ravages were disastrous. In 1874 they came again and stayed three years, eating everything in the Red River Valley, and the settlers were obliged to haul their flour from St. Cloud. Minneapolis and St. Paul sent relief to carry the poor through, which saved many from actual starvation.

Thus the Selkirkers, with the simplest and rudest of agricultural implements were always prosperous, and want was unknown among them. Through them we learned that the Dakota lands were not the barren wastes and howling desert of dry, drifting sand that our school books had taught us, and that the Red River Valley contained a mine of wealth greater than any discovered mine of silver or gold. This we were slow to realize, but have at length made the Red River Valley the most bountiful granary of the world. The windmills of that famous pioneer settlement have done their last grinding, most of the old hand labor implements have been laid aside, and the new and improved machinery, so efficient and so exact as to give them almost the appearce of having human intelligence, have taken their place. These are run or propelled by horse and steam power, and the labor of one man has become as that of many. Mr. Cavalier, reminiscently says: "I was here for years, living by the proceeds of chase, never dreanming that this mode of livelihood would ever cease, or that the millions of buffalos that roamed the prairies, would ever be exhausted, and we old settlers would soon be seeking other means of support."

The settlers south of the line had to depend upon the Selkirk Settlement for their bread and butter. Old Father Belcourt, of St. Joseph, near the Pembina mountain, a Catholic priest, and a rustler in all things for himself first and for his people next, built a bull mill at his mission at St. Joseph and run it a few years with oxen, and ground what little wheat the Breeds raised. Having no bolt to take the bran out of the flour, it had to run through sieves or eaten husks and all. The Breeds did not furnish wheat enough to make the mill pay and they could not be induced to greater industry, and so the good old man had to give the mill up. The result was that the Breeds returned to the coffee-mill or ate the grain raw or roasted. That mill was the first. George Emerling and John Mayn built, the next, and that mill is now one of the paying concerns of Pembina County at Walhalla, having all the new improvements in merchant mills.

The first public business tending to civilization was the establishing of a monthly mail between Pembina and Fort Abercrombie. It was a kind of go-as-you-please, sometimes on foot, with the mail bag on the man's back, sometimes by horse and cart, and by courier, any way so that the mail was carried, and in those days it was never behind time. At least the contractor never was docked or fined. From Pembina the mail was taken to Fort Garry, and that office had to use Uncle Sam's stamps. From Fort Garry the route was to Fort Abercrombie and run by dog trains, horse and cart, and one year by ox cart, us all the horses from St. Cloud to Fort Garry died or were rendered useless by an epidemic. Sometime in the sixties, Capt. Blakeley and Carpenter secured the contract to carry the mail from St. Cloud to Georgetown on the Red River, and afterwards had it extended to Fort Garry, Selkirk Settlement. The following is a list of the stations from Breckinridge to Pembina. Begin-ing at Pembina and going up or south, the first station was at Frank La Rose's, at Twelve Mile Point; Bowesmont and Long Point, near Drayton, Hugh Biggiotoff; Kelly Point, now Acton. Kelly was an old driver and gave it up. Gerard was station agent as long after as the route was in existence. Turtle River; Jo Caloskey; Grand Forks; John Stewart, first, and several others afterwards. Buffalo Coulie, unknown. Frog Point, unknown. Goose Prairie, A. Sargent. Elm River, Johnson. Georgetown, Hudson's Bay Company. Oak Point, unknown. Twenty-four Mile Point, McCauleyville and Breckinridge. At none of the above stations was a handful of grain raised. The contractors hauled all their oats from St. Cloud. The above named points were all the settled points and there was not a settler elsewhere on the river from Breckinridge to Pembina.

In 1858, Anson Northup got the steamboat Pioneer in successful operation. Mr. Cavalier says he was then living at St. Boniface, Selkirk Settlement, and with his wife made a trip on her to Lower Fort Garry, and he says the settlers on the bank of the river were as much surprised as were the Indians in their villages on the Minnesota river at the first boat when she steamed up to Mankato. It was a perfect circus all the way down. The International made the appearance within three or four years afterwards as a freight boat for the Hudson's Bay Company, ostensibly owned by Commodore N. W. Kittson, and was used as long as there was any need of a boat on the river. She was all the time under the command of Capt. Frank Symond, a St. Louis Frenchman from Ville Roche, and he was an excellent captain. Since leaving the river he has been living on his farm some four miles above Neche on the Pembina river, where he expects to pass the remainder of his days to a happy old age. The Selkirk came next. She was built by James J. Hill; and other boats were built to supply the increased demand. Then followed the combination known as the Red River Transportation Company, which did business under that head until the railroads successfully shut off river navigation. The amount of business that these boats accomplished was astonishing, and yet they did but little, perceptibly, toward the settling the country, as there were only three or four points on the river that showed a beginning of what was to come. From Fargo and Moorhead to Grand Forks there were only a few settlers, and from Grand Forks to Drayton a few had settled to stay. Bowesmont was a steamboat landing, but never has amounted to much. Then Joliette commenced to grow and is now quite a prosperous community, and, last but not least, Pembina. Back from the river there was no settlement, and without the

aid of railroads it would have taken an age to build up the country to what it now is.

Prior to 1878 there had been a few shipments of wheat, which had been picked up along the river by the boats. Frank C. Myrick, who was in the commission business from 1864, made the largest shipment on one of the boats ever made from Pembina. It amounted to 500 bushels of wheat, which he had collected from the back country on the Pembina, and Tongue rivers. From Grand Forks to Pembina settlers came dropping in by families one at a time, and all came with the idea that, wheat was the only staple to be cultivated in the Red River Valley, all of which they had learned from the remarkable crops raised in the Selkirk Settlement with primitive tools for cultivation, yielding from twenty to fifty bushels per acre. In one instance by garden cultivation as an experiment on the ground of Deacon James McKay, the yield was seventy-five bushels to the acre. If such crops are raised in Selkirk with the imperfect cultiva-tion, why not, they reasoned, do the same or better with improved machinery further south in the valley? For a few years they did do so, and they continued to do well as long as they confined themselves to the extent of land they could properly cultivate. But greed was their worst enemy. If 160 acres panned out so well, why would not a section do better? And there is where they made a mistake, as will be explained later.

