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Wisconsin Farmers' Institutes

Madison, WI: Western Farmer Co., Printers and Publishers, 1889

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MADISON, - WIS.



WISCONSIN

Farmers' Institutes

1889.

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BULLETIN No. 3.

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EDITED BY

W. H. MORRISON, Superintendent.



MADISON, WISCONSIN.

1889.

WISCONSIN

Farmers' Institute

WESTERN FARMER CO., . . .  
PRINTERS AND PUBLISHERS, .  
. . . . . MADISON, WIS.

W. H. MORRISON, Superintendent



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# Wisconsin Farmers' Institutes—1889-'90.

<i>Town or Cities.</i>	<i>Counties.</i>	<i>Dates.</i>
Seymour .....	Outagamie .....	Nov. 19, 20
Colby .....	Clark .....	Nov. 19, 20
Medford .....	Taylor .....	Nov. 21, 22
Waupaca .....	Waupaca .....	Nov. 21, 22
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River Falls .....	Pierce .....	Dec. 2, 3
Menomonie .....	Dunn .....	Dec. 4, 5
Hammond .....	St. Croix .....	Dec. 4, 5
Durand .....	Pepin .....	Dec. 6, 7
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Grand Rapids .....	Wood .....	Dec. 12, 13
Ono .....	Pierce .....	Dec. 17, 18
La Crosse .....	La Crosse .....	Dec. 17, 18
Fountain City .....	Buffalo .....	Dec. 19, 20
De Sota .....	Vernon .....	Dec. 19, 20
Baraboo .....	Sauk .....	Dec. 23, 24
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Lone Rock .....	Richland .....	Jan. 2, 3
Stoughton .....	Dane .....	Jan. 2, 3
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## PREFACE.

---

The farmer is the object of a great deal of solicitude in this day and age. A great many men have a message for him. He is made the subject of a great deal of gratuitous advice. If he fails to benefit by this advice or grow quickly to the full measure of his stature as a producer of food, and a citizen, it certainly will not be for a lack of self-sacrifice on the part of society in his behalf.

The foregoing is not written in a spirit of sarcasm, although much that is said and done for the farmer needs to be satirized, for the farmer himself is being farmed by interested parties. The fact remains, however, that there never was a day of greater activity among the forces of society for the enlightenment of the farmer than the present day.

The very first difficulty that is confronted is the greatest of all. It is the question, "How shall the farmer be reached?" We do not mean the intelligent, progressive farmer. He reaches himself and does not depend on others to think for him. He constantly seeks food for better thought and judgment by virtue of his own force. He is constantly in the knowledge market ready to buy what he wants.

It is the average farmer that society is after just now. Of necessity he stays at home most of the time. Of necessity he works hard early and late. He thinks he has no time to look about and see if there is not a better and more profitable way of doing his daily work. The work is there right on top of him every day, and so he does the best he can and toils along in the same old way, working hard and getting little pay for his labor. It is the general conviction of these facts that has caused such a quickening in society in his behalf.

Now this average farmer must be reached in some way. How shall it be done? He is the mountain. He cannot go to Mahomet. How shall Mahomet get to him?

The great object is to reach him and create in him a hunger for more and better knowledge. Two great facts confront this average farmer and silently, like the forces of light and heat, they have been making his kind of farming more and more difficult.

First, under the natural law of competition, his products have been gradually growing cheaper while he has taken but little pains to keep pace with this decrease in price by studying how to reduce the cost of production. With him it is less and less money each succeeding year, and still the same expense for production.

Right here step in a lot of advisers who tell him that the cause of all this lies in railroad extortions, or the tariff, or trusts, or monopolies. Scarcely one will tell him that the reason of the fact lies in himself. It is so easy for the unsuccessful man to cast the blame upon everything except himself. He has not kept pace with the world; he has been jogging along in old ways and methods until

old ways and methods will no longer produce a pound of grain, or butter, or cheese or meat or wool, cheap enough to meet the price and leave any profit. This average farmer is a manufacturer of food, and he must wake up and use a manufacturer's brains, and close economies in production, or he will be worse pinched in the future. There is no hope for old methods. The world is bound to have cheap food, and the world is right. The success of the brainy, progressive farmer in producing it and that, too, at a profit, shows it can be done.

The second great fact that is troubling this average farmer is the loss of fertility in the land he tills. Here is the upper and nether mill-stone between which he is being ground: *Less price and less productive power in his land.*

No wonder he squirms. No wonder he looks eagerly from Doctor Anti-monopoly to Doctor Anti-trust or Doctor Free Trade, and asks: "Have you no remedy for my deep distress?" Plain old Doctor Common-sense tells him he must stop this ruinous way of doing things; that he alone is to blame for the situation and not outsiders. He tells him that the land is poor because he has made it so, and not the railroads or the tariff. He tells him that it takes more brains to make a profit at any kind of farming than it did in times of high prices and more productive soil, and that he must adapt himself to the changed order of things. *All* this he tells him, or would tell him if he could only get his ear and attention. Therefore, how shall this farmer be reached? is the important question of the hour.

We believe that the most practical and successful method of reaching him is through Farmers' Institutes, and meetings of like character. The two hundred and forty two days' meetings held by the Wisconsin Farmers' Institutes, have done more to reach the great mass of unreached farmers in this State, in the past four years, than all other agencies of society combined. These meetings have implanted a hunger for better intelligence in thousands, where it but feebly existed before. A wonderful amount of daylight has been let into dark places. The conceit of ignorance has been driven out and the dry rot of stupid indifference banished to an extent that is wonderfully encouraging. The agricultural journal, the agricultural book, the agricultural college and the experiment station are for the men who read, study and think. Let the Farmers' Institutes have their perfect work first and these will follow. In this way shall the average farmer be reached.

## LETTER OF TRANSMITTAL.

---

HON. GEO. H. PAUL,

*President of Board of Regents, University of Wisconsin:*

I have the honor of presenting to you Bulletin No. 3, Wisconsin Farmers' Institutes. An edition of 31,000 copies has been issued and will be distributed to the farmers of the State free.

Early in September I addressed a circular letter to many of the leading men of Wisconsin, and to a few of the most prominent agricultural thinkers who have assisted at some of our institutes, the following questions:

Have the Farmers' Institutes been of any benefit to the farmers of your county? Have they aroused a spirit of inquiry for better work, and for more systematic effort? Has your observation led you to note that the most intelligent and successful farmers attend and take part in these Institutes, and invariably have faith in their business? Do you think they have a tendency to advertise and popularize our State University? Have they given our State a prominence abroad?

I append the following letters.

W. H. MORRISON,  
*Superintendent.*

*Madison, Wis., Nov. 1, 1889.*

---

MR. W. H. MORRISON — "Judging from the list of your institutes for 1889-90, there seems to be no abatement of effort on the part of those who have made the Wisconsin Farmers' Institutes not only the pride of the State, but factors of active power for the betterment of the condition of the farmers throughout the whole continent. I came back from the Wisconsin Institutes to Canada with a new inspiration for endeavor on behalf of our farmers here, and also with an increased store of information for their benefit.

"The published annual report of your Institute work is the best compendium of crisp, living thought on practical agriculture that has come into my hands, and through the medium of the agricultural press, its contents are touching the reading farmers in all English speaking countries. Largely through the agency and aid of Farmers' Institutes, agriculture is beginning more fully to offer scope for the exercise of the powers of the most ambitious and talented young men in all highly civilized lands. You are engaged in a truly good and ennobling work. I wish you God speed."

JAS. W. ROBERTSON.

*Ontario Agricultural College, Guelph, Ont., September 23.*

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MR. W. H. MORRISON — "To all the above questions I unhesitatingly and most emphatically answer, yes.

"The design of the Institutes was to awaken an interest in farming, and to impart practical knowledge in its various branches. And in both of these directions the success has been greater than their most sanguine supporters dared to

hope. It was supposed that after they had ceased to be a novelty the interest in them would decline, but from personal observation I think the attendance during the last winter was uniformly larger, and the interest better sustained through the entire session than when first started.

"As to the State University, only a few years ago a feeling of antagonism was almost universal among the farmers; but the attendance of Professors Henry and Babcock, and their teachings, together with the work of the Experiment Station, has produced a marked change; and to-day the State University of Wisconsin may reckon among its staunchest friends the better class of farmers through the entire State.

"The almost universal sentiment is, I believe, that in no other way could so small an amount of money have been used with such good results as that expended in Farmers' Institute work; and all are looking forward to the meetings of the coming winter with increased interest."

CHARLES R. BEACH.

*Whitewater, Wis., Oct. 4.*

MR. W. H. MORRISON — "While it is true that I did not have the opportunity of visiting your State the past year of Institute work on account of other engagements, I have remembered with pleasure my brief experience during the course of the work for 1887-88. I have thought it over and over again with increasing favor. The work is so practical and, withal, covers so much ground, that I do not wonder at all that halls were crowded, in many places almost to suffocation. If the farmers of your State fully understood the character of the work being done in the holding of your Institutes, they would have to be multiplied a hundred-fold to accommodate the attendance. No farmer, fruit grower or the breeder of any kind of live stock, can afford to neglect attending your Institutes. They have an uplifting influence that will be developed more and more as the work progresses. They are in fact so many schools in which the experience of the life time, almost, of practical men is handed out without money and without price, to aid those in attendance in achieving better success in life.

"I sincerely wish that your work for the season, just beginning, may be marked for the increasing interest attending it, and I shall expect to hear from time to time a good report from the leading State in the Farmers' Institute work."

J. J. W. BILLINGSLEY.

*Indianapolis, Ind., Sept. 19.*

MR. W. H. MORRISON — "I have often had occasion to tell the story of that farmer, out in Buffalo County I think it was, in your State, who came to the Institute on horse-back and became so much interested that he walked home, two miles, and never once thought of his horse until he missed him from his stable, when doing his chores. If the Institute did not help that man, I am no judge. If there were not thousands of others stirred up and helped, I am greatly mistaken.

"I consider your Institutes models, as conducted, and would that every State could be roused up to do as well."

T. B. TERRY.

*Hudson, O., Sept. 16.*

MR. W. H. MORRISON — "I have, as you know, followed the Farmers' Institute work with special interest and attention, not only in Wisconsin, but in sev-

eral other States. To say that I regard the work of this particular feature of our intellectual progress as the most important now going on in our midst, and that nowhere is it more energetically and more practically carried on than in Wisconsin, is simply to re-iterate what I have often said before in the agricultural journals with which I have been connected. Lest the first statement, so briefly and strongly put, should seem to some who have not given the subject the attention it deserves, to be exaggerated, I would add an expression of my conviction that without the Institute work, the Agricultural Colleges and Experiment Stations would never reach the people they are designed to serve; the intellectual development of the farmer and the practical application of science to agriculture would thus be arrested. Now, in considering this fact, let it be borne in mind, that the farmer class represent nearly one-half the active workers in our great American hive, and, probably, in view of their larger families, more than one-half the population, and that the prosperity of all other industries is contingent on theirs, and I think my estimate of the importance of Institute work will no longer appear exaggerated.

"It gives me great pleasure to congratulate you upon the gratifying progress going on steadily from year to year in the work under your charge — work which must greatly inure to the greatness and prosperity of your beautiful State."

GEO. WM. HILL.

*U. S. Department of Agriculture, Washington, D. C., Sept. 16.*

MR. W. H. MORRISON — "We are pleased to receive notice that the farmers of Juneau County are to be favored with one of your valued Institutes, the coming winter.

"It is indeed astonishing to note the change in methods and system among our farmers, during the past three years. Since these Institutes have come among us, people who worked in the pinery winters, and regarded their farms as a place to while away their time summers, until the snows again fell, have suddenly realized that the farm can be made a comfort and a home, and that, by proper attention and management, it could be made to pay handsome returns. They have suddenly acquired an interest and liking for the business, and are pushing into improved stock, dairying, small fruits, bees, etc. The result is that their farms are working right up in fertility, and are yielding crops of all kinds, which a few short years ago were not dreamed of. The farmers themselves are getting out of debt, and are on the road to independence and affluence. We credit the Institutes with sowing the seed and pointing out the way to this result. As you must remember the universal attendance of our people at the Institutes each year, and the interest with which they grasp each idea and suggestion advanced, you will not be surprised when I tell you that they did not stop there content with the Institute work alone, but organized farmers' clubs and held regular meetings, and kept right on reaching after knowledge and comparing notes and ideas, with the result as stated.

"It is indeed the best work the State University ever did, and the best paying investment the State ever made, so far as this community is concerned, and we notice with pride the exalted position the State is taking as an agricultural people abroad, since this work has been in progress. Long live the Farmers' Institutes."

W. H. H. CASH.

*New Lisbon, Wis., September 20.*

## LETTER OF TRANSMITTAL.

MR. W. H. MORRISON — "As far as I can judge, the Farmers' Institutes have been of great benefit to the farmers in this vicinity. We had a good attendance at the one held here two years ago, and all the best farmers in the immediate neighborhood were there. I also noticed thereafter, in our Grange, a continuance of discussion of ideas advanced there.

"This State has an undoubted lead in Institute work, and Mr. Charles Dudley Warner's article in Harper's Magazine, has given the subject notoriety throughout the whole country.

"I have received letters from my old home in New Hampshire, asking about them, and I reply that it is the best thing we have; that it increases our knowledge, our crops, and the the general intelligence and welfare of our people, and elevates the whole tone of thought of the farmers who attend."

*Waterloo, Wis., Sept. 23.*

MRS. J. A. CLARK.

MR. W. H. MORRISON — "I have no hesitation in saying that, in my judgment, Farmers' Institutes as conducted by you in Wisconsin, are of more moment and fraught with more benefit to the farmers than any other educational system that could possibly be adopted. These Institutes have already been the means of advancing Wisconsin to the front of all her sister States in progressive agriculture. It is fortunate that you have such men as ex-Governor Rusk and Governor Hoard to lend helping hands in the noble work."

*Minneapolis, Minn., Sept. 16.*

JOHN H. STEVENS.

MR. W. H. MORRISON — "I desire to bear testimony to the remarkable success that has attended the Farmers' Institutes held in this vicinity.

"The plan of calling forth the experience and wisdom of the farmers in each locality has added greatly to the profit and interest of these meetings, and so great has been the enthusiasm that the size of the gatherings has been limited only by the capacity of the audience rooms.

"The best feature of the Institutes is their power to produce practical results, and I believe that the first series of Institutes led to more improvements in dairy methods, to the purchase of more blooded stock, to the building of more silos, and, in short, accomplished more good than could have been achieved by any other agency.

"The farmers have responded with an enthusiasm and ability for which I had not given them credit. It reminds me of the days of the civil war when the common people rose so grandly to meet the needs of the nation. If we continue to build on this broad and solid foundation of facts and experience, and make the Farmers' Institute a part of our national life, we shall elevate American farming to its rightful place, as the highest and noblest of all the sciences."

*Burlington, Wis., Oct. 2.*

F. B. NORTON.

MR. W. H. MORRISON — "I deem it a privilege to be able to add my testimony to the expressed opinions of others, regarding the value of the Farmers' Institutes as a bettering influence throughout this State. My experience in Institute work in this county has been inconsiderable, but in the counties of Trempealeau, and



La Crosse, for the past four years, I have taken an active interest in the work, and it has been demonstrated to me beyond the possibility of a doubt that the Farmers' Institutes conducted by yourself in this State, have exerted a wonderful power for good. The knowledge they have diffused has been a revelation to even the best and wisest farmers of the State. They have given to farmers a new interest and life in their work, and have done much to encourage and exalt the business of agriculture, conserve fertility, improve our live stock, produce and increase better farm products, infuse system and business principles into farming, and at the same time develop a citizenship of thought and intelligence, of ownership of land and home, than all the other forces and influences combined, which have had in any way to do with our agricultural prosperity. In short the Farmers' Institutes have caused two blades of grass to grow where but one grew before; they have vastly increased the productive qualities of every cow and every acre of land in the State; they have enlightened and made contented the farmers in my opinion, and brought dignity and profit to the profession.

"Five years ago there was not a successful creamery or cheese factory in Trempealeau County. To-day there are seven successful factories of this kind, and the dairy production of the county has been more than doubled. I believe the channels of usefulness for the Farmer's Institutes in this State are numerous and important, and that they should be encouraged and fostered, to the end that their usefulness and value may be increased."

F. F. MORGAN.

*Cumberland, Wis., Sept. 26.*

Mr. W. H. MORRISON — "For two years we have watched the work of the Institutes as carried on in your State; first by a study of the papers presented at them and the discussions that followed, as they appeared in agricultural journals, then by mingling with your farmers at agricultural, horticultural and stock meetings, and lastly by attendance at an Institute. By the first we were impressed with the vast amount of valuable information brought out. By the second we noticed the broad views and high aspirations of your agriculturists, obtained through the Institutes. By the third we were more than ever thoroughly convinced that there is nothing that tells upon men so much as personal experience. The man who can say, "I have done it," is the man whose words tell. What the farmer of to-day wants is experience, not theory, and that is what the Wisconsin Institutes, more than those of any other State, give its farmers. It is my earnest wish that the coming winter may add new success to that already attained by the Institutes of Wisconsin — the pioneer in this grand work."

W. B. LLOYD,

*Associate Editor Farm, Field and Stockman.*

*Chicago, Ill., Sept. 17.*

## LAW PROVIDING FOR AGRICULTURAL INSTITUTES.

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*The people of the State of Wisconsin, represented in senate and assembly, do enact as follows:*

SECTION 1. Section 1, chapter 9, laws of 1885, is hereby amended, by omitting from said section the words, "in the months of November, December, January, February, March and April in each year," where they occur in the fifth, sixth and seventh lines thereof, so that said section, when so amended, shall read as follows: Section 1. The Board of Regents, of the State University, is hereby authorized to hold institutes for the instruction of citizens of this State in the various branches of agriculture. Such institutes shall be held at such times, and at such places as said board may direct. The said board shall make such rules and regulations as it may deem proper for organizing and conducting such institutes, and may employ an agent or agents to perform such work in connection therewith, as they deem best. The course of instruction at such institutes, shall be so arranged as to present to those in attendance, the results of the most recent investigations in theoretical and practical agriculture.

SECTION 2. Section 2, chapter 9, laws of 1885, is hereby amended, by striking out the words, "five thousand dollars," where they occur in the fourth line of said section, and inserting in lieu thereof the words, "twelve thousand dollars," so that said section, when so amended, shall read as follows: Section 2. For the purposes mentioned in the preceding section, the said board may use such sum as it may deem proper, not exceeding the sum of twelve thousand dollars in any one year, from the general fund, and such amount is hereby annually appropriated for that purpose.

SECTION 3. This act shall take effect and be in force, from and after its passage and publication.

Approved March 16, 1897.

## SHORT COURSE IN AGRICULTURE.

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The University of Wisconsin has provided a special course in Agriculture, to accommodate those young men who desire to gain a better knowledge of the science underlying successful agriculture but who can give only a limited time to such preparation. For the accommodation of such students the term opens January 6, 1890, and lasts twelve weeks.

The facilities now provided to make this an intensely practical and profitable course for young farmers are greatly superior to those offered in previous years.

A reading room and library have been provided in which students will find the standard works on agriculture and files of seventy of the leading agricultural periodicals, nine of which are from Europe. The lecture room is provided with an electric light so that lantern slides illustrating the lectures may be used.

The famous *Auzoux* life size model of the horse, which can be dissected to show the separate muscles, nerves, blood vessels and bones, will be used to illustrate the lectures on anatomy.

A new feature, added this year, and one of great practical importance is

### A COURSE IN PRACTICAL DAIRYING,

under the supervision of Dr. Babcock and Mr. E. M. O'Connell. This will consist of practical work in the new dairy house, combined with lectures and laboratory work.

Mr. O'Connell has studied with Prof. Robertson, of Canada, and during the past season has been giving instruction in dairying to the cheese makers of Sheboygan County, under the auspices of the State Dairymen's Association; Hiram Smith regards him one of the best practical cheese makers in the State.

Through an increase in the corps of instructors and more ample accommodations than heretofore, it has been found possible to so expand the course as to offer the student work ample for two terms, from which he may elect such subjects as, in his judgment, may seem best for the time, and still have fresh work to which he may return another year should he so desire.

The course embraces the following:

Sixty lectures, mainly devoted to the feeding and breeding of live stock, by Prof. W. A. Henry.

Sixty lectures on the elements of agricultural chemistry, by Dr. S. M. Babcock.

Sixty lectures on horticulture and economic entomology, with laboratory work, by Prof. E. S. Goff, embracing propagation, planting, cultivation, pruning, marketing, harvesting and preserving fruits; the growing of vegetables; the formation and care of hot beds; the culture of flowers; the principles of land-

scape gardening; how to grow, cure and preserve seeds; the principles of selection and the art of cross-fertilization; also the classification of insects, the principal injurious and beneficial insects, with means of preventing insect ravages.

Forty lectures on the leading principles underlying the cultivation of soil drainage, farm machinery, fences, etc., accompanied by laboratory exercises; together with twenty lectures on the physical features of the climate, and meteorology of Wisconsin and the United States, by Prof. F. H. King.

A course in shop-practice involving the use of wood-working tools and the forging of iron, by Supt. C. I. King.

Thirty-six lectures on the anatomy of domestic animals, by Dr. V. T. Atkinson, State Veterinarian.

The expenses of the term need not exceed \$70.00 for fees, books, board, room and washing.

This course opens January 6, 1890, and lasts twelve weeks.

No examinations will be required, but applicants must be not less than sixteen years of age and have a common school education.

For further particulars, address

PROF. F. H. KING,  
*Madison, Wis.* e

# Closing Farmers' Institute—1889

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**Waukesha, Wis., March 26-28.**

Young Farmers' Institute

Waukesha, Wis., March 1904

## SMALL FRUITS ON THE FARM.

By C. H. HAMILTON, Ripon, Wis.

**Start a Fruit Garden.**—Set apart a good, liberal piece of ground from your farm for a fruit garden, and give it good protection, by putting a fence around it so that there will be no danger of pigs getting in and despoiling your labor. Fruit on the farm is a subject of great importance—one which the average farmer does not pay the attention to he ought, and he will never know how mean a man he has been to his wife and family until he comes to have the supply of fruits which he may have by a very small outlay of expense and labor. From the middle of June to the first of October he may have for his table fresh fruits picked from the vines, and plenty to put up in cans to use until the fruit season comes again.

**Preparing the Ground — Planting.**—Prepare the ground well, by applying a liberal supply of barn-yard manure. Plow and harrow it thoroughly, until all the lumps are pulverized, for labor bestowed on the land before plowing can be done with greater ease than after. What shall we plant to secure a grand succession of fruits, from early summer until fall? Strawberries, raspberries, red and black, blackberries, currants, gooseberries and grapes.

**Strawberries.**—For strawberries don't undertake to set all you may read about in the different catalogues. Let the prosperous fruit-growers experiment with the newer and expensive varieties, and you may learn from them which are best for you. Quality of soil has a great deal to do with the success of

many varieties. What may do well and thrive on one kind of soil may be entirely worthless in another section where there is different soil. The Wilson, Crescent, Captain Jack, Manchester, and many of the old and tried sorts will give you an ample supply of delicious fruits, if well taken care of.

Plant your strawberries, as well as other fruits, in rows so that they may be cultivated with the help of horse and cultivator. Plant in rows,  $3\frac{1}{2}$  to 4 feet between the rows, and the plants  $1\frac{1}{2}$  to 2 feet in the rows.

Frequent and thorough cultivation will pay you, and when cold weather comes on, cover them with some coarse marsh hay, or cornstalks. Remove the same early in the spring.

I think the surest way to have a good crop of fruit every year is to set a new bed each spring. Be careful in the selection of your varieties to get staminate kinds to set along with your pistillate varieties. For example, in setting the Crescent, which is a pistillate, set the Wilson. Some are of the opinion that the expression, "Give them Jessie" was well carried out in the poor success they had with this variety. I have yet to hear of satisfactory results on sandy soil, while with me, on my prairie soil, it has proved quite satisfactory, yielding large, fine, luscious berries.

**Raspberries.**—Plant raspberries in rows, not nearer than 6 feet between rows and 2 feet in the row. Give them good cultivation, and attend to cutting back the new growth so as to make a

low stocky bush, with fine, strong branches. The red raspberries are, as a class, great to sprout, and you need to keep them in rows, generally in a continuous row; but be sure to keep a right-of-way between the rows, so you can cultivate.

**Blackberries.**—Blackberries should also be planted in hills 3 feet apart in the row, and the rows 7 feet apart. Give them good care, the same as all your other fruit; endeavor to keep them in hills. Pinch them back, and don't let the main stalks grow over  $2\frac{1}{2}$  to 3 feet in height; support them by wire on each side and stakes every 20 feet; lay them down in the fall, and cover them with earth.

**Currants.**—Currants can be as easily grown as potatoes. Set them in rows 6 feet apart and  $3\frac{1}{2}$  feet in rows; this will apply to the gooseberry also. Both are subject to the attack of the currant worm, which can be as easily exterminated as our potatoe bugs, by using Paris green in a weak solution, applied at their first appearance, which is generally about as the fruit first begins to form. After that white hellebore can be used with less danger. By watching for their appearance on the bushes and applying either of the above, you will exterminate them with very little labor.

**Grapes.**—Grapes are as easily cultivated, and about as sure a crop as most of the other fruits. They need good care in cultivating, and pruning or pinching back during their fruiting season. Check strong growth of wood, and see to it that the vines are not overloaded with fruit—more than the vine can probably carry through and ripen. In the fall a vigorous use of the knife is necessary for the good of the vine, in cutting away the most of the new growth, to within a few buds of the old cane, and in removing the old cane

as fast as we can procure a young shoot from the crown or base of the plant.

I think the old idea of digging a large hole and filling up with old bones and even dead animals is a thing of the past. My theory is that land good enough to raise a crop of corn is good enough to plant your vines on. Plant them 8 feet apart; train them to a stake or wire trellis; lay them down on the ground and give them some covering—I think to cover with earth is the safest. Straw will answer, but I fear the mice will sooner or later rob me of one season's fruit by gnawing my plants. The varieties of grapes are many, but those for general cultivation are few.

There are many locations in our State well calculated for grape growing yet undeveloped. Plant some grapes. The Concord, a general favorite, Worden, Moore's Early, Lady, Delaware, Brighton, are hard to duplicate.

**Fruit as Food.**—The importance of fruit as an article of diet is at last beginning to be appreciated. The taste for fresh fruit is growing fast, and while many of our farmers know that they ought to supply it to their families, they still fight shy of planting and say they can buy what berries they want cheaper than they can grow them. Yet they do not. Farmers do not deceive yourselves. Why deny yourselves and families these delicious articles of food? Let us decide to plant them.

#### Discussion.

**MR. FLEMING.**—How deep would you plant currants and gooseberry bushes?

**MR. HAMILTON.**—I should prefer to plant them not over six or eight inches deep. I would not advise the raspberry over an inch and a half under the soil. In planting any plant that has been removed, especially of the vine or tree sort, I generally calculate to plant about two



inches deeper than they were before; so as to allow for the settling of the earth around them.

MR. PEPPER.—What varieties of gooseberries do you recommend?

MR. HAMILTON.—The Downing with me has proved the best success, been free from mildew, and yielded a fine crop of berries. The Industry has always done amazingly well for a variety that has not originated in this country, but I find the summer's sun too hot for it, and I also find, by correspondence, that in the old country they are raised most successfully in the shade. I put a cover over my Industry gooseberries, and then I get the strong effects of the sun away from them. I put mosquito netting over them, just enough to break the rays of the sun.

QUESTION.—Have you had any experience with tree gooseberries that are talked about by agents?

MR. HAMILTON.—I never happened to strike one that was very much of a tree. I can manufacture a gooseberry bush that will answer the purpose for a year or two, but I would not guarantee it to remain in the tree shape very long.

MR. DYER.—I am very much troubled with the borer, and have not been able to raise any currants for several years.

MR. HAMILTON.—I have never had any serious trouble with them. I have never done anything more to guard against them than to give my plants good cultivation, and where I have had them attacked they have out-grown the effects of them.

MR. KELLOGG.—If the currant borer once enters the bush, it is very hard to get at. I think the knife and fire and poison are our only remedies.

SUP'T. MORRISON.—How much bush would you have left after all that?

MR. KELLOGG.—I would cut out the older wood and burn it, and leave the

two-year-old. I might have to lose my crop of currants, and could afford to. I would poison them every two weeks, the first season. Of course the more you cultivate, the better crop you will have. The best two reds I know are the Fay and the Victoria, which are far better than the cherry.

MR. HAMILTON.—I think the borer will come to solid ground more than if the bushes are well cultivated.

MR. FAVILLE.—Can you tell us what kinds of fruit will thrive, with the attention that the ordinary farmer can give them?

MR. HAMILTON.—There is no use trying to get a good liberal supply of fruit without giving it care. The nearest that will come to it is my friend Kellogg's Crescent strawberry; that will fight for itself better than any strawberry that I know.

MR. FAVILLE.—Isn't it a fact that the average farmer can buy his fruit cheaper than he can raise it? I know you will all say he won't buy it, and very likely he will not, but isn't it a fact that he can devote his attention to his farm crops, and buy his fruit of a professional grower to better advantage, and cheaper?

MR. KELLOGG.—I have my doubts, that is if you take into consideration the enjoyment of going out and picking his own fruit. They say they haven't any time, but I notice that where a farmer goes into his own garden and finds lucious fruit hanging there in bunches, he will pick and eat a good deal. I believe that where the average farmer will buy one case of fruit for his family, if he has the same fruit in his garden, they will eat six or eight times as much.

MR. LOUIS.—I think that Mr. Faville has rather overdrawn the picture. I think if you will give your boy a good

cultivator, and have your fruit in rows, and fix it so that he can spare half an hour when he comes out of the corn-field to work in the garden, we could have lots of fruit. My experience is this: If we have to buy fruit we will never have it. With us we can always get it.

SUP'T. MORRISON.—I would like to have some questions drawn out about blackberries. Mr. Hamilton has shipped them across the State and into Minnesota and made money out of them.

MR. McCLURE.—What kind of blackberries would you recommend for the average farmer so that he can have hardy varieties?

MR. HAMILTON.—I have yet to find the plant that I consider perfectly hardy in all parts of the State. Stone's Hardy will stand some of our winters, but not more than one-half of them; neither will Snyder nor Briton. I do not consider it safe to try to go through the winter with any of them, without laying down. This last winter we have been all right, but you can never tell. It costs very little to lay down the few plants which a farmer has. I am sure \$10 would cover the expense, and then you are sure that you are safe and have secured your crop. I consider the Ancient Briton, either for the farm or shipping purposes, the king of them all. The Snyder may be a little bit hardier. It has a little harder wood, something like the Duchess of Oldenburgh, and is a little harder to lay down and protect than the Briton.

SUP'T. MORRISON.—How many acres have you in blackberries?

MR. HAMILTON.—I have but eight acres at present. I think in the vicinity of Ripon there are not far from one hundred and twenty-five acres in cultivation, and I know no reason why they are

doing better than in other localities where they get the same care.

MR. PEPPER.—We have had great trouble in our section, the last two seasons. Our fruit has burned up before it was ripe.

SUP'T. MORRISON.—Mr. Gale, do you raise any blackberries?

MR. GALE.—We raise some. We lay down and protect them the same as Mr. Hamilton. We find no variety that will stand without protection. The two last years we found the same trouble the gentleman last spoke of—they have been scalded in the vine, with the best cultivation.

MR. HAMILTON.—A year ago last summer the drouth with us was very severe. It was extremely hot, and the crop in general was a good deal of a failure. I used the "poor man's irrigator" (what they call the horse and cultivator in California), and used it thoroughly and steadily every day. My neighbors came to consult me about the crops drying up, and asked me why my crops looked better than theirs. I kept the cultivator going and carried my crops through, while some of my neighbors stood around on the corners of the street, in town, and told how dry it was, and how we were not going to have any corn or berries. Some of them stayed at home and stirred their ground and cultivated it, and they came out the best. While my neighbors had hundreds of bushels dry upon their vines, with my steady use of the poor man's irrigator, I carried the crop of hundreds of bushels through. I use mulching as much as I can; still I cannot say that if I mulched my vines I need not cultivate. I cultivate them just the same.

MR. THOM.—How can you cultivate when you mulch?

MR. HAMILTON.—The rows are seven feet apart, and we calculate four or four

and a half feet in there to keep stirring. There shall be a mulch of about one foot on each side, and then we have it fine and make a mulch out of the earth itself. You will find after cultivating, that there is a vast amount of moisture collected under this mulch that we have made out of the land, by breaking up the little capillary air cells. I cultivate shallow, a little deeper in the spring, and not over two and a half or three inches.

QUESTION.—Have you ever tried dew-berries?

MR. HAMILTON.—I have tried a few hundred plants. The Lucretia did extremely well, and bore a very good crop of fine berries.

MR. DYER.—Tell us your method of operating; whether you leave many stalks in a hill, and how much you cut off the tops of your blackberries.

MR. HAMILTON.—I plant my blackberries seven feet apart between rows, in rows three feet, and I try to keep them in hills. They are supported by wire on either side. When the growth has got to the length of about two and a half feet, I cut the top of the cane off; that stops the upward growth of the plant.

The blackberry is inclined to grow a long spindling cane. I cut it back and it forms itself into a tree. In laying them down, if the rows are running north and south, we will commence at the north end. We will remove the earth say four inches from the hill, and three inches under. That gives you room for this crown to set over in, and for the plant to set down in this hill, you turn it over and place your foot firmly at the base. Remember we are bending the root and not the cane. We put earth enough upon them to press the tops together as close as we can; then cover them, so that one lays alongside of the other. I put on just enough earth so that they are out of sight. I uncover them in the spring as soon as the earth gets in good workable order. It is better to uncover them early than late, because they will start under the earth sooner than they will if they are taken up. I shall not uncover mine until the middle of April, unless the season turns out much different than we anticipate. The thornless blackberry is something I have never seen, though some have less thorns than others.

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## THE FARMER'S FRUIT GARDEN.

By GEO. J. KELLOGG, Janesville, Wis.

Why have our apple trees died so badly all through the State in the last five years? The poor shape of the top is one cause. There is not one tree in a thousand that is put in the ground in good shape. The tree should have a central trunk, with side branches from

six to eight inches apart. You don't want any crotch in the top. Just as soon as the tree forms a crotch, it is in bad shape to stand the effects of frost and ice and wind. It becomes cracked in the crotches and liable to break down. Do not have limbs nearer

than three or four feet from the ground for *certain kinds*, and other kinds five feet. If your trees are not in good shape, prune them into shape.

**The Best Site.**—The best site for the orchard is on the clay ridges. There is some stony soil out west of here that is better for apples than anything else, and you won't have to move the stones either to plant a few apple trees; you want to put them on the north side of the hill on the highest ground you have. If you have low black soil, plant but few kinds. There are plenty of varieties that will flourish in this State, if properly pruned at planting and cared for in the trunk. The trunk must be shaded. Mr. Philips, of West Salem, has gotten up a device which is a good thing for that—lath and wire woven together, and it surrounds the tree, protecting the south side from the sun in the winter and summer, and prevents the bark from bursting and the borer from getting in.

Just as soon as the sun scalds the southwest side of the tree, the borer gets in, and that is usually the first season. You should shade that side of the tree, and then the borer won't work and you will get none of this sun-scald. It is the heat of February and March that kills the trees on the southwest side, and also the heat in June July and August. If you have nothing better at hand enclose the tree with brown building paper or newspaper, never using black; anything to keep the sun off. A wisp of hay, tied up and down will do, but Mr. Philip's device of lath will also protect trees from mice and rabbits, as well as sun-scalds and the borer.

The first few years I would raise in my orchard a low crop; potatoes are best. There are some places on which you can not grow apples, but in this

low black soil you may, by ridging and planting on the back furrow, grow the Tetofski, a few of the Russians, a few of our native seedlings and Duchess and make a comparative success of it.

**Plums—Cultivating.**—If you don't raise your apples and your plums, you won't have them, as Mr. Hamilton says. The old Eastern varieties are not worth planting unless you jar your trees once or twice a month for two months. If you do that, you will fetch down the little bug that is on them, the Curculio, and if you will have your chickens under the tree you needn't bother to pick them up yourself. I would like to cultivate the orchard for two or three years, then seed it to clover so as not to get too great a growth; and do not cultivate your orchard later than the first of July. If you do, you will get up fall growth and the sap may be caught up and the frost burst the bark of your trees.

**Seeding Down—Manuring.**—After the orchard gets to bearing, or even before, if it gets to growing too rapidly, you had better seed it down. You do not want more than six inches of growth on the end of the limb, and then it goes into winter quarters in good shape. The only way for a tree that is growing too late is to pinch off the terminal shoots as far as you can reach them. Seed down the orchard about the time it gets to bearing, and after that your orchard is paying you, give it manure and keep up a good growth. The apple tree that bears heavily will make hardly an inch of wood. It should make at least two inches every year; so if your orchard is paying you in bushels, give it manure. There are more orchards starved to death in Wisconsin to-day than the winters have killed. The apple tree that bears for twenty years and never a wagon load of manure gets around it, ought to die. Manure it in winter, or

spring, any time you have the manure. Winter is the best time. Give it all the wood ashes you have unless you want them for the strawberry bed.

**An Acre for Garden—Grapes.**—I would like to throw out a few suggestions about the farmer's garden. I would like to have the farmer devote to it one acre of the best ground, that is fenced off, so the chickens cannot get into his garden. I want you to have this acre a long acre. Don't make it square; make it not less than twenty rods long. I would begin on the west side and go out eight feet from the fence, and put in a row of grapes. I would put the grapes on one side, because they will stand for a long time and pay you; and I want them eight feet from the fence, because I want you to get through there with the cultivator, and if it is twenty rods long you can afford to use the sulky cultivator. There are many kinds of black grapes—the Concord, Moore's Early, the Victor, Worden, Brighton and Delaware for red; the Lady, and the Niagara for white. The first year you want to throw all the growth into the cane, growing it up as high as you can; tie to any kind of support. You don't want an expensive trellis; you don't need a trellis at all until you get your vine bearing at three or four years. In the fall I would cut the cane clear down to two buds; the object is to give strength and growth. Then, I would let two canes grow and throw all the growth into these two canes the second year. Do not fail to prune your grapevine just as soon as the leaves fall in the autumn, any time in October or November or the first of December; then cover it with earth. You always want to lay down the same way. The second season grow two canes as big as you can; the second fall cut one of them off clear

down to the ground, leaving two buds only.