During the period thus far traced there was no wheat raised south of the international boundary line. The settlers there lived on fish flesh and fowl. They raised all the garden vegetables needed, and bought flour , from the Selkirk settlement. For fresh meat they depended upon the plains and were seldom out of a supply. Barley was raised for horse feed, and some oats were raised, but the blackbirds devoured most of the oat fields. Having no mills to grind wheat the settlers on the south side of the line raised none, but did raise squaw corn for roasting ears. The few cattle they had were kept on hay in winter, and the Indian ponies dug theirs out of the snows, save in a period of unusually cold weather and deep snows, when they were fed hay.

In 1871 or 1872, Charles Bottineau, who had tilled ten acres to garden, seeded it to wheat, and claims to have raised fifty bushels of No. I hard wheat to the acre upon it. His place was four miles above Neche on the north side of Pembina river. Two years later Charles Grant, two miles west of Pembina, raised a small field of wheat, and claims to have averaged forty bushels to the acre, all of which they hauled to the Sel-kirk settlement to have it ground. A man named Vere Ether came to Pembina at the beginning of Riel's rebellion (1869 and was stopped at the boundary line by Riel's scouts. They sent him back to wait for a more convenient time. He was pursuaded to take a pre-emption on the Pembina river a few miles east of Neche. He opened up his farm and was the first settler there who made wheat-raising his chief employment, he always had good crops, in good seasons receiving forty bushels per acre and never less than fifteen bushels.

One of the oldest settlers and farmers in the Red River Valley, south of the international line, is Hon. R. M. Probstfield, now living on his farm three and one-half miles north of Moorhead, Clay County. He came to the valley in 1859 and located at the mouth of the Sheyenne river, about five miles south of Georgetown. In October, 1860, he went to Europe and returned in the spring of 1861, but, owing to the flooded con-dition of the Valley that spring, he was unable to reach his location until

June 10. At that time parties by the name of Roundsville and Hanna were on the land where Mr. Probstfield now lives, and that spring sowed a little wheat and planted potatoes. Roundsville and Hanna were called away and they made arrangements with Mr. Probstfield to harvest the wheat and dig the potatoes, but the Chippewa Indians threatened to drive them away and kill their stock. The wheat was destroyed by hail. Mr. Probstfield dug the potatoes. He had brought some cattle from St. Paul and that fall cut some hay on the place now occupied by Jake Wam-bach. The Indians never molested them, as, after the troops at Fort Abercrombie had given them a whipping, they went north into the British possessions. In the fall of 1861 he went to the post at Georgetown, and lived there until March, 1863, "when General Sibley ordered all whites to go to Abercrombie. This was owing to the Indian uprising. He remained at Abercrombie until June, 1863, when he was ordered by General Sibley to remove to St. Cloud, where he remained until May, 1864, when he returned to Georgetown. The Indians had burned his buildings on the Wambach place, on the Buffalo river near Georgetown. He then opened a boarding house in one of the Hudson Day Company's buildings at Georgetown, and was appointed postmaster. There were twenty-five men there at work building barges, who lived in the military quarters and boarded with him.

From 1864 to 1868 Mr. Probstfield was the Hudson Bay Company's agent at Georgetown. In 1862 the company seeded some wheat, but it was not harvested, owing to the abandonment of the post on account of the Indian scare. The company leased its boat, the International, to Harris, Gaeger, Mills & Bentley, until the post was again opened in 1864. Roundsville and Hanna having abandoned the farm in Oakport, Mr. Probstfield took it as his homestead and occupied it in May, 1869, where he has ever since lived. There were seventy-one acres in the place, and he afterward purchased additional land at $1.25 per acre. In 1869 he broke land for a garden, and seeded oats and barley and planted potatoes. He also kept live stock. As there were no threshing machines or mills in the country, it would not pay to raise wheat. In 1874 the Hudson Bay Company bought a thresher, a horse power machine, and the company's agent at Georgetown, Walter J. S. Traill, offered to thresh any wheat that was grown. Mr. Probstfield accordingly broke up fifteen acres and seeded it to wheat, harvesting twenty-eight bushels per acre, which was sold at about $1.50 per bushel.

I should have remarked that during the years 1870 to 1873 Mr. Probstfield cultivated ten acres to oats, barley, corn, and garden. Moor-head and Fargo had begun to be established in 1871, and these places afforded an excellent market for all the produce grown.

Nels Larson raised some wheat also in 1874, on land about two miles - north of Moorhead, now known as Dr. Brendemahl's farm. Ole Thompson, Hogan Anderson, (Hicks) and Jens Anderson raised wheat south of Moor head the same year. This wheat was sold to an elevator in Fargo that was built before Bruns & Finkle had built their large elevator and mill in Moorhead.

In 1875, Mr. Probstfield again raised wheat, and the number who were engaged in the industry considerably increased that year. In the spring of that year a number of Norwegians from Houston County came up and had looked at land on the Dakota side between Georgetown and Argusville. Finding the land very wet by overflow of the river, they returned to the Minnesota side, and Mr. Probstfield, meeting them, asked where they were going, and they replied. "Back to Houston county." He

was cultivating potatoes, and he said to them if they would put two young men to work in his place he would so with them and show them good land that had been surveyed. They agreed and he took them over to the Buffalo river about six or eight, miles east, where they located. There were six or seven families, and among them were Ole Thortvedt, Ole Tauge, Torgerson Skree, Ole Anderson and others. They were delighted with the location and land, and they or their descendants are still there and prosperous. Kassenberg, Kragnes, and B. Gunderson and others, came a little later, and located on the Buffalo. Jacob Wambach came in 1874, with his father-in-law, Joseph Stochen. Contemporary with Mr. Probstfield was K. R. Hutchinson, who settled in a place where he still resides, about two miles south of Georgetown on the river. The boom began again about 1873. when the immigration into the valley was very large. Wheat sold for $1.00 and above until about 1882, and it fell until it reached the low price of 42 or 43 cents.

One of the oldest settlers in the valley on the Dakota side, and one of the most successful farmers, is James Holes, He came in July, 1871, and bought out the claim of Ole Hanson, who had a cabin on the west bank of the river about one mile north of the Northern Pacific surveyed line. Hanson had a small patch of corn and potatoes. No corn was secured that year and Mr. Holes says he dug about half a barrel of potatoes. The Northern Pacific railroad had laid tracks in the fall of 1871 to the east side of the river, to a point where Moorhead now stands. There was no bridge as yet, and owing to want of timber the bridge was not built until the summer of 1872. The first engine crossed the river July 4 (or June 6), 1872, Mr. Holes states that the freight charges for wheat to Duluth at that time were prohibitory, and this discouraged the growing of it. He interviewed the general manager and made such representations to him. The charge then was $99.00 for 20,000 pounds. This was exactly 30 cents per bushel. The company soon after (in 1873) made a considerable reduction. In 1872 Mr. Holes had the largest cultivated field in Cass County. It was cropped to oats, potatoes, and garden vegetables, and contained twenty-four acres. There were good markets, and Mr. Holes shipped his produce to Fort Buford, Bismarck, Winnipeg, and Glyndon. In 1873 he pursued the same employment. In 1874 he seeded fifteen acres of wheat, and harvested twenty bushels per acre, The season was dry, and, as the land had been gardened, it blew out badly, which caused a rather light yield for those early years. The wheat was the Scotch Fife variety, and he sold it for seed. In 1875 his acreage of wheat was about the same, but having in 1876 broken 150 acres, in the spring of 1877 he seeded 175 acres to wheat and secured an average of twenty-seven and one-half bushels per acre, which he sold at $1.00 per bushel. As this wheat was raised on land worth $5.00 per acre, the profit was large.

From 1878 to 1893 Mr. Holes yearly increased his acreage of wheat until he had reached 1,600 acres, which has been about the extent of his yearly wheat cultivation since. His land is now worth $30.00 per acre. The poorest field he ever harvested was ten bushels per acre, and the best forty-four bushels. His average has always exceeded ten bushels, but never exceeded twenty-seven and one-half bushels. The price has ranged from $1.50 to 45 cents per bushel. Grasshoppers prevailed from 1871 to 1877 and wreaked more or less damage every year. In May, 1876, the settlers burned the young grasshoppers in the prairie grass, which checked them; and in 1877 they all flew away and this part of the valley has not been troubled with them since. Mr. Holes' crops have, in the

twenty-eight years of his residence here, been injured by hail four seasons. The most disastrous hailstorm was last season, when he lost, as he figures it, about 16,000 bushels of wheat by hail. Mr. Holes states as his judgment, formed after a long experience, that wheat can be produced at a profit in the valley when properly cultivated, excluding from the calculation the advance in price of land, and that the valley is one of the best in the United States for profitable fanning.

Moorhead was the terminus of the Northern Pacific railroad for a period of two years, and a large amount of freight was transferred at that point for transportation down the Red river to Winnipeg and other places. At that, time nine steamers were plying on the river and a number of flat boats were used in connection. An eye witness has informed me that he had seen as many as eleven hundred Mennonite immigrants camped at Moorhead who were bound for Manitoba and the Northwest Territory, who pitched their tents on the banks of the Red river awaiting transportation by boat down.

In May, 1871, there were a few settlers at Glyndon, Muskoda and Hawley, and a few along the Red river within the present limits of Clay County. The very earliest settlements were made at Georgetown by Adam Stein, R. M. Probstfield and E. R. Hutchinson, who became hus-bandmen and tillers of the soil. We have the gratification of knowing that they are still living witnesses of the fertility of the Red River Valley soil and the healthfulness of the climate, and moreover of the fecundity of mankind when under the influence of both these. Mr. Hutchin-son is the father of seventeen children, Mr. Probstfield of thirteen, and Mr. Stein of eight.

It may be of interest to my hearers to learn the particulars as to how it happened that these three pioneers drifted into what is now one of the most famous agricultural regions in the world, but which was then a dreary waste uninhabited save by Indians and roamed by wild beasts. In March, 1859, a party of capitalists consisting in part of Messrs. Peter Poncer, Welch, and Bottineau, of Minneapolis, and Barneau, John Irvine and Freudenreich of St. Paul, explored the Red river country, and their investigations convinced them that a point at the mouth of the Sheyenne river, about fourteen miles north of the present site of Moorhead, was the head of navigation of the Red river, and they judged that it was the natural point for a townsite. They therefore covered a plot of land at the point named on the Minnesota side of Red river with scrip, and laid out a town which they named LaFayette, and they sold a great many shares in this townsite to parties east. On the site they built a large log house, which they intended for a tavern. At this time Mr. Probstfield was in business at St. Paul in partnership with George Emerling, and the townsite owners induced Mr. Probstfield to go up to LaFayette. He remained there for a year or more and soon after pre-empted a claim on the south side of Buffalo river, not far from Georgetown. In 1864 he went into the employ of the Hudson Bay Company at Georgetown, where they had a warehouse and trading post.

Mr. Stein was induced in July, 7859, to go to LaFayette and afterwards pre-empted a claim near Georgetown. His first work was in cutting prairie grass and making hay which he sold to the Hudson Bay Company; and afterwards he worked in erecting buildings at Georgetown for that company. In December, 1861, Mr. Stein enlisted as a soldier in the Fourth Minnesota regiment and served through the Civil war. After his return from the war he settled on land near the Hudson Bay Com-

pany's buildings at Georgetown, and has been a farmer ever since, he-still living there,

The first boat that was ever built on Red river was built at LaFay-ette, the materials for which were transported across the country from Crow Wing on the Mississippi, where the steamer North Star was broken: up for that purpose, which new boat was named the Anson Northup. With the party who came across the country with those materials was E. R. Hutchinson, who helped to build the boat, and for a number of years was engaged in boating on the Red river and building boats thereon, and, also on the Saskatchewan. Mr. Hutchinson afterwards became a farmer and pre-empted land not far from the old site of LaFayette, where he now lives. I have related in another place how Mr. Probstfield became one of the first farmers in the valley. Besides these three men on the north of, the line of the N. P. railroad, there were on the south Jens Anderson and his brother, about three miles south of Moorhead. Ole Thompson made settlement about the same time on the river about eleven miles south.

Early in the spring of 1871 Henry A. Bruns went from St. Cloud to Brainerd, which was then the western end of the Northern Pacific railroad track. From Brainerd he rode to Oak Lake, which was then the engineers' headquarters of the road, where he met Gen. Thomas L. Rosser. The N. P. had surveyed its line to the Red river, some twenty-eight miles below Moorhead. Mr. Bruns was prospecting, looking for business chances. He then returned to St. Paul, where he bought a load of provisions and ready-made clothing, and hauled them to the Red river. At this point, where Mr. Probstfield's house now stands (about three and one-half miles north of Moorhead), he found an encampment of tents and here he met H. G. Finkle, J. B. Chapin, and John Haggart. This was about June, 1871. Mr. Bruns opened out his goods in a tent, and formed a partnership with Mr. Finkle. They remained at this point (Oakport) until September, when, the townsite of Moorhead having been staked out, all those at Oakport removed thereto. At Moorhead they did business in tents all winter. In March, 1872, Mr. Bruns went to McCauleyville and bought a lot of lumber, hired teams, and hauled it to Moorhead. Bruns & Finkle then erected a frame building of 21 by 50 feet. They continued to do business in this building until 1877, when they built a large brick store.