**Fruit-Buds—Foliage.**—[Samples of cane and grape wood shown to the convention.]—There are three fruit-buds, each one capable of producing three bunches of fruit, nine bunches, which is more than you ought to expect of a two-year-old vine. After you have grown your vine until you get an old cane with side branches, prune and leave on but three buds of *new wood*; that is what bears fruit. You want to remember one thing—it is the foliage that ripens the fruit. I have seen persons cut off the foliage to let the sun get at the fruit. If you do that your grapes will stand right there until new leaves are made; they cannot breathe without those lungs. It is shade that makes nice fruit. Of course, if the foliage is mildewed, it will do no good; the fruit won't ripen anyway, but it will do very little harm to leave it.

**Pruning.**—The full bearing vine is at four years. You aim to have on that vine one hundred buds, thirty three spurs. If you remove the third bunch, you will get almost as much on the two remaining as on the three. Do not let your vines over-bear; that is one reason the Concords did not ripen last year. We had a good many cold nights, too, in the fall. If your vines get so big and clumsy that you cannot lay the old canes down, no matter about them. If you can lay the *top* down and cover this new wood, you are safe. Always keep a new cane at the ground so that if the mice or anything should injure your old bearing cane, you can renew from these new ones.

If your vines have grown out of your reach, fifteen or twenty feet, just saw off the old cane and raise a new one near the ground, if you can afford to do without the fruit; or I would coax them along

through the summer, and in the fall I would renew them; but if they are out of shape, have not been pruned, you can do it this spring, after the leaves have been fully formed, you can cut the vines all to pieces and it won't hurt them.

**Currants — Gooseberries.** — The next row to grapes, I would put in currants and gooseberries, and if you don't want a whole row, finish out with pie-plant, but do not make the row less than twenty rods, and I would leave eight feet between rows; then you can take in a wagon-load of manure, or your cultivator, very easily.

**Blackberries — Covering.** — Next after the currants, I would plant the blackberry, because that is a high bush and you can't drive over it. Snyder is the earliest, then Stone's Hardy and Briton; you can plant all kinds. The Bartel Mammoth dewberry on rich clay soil is doing fairly well, and the Lucretia also. In digging to lay down your bush, I would dig on both sides.

You can cover blackberries very easily. In the spring get them out pretty early; they will stand the cold nights better, and they won't leaf out quite so quickly. I have left them in so long that the buds have become white, and I have lost the fruit.

**Red Raspberries.**—Next after the currants and blackberries, plant a row of red raspberries; the kind with suckers that come up all over the lot, and treat these suckers just like weeds and they won't bother you. Put in your rows eight feet apart. There's nothing better than the Turner and Cuthbert, and if you want to finish out your row with a kind like the black raspberries, I would plant Shaffer's Colossal. It is not as sweet as the other two, but it is a great bearer, a mongrel red.

**Black Raspberries.**—In the next row I would plant black raspberries,

Tyler Souhegan and Gregg. There are two or three other varieties, the Nemaha and the Ohio.

The Gregg is the largest and latest; the two first are the earliest. I would cut the new growth at three feet so that they throw out laterals; they are easier handled and stand up against the wind better and are easier to cultivate. Now we have the five permanent rows, that will stand there for ten to twenty years, if you take care of them.

**Strawberries—Setting Out.**—Now we come down to the strawberry ground. You should renew your strawberries every two or three years; plant on potato ground. If you have to plant on sod ground, watch for the grub. He does not follow the potato or corn crop very much. In this first row of strawberries, eight feet from the black raspberries, I would advise you to set one whole row the length of the garden. If you put the plants three feet apart, one hundred plants will go the whole row. I would put in that row about four kinds of pistillate varieties, all in one row. I would not plant nearer than four feet. and one, two or three feet in the row. For the pistillates I would mention the Crescent, the Manchester, the Bubach, a new variety, and the Ontario for the fourth. In the second row, right opposite, because the blossoms of one have to pollinize the other, I would have the Wilson and the Jessie; the Captain Jack and the Miner. These are all good kinds.

**Large Crops of Strawberries.**—The Jessie has not done quite as well as was expected; on the lighter soil it may not do as well. A prize of twenty-five dollars was offered for the best show of fruit and the most pounds from 12 plants in the United States, and a man in Massachusetts drew the prize; he had one berry nine inches in circumference.

From twelve plants he raised  $41\frac{3}{4}$  pounds. This is sworn to, and there is no question about it. This is at the rate of 1185 bushels to the acre. I am not prepared to tell you the minutia as to how he did it. He not only fertilized that ground to the highest possible point, but he knew just how to do it. Then he put on water enough to make up the rest. With plenty of water and manure you can almost defy the seasons in growing strawberries.

Mr. Smith, at Green Bay, piles up the manure six feet deep and *spreads it around* and goes to work. You want rich ground if you are to get a product of anything. I have known the Wilson to bear, on a square rod of ground, five bushels; that is 800 bushels to the acre. The first plantation I put out of the Crescent, the first season's picking, I put a boy on one row and he took off 100 quarts in nine hours from one hundred plants, but Crescent is worthless alone.

**Hoeing—Cultivating**—In growing any kinds of strawberries, hoe them the first season every Monday morning just as sure as your wife washes; it will pay you. Keep them cultivated narrow; if you can't hoe them, keep the cultivator going the best you can. In the fall just cover the foliage out of sight. Next season, set two more rows and four different kinds; then you will be sure of having berries right along.

Discussion.

MR. TIFFANY.—How do you bring down the blackberries?

MR. KELLOGG.—Put the fork on top and then put your foot at the base. I can do it alone; it is better to have three. When the plant becomes larger, the cane heavier, dig around a little more and bend it in the root. You don't want to break the cane.

MR. LOUIS.—I find that a six-tined manure fork, stuck right over the top of the bushes and fastened in the ground gives me a good chance to cover them, and I can do it alone pretty easily.

MR. KELLOGG.—Yes, and you can use a board that way.

QUESTION.—What kind of manure would you recommend for the garden?

MR. KELLOGG.—The best rotted stable manure for the garden. Cover your strawberries with marsh hay or corn-stalks, or anything that has not clover or timothy seed in it.

CAPTAIN ENOS.—How was the land manured that raised 1185 bushels of strawberries to the acre?

MR. KELLOGG.—Not only was the best stable manure used, but commercial fertilizers were added to an enormous extent. Any of you can grow two hundred plants of well selected varieties and get three to five hundred quarts the following season, with fair treatment. By-the-way, don't have a tree of any kind around a vegetable or fruit garden. There is room enough for all your onions right alongside of the strawberries. Give your grapes the sunny side. If your rows run north and south, put your grapes on the west side so as to get the morning or east sun.

## SIGNS OF PROGRESS IN HORTICULTURE.

By B. S. HOXIE, Evansville, Wis.

**Knowledge Required.**—Horticulture is nothing more than intensive agriculture. If a man says that he is a horticulturist, you must expect that he knows something about the soil, its value and capacity; he must know something about trees, and plants and birds and insects; he ought to be prepared to answer a great many questions that the agriculturist would not know very much about. The diseases of trees and plants seem to be assigned to the horticulturists to be studied out, because they come more into contact with all these things. They are learning more about birds, those that are our foes and those that are our friends; they are learning more about all the species of trees that can be cultivated in our climate, or in any of the States of the United States, that are found in foreign lands; they are experimenting in different directions; they are lovers of nature and workers with nature.

**Progress in Thirty Years.**—We find, in looking over the history of horticulture, and the work that has been carried on by individuals and experiment stations, that we are now just beginning to find out something of the capacities, something of the blessings, the advantages of fruit and fruit culture. Thirty years ago, where there was one grape-vine growing in the United States, I presume to-day there are a thousand. You older people can remember when the Concord grape came out, and now it is the grape of the million. I think Prof. Henry, at the

experiment station, has shown to the farmers of Wisconsin how many tons per acre the people of Wisconsin can raise, and just what it costs them. I think he states that we can raise grapes at about two cents a pound; but there is a larger value attached to fruit-growing than mere dollars and cents, and so there is in cultivating plants and shrubs about our houses, on the roadsides, and about our depot stations, and everywhere where you have something to beautify nature.

**Horticulture in the Schools.**—We should find the work of the horticulturist more evident on our school grounds; our boys and girls should know something about horticulture. I think if you should go into your school and ask the boys and girls how many varieties of trees you have in your beautiful village, and where they originated, there would not be one in fifty who could tell you; they would not know what the trees were good for, except to be a shade on the roadside, or, perhaps, for firewood. Now, in Austria and in Denmark and France they teach those things in their schools. They have a dozen schools in agriculture and horticulture in Austria where we have one in the United States. The boys and girls are learning all about birds and insects. Some have taken the ground that we should have an agricultural college in every State and a branch school in every county, and that the teachers in the schools should have a general idea of agriculture and horticulture.



Last year an application was made to me by some ladies who were running a school. They had a farm that was willed to them, and they wished to raise on it for their school all kinds of garden products, and wanted to find a man who knew how to take care of a garden and fruits, cultivate them, etc., and they supposed I could find one, and I thought I could. I wrote to J. M. Smith, of Green Bay, and he replied that he had had frequent applications for such men to take charge of gardens, and he did not know one, and the result was I was obliged to write to these ladies that I could not find them a gardener.

#### Horticulture at the Exp't Station.

—This State has felt the need of a professor of horticulture for a number of years. Those who have been long engaged in the work of horticulture, experimenting in raising fruits, etc., have met with a great many disadvantages, more than they ought to, in some cases, and we have felt the necessity of a professor of horticulture, one who would put us on the right track, so that a man might know whether, if he planted, he could expect to reach any results. Prof. Goff, of the New York Experiment Station, has been engaged to come to this State to occupy the chair of horticulture in the University of Wisconsin. Prof. Goff is well known, though he is a young man, and we are hoping for good results, but do not expect too much. Do not expect that every farmer can set out apple trees and raise fruit to

perfection, or that we can have every variety of fruit that is grown in New England; but let me tell you that a man who understands the business of experimenting on a right line of work and directing these experiments, if he is the right man, can accomplish far more than we can groping our way blindly.

**Fruits for Wisconsin.**—While Wisconsin is not so well favored as the middle States or Michigan in the raising of certain kinds of fruit, yet there are fruits that we can raise in Wisconsin with a greater degree of perfection than they can in any other State. J. M. Smith says there is no State in the Union that can raise strawberries equal in flavor and quality to the State of Wisconsin. We have to use judgment in all these things. Because Hiram Smith at Sheboygan succeeds at dairying, or J. M. Smith at Green Bay in raising strawberries, it does not follow that every farmer can be successful as a dairyman or in raising such fruit. Every man must do that which he is best adapted for, or his land is best adapted for.

Our fruit growers have done a good deal of experimenting, and so far generally to their cost, and we have made progress. We have found out that we can raise better strawberries and better raspberries and better blackberries and just as good grapes as can be raised any where in the world, and I feel sure that the farmers of Wisconsin can raise all the apples they need for their own use.

## DECORATIVE HORTICULTURE.

By JAS. CURRIE, Milwaukee, Wis.

**Objects of the Art.**—Decorative horticulture, as we understand it, means the art of gardening in all these branches, namely: The making and care of the lawn, the planting of trees and shrubs for ornament, and the cultivation of all kinds of flowering and ornamental plants, whether native or exotic, hardy or tender, in the open garden, or in the conservatory. The objects of this art are varied. You all know what a transformation it has, within recent years, effected in our cemeteries. The best of these, only a few years ago, were either bare and bleak, or if wooded, no better than the ordinary forest or clearing; in either case rough and uncared for, very desolate and uninviting. Now we find them places we even delight to visit. And then witness the many beautiful public parks, those grand resorts for the people of crowded cities, where they may go to enjoy, to their heart's content, the clear fresh air, rendered none the less pure by the sweet fragrance of lovely flowers, and the balmy foliage of trees and shrubs. In every instance these parks are indebted to the art of decorative horticulture for much of their beauty. All the beautiful private places, now so numerous in this country also bear evidence to this art.

**Taste for the Art.**—We cannot expect to find, in a country so new as this is, many places of large extent so beautifully laid out as we do in the older countries; but we have abundant evidence that the taste for this art is very

rapidly developing everywhere throughout this country. The changed and ever improving appearance of our city and village homes assures us of this. Nearly every occupied lot now has its well-made, well-kept lawn, its handsome trees and shrubs and pretty flowering plants, and sundry other embellishments, rendering it attractive and beautiful. The country home of the city merchant is now less frequently seen situated in a thick forest or in a bare, uncultivated field. He has been obliged, perhaps, to take up his residence in the country for the benefit of his health; or his love of rural scenery has been the incentive. He delights to breathe the pure, bracing air of the country, and never tires of feasting his eyes on the extensive and varied landscape which surrounds his pleasant home. He is a true lover of nature, in all her native and rugged grandeur; but that does not prevent him from employing the landscape gardener's art to improve the immediate surroundings of his home. Some people condemn that art, because they consider it but an imitation of nature, and they cannot endure imitations of any sort, and this one in particular. But the true artist has really no intention of imitating nature's works. He employs her materials to create scenes which are polished and refined, pleasing to the eye and adapted to the circumstances. Under his masterly direction he produces effects, which, it is fair to say, are scarcely less natural, and certainly are more consistent in the vicin-

ity of the home, than any of nature's handiwork. Our country resident, therefore, who thoroughly appreciates the beautiful, as well as the picturesque in nature, and who has a keen sense of refinement, embellishes his home grounds, but is careful not to over-do his work. Good taste is strictly adhered to.

**Pleasures and Benefits.**—I am grieved to find so many people, possessed, too, of more than ordinary intelligence, who are stone-blind to the pleasures and many real benefits to be derived from decorative horticulture. They look upon it as a most unwarrantable luxury, still a very good way for fools and rich men to put some of their surplus money into circulation. The cultivation of flowers, they say, may be fit for women and children, but full-grown business men have no business with it, and any one who devotes any of his time and talents to it is a crank, with a strong tendency toward softening of the brain. What a delusion! All of you who have lawns and flower gardens, I know, will be prepared to corroborate my assertion, that the pleasures and benefits to be derived from the cultivation of plants, a well-stocked flower garden and nice lawn, with trees, shrubs and flowers pleasingly arranged, are almost innumerable and inestimable. Let me direct attention to one important benefit to be derived from the cultivation of flowers. The necessary labor is light and very interesting. It demands attention, but does not impose a burden on the mental faculties; it may be made really nothing but amusement; and, moreover, is conducted out-of-doors in the clear, fresh air and sunshine. Is it any wonder, then, that it proves so often such a splendid tonic for invalids and weary, care-worn business men? I fancy I hear some of you farmers saying: "That sounds very well, and may be all right

in the city, but of what benefit is gardening of that kind to us? We have all the out-door exercise and labor in our fields that any man can want; and where have we time to bother with flowers and fine lawns?" This is nothing new to me. I have listened to many similar arguments many a time; but I am still prepared to defend the art, and most emphatically assert that it is as much at home on the farm as on the city lot, or in the public park, and its pleasures and benefits may be participated in and enjoyed as much by the farmer as by the townsman. I take my stand with the greater confidence, because I am assured of the support of every farmer's wife and daughter, and of all those farmers whose handsome homes we find here and there throughout the country, a delight to their owners and even the pride of their neighbors.

**Make Your Homes Attractive.**—Farmers, I admonish you to make your homes attractive, to satisfy your wives and your children! We hear a great deal about providing children with amusements at home, that they may have less desire to go elsewhere to seek them. Then, why not give them a nice garden, and encourage them to spend some of their leisure hours in it, and buy them a few plants and seeds, and let them cultivate their own flowers? Very few children are averse to this kind of work; it is amusement to them, and, as you are aware, most healthy recreation. Many a very delicate boy and girl, even on the farm, have, by the light work in the garden, which kept them employed in the open air, been nursed up into strong and healthy men and women. The city has great allurements for the farm boy. I am by no means opposed to his coming to town, for we need our Lincolns, Garfields and

Rusks to man the ship of state, and we look to the farm for them; but we cannot afford to deplete the farm, so we must offer every inducement to keep the boys at home. Try to make your homes the pride of your children so that though they go on a visit to town, they may see, at least, few homes more attractive than their own. You can easily do it; you have generally the best opportunities. The soil on the ordinary farm is of good quality. An acre devoted to the lawn is never missed from the farm. Labor is not an expensive item, because the work of making the improvements can be done at odd times when farm work is not pressing. Trees, shrubs and hardy flowers, which are no further expense than the first cost, are now very cheap. The future care of the lawn involves very little labor, as light running lawn mowers, which the boys even consider as play-things, do the work of cutting the grass rapidly, and leave the lawn looking smooth and trim. Try it, there is nothing to lose, but much to gain. There is besides money in it. Who does not acknowledge the superior value of the farm which has a neat dwelling, situated on a broad lawn, nicely laid out and well cared for, and planted with a variety of handsome deciduous and evergreen trees, artistically located, and a few beds of pretty flowers as finishing touches to heighten the general effect—the ordinary farm buildings being situated some distance in the rear, and all the objectionable parts screened from view by trees and clumps of shrubbery; and along the side of the public road, a line of hard maples or other equally desirable trees. All other things being equal, do you not look on such a place as the ideal farm? I know you do. I do, and often wish I was the owner of such a farm.

Within recent years the value of decor-

ative horticulture has attracted the attention of several of the great railroad companies of this country, particularly those operating roads in the East. They employ it extensively about all the larger depots along the lines. Thoroughly capable landscape gardeners are permanently employed to direct all the operations. All the available ground in the vicinity of the depots is judiciously and carefully laid out, and tastefully planted with trees, shrubs and flowers; and the grass is always kept short and green. The effect, as may easily be imagined, is very pleasing to the travelers. This work is certainly very commendable and does great credit to these companies.

**Beautifying School Grounds.**—The beautifying of our school grounds to some extent with trees and flowers is a question now being widely discussed. I deem this a subject of vital importance for many reasons, too numerous to mention here; I can only trust that, ere long, we may see every school ground throughout the country so ornamented.

**Materials.**—There is no lack of materials to use in decorative horticulture. Trees, shrubs and flowering plants of suitable kinds are in abundance, and sufficient for the purpose, even though our rather severe climate precludes the culture of many beautiful sorts. But the kinds we have are already so numerous, and the desire to use them all is so strong and tempting, that much wisdom and self-denial are required to choose only a sufficient number of the most appropriate sorts for the location and space they are to occupy. The general tendency is to over-crowd. It is so hard to satisfy ourselves with one tree when one is sufficient for the purpose, and our judgment even tells us so. The love of flowers has that tendency even more strongly. While their culture is always

commendable, great care must be exercised in selecting them, and giving them their appropriate place. The flower garden or border is the proper place for a large and general assortment—a bed or two perhaps being sufficient to tastefully embellish the lawn.

Let me conclude by hoping that the

taste for decorative horticulture already making rapid progress, may quickly become universal, so that in the future every town and village lot, and every country place and farm home may be tastefully adorned with fine lawns, handsome trees and beautiful flowering shrubs and plants.

## SOILING VS PERMANENT PASTURE.

By HON. HIRAM SMITH, Sheboygan Falls, Wis.

**Innovations in Methods.**—I am well aware of the prejudice existing, and the suspicion felt, towards any innovation in the old established methods of farming. We have all been brought up to regard the pasturing of animals as the true way to keep them through the summer, cutting hay mainly on which to winter them, and many who do not figure very closely, or reason very logically, conclude that there is no better way of keeping animals than the way they were taught; but the competition existing in all branches of business and trade has forced many either to abandon the work they were engaged in, or devise some means by which they could increase the productions of their farms, and add to the animals from which they received their remuneration for their work.

### Milch Cows Require no Exercise.

—It occurred to me some years ago that soiling cattle from the green crops that grow upon the land, could be done with less acres than to pasture the cattle. Of course, many will think that this is a poor way to keep cows, and we

often hear the objection that they ought to have some exercise. It has been satisfactorily proved, by repeated experiments, that an animal that chews a cud requires but little, if any exercise, and a cow that is producing milk does not require any exercise at all. I have tried it, and many others, and I think we are fully convinced that a cow that is giving milk does not need any exercise any more than a horse that works on a tread-power. The elaboration of milk is as great an exercise as the elaboration of power from the feed the horse consumes to apply to the tread-power. Therefore, the next question is a question of money. How much more stock can we keep? How much more food can we get from an acre that is left to nearly mature in a proper soiling condition, than we can to let the cows roam over the land? He who has watched the habits and characteristics of cows knows very well that the cow will visit every rod of the field she is in, and if, say, one animal occupies two acres, every foot square of that soil is tread upon every day that they are in the pasture.

It is well known by those who have observed closely that a cow, or any other animal, for that matter, that travels over the soil to get its own living from cropping the grass, fouls and treads down two-thirds of all the grass upon that acre, so that it is but a matter of economy to maintain our position. If we can keep three cows where we kept one, here comes in an opportunity to make our business more remunerative. If we have been working hard, living without many of the comforts and none of the luxuries of life, and found it difficult to meet our taxes, and if, by putting on three cows where we had one, certainly we can thus better our condition, and at the same time better our land, for the more stock we keep, the more fertilizers we shall have to raise larger crops.

**Soiling and the Silo.**—The history of soiling in this country is somewhat analogous to the history of the silo. It has been found that by raising a crop of fodder corn and putting it into the silo every acre will winter three cows, and there is hardly one acre of meadow in Wisconsin that will winter one cow. If we take into consideration how much we have gained by the silo, we shall be easily convinced by a little experimenting and observation how much we shall gain by soiling our cows instead of pasturing them. After I have been at this business some six or eight years, it seems as though it ought to have been thoroughly understood long before this. I get somewhat impatient sometimes at the slow progress that has been made. After experiments have repeatedly demonstrated, and the results of such experiments have been published, it seems almost superfluous to talk in favor of soiling cows.

**Keeping Cattle in the Barn.**—There is another consideration that we

should look at. In the fore part of the season the ground is soft, mellow, physically all right to produce a crop. The frost has done its perfect work and left the soil in a loose condition, so that the crop may grow and flourish and have a chance to mature as nature intended; but if we put on every two acres a heavy animal, weighing from ten to sixteen hundred pounds, trampling over that ground, treading it in its soft condition, packing it down closely, it gets it into a condition where the soil can furnish hardly more nourishment than a stone. It has been packed so that it will not give forth fertility or moisture. A plant to live must have moisture, must have room for the roots to grow. They will grow, as you know, very little after the first of July, and consequently we almost universally have dry, short pastures for the cattle, and they soon run down in their production and become of very little value after July or August; not so much because there is hot weather, but because the land is packed so closely that the plants cannot grow. There is not the slightest doubt that the crops will be in better shape, if the cattle are kept in the barn.

**Expense of this System.**—Many urge sincerely and honestly the great expense of this system; but if you will take your pencil and figure the expense, it looks so small that you are almost ashamed of it. One boy, seventeen or eighteen years old, will take a team and go into the field of clover, or corn, or millet, and get sufficient in for the night's feed and the next morning's feed, and clean out the stables, and get it all done in half a day. After his milking is done, there is actually only a quarter of a day spent with one man, and his wages amount to sixty cents a day, if hired by the month, so that it costs fifteen cents to soil one hundred

head of cattle every day in the year. I doubt if it takes any longer than it used to do when we drove the cows out to pasture, and had to go out and hunt them up and gave them nothing in the barn; they had no inclination to come to the barn, they had to be driven into the yard, and it took a good deal of time—quite as much, I think, as it now takes to soil the entire herd. If some wealthy man wanted his farm well taken care of, and should say to me, "if you will take this one hundred acres and twenty cows and take care of things properly, you may have all that grows on it," and another man with two hundred acres and eighty or one hundred cows, told me he would let me have the farm at halves, I would jump at the chance to take the dairy farm well equipped with a silo and everything, rather than to take the small farm and have it all. I couldn't afford to do it. It would give me no wages. An acre of land will produce more feed for summer feed than the best two acres of meadow in Wisconsin.

#### To Double the Farm's Receipts.

—Here is an opportunity, with the system of the silo, to double the receipts of the farm. As many again cows can be kept at very little more expense, a few hired men more, but no increase of teams or farm machines—scarcely any additional expense except a little more hired help, and the vast increase in the production will warrant four times the expense it will cost. Corn put in the silo makes a great deal better feed than hay, and makes as good butter as ever was made in June, and the change from summer to winter dairying costs almost nothing. It may be done gradually; the cost is nothing, and there is all the time an increase of production.

Now, if you can, by adopting these methods, throw aside your old prejudices and quit reading accounts of the census

reports of the grass crop, you will find it will pay; it will figure in your bank account. I have sometimes, in an early day, wintered in the lumber woods, taking a cow along and keeping her ten or twelve weeks, never out of the stall and never producing better. Prof. Daniels, at the University, has for years, put a new milch cow in the stable from November till May, and the experiments have proved that the cow does not need exercise; she will produce more without it than with it. There is a constant loss when cattle are traveling over the pasture looking for something to eat.

**About my Silo.**—Somebody has asked about the silo. My first silo I filled with corn, and fed to ten cows in the barn. I filled the silo from less than three acres, and kept ten cows over the winter, and three cows until the last of August so as to see what the effect would be in the production of milk in the winter. They were confined in a small dry yard; there is a shed in the yard, and water from a spring, running through a pipe. They had plenty of water and all the ensilage they could eat, and eight pounds of bran. We fed a little hay, but they didn't care for it; therefore I fed the cows all winter until the last of August without any other feed, practically, but ensilage and wheat middlings or bran.

#### Discussion.

**MR. SHERMAN.**—Is it practical to feed ensilage the year around?

**MR. SMITH.**—I am satisfied that it is practical, although I would give a change—different kinds of ensilage, a little clover, and a little corn, and always a little dry hay, if they care for it. The milk from those cows was weighed and computed against the milk of three other cows running in the pasture, and

they did equally well and only ate what grew on one acre, whereas the three in the pasture ate what grew on six acres. That is the practical result of the experiment.

MR. SPEAR.—Have you had any experience with clover ensilage?

MR. SMITH.—I have put in a second crop of clover with good results. It is the cheapest way to handle a second crop of clover, and the first crop also.

MR. CLINTON.—What crop would you raise for continual soiling?

MR. SMITH.—I know of nothing cheaper than corn ensilage. Let that run until about the 20th of June when the clover begins to blossom, and that is in good condition for soiling food. We could use the clover for soiling only about ten days, beginning about the 25th of May. Then, the clover is good enough, and upon good productive land you can get three crops of clover, that will carry you until the fodder corn is in the roasting stage. Fodder corn, if cut before there is any appearance of ears, has but very little value; it is a great waste to cut it until it is near the roasting stage. When it reaches that stage it will do to cut, and you can feed that corn until you open your silo in the winter. There is no difficulty in this climate in having a succession of crops that will do better, with a greater variety, than almost any other method of feeding cows.

There has been a good deal read and published about permanent pasture. Some of you may remember that Prof. Brown, of the Agricultural College of Canada, two years ago, was very enthusiastic over what he called a permanent pasture. He sowed some twenty-five or thirty different kinds of grass seed, and reported very large results the first year; but after two or three years it ran out; only four or five kinds of

grasses could be found in the field. I visited that farm last year, and asked the farmer how the permanent pasture turned out, and he said: "It is no good; you can go and see it." It had proved a failure, comparatively, and while I was there, in October, I am satisfied that one cow would eat all that grew on six acres, and it could not be depended on to keep up the flow of milk. We have still to find out that there ever was such a thing as a permanent pasture except from native grass or the June and white clover. Of course, pastures can be improved by fertilizing, and made to produce a good deal more than they otherwise would, but they cannot be made to produce more than one-half, if the cows are allowed to travel over them.

PROF. NORTH.—You are aware that there are permanent pastures in England and Scotland?

MR. SMITH.—Yes, but I doubt if there is one of them which can produce anywhere near as much as a soiling crop, for the reasons I have stated. In France they seem to be aware of that fact, and although they allow their cows to crop the grass from the field, yet they have a long frame on wheels, the cows are put in stanchions and the wheels are rolled up until they eat just within their reach and then they are wheeled along farther. They can't tramp and waste the pasture, nor can they waste their substance in extra exercise. This, however, is not what I understand by pasture where cattle range at large.

MR. GORDON.—Don't you think that cows need a good deal of sunshine?

MR. SMITH.—Yes, I think they do. If you have a good, dry yard, perfectly adapted to the business, they can get just as much sunshine as there is. Of course, we don't keep the cows in the stable every minute.



MR. KELLOGG.—Why do you give your cows warm water in the winter?

MR. SMITH.—Because we think we save a little feed, and I don't know as we are certain about that. The experiments don't quite back it up. Chemists told us that it required the expenditure of food to heat water that was down to forty degrees up to ninety-eight or one hundred, as the cow must have it. I think the main reason we have adopted the warm water is that we think we save some food, and the cows certainly appear to enjoy it. They drink more of it, and if they give a little more milk, even if it don't make any more butter, we get a few more pounds of milk, at any rate.

MR. BROOKS.—Do you cut up your corn that you feed in the summer?

MR. SMITH.—No, I do not, unless it is past the roasting stage, but I take it green from the field when I feed it whole.

MR. MCKERROW.—Do you think you ought to deprive the cows of exercise?

MR. SMITH.—They seem to enjoy themselves. You see, a cow will chew her cud six hours every day, if she is properly fed, and it is about as hard work as chewing gum.

QUESTION.—Do you think the vitality will continue in their progeny from generation to generation, if deprived of exercise?

MR. SMITH.—I never was a man to look into futurity, but I don't know of any reason why it should not improve them.

MR. HOXIE.—Do you allow your corn to wilt before you draw it in?

MR. SMITH.—We cut it in the morning and let it wilt.

QUESTION.—Do you feed your cows ensilage before or after milking?

MR. SMITH.—Either way, both ways. I feed two feeds a day of ensilage,

MR. KELLOGG.—Is the idea of Southern corn being the best going out, by experiment?

MR. SMITH.—I have seen no results bearing upon that. I do not think there have been satisfactory experiments on the subject. I have always been satisfied with it. The stalk is tender and juicy, and we can raise more corn on the acre of that kind than any other kind. I have made ensilage of four or five different kinds. As I say, I raise mainly B. & W. corn, but in order to begin filling the silo early, I raise some of the Wisconsin White Dent, which has a very heavy crop; there will be fourteen or fifteen tons on the acre, generally, and it makes very good ensilage. It ears pretty well, and we can get to work at least about two weeks or ten days earlier than we can on the B. & W.

MR. LOUIS.—During this winter I have listened to the dairymen at the various institutes, and there seems to be an idea in our State that the corn must be almost in a matured state to go into the silo for food for the cows. From a breeder's standpoint, I think that in time it will become dangerous to the breeding qualities of the animals. What I call mature is what I call ripe.

MR. SMITH.—I have seen some very bad effects from corn getting ripe and being fed. One man at Oshkosh had read that the corn should wilt three days after being matured. Then he read that it was better to let it stand in the shock, and he did that and the consequence was that his corn was hard and dry; it did not have moisture enough to heat up to the proper degree and he nearly lost his crop. My impression is that when it is in the roasting stage, just big enough as we pick it to eat ourselves, it is just in the right condition for the cow. I don't think we ought to

use our cows much worse than we use ourselves.

MR. CHAFFEE.—Can you get the B. & W. corn in your locality to the roasting stage before it freezes?

MR. SMITH.—I have never had any trouble.

CAP'T. ENOS.—Are you far enough from the lakes not to feel the effect of the lake breezes?

MR. SMITH.—The lake breezes effect poor land very badly; they don't seem to affect rich land very much. We have frost earlier than they do within a mile of the lake.

A GENTLEMAN.—Upon my farm I have experimented for the last three or four years. I have been soiling my herd of cows for the last ten or twelve years, as the pastures began to fail. Last year I made a couple of experiments. I measured off the same quantity of land in the same field and got this large corn that grew up twelve or thirteen feet high, and side by side with it the Evergreen sweet corn, and the result of two or three experiments was this: On the same amount of land, ten square rods, measured off, that sweet Evergreen corn beat the big corn. The percentage was not very large, but when you take into account the avordupois of the products of the two pieces of land, the percentage was quite considerably in favor of the sweet corn.

MR. FLEMING.—In what stage of maturity were these two kinds of corn fed?

A GENTLEMAN.—They were planted at the same time, and the experiments were made, first with the sweet corn, then with the large corn, then back again to the sweet corn and back again to the large corn. Perhaps the sweet corn was a little more matured, but we alternated between the two, and in every instance the sweet corn

came out ahead. We kept it up until we were obliged to cut up the corn.

MR. FLEMING.—At any time when you were feeding the big corn had it got to its best?

A GENTLEMAN.—Yes, the last experiment, particularly. I watched it very carefully. Do not understand me that we got the same amount of pounds from the sweet corn per rod that we did from the large corn. I estimated the difference in the weight of the two pieces was from twenty to twenty-five per cent. This was for soilage, you understand, not for ensilage.

MR. KELLOGG.—Mr. Smith, how much seed did you use?

MR. SMITH.—I used about eight to ten quarts of seed to the acre, and planted with a horse drill, dropping one kernel every ten inches, and the rows are three and a half feet apart. It is thoroughly cultivated with a disc harrow before planting; then it is planted about one and a half inches deep, in rows as straight as a man will drive a horse, which is generally straight enough. As soon as that is done, and sometimes before, the team follows with a smoothing harrow that is kept going every day or two, until the corn is up four or five inches. Then the cultivator is started, one or two inches deep if we can arrange it, and that is kept going until the corn shades the ground; then the weeds don't bother any more. I plant one kernel, because, especially in our latitude, four do not do as well. If four are planted in one place, four sets of roots start out in competition with each other to get what moisture they can reach, while it is in that delicate condition striving for life. I have sometimes made the remark that it is no more sensible or philosophical to plant four kernels in a hole than to plant four apple trees in the same hole.

MR. WAGNER.—When you are soiling, do you feed in the open yards in racks or in the manger in the stable?

MR. SMITH.—I never feed the cows anywhere except in the manger, and only twice a day.

CAPT. ENOS.—I would like to ask as to the relative merits of the large B. & W. corn and the Evergreen corn, point for point, ton for ton, in the same stage of maturity.

MR. SMITH.—There are investigations in progress at the Experiment Station on that point. It requires a great deal of patient work, which has to be duplicated several times to be reliable, but the work is being prosecuted there.

CAPT. ENOS.—I will state that my old Scotch farmer and myself have arrived at the conclusion that we plant no more of the big corn, that is after three years' trial. We have concluded to fall back on the sweet corn alone for soiling purposes.

MR. SMITH.—I think Capt. Enos will fool away two or three years' time, but he will have to give it up. Eight years ago I thought and talked just as he does now; I went around and harvested about eight tons of Evergreen sweet corn, and got from sixteen to twenty tons of the other, and forty-five pounds of the big corn makes a pretty good daily ration for a cow, and especially a Jersey cow, through the winter. The difference in the amount greatly overshadows the supposed better quality.

MR. GORDON.—The last experiment, published by the Experiment Station of the State of Minnesota give us experiments with three crops of corn, as to the nutritive value from the silo. Prof. Porter groups the corn as to nutritive value in this way: First of all in nutritive value, the dents; second the flints, and third the sugars. Among the dents, first, the B. & W., in the roasting stage;

second, B. & W., in an immature stage; third, the Pride of the North in the roasting or glazed stage; then one flint comes in as an accident, then comes in the rest of the dents, including almost all of the Southern and Western dents. Then comes the group of flints, and last of all comes the Evergreen, and Stowell's Evergreen is almost at the lowest point among the sugars, and Prof. Porter recognized very clearly that that range applied particularly to the Northern States.

CAPT. ENOS.—That is for ensilage purposes, not soiling?

MR. SMITH.—I think they are practically the same.

MR. ROOK.—I have raised B. & W. corn for summer feeding and for ensilage for several years and found it very profitable, when my neighbors had nothing to feed their cows, and it was easy to induce a great many to plant a little for summer use. After the first season they would nearly all say: "I will never raise that corn again; I don't want to handle that great stuff." But I don't find it so hard to handle.

MR. SHERMAN.—How do you cut the corn ready for the machine, Mr. Smith?

MR. SMITH.—I cut it with a Champion self-raking reaper.

CAPT. ENOS.—Do you keep all the sweeps on?

MR. SMITH.—Yes, they act as reels. The ordinary rake isn't heavy enough and at first we put a man behind with a garden rake to help the rake, but it occurred to me that if we weighted that rake it would be all right, so we weighted it with a bar of iron, and had no further trouble. It will not do to have new knives on the sickle bar, they should be worn off short; it will break a new knife; old blades are just the thing. A good deal of my corn was thirteen and fourteen feet high, and we had no trou-

ble in raking it off. It does not come off quite in the nice gavels like grain, but it is easily picked up; let it lie in any shape. Single stalks will weigh from three to nine pounds. We have two poles on a truck, put on a bolster in front, leaving it behind, under the bolster, so it is just high enough to clear the ground. We simply end it over on the pole, and it is very easily loaded. I have heard a great many say that it is impossible to cut with a reaper, but you put a good

team on an old Champion reaper, take one row at a time and drive a good fast walk, and the trouble all passes away.

MR. SHERMAN.—I visited Mr. Fargo, at Lake Mills, and he tells me he raised B. & W. corn seventeen feet high. I don't see how you could cut that with a reaper.

MR. SMITH.—It doesn't make any difference about the height of it. The end strikes the ground and drags it off; but there is practically no difficulty.

## PRACTICAL EXPERIENCE WITH ENSILAGE.

By WELDON VAN KIRK, Winnebago County, Wis.

The Silo Appreciated.—It goes without saying that the silo is coming to be appreciated. So far as we have had a chance to observe, there is a healthy, growing sentiment in its favor. It is a fact that the prejudices so long, so persistently and so sensibly entertained against it, by the mass of our farmers who have gotten the greater part of their education in the hard school of experience, are becoming extinct just in proportion as the red tape, and I may almost add the superstition, that have so largely made up our knowledge of it in the past, dies out. Is it any wonder that the matter-of-fact man of small means should look with distrust on a system so long and so poorly manipulated by men with more money than good judgment, and whose chief satisfaction—for there was no profit—was derived from the fact that they had something that a poor man couldn't afford to have? It is to the credit of Yankee ingenuity that so good a thing

as the silo should be recovered from among the projects of the millionaire farmer, and brought within the easy reach of any man who has a grain of energy that he cares to exert in that direction.