We have given this somewhat lengthy introduction of Mr. Bruns into this history for the reason that he was a pioneer in promoting the industry of wheat raising in the Red River Valley. In the winter of 1871-2 Mr. Bruns purchased 500 bushels of seed wheat, which he gathered along the Minnesota river and further south and east, and transported it hundreds of miles by sleds, which wheat he distributed among the farmers of Clay and Norman counties, Minnesota, and Cass and Traill counties, Dakota. The facilities for raising wheat that year being poor, and the grasshoppers very destructive, there was no surplus from the harvest in excess of the amount required for seed the next year. Early in 1874 Mr. Bruns organized a stock company which erected the first flour and saw mill. This mill soon demonstrated that the wheat of the valley was of superior quality for making strong flour and excellent bread. The flour was awarded first premium at the Minneapolis and State fairs two consecutive seasons. The sawmill cut timber for the construction of the steamboats, the Minnesota and Manitoba, built at Moorhead in 1875, by the Merchants' Transportation Company, of which James Douglas, brother of John Douglas of St. Paul, was president They were the best boats ever on the Red river. This assisted in opening up Manitoba and

the Northwest Territory markets. Later the Upper Missouri and Black Hills countries were secured, and later still the Yellowstone country, as markets for the flour of this mill. This mill created a market for the wheat produced within a wide radius, and for a number of years took all that was offered, rarely giving less than $1.00 per bushel.

In 1878, Bruns and Finkle, seeing the necessity for more storage for the rapidly increasing production of wheat, erected a large steam elevator at Moorhead, with a capacity of 110,000 bushels. It was the first steam elevator ever built in the Red River Valley. Mr. Bruns informs the writer that in the fall of 1873 he shipped the first carload of wheat from the Red river to Lake Superior, which, by personal hard work in cleaning, was graded No. 2, though it certainly was No. 1, none like it ever having been shipped in the history of the world before. Mr. Bruns, in a personal letter, says: "In the fall of 1874 I commenced to grind about all the wheat then grown in the Red River Valley, and in the fall of 1875 I gathered, not as before by the thousand, but by the tens of thousand of bushels of wheat and other grains, and with flour of my own grinding, supplied the Canadian government and Menonites with seed and bread throughout Manitoba."

Of the pioneer farmers who broke land extensively and opened farms in Clay County are John and Patrick H. Lamb, Franklin J. Schreiber, S. A. Holmes, Lyman Loring, George M. Richardson, Capt. W. H. New-comb, A. M. Burdick, W. J. Bodkin, Chas. Brendemahl.

Wheat was grown near Abercrombie, on the east or Minnesota side of the river, in what is now Wilkin County, about as early as anywhere in the valley, except in the Selkirk settlement and in Pembina County, North Dakota, then the Territory of Dakota. Probably the first man to sow and harvest wheat in the upper or southern part of the valley was Hon. David McCauley. I append herewith his narrative just as he has given it to me:

D. McCauley: "I came to Abercrombie July 17, 1861, to act as post sutler, postmaster and agent for the Northwestern Transportation Company. In the spring of 1863 I sowed a few acres of barley, planted potatoes, and opened up a garden, which was destroyed by the Indians in August. In the spring of 1864 I crossed over on the Minnesota side of the river opposite to the fort and commenced farming. In 1865 I sowed some seventy-five acres of oats and planted a few acres of potatoes, and continued to sow and plant the same crops until 1871. There was no market for wheat until that time nor until the railroad reached Moor-head or Breckenridge. In the spring of 1872 I put in a few acres of wheat, and have continued the same up to the present time. This season (1899) I raised 10,000 bushels of wheat. In the earlier years the yield of wheat was about the same as now. The land that I cultivated in 1865 has been cropped every year since except three, and the yield in 1899 was as good as I have known it. I know of no wheat being sown in the valley earlier than mine. The following are some of the men who sowed wheat soon after I did: Edward Connolly and Mitchell Robert, Breckenridge; Loure Bellman. J. R. Harris, and J. B. Welling, McCauleyville; Frank Herrick and John Eggen, Abercrombie. In the early days the only market for oats and potatoes was Fort Abercrombie."

Prior to 1878 there were no settlements away from the Red, Red Lake, and Pembina rivers, in the lower or northern portion of the valley, so that in treating of the Minnesota side north of the Northern Pacific railroad it is apparent that no wheat was grown on that side (except near Moorhead) until the completion of the St. Paul, Minneapolis &

Manitoba railroad (now the Great Northern) to St. Vincent, when immigration set in, bringing settlers to many stations, who at once began to break land and sow it to wheat. The district between the railroad and Red river was first settled. It is a fact that none will dispute that the building of railroads into and through the valley has been the most important factor in settling the country and developing the resources of this fertile plain. Without these it would today be practically unpopulated and undeveloped, as it remained for fifty years after the Selkirk settlers had demonstrated its adaptability to cultivation. There might have been a fringe of settlements a long the streams, but without more efficient means for transporting wheat and other agricultural products to market, there could not have been any great development and production.

Another leading factor in settling the country has been the so-called bonanza farms. These demonstrated on a large scale the practicability of producing wheat at a profit on the flat lands of the valley. They advertised the results of great operations and made known to the world the wonderful possibilities of the region. The first of these was the Dal-rymple farm, eighteen miles west of Red river, opened up in 1875 and subsequent years. A brief description of this farm may be of interest. In the year 1875 a number of large holders of the bonds of the Northern Pacific railroad company, supposed to be the Grandin brothers, Messrs. Cass, Howe, and Cheney, who had taken the bonds at par and which were then worth only 10 cents on the dollar, determined to save as much as possible, and exchanged the bonds for a great block of the company's lands in the Red River Valley. In March, 1875, Oliver Dal-rymple, an experienced farmer of Minnesota, examined the land and became convinced of its value for wheat growing. He therefore entered into a contract with the owners to test the merits of the soil, the terms of which contract are understood to be that they were to furnish the stock, implements and seed with which to cultivate the land and were to receive in return seven per cent or the amount invested, Dalrymple to have the option of paying back the principal and interest, at which time he was to be granted one-third of the land. In that year he broke 1,280 acres and his first harvest, in 1876, yielded 32,000 bushels of the choicest wheat, or a little more than twenty-three bushels per acre average. As soon as the results of Mr. Dalrymple's experiment became known, capital began seeking the depreciated railroad bonds and exchanging them for land, and labor flocked from adjoining states to pre-empt government land. In May, June, and July, 1879, the sales of government land amounted to nearly 700,000 acres, and during the year 1,500,000 acres were taken on homestead, pre-emption, and tree claims in Dakota. The Dalrymple holdings comprised some 100,000 acres in all, and in 1878 the wheat acreage had been increased to 73,000 acres; and it was increased from year to year until in 1805 there were some 65,000 acres under cultivation. The cultivated land was subdivided into tracts of 2,000 acres, each tract being managed by a superintendent and foreman, with its own set of books. Each estate had suitable and complete buildings, consisting of houses for superintendent and men. stables, granaries, tool-houses, and other buildings. As a matter of course, to carry on the Dalrymple farm required the services of a large number of men and horses, the use of many plows, barrows, seeders, harvesters, threshers and engines, wagons, and other implements and tools. A settlement was effected in 1896 and years fol-lowing, Mr. Dalrymple taking his share, and the great farm was divided and now comprises, besides the Dalrymple, the Howe and Cheney farms, and perhaps others.