The Silo Simplified.—Plans for building and methods of filling and emptying, once thought to be imperatively necessary, that practically placed it beyond the reach of the average farmer, are now known to be useless, and worse than useless. Year by year the whole matter has been simplified, the cost reduced and the production improved. For example, we were told, only two years ago, that the lining must be of planed, matched floor boards, at a cost of from \$18.00 to \$22.00 per M., and most of us believed it. In our own experience we were unable to get that grade when we built, so put in common lumber at \$11.00, and saved our money by it. For all practical purposes we find it just as good.

**The Round Silo.**—We have no hesitancy in predicting that the orthodox silo of the future will be round. It is easy to compute that this plan will still further reduce the cost, and will effectually do away with the corners, where nine-tenths of all our losses occur. Those having buildings or parts of buildings which they wish to utilize may devise some way of rounding the corners and thus secure the same results; but I am of the opinion that a radical change from the old plan of building square corners is necessary to obviate the difficulty.

It may be excusable on the plan of thoughtlessness in the man who hires all his chores done, to *locate* his silo across the barn-yard from the stables, but he will pay dear enough for it in the end.

**The Crop to be Depended On.**—The question that seems to us most imperatively to demand the attention of ensiloists at present is that of the crop to be depended on. Prof. Henry says that red clover and corn are the crops that the farmers had best fall down and worship and not be running off after strange Gods. Our silo has been filled two seasons, both with the large southern ensilage corn. A year ago last summer, on account of the drouth, it proved to be the best thing we could have planted. We were so well pleased with the large growth that it made when other varieties were a comparative failure, that we made the mistake of depending entirely upon it the past season, notwithstanding the cold, backward spring made it impossible to begin planting before the middle of May.

**Filling.**—The first year, having given up all hope of seeing any ears, we commenced filling the last week in August, and without waiting for the corn to wilt. The result was sour ensilage. Later on

ears made their appearance, and before the last of it was in, they had nearly reached the glazing stage.

In feeding it out, we found that on the top sweet, and very much better than that put in first.

This year, thinking to improve by last year's experience, we waited until the last week in September before commencing. Within a week from the time we began, the frost came, and the general appearance of the corn field reminded one of the cedar swamps of Peshigo, killed, but not consumed, by the great fire of 1871. Had we possessed the good common sense that it would seem any granger ought to have, we would have rushed it into the pits at once; but that erroneous idea that each successive day's filling must remain uncovered until it reached a certain heat had possession of us, and unable to bring ourselves to a point where we dare go against the doctor's orders, we took it slow and let the leaves dry up, except as we were able to prevent their doing so by cutting the corn and throwing it into large gavels, five or six of which would make a load. Dry weather followed, or heavy losses might have resulted from that method of handling.

**Slow Filling not Necessary.**—I have come to be most emphatically of the opinion that slow filling is not necessary to the making of sweet ensilage; that much more depends upon the crop having come to maturity before being put in, than upon any particular method of filling.

**Planting Native Corn.**—Our plan for this year is to plant a part of our acreage to some native varieties, something that we can begin on early, and thus get through if possible before frost comes. We shall, of course, not get as many tons per acre, but we hope that

what we lose in quantity will be partly made up in quality. The fellow who, day after day, will handle the B. & W. corn and not stop occasionally to wonder if the water he is lugging round is really charged with anything of very great feeding value has more muscle than brain.

**Covering not Necessary**—Perhaps in regard to no other matter concerning the silo has so many erroneous theories been entertained, and one after another been exploded, as in the matter of the cover. Since the time when it was thought necessary to put on one-half a ton of weight to every of ton ensilage, we have learned that it is not absolutely necessary to put on anything, and while economy may dictate that it is better to put on a foot or so of cut straw, green marsh grass, or something of the sort, rather than to sacrifice that amount of ensilage, yet no fears of any extensive loss need be entertained if no cover at all is provided.

The past season we expended a good deal of energy tramping the cover for the purpose of making it follow closely after the ensilage, as it settled, and thus exclude the air. We were somewhat surprised on opening it, to find as much mould as we did, but have since figured out that the only result of our tramping was to shatter the otherwise air-tight blanket of mould that kind nature was forming in that buckwheat straw, and in so doing let the air through and necessitated the forming of another layer underneath.

#### Discussion.

**MR. SHERMAN.**—I built a silo, but failed to fill it. It is long, and one end opens towards the cows and the other towards the sheep. I want to know if any one here has had experience in feed-

ing ensilage to sheep and cows and horses.

**MR. MCKERROW.**—On the Sherman farm, Springbrook, they have been using ensilage for several years; also the Messrs. Brewer, who are large sheep feeders, and they all tell me ensilage is giving good results in feeding sheep. Prof. Cook, of Michigan, tells me he has had fine results in the same line, and I have failed to meet any sheep feeder who has been dissatisfied with it.

**MR. KELLOGG.**—I put in a silo last year; I have been feeding two horses a bushel apiece, once a day. I have been feeding one brood mare, one driving horse and two colts, and we give them that which is not the best, taken out of the corners, and they like it and are doing well on it.

**MR. THOM.**—I have a horse which I cured of the heaves this winter with ensilage. It has had the heaves for four or five years, and has had ensilage and oat straw exclusively during the entire winter and to all appearances there are now no signs of its having the heaves. It has been in harness nearly every day this winter.

**MR. HOXIE.**—I think there is quite an important point in filling the silo—rushing it in. We have been taught heretofore to put it in one day and wait two or three days for it to heat up. It seems to me that it is a very important fact to know that if we get caught with a frosted field of corn we can put on men and get it in quickly, before it spoils.

**MR. FAVILLE.**—More than half of my ensilage was put in after the corn froze. It caught our common Dent corn pretty badly, but did not affect the B. & W., standing side by side. The B. & W. was perfectly green, and the leaves of the other caught it. We commenced filling the silo and had a hard frost two weeks

afterward, killing everything, even the B. & W. We hurried it into the silo, and the ensilage from the last is sweeter and better than the first that we put in. If it had rained, however, during the time, I have no doubt we should have had a poor mess of stuff. I don't think the frost did it any harm. There was no frost in the first that we put in; it was perfectly green. In the corners there was quite a difference in the quality from that in the middle. It was not rotten, but it was vastly more acid.

MR. HIRAM SMITH.—I think if the corn is just in the roasting stage, that there is no sort of trouble about filling the silo as rapidly as we please. In fact, it was thoroughly tested last year at the experiment farm. You will notice, in the bulletin of Prof. Henry, that he filled it in one day fourteen feet deep. The corn was cut and put in as soon as they could do it. I think if it is all filled in one day, it will heat up. There is air enough carried in with the feed as it passes from the carrier into the pit to heat it up. Very green corn, of course, would not do so well.

MR. THOM.—I know a silo holding three hundred tons of corn say in the roasting stage, filled four feet at each filling, heating to one hundred and twenty. That silo does not contain a pound of ensilage that any stock will eat; it is as black as your hat, all the way through, and I would like to know what is the matter with it?

MR. SMITH.—Do you know whether the pit was made properly—was it airtight?

MR. THOM.—It is as well made a silo as I know. It is inside the barn; it is made of two thicknesses of matched lumber, with tarred paper between. The corn was cut from the stalk.

MR. SMITH.—I don't know of any reason. It is one among a thousand in-

stances. The great majority of silos that are filled come out perfect, and I find the corners will come out as good as the rest, if before filling the second day they are pitched out, and the heated ensilage from the center pitched into each corner, where it is colder.

MR. SAWYER.—Had the silo spread any?

MR. THOM.—No sir. There is one point that I should state. The man filled the silo from top to bottom without going near the inside. It was not spread or tramped at all. It was filled in the center of the silo.

MR. FLEMING.—I can readily see from that statement one of the reasons for the ensilage being in the condition you say it was. Being simply pitched into the silo, and not evenly distributed in regard to the heft of it, the lighter portion of the ensilage dropped near the wall from the carrier, while the heavier portion, of course, was thrown over and settled much more than the other. The fine portions did not have sufficient weight to pack, and, of course, left spaces through which the air passed and penetrated the whole mass.

MR. THOM.—We visited Mr. Byron Snyder's silo, and saw where the ensilage had drawn away from the walls.

MR. PEPPER.—If the gentleman's silo had been built like mine, I don't think that would have happened. I made mine about two inches smaller on the bottom than on top, and as it settled it always got harder instead of loose.

MR. GORDON.—I saw on the farm of Mr. Morgan Manuel, perfect clover ensilage. I asked him how he did it. He said that he cut the clover when the top blossoms were brown and the lower part of the stalk was a little woody; cut it after the dew was off, and put it in straight, without cutting or any further work; kept it thoroughly distributed,

and then weighted it a little with plank and other weight, just sufficient to overcome the natural tendency of hay not to settle. It was the most perfect article of food I ever saw in my life, rather brown and green; had not any of the Limburger smell that clover ensilage generally has. He says the secret of clover ensilage is in putting it in in exactly that stage. I saw one silo where the clover had been put in alternately with corn and not cut, but the clover smelt like Limburger cheese; the corn was all right.

MR. HODSON.—We put some in this year, and cut it and it is a perfect success. Since we began to feed it, the herd has gained about two pounds a day. I venture to prophesy that some day not far off all intelligent dairymen will put up half of their ensilage in clover.

MR. SHEERMAN.—I have had bad luck. I put in five jags of clover. It was not very good clover; it was a little past the green stage, rather getting ripe. It did not heat up satisfactorily. I dampened it and tramped it, and made a square billet of wood and pushed it down, but still I haven't anything very satisfactory.

MR. FAVILLE.—I filled the silo with clover two years ago, and it was very satisfactory. I haven't filled it since for the very good reason that we haven't had any clover. Our cows ate it very greedily, and gave milk on it just about as they would eating green grass.

MR. SHEERMAN.—I filled my silo because I wanted some of the protein these men are talking about at the experiment station. I do not believe the hogs will touch it, but I am sure the cows will eat it when they can.

MR. THOM.—Is there a man present who owns a silo who wishes he had the money back that it took to build it. I would like to see the hands of those who

own silos. I see twenty-two. That's pretty fair for a beginning.

MR. GORDON.—I would like to have the money back from mine, so that I could build a larger one. I believe that the secret of all this matter rests largely in furnishing one's mind first with a theory—the correct theory of ensilage. We have been talking broad. It is very useful to get the practical side of the question presented, with all the mistakes and all the successes of the silo, but I believe we must get firmly into our minds the complete theory of ensilage so as to be able on our own farms to meet the accidents and incidents that we have to meet and never have seen before. It was a new thing for me to get up in the morning and find all my corn frosted and not a bushel in the silo, but Edward Fries' little book, that costs fifty cents, gives you the theory based on the natural law of what ensilage is, that you may meet those emergencies very easily by exercising common sense. For instance, I found that the corn had dried up one-third of the way one year. I was puzzled to know what to do, but Fries' book set me right about it, without having to look through one hundred speeches of practical men. I believe you had better, all of you, send for this book, which is the only book in the English or French language that gives completely the theory of practical ensilage. It is Edward Fries' book, sold for fifty cents by the WESTERN FARMER COMPANY, Madison, Wis.

MR. KELLOGG.—I put up a silo last season and filled it with B. & W. corn. The lower leaves had yellowed for three feet on the stem, but it is coming out very satisfactorily, except the corners. The boards on the inside were unplanned, and that is where I think I missed it; I shall probably have to put on a third thickness of boards, and



planed boards up and down. I am satisfied that it pays, even for twelve head of stock.

MR. THOM.—Don't put the boards up and down, for the reason that if two boards are set up this way, you have a chimney that runs clear to the bottom of your silo, to let the air through the whole length of it. If you put it the other way, the only chance for the air to come in is at the top.

MR. KELLOGG.—Would you put in another thickness of paper before you put in that third lining of boards?

MR. SMITH.—I think, to make a sure thing, I would put in a thickness of paper, and then put cheap shingles laid six inches to the weather, the same as you do on the roof. Last year I built a silo with cheap cull boards outside and in, and then the shingles. It cost only half as much as common lumber. The ensilage kept as perfectly as in any other silo I ever saw.

CAP'T. ENOS.—I would like to hear what Mr. Hodson can tell us on the subject of uncut ensilage.

MR. HODSON.—There is one point I make against cutting ensilage corn. We don't cut ours, and there is less waste in the corners. In our silo you won't find three inches of waste, and the outside is perfect. When you fill with whole corn, the heat drives to the outside and comes up and keeps it sweet. Another thing: It is natural for a cow to chew her food, and it mixes better with her feed when she eats it. All scientific men tell us that if it is mixed thoroughly it helps digestion. The machinery of the cow's stomach is called on, having this stringy stuff in it. Everything that is swallowed passes into the first stomach, and there is somewhat of a sifting process. If she takes her food cut, more particles pass through unchanged than if it is fed to her uncut. We have tried

repeated experiments, changed cows back and forth, and we find they always produce the most on uncut feed. I have noticed in killing cattle that if we feed corn-meal, say, and mix it with uncut food, it is thoroughly mixed in the ruminant, and you will find pieces two inches long in the manifold; if you kill that cow six hours after she is fed, you will find the food pretty well sifted out. The cow needs to have long, fibrous feed so as to sift it finer. I find also a great difference in the droppings of cattle. I have found corn-stalks in the cow's fourth stomach an inch long, and hay also. We have proved to our satisfaction that the large corn is not the corn for our cows; we must have the small corn. We tried the cows last year back and forth, and they would come back to the small corn every time. I am satisfied I can get net profits of forty to fifty cents a ton more in uncut corn than in cut.

MR. THOM.—Do you have to carry it in your arms to the cows?

CAP'T. ENOS.—They carry it by railroads. They do things by clock-work over there.

MR. HODSON.—I told at the institute last year that we could take whole ensilage out of the silo and feed to 27 cows inside of seven minutes.

MR. SHERMAN.—I wish Cap't. Enos would tell us the cost of the contrivance by which Mr. Hodson feeds his cattle so nicely.

CAP'T. ENOS.—I think it may cost about \$25. Mr. Hodson built his all himself. There is an alley between the two rows of cows about three and a half or four feet wide, and about forty feet long. At one end of the alley is the silo. The door of the silo opens right in front of the alley. He has built an elevated railroad, or rather he has taken barn door wheels and built a platform

that runs right along within three or four inches of the floor, and right up against the door of his silo. He takes his ensilage and loads it upon that platform, and when he has enough to feed his stock, he starts off, and as he goes along throws it to the cattle on either side till he gets to the other end, forty feet away, and the cattle are fed. I haven't any doubt at all that Mr. Hodson can feed his herd of twenty-seven head of cattle in seven minutes, and not hustle around very rapidly either. It is one of the most ingenious and nicely arranged stables that I ever saw. He waters his stock on the same principle. He runs the water right in front of each row of cattle, so that his stock is watered and fed in about ten minutes.

MR. GORDON.—I would like to advise anybody who thinks of putting in an overhead railroad to feed cattle not to go to the regular dealers, makers of packing house railroads. I have one

hundred and thirty-five feet of overhead railroad track. I found that it would have cost me about \$225 to have that work put up, if I put it into the hands of the packer people, but by putting an iron wagon tire on the end, with couplings made at the blacksmith's shop, having my bails made at the blacksmith's shop, I got my one hundred and thirty-five feet of railroad track, to feed the entire herd and take care of all the traffic in the barn, for forty-five dollars. I believe now I shall put in two tracks behind, to cross so as to carry the manure out of the barn and dump it, and I believe the two tracks for the manure with crossings, &c., can be put in at forty dollars. On my track a child can push a car that is full of ensilage to feed fifty head of cattle. I believe it is a great saving of labor; I believe one man can feed one hundred cattle in less time than three men can otherwise.

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## THE PROFITS OF DAIRY FARMING.

By S. A. GERON, Waukesha County, Wis.

**Dairymen Should be More Exact.**—In this time of depression in all branches of trade, when profits are very small in all kinds of business, even when large amounts of capital are invested, when competition is so brisk that there seems to be an overproduction of almost everything, the question naturally arises as to whether there is any profit in dairying, and if so, what are some of the methods necessary for dairymen to pursue in order to secure it?

The trouble with two-thirds of our

dairymen is that they do not know what the income from their cows is, neither do they have any idea of the yearly cost of keeping a cow. They seem to think that all they have to do is to labor hard sixteen hours out of twenty-four, and trust in Providence to make the balance come out on the right side of the sheet at the close of the year, a task which she seems utterly unable or unwilling to perform.

**To Whom Failures are Due.**—It is the fashion now-a-days to lay nearly all

failures in dairying to the scrub cow, and doubtless she deserves nearly all the abuse she gets; but I think far more of the failures can be traced to the scrub man who feeds and cares for her. The best dairy herd in this county would soon degenerate into scrubs if they were fed scrub rations by a scrub dairyman.

**The Successful Dairyman**—Must know how to select and breed good cows; he must also know how to feed, handle and intelligently care for them. If he is manufacturing the product himself, he must know how to produce a first-class article and be salesman enough to find a first-class market for it. His maternal ancestor may have made the best butter he ever ate, and the best keeping butter; but he must remember that times and tastes change, and he will do well to keep up with the times and try to tickle the palate of the man he sells to. He must know how to produce the largest amount of good, nutritious food on the smallest amount of land, and how to preserve it in the best and most economical manner. As he cannot produce all the different kinds of feed he will require, he must know when, where and how to buy the balance.

Of one thing he need have no fear, and that is the loss of fertility of his farm if the manure from his cows is properly saved and applied; and as time passes I think he will not find this to be one of the least of the items of profit.

**Profit and Loss in Dairying.**—While there is a profit for some dairymen, many are making sad failures. In a series of papers written for Hoard's Dairyman, by C. W. Jennings, entitled a "Cow Census," giving the statistics of the dairy business of the town of Ellensburg, Jefferson County, N. Y., some light is thrown on this dark subject, Jefferson County is one of the oldest

dairy counties in New York, and stands third in the State in regard to the number of cows kept. Following are some of the figures of this census:

Number dairymen interviewed .....	367
Number of cows kept .....	5,507
Average number cows per dairy .....	15
Lowest average gross earnings, herd of 10, per cow .....	\$18.10
Highest average gross earnings, herd of 5, per cow .....	\$81.00
Average gross earnings per cow .....	\$31.74
Average estimate of cost of keep per cow .....	\$36.36
Average loss per cow .....	\$4.66
Total loss on 5,507 cows .....	\$24,480.00

Of the whole number of cows reported, 70 per cent. failed to bring in enough to pay for the cost of their keep, while of the remaining 30 per cent., 20 per cent. did not bring in enough over the cost of keep to pay their owners for the time spent in caring for them. This would leave 10 per cent. of all the cows kept in that township that were paying a net profit to their owners; or, while 10 men in every hundred were making a profit in dairying, 20 were just about holding their own, and 70 were losing money.

A curious fact shown by this census was that very little grain or mill-stuff was fed to these cows, and the ones who fed the smallest amounts of these feeds were *always* the ones showing the smallest incomes, and that where money was invested in this kind of feed, it was given back by the cows with interest at the rate of 500 per cent. This convinces me in this case that there were more scrub dairymen than scrub cows.

**Dairying in Waukesha County.**—Waukesha County, I think, can show more good dairymen to the square mile than that down east town. Let me give you a few figures as to what we are doing around here. First, let me give you a few conclusions arrived at by looking over the report of the Waukesha Butter and Cheese Factory for 1888. This factory paid out over \$22,000 last year to its patrons, and now that it

seems to be established on a paying basis, there is no reason why it should not receive a much larger patronage.