Another bonanza farm of large extent was the Grandin farm, consisting of 38,000 acres, of which 14,000 acres in and around Grandin, and 6,000 acres near Mayville in Traill County, N. D., are now under cultivation. The first crop of wheat was grown and harvested on this farm in 1878. This farm was operated in a similar manner as the Dalrymple farm, being divided into tracts of 1,500 acres, managed by a foreman. The two farms employ some 300 men and 300 horses, and use 100 plows, 50 seeders, 75 binders, 10 separators, and 10 engines, etc. The average yield of wheat on this farm has been seventeen bushels per-acre. In 1899 a severe hailstorm destroyed eight sections of wheat on this farm, which was ripe for the harvest. This was the only widespread damage that has occurred to the crops of the farm in the twenty-one years it has been operated.

There are a number of other bonanza farms on both sides of the river, as the Lockhart and Keystone farms, respectively in Norman and Polk counties, Minnesota, and the Dwight, Fairview, Cleveland, Downing, and Antelope farms in North Dakota. In fact, large farms have been opened in all the twelve counties, farms comprising three to five sections of land. They have served their purpose, and many of them have been reduced or divided and sold.

It is interesting to note the rapid population And wealth that has taken place in the Red River Valley within thirty years. In that time many cities, villages and hamlets have been established and builded, some of which have reached what may fairly be denominated as magnificent and metropolitan. It is hardly needed to name Fargo and Moor-head (one city in a commercial and social sense, although situated in different states, Grand Forks and East Grand Forks, similarly situated; and Wahpeton and Breckenridge, ditto. Pembina and St. Vincent also are somewhat similarly situated, though more distant from each other. Crookston, on the Red Lake river, Hallock, Warren, Ada, Barnesville, in Minnesota, Grafton, Hillsboro, and many others of less note in both states.

In 1870 the population of the twelve counties was about 1,000. In 1880 it was 56,000. In 1800 it was 166,000. In 1000 it is estimated to be 350,000. The valuation of property in the valley in 1870 was zero. At this date is is estimated at not less than $100,000,000; and I am speaking of assessed valuation, which is, as a matter of course, far short of actual valuation.

While there has been a somewhat remarkable development of the wheat-growing industry in the Red River Valley, and it is undisputed that its soil and climate are as favorable as any in the United States, and perhaps in the world, many industrious men have scored failures. Failures occur in every employment, business, or industry; and, therefore, if they have occurred hi raising wheat where the conditions are favorable, it is not exceptional. It is also clear that such failures are chargeable to the mistakes of the men so engaged, rather than to the country. From a long observation of the methods employed and of the equipment of those who have pursued the work, I am of the opinion that the chief cause of failure has been the fact that men have undertaken larger tasks than their means warranted. In the early years of the settlement of the valley men were infected as with a craze. Wheat was selling at a dollar and upwards per bushel, while land could be had by paying the government fees for making entry, or purchased at $5 per acre. Stories of large yields and high prices were circulated, and many believed that they could make themselves rich in a few years by raising wheat. Many embarked in it

on borrowed capital, secured at high rates of interest; and some capital is needed although no payment of money was made in advance on the land. It must be broken and seeded, the crop harvested, threshed, and marketed. To do this requires horses, implements, and hire of laborers. Many men, doubtless, who have commenced in this way have succeeded; but this result has been accomplished by superior skill, economy, good business management, and fortuitous circumstances. By far the greater number have failed in the end. They may have won some success for a year or more, but when they found themselves ahead, greed got the better of their foresight and judgment, and they have contracted for more land and larger equipment. Then a year of light yield, of damage by flood, drouth or frost, and a fall of price in conjunction, have succeeded, which have greatly diminished the value of their harvested crop; while the labor bills, the payments for machinery, the interest on borrowed capital, have piled up, and so the failure comes. If these men had been satisfied to let well enough alone, if they had continued to cultivate what they might have done without hiring much help or buying additional machinery, they would have weathered the unfavorable years, as their obligations would have been small; and as to obtaining a living, there is no question but that they could have done that, though their entire crop was a failure. They could have found work with their horses among their neighbors; they could have cut hay on the wide prairies and have hauled it to market, or found employment sufficient to keep themselves and families, in a score of ways.

It has been the undue haste to get rich, the reaching out and covering more land than they had means of doing, except on borrowed capital, that has been the ruin of so many. This inclination has also had another injurious effect. It has produced for cultivation, careless plowing and seeding, harvesting and threshing at unseasonable times, and general slighting of work instead of thorough, timely and skillful cultivation, which always brings its reward, but the other kind never.

I am of the firm opinion that, whereas the average of wheat produced from an acre of land in the valley is about fifteen bushels per acre, or in some years a little more, it could be raised to twenty-eight or thirty bushels; and that, while there are now produced crops ranging from twelve to thirty bushels per acre, there could be secured thirty to forty bushels almost invariably. I am confirmed in this opinion by numerous instances where small fields which have been especially treated and cultivated, sown to wheat, have produced thirty-five to forty bushels per acre. Thus we have seen pieces which had been cultivated to roots, potatoes, garden vegetables, etc., in previous years, the cultivation of which crops has required deep tillage, frequent stirring of the ground with plow or cultivator, and other pieces which had been seeded to timothy and pastured, being plowed and sown to wheat, have produced thirty-five and as high as forty-two bushels per acre in years when the adjoining large fields did not average more than sixteen or eighteen bushels per acre.

And so the conclusion is drawn that when the valley becomes more thickly settled, the value of land higher, compelling to better cultivation, and in less extensive tracts, no man undertaking to exceed 320 acres, the yield per acre will be increased. When this time comes, it will be accompanied also with more diversified farming. There will be flocks and herds, milk and butter, eggs and fowl, beef, pork and mutton, etc., and then the Red River Valley will be, according to its extent, the most productive region in the whole country.

Along in 1883 or 1884 the price of wheat at Red river points having

fallen to about 60 cents, there was little or no profit in its production, and in many cases a considerable loss, which caused great uneasiness and dissatisfaction among the farmers. They looked about them for some relief, and, as the cost of transporting wheat to the terminal points was the same, namely, 25 cents per hundred pounds, or 15 cents per bushel, as when wheat sold for $1.00 or more per bushel, they were of opinion that the freight charge should be reduced. They thought that the railroad companies might fairly be called upon to share with them some of the loss that they sustained. Appeals to the companies for reduction were without effect. Therefore, the farmers resolved to secure a reduction, and other reforms connected therewith, by political action, and they began holding meetings, where the whole matter was discussed and resolutions passed. A good deal of complaint was also made against the alleged close alliance that existed between the railroad companies, the elevator companies, and the millers' association, by which every producer was compelled to pass his wheat through an elevator and pay its charges for handling, which fixed its grade, and he generally had to sell it to the elevator at such price as the company owning the elevator might give. The farmer wanted the right to load on cars and ship direct to a terminal market. This agitation had its birth in Clay County, and it extended throughout the wheat-raising districts of the state. It was the promoting cause for the organization of the Farmers' Alliance, which afterward became a political party, and evolved into the People's party. It had its effect, and the legislature, in its session of 1885, passed an act, approved March 5, 1885, which regulated railroads and provided for the board of railroad and warehouse commissioners.

Briefly stated, the law provided that the railroad companies should make annual reports to the board of commissioners, showing amount of stock subscribed, amount of assets and liabilities, amount of debt, estimated value of roadbed, of rolling stock, of stations and buildings, mileage of main tracks and of branches, tons of through and local freight carried, monthly earnings for carrying passengers and freight, expenses incurred in running passenger and freight trains, and all the expenses, note of pasenger fare, tariff of freights, and many other minor particulars and things; and the commission was authorized to make and propound other interrogatories relating to the condition, operation and control of railroads in this state as might be necessary, and they were empowered to make investigation, examine books, etc.; and proper penalties were provided for in case of refusal of companies to furnish the information demanded. It also required every railroad company to permit any person or company to build and operate elevators at any of its way stations. It compelled railroads to furnish cars on application for transporting grain stored in any and all elevators or warehouses without discrimination. It prohibited extortion and discrimination in rates, and also empowered the commission to notify any railroad company of any changes in rates, or in operation of roads, that in their judgment ought to be made for carrying passengers or freight, and in case of refusal of the company to make them to institute suit to compel such changes or reductions.

At the same time the legislature passed an act to regulate elevators and warehouses, and for the inspection and weighing of grain. The main provisions of this act may be stated as follows: Declaring all elevators and warehouses at Duluth, Minneapolis, and St. Paul, public; requiring their proprietors to take out license; providing that such elevators and warehouses shall receive grain for storage, without discrimination, to give receipts therefor, to deliver the grain or return the receipt;

requiring the owner or lessee to make and post weekly in a conspicuous place a statement of kind and grade of grain received, and to publish rates for storage; prohibiting the mixing together of grain of different grades; providing for the appointment of a state weighmaster and assistants, who shall weigh grain at points where it is inspected; providing for the appointment of a chief inspector and of deputy inspectors, for the inspection and grading of grain under such rules as the commission shall prescribe, for which inspection a fee shall be collected sufficient to meet the expenses of the service; and providing that the commission shall establish Minnesota grades and publish the same.

Under these laws 'and amendments thereto, it is well known and undisputed that there has been much more freedom in the shipment of wheat and other grain than before. Farmers have since been able to order cars to a side track and load them from their wheat fields, or otherwise, whence they are hauled to such market as they shall designate. The commissioners have, under the law, defined and established grades of wheat, and the inspection is made at the terminals in accordance therewith, and the wheat is also weighed.

The operation of this law seems to have been beneficial and satisfactory for the most part. The season of 1898 was an exception, when it was charged that the grades were suddenly stiffened, by which the producer lost one or more grades, or from 4 to 7 cents in value per bushel of wheat, and that this stiffening was without just ground. These charges also originated, as the agitation for reduction of freight charges had done, in Clay County, and were made an issue in the state election that year; and it is believed that, as Hon. John Lind, the candidate for governor of the Democrats, Populists, and Silver Republicans, championed them, it gave him many votes. They were substantially verified by an investigation made by a joint committee of the legislature.

The freight on wheat per 100 pounds, since the settlement of the Red River Valley, from different primary points to Minneapolis and Duluth has been as follows:

FROM	Various Dates	To Minneapolis			To Duluth		
		Sept. 1 1891	Oct. 9 1895	July 21 1898	Sept. 1 1891	Oct. 9 1895	July 21 1898
Morris	1873 28c.	12	12	12	45	15	14 ½
Breckenridge	1872 35c.	14	14	13	15	15	14 ½
Crookston	1880 27c.	16 ½	16 ½	14	16 ½	16 ½	14
St. Vincent	1880 35c.	18	18	16	18	18	16
Moorhead	1881 25c.	15 ½	15 ½	14 ½	15 ½	15 ½	14 ½
Fargo	1881 25c.	15 ½	15 ½	14 ½	15 ½	15 ½	14 ½
Glyndon	1881 25c.	15 ½	15 ½	14	15 ½	15 ½	14
Fergus Falls	1881 23c.	14	14	13	14 ½	14 ½	14

Since the first wheat was grown in the Red River Valley, a revolution has occurred in plowing, seeding, harvesting, and threshing. By the old method of plowing, with the best plow and horses, one man with 14-inch walking plow and a pair of good horses, might plow two and one-half acres of land in a day. Now one man with a gang plow, turning 28 inches, and drawn by four horses, can plow four and one-half acres. The area is not quite doubled for the reason that the speed is somewhat slackened by increased weight, the driver riding on the plow, thus rendering the labor much easier to him.

By the old method of seeding by hand one man could sow sixteen acres in a day, and the land had to be harrowed and dragged, often with tree tops, to smooth it. Now, with a drill, drawn by four horses, one man will put in twenty-five acres, and no harrowing is necessary afterward, although many harrow the land previous to seeding.