I find that the average price paid by them for milk by the year was 93.3c. per cwt. The lowest average price paid was a fraction less than 80c per cwt.; the highest average price paid \$1.086 per cwt. As each of these men received the same price per cwt. for the same months, there is a difference of nearly 29c. per cwt., by the year, in favor of the man who furnished the most milk when it was worth the most money, that is in winter, and I think we are wintering our cows now about as cheaply as we can carry them through our dry summers. This 29c. per cwt. can be set down in this case as one of the profits of dairy farming, and the reason why there was a profit was because there was something to sell when the market was not overstocked.

**Figures That do not Lie.**—A few figures telling what some of our individual dairymen are doing may be of interest. These figures give the gross earnings per cow for 1888. In each case the cow was credited with two dollars for value of calf. Where butter was made and cream sold, 20c. per cwt., was allowed as the feeding value of skim-milk. No allowance was made for whey where milk was taken to a cheese factory, because when a man sells a ton of milk off his farm he sells \$2.43 worth of nitrogen, potash and phosphoric acid. When he manufactures the ton of milk into butter and sells that, he sells about three cents worth of these valuable fertilizers, and \$2.46 per ton I think would be a big price for any whey I ever saw. Here are the figures:

Dairy.	Cows.	Gross receipts per cow.	
1.....	20.....	\$49.00	Delivered milk to factory.
2.....	18.....	49.66	
3.....	22.....	56.43	
4.....	16.....	69.87	

5.....	15.....	60.00	Sold cream in Milwaukee.
6.....	33.....	60.00	
7.....	19.....	68.00	Made butter
8.....	24.....	72.33	
9.....	20.....	74.80	
10.....	19.....	84.60	

Here are 10 dairies that average over 20 cows each. The average earnings per cow are \$64.47. Most of these dairymen know very nearly the yearly cost of keeping a cow as they keep them. Taking an average of their figures, I think \$35 per cow would be about the cost of feed for a year. Now, if we add \$10 for the cost of caring for her for a year, then \$45 is about the point where we may begin to figure the net profit. If these figures are nearly correct, then these 10 men have a net profit of nearly \$20 per cow, not a very bad showing when we remember that 1888 was a very dry season with us.

We undoubtedly have dairymen with us who are realizing larger profits on their herds, where they are favorably located for retailing milk and cream, and, doubtless, others are doing better in butter and cheese production. Many, of course, are not doing as well as this, and some are working at a loss; but if they were as anxious to learn new and better ways as the successful ones are, they would soon have the balance on the right side of the ledger.

**The Secret of Success.**—What was the secret of the success of these dairymen? Having gone into the dairy business to make a success of it, as a business man would go into any other kind of business, they first selected their cows with a view to the kind of dairy work they wished to engage in. If butter making or cream production was the object they had in view, they selected cows that would produce large amounts of butter fat in their milk for the food consumed. If they were patrons of a cheese factory, they selected the cows that would give a large flow of milk regardless of quality.

This, of course, was not as it should be, but until some way is devised of paying for milk according to quality, the inducements held out to patrons are all for quantity. Having selected these cows for the object they had in view, they realized that, like a threshing machine, the more of the proper kind of feed they could run through them without clogging

the sieves or impairing their digestion, the larger the profit would be, and as they did not select them in the first place with a view to profitable beef production, when they cease to yield a profit as milk producers they will not keep them long expecting to make a profit on 2c. beef.

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## DAIRYING AND BEEF PRODUCTION.

By C. R. BEACH, Whitewater, Wis.

**Beef Produced at a Loss.**—It has been so often demonstrated, both theoretically and practically, that dairying can be made to pay a handsome profit on capital invested, and labor performed, that I need not stop to show the way in which it can be done. But I think that it is claimed and generally admitted that but little if any beef is produced in Wisconsin, except at a loss, or, in other words, the food used for that purpose could have been sold or put to other use, and would have brought more money. Now the object of this paper is to attempt to point out a way by which, in connection with profitable dairying, beef can be produced at a profit.

**Selling Cows from the Dairy.**—As I am to work along the line and in harmony with successful dairying, I will start with the self-evident truth that the successful dairyman keeps no cows but those of good age. But he will find that all are not as good as the best, and he will think it for his interest to dispose of a certain number yearly and to replace them by purchase, or, what will perhaps

be better, with heifers from his best cows. The usual course now pursued, is to sell those cows in the autumn or early winter for what they will bring, usually from 1½c. to 2c. per pound. One day in the early part of the present winter I saw three good sized cows, not very old, sold for \$25. Two sold for \$8 each, and one for \$9. I remarked that the price seemed small. The answer was "it is, but they will eat their heads off before spring, and I had better sell them."

Was there a better way by which one could have kept those cows and fed them until they were good beef, and made money on the feed they would have eaten? I unhesitatingly answer, yes. It would have required a little fine thought and planning, but so does any successful work. We do not stumble into the best way of doing things; we have to do lots of hard thinking to "get there."

**Feeding For Milk and Beef.**—As these instituites are designed to impart knowledge that has come to us through practice, rather than that which has been deduced through theoretic specula-

tion, perhaps I can not enforce what I wish to say better than to relate a little of my experience: For several years previous to 1872 I was engaged almost exclusively in feeding cattle for beef. A part of the time I fed heifers and dry cows, and almost invariably found that they would put on more flesh on a given amount of feed than steers, and generally yield a better profit.

In the winter of 1871, during the month of February, I purchased 20 farrow cows that were then giving milk at a cost of \$30 per head. I milked them until I had sold \$100 worth of butter. They were then dried, and fed for beef, until grass grew, when they were turned to pasture without grain, and about the 20th of June were sold as beef to ship to Chicago for \$55 per head, or \$1,100, making \$600 for the feed. I then thought I would buy my cows in the summer, send my milk to a cheese-factory, and feed the cows for beef during the winter.

In July I bought 20 cows, at a cost of \$31.70 per head, and milked them, sending to a factory that closed the first of December. As the cows were giving a large flow of milk, I thought I would make a little butter before drying them. I made a couple of jars, and sent to a hotel in Chicago, for which I received 31c. per pound with an offer that if I would furnish them a hundred pounds a week for a year they would pay me 32c. per pound. In the place of drying my cows, as I intended, I arranged my cellar for keeping milk, and milked those cows all winter and spring, then selling them for beef at an average of about \$40 per head.

I continued to furnish these parties with butter by the year, buying my cows fresh in the spring, keeping them farrow, milking, feeding, and selling for beef the following spring. In the

spring of 1875 my books showed that, during these three years, I had purchased 79 cows at an average cost of \$31.59, which had been sold for \$40.41. The experience of these three years convinced me that I could milk cows and make beef at the same time. As times changed, and it became more difficult to buy good cows, and beef sold at less price, I of course have deviated somewhat from the original plan, but have never entirely abandoned it.

If I find in the spring of the year that I have cows that had better not be kept, or have more than I wish to keep, they are kept farrow and milked until the next spring. Then they are sold for beef, sometimes drying and turning to grass, and sometimes selling from the yard, before drying. The prices received have almost invariably been more satisfactory than to have sold them the previous fall.

**Figures That Show a Profit.**—Let us look at this matter a little more in detail. The cow that comes in milk in the spring and is milked to the 1st of December, weighing 900 to 1,000 pounds, would not, the last two or three years, have brought over 2c. per pound for shipping, and often less. If, now, a lot of such cows be fed daily from that time until the 10th day of May, 40 pounds of field-corn ensilage, worth 5c., with 10 pounds of wheat bran, worth 6c., and 10 pounds of good hay, worth 3c., making a daily ration worth 14c. (there are other rations equally as good, but I have mentioned this because I used it last winter and this, and know that it is both cheap and good), they will give from 12 to 20 pounds of milk per day, averaging 16 pounds, which will be worth from \$1 to \$1.50 per hundred, averaging \$1.25, making the 16 pounds of milk worth 20c. daily, or 7c. above the cost of the rations. The manure

will pay for the work, and you have for the 160 days' feeding \$11.20 above cost. If, now, these cows be dried, turned to pasture, and fed five pounds of corn meal until the 20th of June—40 days—at a cost of \$1.80 for pasture and \$1.20 for grain, the expense will be \$3. Deduct this from the \$11.20 profit on milk, and you will have \$8.20 as the average amount they will have payed, *above their keeping*, out of their milk. At this particular time of the year the winter-fed cattle will be out of the market, grass beef not yet ready, and your cows will therefore sell well and bring at home 3c. to 4c. per pound, live weight, averaging  $3\frac{1}{2}$ c.; they will have each added a hundred pounds or more to their original weight (I have in several instances had a whole car-load of cows add 80 pounds each by running 40 days on pasture), without grain, and will therefore bring \$35 to \$38 per head, or \$17 to \$18 above what they would have sold for the 1st of December, which, add to the \$8.20 profit on milk, and you have a net gain of \$25 to \$26 per cow.

You may think these figures fanciful and extravagant, but they are not, and it will not take your best cows to do it, either. We, in Wisconsin, dispose of not less than 100,000 cows annually, most of them going for canners, at less than 2c. per pound. Had these cows been handled as I have indicated, with the results as I have figured, there would be an annual gain of \$2,600,000 to the wealth of the State.

Do not think I am trying to persuade you to slaughter your good cows, in order to get money. I am only trying to show how more money could be made out of those we do dispose of. Some of our teachers are continually teaching that one-half the cows in Wisconsin do not pay their keep, and they advise us to sell them and supply their place with

better ones; but they do not tell us how. It would be almost wicked to sell them for dairy cows to those who do not know as much as we.

**Experience in England.**—In confirmation of what I have said, some twenty-five years ago Mr. Hosford, of England (as reported by Stewart in his work on feeding) made a specialty of purchasing cows under six years old, feeding them for beef and milking them at the same time. In this way he could, in 6 or 8 months, increase their selling value for meat something like 50 per cent., and at the same time realize a handsome profit above cost of feed out of their milk. He fed six cows 191 days at a cost of 27c. a day each, amounting to \$311. They averaged  $35\frac{1}{2}$  pounds of milk per day, which brought \$1.44 per hundred pounds, amounting to \$592, leaving a profit of \$281, or \$46.83 per cow on the milk alone, besides their increased value for beef. They had added to their live weight 84 pounds each.

**Skim-Milk and Whey**—I wish now to ask your attention for a short time while I attempt to show how we can utilize with *profit* the skim-milk, and the *whey* from our dairies in producing beef.

There are three reasons why we fail in our attempts at profitable beef production. We spoil our calves during the first three months of their lives. We attempt to put too much weight on the same animal, and we take too much time. The spring calf fed a few days on new milk and then changed to cold skimmed milk, and after a few weeks turned to grass and fed only sour milk until weaned, at three months old, will be worth but little to grow, and to convert into beef at *any age*. You can raise a spring calf that will be a good one, but he should never have green grass and sour milk at the same time, and I doubt the

advisability of giving him any grass for the first six months of his life.

One of my neighbors in New York State, more than thirty years ago, raised twenty spring calves, that were kept in the stable all summer and fed on hay, bran and oats, the sour milk, and the butter-milk, together with a gruel made by soaking oil cake in cold water. They were sold at about six months old and brought twenty dollars each, and were supposed to weigh about 500 pounds.

#### Advantages of Early Maturity—

Were we to plan to have our steers ripe for the market at fourteen or sixteen months old, and weigh one thousand to twelve hundred pounds, instead of keeping them until they are thirty or thirty-six months old, and weigh from twelve hundred to fifteen hundred pounds, our chances of making a profit would be greater. We have learned that the pig may be made to pay a profit, if mature at eight months old, but will generally run his owner in debt if fed eighteen months. Why will not this law of early maturity hold good in making beef?

#### Feeding a Calf for Profitable Beef.

—1. I will not choose a spring calf, because for the first six months of his life I propose to feed him largely on skim-milk and whey, and from May to October it is very difficult to have these two articles sweet, and if they become sour they lose much of their feeding value.

2. Because at the age when he needs the most care I am most busy with farm work, therefore shall be apt to neglect him.

3. As he is to be raised without grass while fed milk or whey, he will not get much exercise the first summer, and the same will be true of the winter following. This close confinement for a whole year will prevent a healthy development of bone and muscle.

4. I propose to sell him at fourteen or sixteen months, and this time in the care of the spring calf will fall in the summer when prices are generally at the lowest.

5. As profitable dairying is one of the conditions to accompany profitable beef production, and that generally means winter dairying, I prefer that the calf should be dropped the last half of September or the first half of October. This calf will then have time to grow to a size that will enable him better to withstand the extreme cold of winter.

Having thus settled that our calf should be a fall calf, and that we are to have him ready for the market in fourteen or sixteen months, what and how are we to feed and how handle him?

The first sixty days of a calf's life are most important. If neglected or mismanaged then, he will rarely recover. Governor Hoard, at the Janesville institute, named four conditions that he considered absolutely essential to success. The food should be sweet; it should be fed warm and often, and the calf should be kept dry. I most heartily indorse what he said.

For the the first ten days the calf should have new milk. Skim-milk may then be substituted, feeding from two to three times a day, the milk to be sweet and warm. We often injure calves by feeding too much at a time. After a few days ground flaxseed may be added to the milk. At five or six weeks old the calf will begin to eat a little fine hay, which should be kept within reach, and soon will lick a little wheat bran, and at two months will eat whole oats. If you have carried him up to this time in good shape, the critical period is past. After this, the milk can be gradually lessened, but to produce the best results it should be kept up until the calf goes to grass in the



spring. After the calf begins to eat hay and grain, he should have water daily.

**Cost of Keeping.**—Let us now try and determine what this calf should cost for keeping from the middle of October to grass time, 200 days. His food will, of course, be varied in kind and amount, but we will allow the following for an average daily ration:

12 lbs. of milk, 200 days, 2,400 lbs., at 25c.....	\$6 00
1 lb. of oats, 200 days, 200 lbs., at 1c.....	2 00
2 lbs. of bran, 200 days, 400 lbs.....	2 40
1 lb. of oil meal, 200 days, 200 lbs.....	2 50
1 lb. of hay, 200 days, 200 lbs.....	0 60
Total cost .....	\$13.50

He will weigh from 400 to 500 pounds, at a cost of not exceeding 3c. per pound. As the whey of our cheese factories can be kept comparatively sweet in winter, it can be used in place of milk by increasing the oil meal, or, what is better, flax-seed gruel.

The calf that has cost us \$13.50 up to grass, can now be turned to pasture and fed two pounds oats and two pounds wheat bran daily for 100 days, or up to the first of September. At 20c. per week for pasture and the grain at cost, your calf has cost you \$18, and should weigh from 700 to 800 pounds. From the first of September to January, you may feed him anything that he will eat that will make him take on flesh the fastest—grass, fodder corn, shocked corn, run through a cutter, ensilage corn, ground oats and wheat bran. The flies are away, and you can make him grow wonderfully; you ought, in these 120 days, to make him put on from 300 to 400 pounds. Prof. Henry reports that he made a lot of steers, fed on corn ensilage alone, put on 3 7-10 pounds daily for twenty-six days in succession. A lot of 30 1,000-pound steers that I wintered in the winter of 1884, the following summer added 300 pounds in 100 days on pasture

grass alone. The cost of the feed for this steer for the last 120 days ought not to exceed 10c. per day; he is on grass for more than half the time, making the entire cost \$30, and if he weighs 900 pounds and sells for but 4c., he will bring \$36, and if he weighs 1000 lbs. he will bring you \$40 or more. Success in this plan depends upon starting at the right time of the year, utilizing your waste dairy products. Make your calf do his best every day he lives, and sell him before he eats his head off.

**Utilizing Whey.**—This utilizing whey, feeding it at the time of year it can best be kept sweet, is deserving of more than a passing consideration. Sweet whey contains over 6½ pounds of dry solubles in each hundred pounds, more than half as much as new milk. If we could feed all the whey made in Wisconsin while it is sweet, it would amount to a good many hundred thousand dollars more than we now get out of it.

In proof of the value of whey for calves, Mr. I. H. Wanzer, of Elgin, in 1876, fed 120 calves whey, oil-meal, oats and bran. They were fed milk four weeks, and were sold at seven months old at an average of about \$21 (E. W. Stewart is my authority).

**Skim-Milk and Whey for Hogs.**—While skim-milk and whey make excellent feed for hogs, they yield better in returns fed in summer than in winter. By planning to raise winter calves, we could feed in the summer the pigs we ought to sell at eight months old; and then, in the place of raising fall pigs, to eat winter slops, we could feed the slops to calves with perhaps greater profit.

**Jersey Beef.**—How about Jersey beef? we know that it won the first place as to quality at the late fat stock show held at Chicago. It matures early,

and if it should be found that the neck of a Jersey steer made better beef than the sirloin of a Durham, perhaps he will pay for the feed he eats, if he don't weigh quite as many pounds.

#### 50,000,000 lbs. of Beef a Year.—

The people of Wisconsin consume from thirty to fifty million pounds of beef annually. We can not afford to import it, and one of the problems for Wisconsin farmers to solve is, how to make it the cheapest.

#### Discussion.

MR. CLAPP.—You bought your cows for \$31.70.

MR. BEACH.—I take the cow when the man wants to sell her in the fall. I am not taking her at the price I buy her for a dairy cow. I am talking about cows that you want to dispose of, and not the best cows which you are keeping.

MR. FAVILLE.—Have you sold any cows this spring?

MR. BEACH.—I have a carload that I shall sell.

MR. FAVILLE.—When you get four cents a pound for them, let us know.

MR. BEACH.—Last year my cows brought me over three dollars, without drying, before they went out of the yard; if I had dried them, would have got a cent more.

MR. FAVILLE.—I have tried that plan of feeding cows, and I didn't make any money by it.

MR. SHERMAN.—Is it practical to feed old, full-blooded Jersey cows?

MR. BEACH.—Dairymen don't keep cows so long; they can't use them.

PROF. HENRY.—My students in agriculture are going over figures in regard to some work in feeding at the Station. We are feeding several calves, keep an account of what each one eats, and at the end of about twelve weeks feeding,

when the calf was about thirteen to eighteen weeks old, we went over several of the reports, and found that the calves were then taking twenty pounds of sweet skim-milk a day. They were eating ten ounces of oats a day; the hay was so small a quantity that we could hardly weigh it. Now, upon that twenty pounds of sweet skim-milk and ten ounces of oats daily, the calves are gaining from one and one-tenth to one and seven-tenths pounds. We are getting an average of one and four-tenths gain a day for the lot, by feeding that way. Those are grade Jersey calves.

MR. BEACH.—I hope no one will get the impression that I advised giving up dairying, and going into what cows one can find; but, if you are dairying profitably, you must sort out your cows, and I am merely trying to show you how you can make the best possible use of them. Most people raise their cows, and they wish to dispose of those that are the furthest advanced and the most unsatisfactory. We don't buy cows to sell again, if we are dairymen.