By the old method of cutting grain with a cradle a good man could cut four acres, while it required another man to rake and bind it. Now, with the best binder, drawn by three horses, he can cut sixteen acres, and the machine binds it and carries along a number of bundles and drops them in rows.

In threshing there is even more disparity in the amount accomplished by modern machinery over old methods. In fact, the difference is so great that a comparison is not worth while. With the host and largest threshing machine, 3,500 bushels of wheat can be threshed in a day. Thus, on land producing an average of twenty bushels per acre, one day's work will thresh the wheat grown on 175 acres. The area of land covered in a day will be more or less than this, according to the average yield per acre. To operate this machine, which is provided with a self feeder and an automatic band-cutter, also a blower which stacks the straw, only four men are required. To haul the bundles to the machine requires eighteen men and twenty horses, or ten wagons, two horses to each. The number of men and horses and wagons required to do hauling of the threshed wheat from the machine to the granary, elevator or cars, depends upon the distance to be traversed. It costs at the present time 10 cents per bushel to thresh the wheat and load it into wagon tanks.

WHEAT PRODUCTION, 1898

I have gathered the statistics of wheat average and yield for from the most reliable sources obtainable, namely, from the county auditor's office of each county. Some of the officers reported that the statistics on this head as furnished by the assessors were not full, owing to the failure of some of the assessors to make returns, but in these cases, at my request, the auditors furnished me with estimates based upon other sources of information, so that, while the figures in the following table cannot be claimed to be absolutely correct, they approach accurately, and it is believed are in no case excessive:

Here follows the table by counties:

Minnesota	Acres	Bushels.
Wilkin	126,418	1,896,270
Clay	210,440	1,367,040
Norman	166,377	2.418,062
Polk	347,346	4,862,844
Marshall	186,716	2,614,024
Kittson	142,857	2,000,000
_____	1,180,154	17,178,840

NORTH DAKOTA,

	Acres	Bushels
Richland	226,720	3,057,714
Cass	495,499	7,916,896
Traill	271,907	5,371,129
Grand Forks	329,498	5,676,322
Walsh	257,500	3,960,175
Pembina	258,211	4,956,680
	1,839,355	30,938,916
	1,180,154	17,178,840
	1,839,335	30,938,916
	3,019,489	48,117,756

Assuming that the average price of wheat for the year's crop at points of production was 60 cents per bushel, the value of the crop for 1898 to the producers was $28,870,653. It is fair to assume that the entire crop was sold, so that this sum measures the wealth-creating value of this one staple for the year named. I say it was all sold. I am led to this conclusion by the following reasoning: It is estimated that about one-tenth of the year's crop is retained for food and seed. At first blush it would be thought that I should deduct one-tenth. But it will be seen upon reflection that this would be erroneous, as in some year previously the amount for flour and seed was reserved, and once having been reserved, it would not be necessary to do so again. For example: If the three Northwestern states produced a crop of 150,000,000 bushels in 1887, one tenth is 15,000,000 bushels, If there had been reserve of 15,000,000 bushels in the previous year and another tenth of the new crop should be reserved there would be 30,000,000 bushels of such reserve in 1898, and this would be double of amount needed. The fact is that enough for flour .and seed has been accumulated in former years, and the entire crop, (or its equivalent amount) can be sold each year, and still its reserve will be kept intact.

But this is not the whole story. The wheat farmers of the twelve Red River Valley counties have produced a greater value. They have .added a much larger amount than nearly twenty-nine million dollars to the wealth of the country. I assume that this entire crop has been transported either as wheat or flour to New York. All of it has not, as a matter of course, actually been carried direct to New York, but a large part of it has been carried to that port, either for domestic consumption or for export, and it is fair to assume that it would cost, on the average, as much in local freights and handling charges to distribute that portion to the consumers throughout the country as to carry it through to New York. The cost of carriage to New York by all-rail is about 24½ cents per bushel, partly by rail and partly by lake and canal it is about 20¼ cents. Basing the calculation on a rate of 21 cents, arbitrarily found, for it is difficult to figure on an average rate for the year accurately, owing to the fluctuations in the lake and canal rate, or to ascertain the amount shipped by that route and the amount shipped by rail, the added value is $10,104,-728. This increased value is properly assigned to the wheat, for the wheat pays the whole cost of marketing it. This large sum of ten million dollars has been earned by the railroads, elevators, inspectors and weighers, boats, transferers, etc., which have given employment to large numbers

of men, and thus the wheat produced by the farmers of the part of the Red River Valley in the United States in 1898 added to the wealth of the country some thirty-nine millions of dollars, and in the year 1899, just past, it is probably nearly as much.

An explanation is needed, however, as to the actual cash price received by the producers for their crop of wheat for the year 1898, I find upon a careful examination of the price paid at Moorhead that the average price for the year was about 57 cents per bushel; that its average price for the four months of September, October, November, and December, 1898, was 55 cents; and for the remaining eight months of the year, from January to August, 1899, the average price was 59 cents, making an average for the year of 57 cents per bushel. It is a fact which must be recognized that the producers in the section I am treating of sell the bulk of their crop in the four months prior to January 1; so that I will make the calculation of value of the crop produced in the twelve Red River Valley counties on this basis of its average local price for that period, which shows as follows: 48,117,756 bushels at 55 cents is $26,464,765.80. This is the minimum amount of value, as, for such part of the crop as was sold by producers after January 1, 1899, 4 cents more per bushel on the average was realized. This explanation does not affect the foregoing argument so far as it relates to the increased value of the wheat at points of consumption and export, all of which must be included in any calculation as to the wealth-creating value of the crop.

I have mentioned Charles Cavalier, of Pembina, who has taken great interest in my labors in gathering materials for this paper, and who has given me much valuable assistance. In further acknowledgment thereof, and in compliment to him, I desire to embrace herein a portion of a recent letter of his to me as follows:

"It would be a pleasant thing for me to be present with them [meaning this annual meeting of the society] and see some of the old faces of fifty years ago, but alas, the infirmities of eighty-one years forbid it. Present my respects to them, and tell them that, though far away, I am with them in mind if not in body. I still keep up an occasional correspondence with my old friend A. L. Larpenteur, and through him I hear from Bill Murray and others of the old timers, and I see occasionally the name of ex-Governor Ramsey, for whom I have a high regard and a warm spot in my heart. He appointed me first territorial librarian, and has in many instances aided and befriended me. May he live until he learns to enjoy the good things of this footstool of God's, and then, after his life of usefulness and goodness, tranquilly fall asleep and awake in the kingdom prepared for him and all of us who have kept God's commandments or tried to do so. Such is the wish of this old settler whose mundane existence of close onto 81 years has been one of pleasure and enjoyment far exceeding its many ills and misery. My health is now tolerably fair."

I have not found it practicable to treat wheat-growing as a statewide industry, owing to its magnitude, and have confined myself strictly to the subject assigned to me, which has necessitated as much labor and research as I have been able, while editing a daily and weekly newspaper, to devote to it. With more abundant leisure I might properly have touched upon the expensive prairies of the state, both level and rolling, and told something of their productions, not only of their wheat, which makes the best bread ever eaten by man, but of their rye, oats, barley, corn, flaxseed, and potatoes; of their green meadows, which abound with luxuriant grass and furnish food and countless flocks and herds, and of the

Minnesota cow, whose milk, after being treated in the creameries, makes the very best butter known to civilization; of the fruit orchards, gardens, flowers, shrubbery, etc., together with the neat and cozy dwellings that dot them o'er and are the homes of a hardy, happy and prosperous people. I might have touched upon the great extent of forests, from which have been taken so many millions of feet: of the best white pine and hardwood lumber, adding largely to the wealth of the state, and yet not exhausted. I might have told of the iron mines, which, for richness and extent, have been one of the marvels of the closing part of the nineteenth century, and art: yet:, maybe, to exceed the most sanguine expectations of enthusiasts; of the mighty river having it rise in out state, whose commerce has been so great a factor in the making of the history of the North American comment, and advancing its civilization; and of the smaller rivers, which are interesting in other ways. I might have dwelt at length upon the surpassing beauty of, the state's landscape, whose ten thousand lakes are bordered by a superb growth of primeval forest timber, through whose foliage the pure air of a wholesome climate sings a ceaseless lullaby to exhausted humanity, which seeks quiet and rest upon their bosom. In these lakes the finny tribe leap and splash and entice the skill of the expert angler, as well as the efforts of the novices, affording the most exquisite enjoyment and the most health-giving and recuperative recreation that man is blessed with, and whose skill, good luck, or patience, is rewarded by the catch of as good fish as swim. And, lastly, I might have said that this great, resourceful-and fertile state of ours, at the age of fifty years, contains a population of nearly two millions of as intelligent, generous, brave and at the same time gentle, as industrious, progressive and patriotic people, as there can be found in any state in all this broad land.

G. S. Barnes is one of the pioneer farmers of the valley. At an early date he engaged in the mercantile business at Glyndon, and also branched out later as a dealer in grain, eventually becoming the president of the Northern Pacific Elevator Company. He commenced growing wheat among the earliest, on hind situated along the Northern Pacific railroad about three miles west of Glyndon, and possessed himself of some 4,000 acres of land, 1,280 acres of which is under cultivation. His farm is perhaps one of the best equipped and managed of any in the country, and his crops of wheat have equalled in yield and finality the very best. Mr. Barnes has paid much attention also to cattle and horses, and has long borne the reputation of possessing the best thoroughbred horses and cattle of any man in the county, or valley for that matter. He has over 280 head of horses and 300 or more head of cattle, and to him as much, perhaps, as to almost any other man, credit is due for becoming an example to the hundreds and thousands of farmers in the valley who have profited by his experience and businesss-like and intelligent methods.

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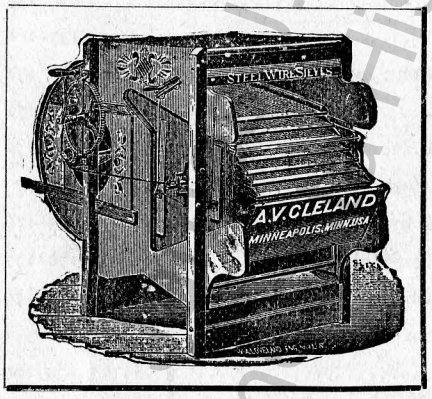

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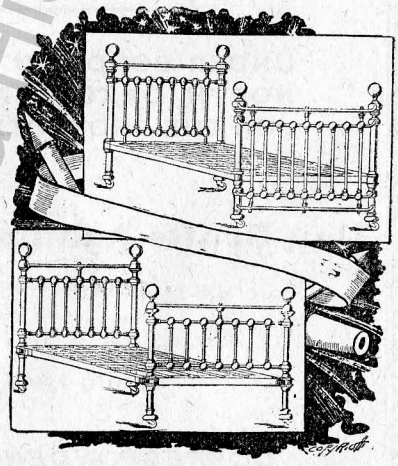

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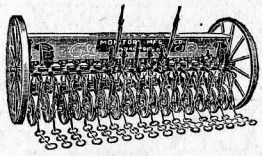

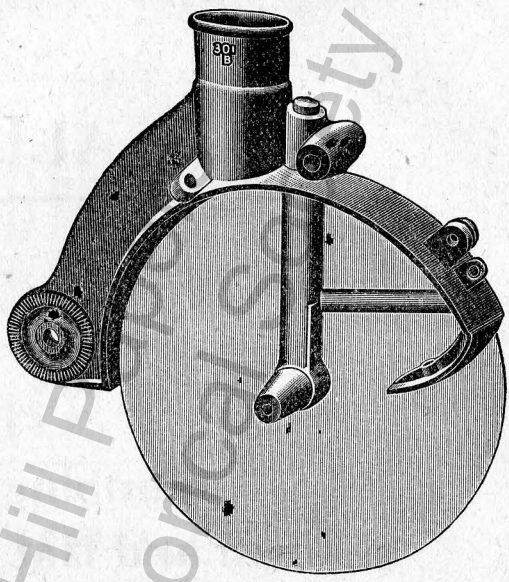

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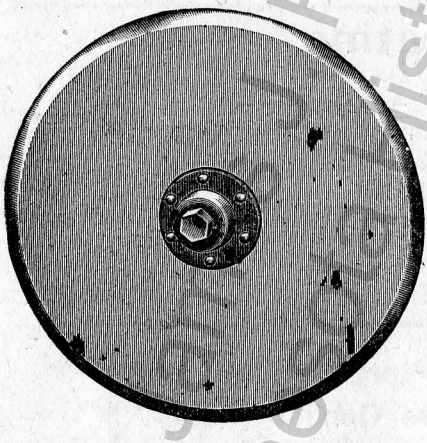

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