CAPTAIN ENOS.—My experience in the dairy business is this: When I had a heifer or a young cow, and when I came to feed high with a view of testing that animal to see whether I should retain it in the dairy or dispose of it, that question was settled by this fact: If the animal put on fat instead of making returns in response to what it was fed, in butter and the pail, that animal was to be disposed of at any price. I went upon the principle of the survival of the fittest in building up a dairy herd, and I long ago discovered that as soon as a young cow began to put on fat in response to her high feeding that she was not the cow for the dairy, at least not for my dairy. When I found a cow that kept her condition fair, and frequently would grow thinner in flesh,

that was the better cow for me. Whenever a heifer or a cow was ready to turn off, I did not ask the question, how much I could realize from that creature. I figured up that if she had been in milk for six or seven years she had earned for me from twenty-five to thirty per cent. net profit every day, and I came to the conclusion that that animal must go for whatever the butcher offered me.

MR. BEACH.—That is precisely what I

propose—to get them ready for the butcher and sell them to him. We agree.

The following resolution, offered by Mr. Gernon, was adopted.

*Resolved*—By the farmers assembled in convention at Waukesha, that we most urgently request our legislators at Madison to take immediate steps to drive all fraudulent imitations of butter and cheese from the State.

*Resolved*—That we urge the establishment of a food and dairy commission to aid in this work.

## ADVANTAGES OF THE CREAMERY SYSTEM.

By A. R. HOARD, Ft. Atkinson, Wis.

**The Farmer a Producer.**—The farmer proper is a producer, and in this age of specialties, the special producer of milk and cream will certainly have an advantage over him who spends half his time in manufacturing and finding a market for his product that only the other half of his time has produced. I have noticed that when a dairyman who has been making butter for years starts in to send his milk to the creamery, he increases his herd of cows. He becomes especially a producer of milk. He wants to send all the milk the farm will produce to the creamery; and, devoting his whole time to that end, he is better able to do it. A dairyman may be able to make just as good butter as any creamery turns out, but he must have the necessary appliances and skill to do it, and in order to make these requirements profitable, he should make up the butter for the neighborhood. It takes just as much skill and time to make 10 lbs. of butter as it

does to make 100 lbs., and the latter will sell for a higher price per pound, as the dealer who buys it will see ten times the profit in the larger lot.

**Increases the Value of Land.**—There is another advantage which a good creamery brings to every farmer in the neighborhood of its location. It increases the value of his land. This advantage is enjoyed by all, whether they patronize the creamery or make up their butter on their farms, so long as the creamery makes good dividends to its patrons. A few individuals may have the conveniences, skill and time to make fine butter, and get full Elgin prices for it. They think it will make but little difference to them whether the creamery runs or "busts up," as the saying goes, for want of patronage. I think they are mistaken. The great majority of farmers are not situated as they are. They have not the conveniences, time, skill or ability to make first-class butter. Should the creamery close, three-fourths

of the milk that went to it would be made up and sold to the grocery as store butter, at a great sacrifice in price. All around you dairying is unprofitable, cows are being kept at a loss. Your neighbors are hard up, and the mortgages on their farms are growing larger. Time goes on. You have milked cows and fought the witches in the cream so long that you think you will sell out, leave the farm and move into town. Now comes your disadvantages for the lack of the creamery system. Land is cheap. A hundred men want to sell to one who wants to buy; but this has not been your first trouble. The creamery system has been abolished and so much poor butter has been made that consumption has not been equal to the supply. Every pound of poor butter fills the place of two pounds of good, and you find the market badly over-stocked, a condition that affects all grades in price.

**Decreases Bad Butter.** — Another point: Were the creameries to go out of existence to-day, oleomargarine, the dairyman's worst enemy, would gain a great point, and the manufacture of it would be doubled many times. What the dairyman needs is a greater consumption to maintain and stimulate prices, and creamery butter has done a great deal to increase consumption, because it has decreased the production of bad butter. It will bear the trial of hot cakes favorably, and everybody knows how fast they go.

**Dairy Butter is not Uniform.**—As I have said before, I believe it possible for a dairyman to make just as fine butter as any creamery; but where it is not the special business of the farmer, it often becomes too much of a secondary effort. If the ladies make the butter, visitors take up most of the time; and a woman who would not stop a churn to receive callers, or make a cake for

her table, in consequence of unexpected company, or the like; who wouldn't put off churning on Monday, when the cream was ready, in order to get her washing out, and a hundred other household duties, "just would not have any home at all"—"might just as well live in a creamery." And yet all this makes an uneven grade of butter. Scarcely two churnings are alike, and a regular customer who pays the highest prices demands these conditions, and unless there is a quantity sufficient to make a business of it, it will not pay for the time and trouble it costs.

**50,000,000 lbs. of Butter.**—Wisconsin produced in 1888 over 50,000,000 lbs. of butter. The average price received for this butter was 16 cts. per lb., if we judge by the value given in the census of 1885. Fully 40,000,000 lbs. of that butter was produced on the farm. The average price of the general run of creamery butter was about 23 cts. Here is a difference of 7 cts. per lb., or, in the aggregate, \$3,500,000 which the farmers and the State lost by trying to make the butter on the farm.

**Creamerymen as Salesmen.**—Many farmers are unfitted by education or contact with the world to make a success as merchants. To get good remunerative prices one must make a study of the markets, and invent ways of reaching the highest priced customers. To do this successfully, one must keep points constantly in mind. Hence it is that creamerymen are more successful as marketmen. The tendency of farm life is to shut a man up between his own line fences, and, as St. Paul says, "measure himself by himself." That kind of measuring keeps a man in ignorance of the kind of man or butter-maker he is. He takes his butter to a country store and swaps it off, and never secures a

particle of market education, because he is not selling in a butter market.

**Special Dairy Education.**—Besides all this, it takes a special dairy education to make the kind of butter that will command the best market prices. This kind of education the farmer is very loth to give himself. Nine pounds out of ten of the milk that produced the great mass of sixteen-cent butter would have made twenty-five-cent butter, providing it could have been taken away from the farmer as soon as drawn from the cow, and subjected to first-class creamery conditions. Hence the great advantage to the farmer of the creamery. The great mass of farmers who keep cows are not dairymen. They do not consider that they need to know any more about the principles of dairying than they did when they were doing nothing but growing wheat. Left to themselves, they make but little improvement. Something needs to be done to make them rub against one another, and thus show up their deficiencies. That something is a creamery. The moment it comes to a neighborhood every man who patronizes it is put into comparison with his neighbor. That stimulates him to increase his product. Thus the creamery becomes the center of dairy education for the little knot of men who are its patrons. The farmers need dairy education sadly. The lack of it is the great reason why they do not make more money out of their cows. There are thousands of new and valuable ideas that the well-posted dairyman has, that the average farmer knows nothing about. As long as he stays an average farmer, he will keep in that state. Make a creamery patron of him and the same man changes. He is in a current. If he does not get more and better knowledge out of it, he alone is to blame.

**The Subject in a Nut-Shell.**—Some

one has put this subject in a nut-shell, when he said: "Within a circuit containing a hundred farms, 100 women empty 100 cream jars into 100 churns at 100 different temperatures, and 100 witches in the cream try the patience of 100 over-worked women and make 100 samples of 100 grades of butter, to be sold to 100 merchants at 100 prices, and what does it all amount to? One good butter-maker, by taking the milk or cream produced by the 100 farms, will turn out more and better butter of one even grade or quality at a much higher price, with more profit and less labor on the farms."

#### Discussion.

**MR. MONRAD.**—How long a distance do you consider it practical to haul the milk here in Wisconsin?

**MR. HOARD.**—I think in a dairy section the cows ought to be thick enough to make the hauling a shorter distance than they generally have to do it. I have milk that comes six miles. It is hauled by way of routes. One farmer living at the other end of the route hauls a load, picking up on the way, and takes whey back. I suppose, practically, it might be hauled a good deal further in one case than another; according to the care it receives, the kind of wagon, etc.—under the best of conditions, I should say not over six or seven miles.

**MR. VAN DUZEN.**—I want to endorse the statement of Mr. Hoard that farmers and dairymen learn a great deal from the creameries when they are first introduced among them. When I commenced running a creamery, about eighteen or twenty years ago, I found that the dairymen who patronized it did not want to have their cows in milk until about the first of May, and wanted them to dry up in October. After they

had had the experience of a year or two, they were willing to change that—to have their cows in milk about the first of April and keep them running right up to the first of December. It is of great advantage to them to have such an institution start among them. They have the figures right before them, they know what they are getting, and they find why their neighbors are doing better than they are, and in this way learn a great deal.

MR. HOARD.—While they are waiting for the skim-milk, from fifteen minutes to an hour, as they have to do when they want the milk sweet for their calves, there is a regular farmers' institute held every morning; they exchange ideas, compare notes, yields, etc.

MR. THOM.—Mr. Hoard, what is the relative value of milk from the separator and ordinary skim-milk for feeding purposes?

MR. HOARD.—I don't know that I can answer that question, not having fed both kinds. I have fed skim-milk from the separator. I have made experiments in feeding sour skim-milk with butter-milk, about two-thirds of the former to one-third of the latter, and the lowest that I ever made it pay was twenty-two and a half cents a hundred. In that experiment I bought fourteen hogs, weighing about one hundred and forty-five pounds apiece, and kept them twenty-six days, and they gained over two pounds a day apiece. They got a pail of sour skim-milk and buttermilk, mixed, in the morning, and another pail in the afternoon. All the corn I fed them was an ear apiece. Of course, I think it would be more profitable to feed some corn with it, but I was after the experiment of finding out what I could do on skim-milk alone.

MR. FARGO.—Do you receive your milk by a test system, or do you distribute to

your patrons according to the number of pounds of milk?

MR. HOARD.—We have a test system, but we don't pay for the milk on that basis.

MR. FARGO.—Is the quality of the milk improved, that is, does it grow better as you continue in the use of the test or does it grow poorer and do you get more milk one year after the other?

MR. HOARD.—This winter the milk has been very poor, but I find that is true with other people also; I don't know the cause unless it is the warmer winter and the cows drinking a good deal of water, the milk being thinned in that way. One generally notices when we have a very cold day, that it will be less milk than the next day to make a pound of butter.

MR. THOM.—I think it is very clearly demonstrated that the more water the cow drinks, the better the quality of the milk.

MR. HOARD.—I don't believe it. I have figured my yield every day for the last three years. I know just how many pounds of milk it takes to make a pound of butter, and after a week of very cold weather—twenty below zero—we will make a pound of butter, say from nineteen and a half to twenty pounds of milk, when in summer weather it will take a pound or so more. We run what is called the Jersey vat. All the milk in that vat is from cows coming in in the fall. When we begin to put in the new milk in the spring, it reduces the richness.

MR. BEACH.—I wish Mr. Thom would tell us how pure water will make richer milk?

MR. THOM.—I am not much of a chemist, but I have heard that if a cow drinks pure water her food is better assimilated. The falling away in the cold weather in the quantity is not due to the

fact that she drinks less water, but that she eats more solid matter. I think water is greatly under-rated in its feeding value. There is good feeding value in turnips, for instance, and yet there is a great deal of water in them.

MR. GORDON.—What is your rule for admitting to the Jersey vat, Mr Hoard?

MR. HOARD.—We have in reality two factories in one. The milk of any patron who has fifty per cent. Jersey or Guernsey blood in his herd goes into what we call the Jersey vat. It is run through the separator by itself and churned by itself. By fifty per cent. Jersey blood in the herd, we mean half-and-half; for instance, one full-blood would take in a native in the herd making the two average fifty per cent.

QUESTION.—Does the Jersey vat but-

ter sell for any more than the other butter?

MR. HOARD.—We do not admit that we cannot make first-class butter out of common milk. In the fall of the year I know that the Jersey butter is much the best. In the spring, I think the other is best, but that is owing to the difference in the time of the cows coming in.

QUESTION.—How much does your pool pay for the Jersey vat?

MR. HOARD.—It averaged last year about ten per cent.

QUESTION.—Do you realize any more at the factory from that class of butter than from the other?

MR. HOARD.—I do not, but there is more butter in the 100 pounds of milk, about ten per cent.

## ADVANTAGES OF CHEESE PRODUCTION.

By T. J. FLEMING, Watertown, Wis.

**Our Strongest Competition** — In my opinion, our strongest competition arises rather from a lack of quality than from surplus or quantity. I believe, and have maintained, that if the quality of our cheese were to increase 50 per cent., the consumption of the same would be proportionally increased. If this is true, is there not at our finger's end a remedy for this supposed overproduction? But what is the best and most opportune expedient to establish? Primary and principal comes the creation of a Dairy Commissioner, whose duty shall be to enforce all laws now existing, or which may hereafter be enacted, in this State, relative to the production, manufacture

and sale of dairy products. [A law was passed by the legislature last winter establishing a Dairy and Food Commission, and Mr. H. C. Thom, of Beloit, has been appointed Dairy and Food Commissioner. — Ed.] He should also advise, if not prohibit, the manufacture of skim cheese and the marketing of green, uncured or premature goods. I believe right here is one of the greatest inconsistencies of our advanced business ideas. It is a lamentable fact that, while we may succeed in getting a small portion of our uncured product upon the earliest and best market, we are doing it at a decided loss to the bulk of our product. Why? Simply and wholly because the immature cheese

is not marketable, edible or digestible, and the fact of its being held in stock by the commission-men, with their very imperfect facilities, tends to deteriorate quality instead of improving it with age. What is the result? Simply that this inferior stock continues accumulating until the commission-men become fearful of the results, and dispose of it at a sacrifice, thereby establishing a price, to a certain extent, by which our better goods are disposed of. This illy-advised practice begets a spirit of dissatisfaction and distrust, and so disarranges the whole business.

**Summer Dairying.**—There is another detrimental practice to this industry, viz., exclusive summer manufacturing; for is it not a fact that our maximum product is made at a time of minimum value. I should like to know if there is any industry in this, or any other country, which can long withstand and flourish under such inconsistencies.

**To Obtain Best Results.**—Thus far I have touched rather upon the disadvantages than the advantages of cheese-making. The advantages and best possible results of cheese-making are obtainable only under the cleanliest care of milk and most skillful manipulation of the same. There should be harmonious co-operation of the cow, the owner and the manufacturer. This will, doubtless, seem overdrawn, but disarrange the union of these and you will be disappointed with the result. Milk intended for the cheese factory should be taken from cows having free access to salt, spring water and abundance of succulent food; and far removed from stagnant pools and decomposed vegetable or animal matter. These have the power of imparting disagreeable and hurtful effects to the milk being elaborated in the cow's system.

**Care of Milk.**—Now that nature and proper surroundings have produced pure and untainted milk, let the owner be true to his trust, and remove at once from all contaminating influences. This milk should be strained at once, and thoroughly aerated before cooling sets in. The object of this is two-fold—it removes animal and other odors, and retards creaming in the milk, both of which are very essential to cheese-making. In transporting milk to a factory, the morning's milk should not be mixed with the evening's, but if unavoidable, never be of a higher temperature. If the patronage is to a factory where milk is received but once a day, the temperature of the night's milk should be lowered to about 65°, and then removed from the water in which it was cooled, never permitting it to remain in water over night. Milk handled in this way, and coming from cows having free access to salt, will go to the factory in a much better condition than if these points are considered non-essential, and overlooked.

**The Manufacturer's Duty.**—If these few suggestions are rigidly followed, the manufacture of a first-class article rests wholly with the manufacturer's skill and knowledge in handling that milk. He should aim (after having studied the conditions of the milk) to incorporate the whole of the cream with the caseine in the coagulated form. This cannot be done by the prevalent manipulation. This cream which has risen upon the milk held over night becomes, to a certain extent, a separate and floating body, and not within the coagulating power of the rennet necessary for the coagulation of normal milk. In this way, people are often disappointed with the quality and quantity of their cheese product, and very justly so, for they are virtually making a skim cheese, though, at the same time, evading the



penalty. What then is the remedy? Cheese the milk twice a day, as I do—or reduce this cream to a more liquid or soluble condition by repeated strainings at the factory, or, better, by the application of pure water, at a temperature of 125° to this already risen cream, and then mix the whole mass together, add the rennet and stir constantly but not vigorously for fifteen minutes. Follow this plan and I will warrant that you will be most agreeably surprised.

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## FARMING TO A PURPOSE OR AT CROSS-PURPOSES.

By HON. HIRAM SMITH, Sheboygan Falls, Wis.

**Does Farming Pay?**—There has been a great deal said about the different branches of farming. Some have complained that dairying does not pay, others that sheep husbandry does not pay—the competition is so sharp on high-priced land that they are unable to meet it. The same is true of beef and pork, and so on through the whole list, and according to the reports, it looks as if the only thing to do is for the farming community to get out of all as soon as possible. But we should remember this can't be done; we can't get out of farming. We are in it, and in it to stay.

**Unfitted for Other Business.**—We are unfitted for other business, and other business is not open to us. If we attempted to go in and compete with people in other branches of business, we would find worse competition than we do now on the farm. We should find the professions over-crowded. Therefore, we must make the best of the situation in which we find ourselves placed, and if we turn our attention directly to this matter, we shall find that we are not so badly off, after all; that there is a chance that we shall be

enabled to pursue our vocation with greater hope of success.

**Understanding Terms Used.**—In taking up the question of farming at cross-purposes, it is important that we understand the terms used, that we may understand the meaning of them alike. Most of the disputes that arise among men arise from not understanding terms used in the same light. A certain gentleman was traveling in the State of Kentucky. He knew that to be the Bourbon State, and he expected to see a great deal of dissipation and drinking. He said to an old lady sitting in the same car: "People in your State, I suppose, are very bibulous people?" The old woman said: "Indeed, stranger, you are mistaken, I don't think you can find a dozen bibles in this county"

**Two Examples of Farming.**—Is there a good deal of farming at cross-purposes going on in this State? I was talking the other day with a farmer, the owner of four hundred acres of land. He had been engaged in making beef, and had just shipped his beef to Chicago, and sold three-year-old steers at \$41 apiece, or \$3.25 per hundred. He told

me it did not cover the cost of their feed—left him no wages, nothing for his invested capital. He had kept them on pasture grass in summer and hay in winter. He had been raising beef at cross-purposes.

Another man had "got onto" the new method. He had a large silo filled with corn, marketed his beef in August when it brought a high price, and made money. The trouble was not in the farm or the surroundings; it was a question of the man's capacity to see the situation and take advantage of it.

This same rule holds in all branches of agriculture. It is not the occupation, but the means employed to carry it forward. Therefore, such meetings as this are to remedy the evils which have sprung up through sloth and inadvertence among those engaged in the business. By a careful watching of the best means, finding out who has succeeded here and there, getting his experience, we can remedy many of the evils of which we have to complain.

**Hap-Hazard Methods.**—A man may try to raise high-priced trotters, or he may buy high-priced Jersey cows. If he has no knowledge of making butter or of properly taking care of his horses, he is pretty sure to fail. We see very many trying to raise Jersey cows, for instance. They come in so that the greatest flow of milk is in the summer, when milk is cheap. Along about August the pastures dry up; he has no silo, no adequate preparation for winter feeding, and has to sell out in the fall. He is farming at cross-purposes; has no well-defined method; has laid no plans by which he could carefully work out his salvation. He goes into things in a hap-hazard way, doing a little of this work and a little of that, and the result is usually that there is a loss. But if a person is farming to a purpose, he will confine himself to a special line and pursue

that line with all the intelligence he can bring to bear upon it.

**Diversified Farming.**—We frequently hear, and always will hear it when politicians address an agricultural fair, of diversified farming, and of the general-purpose farmer, and that if he fails in one line he will hit upon another, endorsing the idea that there is no proper way to pursue but to take your chances on as many odd ends as you would if you were going to buy a lottery ticket. But I say if you will pursue a straight line, get all the information you possibly can, you will be a great deal more apt to succeed. We often hear the argument made that such a man has some capital, he has had some advantages and he may run a special branch of business and succeed with it while another can not. It seems to me, that that is as much as to say that a very smart man with some money can run one kind of business, but that a poor man who don't know much of anything can run four or five kinds of business.

**Special Farming.**—If we will take up special farming, it will be for our interest. We will take delight in learning all there is pertaining to that particular branch of business, and the sooner the people of Wisconsin can abandon the idea that it is at all necessary that a man should raise his own flour for bread, as they used to think they must do, raise the wool and prepare it to make the clothing, or trade it for clothing, and all that class of business, the better off they will be.

Let a man pursue one kind of business and pursue it to the best of his knowledge, and he is more likely to succeed than men who are working at cross-purposes.

#### Discussion.

**MR. PERKINS.**—I have a farm partly adapted to sheep-raising and partly to

dairying. Shall I get rid of my sheep and keep the cows, or get rid of the cows and keep the sheep, or shall I keep both?

MR. SMITH.—I never give or take advice as to what another man shall do. He must judge of his own circumstances. I am here only to tell what I have done.

MR. ODELL.—Won't you give us some points regarding winter dairying?

MR. SMITH.—When I commenced dairying, in 1857, we held no method of farming but summer dairying. We had all been brought up to that. I had become disgusted with wheat-raising, concluded to adopt dairying, and commenced with making cheese in the summer. The cows were so few that we run up what we called a double-curd cheese. After the dairy became larger, we made cheese every day in the summer, making butter in the fall, and the cows went dry most of the time in winter. We pursued that method until we kept fifty cows on the farm, furnishing pasture grass in the summer, and hay, mainly, in the winter, raising a very little corn, fooling away time husking, shelling and grinding it, and giving it back to the cows in poorer condition than when we commenced to husk it. This is the way we pursued our work, with as little hired help as possible, for the receipts did not warrant a very extensive outlay for hired help. We worked along a good many years in that way. When the cold weather came on, the cows gave but very little milk, and the question came up whether they gave enough milk to pay to keep the hired men and board them. You know hired men are generally awful eaters. We would turn off the hired men and get along as we could. We tried to keep our dairy at a temperature of about sixty-two degrees, to

raise the cream in pans. In the course of a cold spell often the cream didn't rise, at least we didn't think it rose because it was thick and leathery. Of course, we didn't know that the cream was below. We waited until it became thick, so as to take it off with the skimmer. As soon as we finished skimming we went to churning. A good deal of the cream was unripe, and it became a sort of a mulch. We didn't know it then, but we probably lost about thirty per cent. of the butter.

We went on in that way a good many years. Sometimes there would be two hundred pans to skim and wash up, and that would be a pretty big day's work for my wife, on the day we churned. It was a very laborious business. It required great strength and left us pretty tired. We didn't think of caring to read anything. If somebody had come in and told us some particularly good story that was just out, some good tale that William Black had written, we should not have known about it or cared; we would rather go to sleep than read. The consequence was that there was no opportunity to make any progress, and, more than all, there was no desire, because our tiresome work left us too fatigued.

We pursued that way for several years, and I will give you the results. The receipts on that farm with fifty cows, with a summer dairy (and they ate everything that grew on the farm, and all that the pork sold for to buy bran) were about \$18.00 or \$19.00 and that was more than a good many dairymen received, but it took nearly the whole of it to pay the hired help, and some little improvements constantly necessary.

At last, we changed over to winter dairying, and commenced a new kind of business. We became satisfied that it was better to sell the large flow of milk

that cows give in the course of a year, if that flow comes when butter is thirty, thirty-three and thirty-five cents a pound, than to be selling it when it is sixteen, eighteen, or twenty cents. Therefore, we resolved to engage in winter dairying, and after we had been at it a very short time, we saw that the cows gave more milk in the course of the year—giving even from 500 to 1,000 pounds more—by being milked as a winter dairy, than when milked as a summer dairy. The main reason was that they would naturally go dry after about seven or eight months, and if they came into fresh milk in September and October, the next summer when we had fresh grass either to cut for soiling or to pasture, the fresh feed kept up the flow of milk. There is where the gain came in.

Again, we found that we had more fodder left by always feeding in the stable—soiling to take the place of pasture grass. We found that about as much would grow on one acre, to cut and haul into the barn, as would, when the cattle ran over it and wasted and defiled and trod it down, on two acres of pasture grass. There are very few farmers who pasture cows, as a rule, on much less than three acres, while it is perfectly within limits to keep a cow on less than one acre. We find that the receipts for winter dairying, after it was fairly under way, have increased the price of the product that we made, and increased the number of cows that we kept by soiling, and by the use of the silo.

We found four years ago, by the use of the silo, and the practice of soiling, that we could keep eighty or ninety milch cows and some young stock, and the receipts from the sales of the dairy product were about \$4,200, leaving \$1,800 to \$2,000 net profit after paying for the

hired help and all the expenses of the farm. There was more net profit left from the winter dairy than the entire receipts were eight years ago when we were running a summer dairy. That is my experience in the change I have made

MR. LINDSAY.—What do you feed for soiling your cows in summer?

MR. SMITH.—The first green feed we cut is winter rye, sowed in August and July previous. This is headed out and fit to cut about the 20th of May, in our section of the country. We use this ten days or two weeks, until the clover is large enough to cut. That begins to blossom about the 16th or 20th of June, and then we begin to cut, and cut the clover till it gets a little old, for fresh feed. We generally have a little millet at that time. Two or three acres of millet will feed eighty or ninety cows for a week or ten days. After the millet, then the second crop of clover is large enough, and that runs till the fodder corn is in the roasting stage. Then we begin and feed fodder corn and second crop clover, whichever is most convenient and easy to manage until winter, then open the silo and feed about forty-five pounds of ensilage per day, in two feeds, giving barley or oat straw, and a little ground feed upon it—what they will eat. We milk at five o'clock the year around, and every morning we give the cows one or two pounds of hay each, not to exceed two pounds, in any case. This we give mainly that the cows may all get up ready to be milked, and that is all the hay they get during the winter. When we changed to winter dairying, there was no sudden change in the kind of cows. They were the same, when I commenced, that I had before, but I always keep a full blood Jersey at the head of the herd, and they naturally improved in quality. Therefore, they

are constantly growing better for butter. The cows have improved a little in butter, and therefore, the yield is more than it would be otherwise.

MR. FAVILLE.—Are these increased receipts from your farm due entirely to changing from summer to winter dairying? Hasn't Hiram Smith's reputation something to do with it?

MR. SMITH.—I did not, in my remarks, attribute it entirely to winter dairying. I said the winter dairying, in connection with soiling cows in summer, and silo feed in winter. I think my increased receipts are entirely due to those three causes, added to what I said in regard to gradually improving the stock. My friend Faville thinks there is some necromancy about the man who sells butter—that one man can sell the butter higher than another, but my opinion is that it is not a question of reputation. My reputation for making butter might not last ten days. If I should send a poor quality of butter this week, before next week it would be all shipped back to me, and it ought to be. I can spoil my reputation in less than one week. Of course, there are some people who have confidence that I will make good butter, but unless I continue to make that good butter, my reputation and my market are gone. You can't hold your market if you don't make good butter. If you do make good butter, you can get any market you go to.

MR. UTTER.—Did you use a grain ration with your rye?

MR. SMITH.—Yes, I always give a grain ration to each cow that gives milk, and generally if she don't give milk. Every day they have the value of no less than six pounds of bran or middlings, and I think it is the cheapest way to keep cows.

I wish to add that winter butter does

not require any contract to sell it. I have shipped butter for the last four years, and made out the bill for two cents a pound less than I could get to send it to New York. Winter butter will always sell well. For the last four years I have shipped butter in sixty pound tubs to New York, through a commission house, and sold it in the butter market for thirty-three cents, and it cost about two cents a pound to get it there. A man with a winter dairy can take advantage of this, but if he has a summer dairy he has to do the best he can. The commission-men won't talk with him. They can't do him any good.

Another reason why this method of making butter is an improvement on the old, is that it removes all work from the house. It takes a young man to make the butter, and we hire a young man every year or two and teach him how. It is not a difficult thing to teach him to make butter. A bright young man can learn it in a week, but I would not undertake to teach a Yankee who had been in the business twenty years. It is a short job to teach it; it is governed by rules and directions which are as plain as those of any other business. It takes it out of the house into the dairy-house where it belongs, and it leaves the farmer in a much better condition, much more contented and happy, with a better opportunity to develop and find out what good there is in the world, instead of being overworked and bringing out the bad that is in him all the time.

MR. VAN DUZEN.—A gentleman wishes me to ask you, Mr. Smith, which you consider the best feed, ensilage and grain, such as you furnish your cows in the winter, or pasture?

MR. SMITH.—I think very much alike. I think good ensilage is just as good for

milk and butter as the best pasture. Of course, it requires grain feed in either case. A cow cannot make good milk from one kind of feed; there is not the material in it that constitutes the proper qualities for milk; but ensilage makes the best butter in winter feed I have ever tried—nice, sweet butter, full aroma, fresh, sweet flavor that men are willing to pay a high price for.

MR. VAN DUZEN.—The great objection to soiling is the amount of labor in getting the fresh cut grass to the cow. Now, why isn't it practicable to feed this ensilage through the summer season?

MR. SMITH.—It is entirely so, and that is what we are all striving for now.

A GENTLEMAN.—In my own State, a dairyman keeps about one hundred cows, and feeds ensilage all the time, and he claims that his cows are making something like a pound of butter per day, being fed on the fresh corn.

MR. SMITH.—There are frequently changes that you cannot account for. If a person goes into business he is watching for them. We always notice an increase in the milk when we commence to feed ensilage in the fall; not so much in the butter, but quite a little in the milk. I have experimented in feeding three cows until the last of August, and the cows' product was weighed every day with that of three other cows that ran in good pasture, and the receipts are equally as good from one as the other.

QUESTION.—Wouldn't it be cheaper to feed the ensilage, then?

MR. SMITH.—It costs only about two-thirds as much to feed ensilage as pasture. The labor of cutting the soiling feed and hauling it into the barn is very light indeed. No one who has ever practiced soiling speaks of it at all, or calls it extra work as those do who never have done anything about it. A young man

eighteen or twenty years' old working for fifteen dollars a month will take a team and go into the field and cut sufficient for the night's feed and the next morning's feed. He can do this after ten o'clock, and get it done by noon, and have enough to feed one hundred cows. The actual cost of that man's labor is sixty cents a day. He milks, and that is enough to earn his wages, and if it took him half a day, it would only cost the cash outlay of fifteen cents to feed one hundred cows. Do you suppose that if it were a losing business those who have been trying it eight or ten years would be pig-headed enough to stick to it? By that process they constantly increase the tillable land, and in a few years, in our State, when land is advanced to \$80 or \$90 an acre, it will be a disgrace to pasture tillable land.

MR. MONRAD.—I would like to ask Mr. Smith to modify his statement that any young, bright, intelligent man can learn butter-making in a week. Of course, I understand Mr. Smith, and I have no doubt that right under his own eyes a good product would always be turned out, but I think it is a great trouble in this country that so many young men come to our creameries and work a short time and think they have mastered the whole business instead of undergoing a proper term of instruction or apprenticeship as we have in Europe. I think it might do harm if that remark went out unmodified.

MR. SMITH.—I will modify it, and reduce it to five days, and to show what a bright boy can do, I will tell you that Prof. Henry was one of them. Now, do not understand that I say I can teach a boy in five days to be a perfect hand at it, and go out and have entire charge of making butter, but for all practical purposes with me, I can teach him in five days to make butter as good as milk.

will make. It is a simple process. You have a tank that will hold about eight cans of milk. There is a thermometer in front of the tank. You put in pounded ice and reduce it to forty-five degrees. The milk is drawn from under the cream the next morning; that cream is put away in the refrigerator in the summer, or in a room above the temperature of the living room in winter, and the next morning the process is the same. The two creamings are put together and one gallon of ripe cream ready to go into the churn is mixed in with these two creamings. They are set near a stove, where the temperature is about sixty-two degrees, warmed up to seventy degrees, and remain there four hours, churning the next morning. It will be just in the

right condition. It will take but little practice with these instructions, as I have given them. I never spent in teaching a new man more than a few minutes, morning and night. About two weeks previous to the celebrated fair in Milwaukee, I hired a new butter-maker. I was busy collecting samples for the fair, but he made the butter in the greatest perfection, and I drew over two hundred dollars in premiums on that butter.

MR. MONRAD.—I am willing to accept Mr. Smith's modification, if he will supply a Hiram Smith with every new young man. I have seen some of the best butter-makers who have learned to make fine butter across the water, and my advice to them all is to go and learn to make butter with a good American creamery-man.

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## HOW TO MAKE BRICK CHEESE.

By T. J. FLEMING, Watertown, Wis.

**Cheesing the Milk.**—Brick cheese can be made by cheesing milk once a day, but the best possible results are obtained only when cheesed twice a day, or from freshly drawn milk which has not yielded up any of its cream. Bring the milk to a temperature of 90 or 94 degrees Fahrenheit by the application of heat or steam, as your contrivance permits. On a small scale, an ordinary brass kettle of the required size, placed upon the stove, but better hung by a flexible crane over the fire, the manipulations of which will enable you to accurately acquire the different temperatures required during the different stages of manufacturing, will prove sufficient for the heating and

cheesing process. For operation in a factory, of course nothing short of a vat and boiler would be practical. These would cost about \$125.00 (3,000 gal. vat).

**Adding the Rennet.**—The milk having been raised or lowered, as the case may be, to the temperature of 90 to 94 degrees, the rennet should be added. I recommend "rennet extract," as it has given me very good satisfaction. Take at the rate of a gill and a half of extract diluted in a gallon of water for 1,000 pounds of milk. Add it at the temperature of the milk, ascertained not by the finger but by a standard thermometer.

**Cutting the Curd.**—Stir constantly, but not vigorously, for ten minutes, and with this treatment normal milk will be

sufficiently coagulated to cut in twenty minutes after adding the rennet. Insert the forefinger into the coagulated mass, raise it upward and forward, and when the curd separates clean-cut and clears the finger, it is fit for cutting, which should be done with a horizontal curd-knife. But, if you are using the small kettle previously referred to, a flat, smooth and sharp stick will serve the purpose. Pass the knife lengthwise and crosswise through the vat—slightly inclined forward—and when through permit the mass to remain undisturbed for a couple of minutes, or until the whey begins to show on the top. Then take the curd scoop, sink it to the bottom of vat or kettle, and raise it to the top of curd, at the same time drawing gently backward. So continue over the whole mass. Immediately recut as before, moving the knife more quickly.

**Stirring the Curd.**—It is now ready for an increase of temperature, which should begin moderately, slowly and continually increasing until it has reached 110°, which rise should consume twenty-five minutes. During this process, the curd should be constantly and thoroughly stirred with the curd-stirrer or breaker, being careful not to let it adhere or gather on the bottom, when, at the expiration of this time, or the attainment of this temperature, the heating appliance should be fully removed and the thermometer brought into frequent use. Though the heat is now through with, the constant stirring should be continued at least twenty-five minutes, or until the curd will grit under the teeth, or appear elastic between the fingers. When this condition of the curd has been attained, draw off the whey by means of the syphon, or any other contrivance suitable to your surroundings, leaving enough to just cover the curd in the bottom of the vat.

**Salting.**—Rub the curd and the remaining whey vigorously between the hands, until it is thoroughly disintegrated. Add a couple of double handfuls of recognized dairy salt (salt as free from lime as possible) to 1,000 pounds of milk, and mix and rub it thoroughly, that it may penetrate the whole mass.

**The Press.**—It is now ready for the press, which, by the way, is of the simplest construction. Take three-quarter inch pine, eight inches wide, and dress it on all surfaces; cut and nail in a rectangular shape, 10 inches long and 5 inches wide, inside measurement, with height equal to width of board when dressed. This form or mold, when constructed, will consist of two sides and two ends, being without bottom or top covering, the sides of which must each have at least six small perforations through which the whey will ooze when the necessary pressure is applied, which consists of a following cover of the same material, working loosely within the frame, and two ordinary building bricks set together and edgewise upon it. These forms are set side by side upon a clean, smooth-surfaced table, and the whole mass (as we left it when salted in the vat or kettle) is dipped into them with the curd pail, at the rate of 1,000 pounds of milk to 20 or 25 forms, governed somewhat by the richness of the milk.

These cheese when cured will weigh about 5 pounds each, more or less, it taking about 9 pounds of normal milk for one pound of cheese.

**Pressing.**—Immediately after putting the curd, as evenly as possible, into the forms, they should be covered and pressed at once. Let it remain not longer than five or ten minutes, then they should be removed as follows: Remove the brick from the first form near-



est that end of the table toward which you are going to turn, then raise the form from you and give it a light and quick jar against the table on that edge nearest the cover. This will cause the cover, which fits loosely, to drop out; then place the form upon the table in an inverted form. Place the cover upon it, as before, and place the two bricks (now weighting the next unturned form) upon it, and so continue until the whole is gone through with. This process should continue hourly for the first three turnings, and once every four or five hours thereafter until the cheese has been in press 20 or 24 hours. In the summer months the cheese should be removed to the cellar as soon as made, the temperature of which should not exceed 65 degrees, if possible. The salt tables used generally are 35 inches wide in the clear, having a rim 8 inches high all around, to prevent the cheese from spreading and losing their proper and original shape.

**Curing.**—When the cheese are put into the salt table from the form, they should have salt well rubbed into them on all the surfaces, except the one upon which they rest, in a quantity not to exceed that which they will absorb in 24 hours. They should have four applications in this way, after which they should be removed to the curing room—a clean, dry, cool and well ventilated cellar. After you have gotten the cheese of four days' make into the table (using a separate table for night and morning), remove as many from the salt table to the curing room as you have fresh cheese to put in, always keeping the cross row in table full. The cheese hav-

ing gone into the curing cellar, the actual and none the less laborious part of the work begins. One of the first objective points desirable is to carefully close all the pores on surface of cheese, which is usually done by rubbing them with a wet cloth in the process of washing. This should be done as quickly as possible to prevent the mold from penetrating the cheese, which is certain to be generated in the cellar, and attack the cheese where it is most easy of access. Cheese made as I have described will be about three weeks in curing, during which time they should be washed at least twice a week, and about as frequently thereafter while kept in stock, unless the cellar is very cool and exceptionally free from mold. The water used in washing should always be in the nature of brine, not so much on account of the salting effect given the cheese, as to prevent the gathering of mold. Though I have described the salting process, it is usually not sufficient, but is supplied during the process of curing by sprinkling a small quantity on the top surface of the cheese after being washed.

**Boxing.**—Many have inquired about the wrapping used for brick cheese. It will be seen by following the formula which I have given that there is none used. Simply, when ready for shipping, wrap them singly in cheese paper, and they are ready for boxing. Pack them on edge, end against end, two rows in the box. Place paper in the bottom of box before putting in the cheese, and another on top to prevent the flies, wind and heat from reaching the cheese.

## DAIRY FARMING.

By PROF. JAS. W. ROBERTSON, Guelph, Ontario.

**The Farmer's Sphere**—Of occupation is to provide food and the raw material for clothing for the rest of mankind. Himself and family have the right to a first toll upon all the fruits of their labors. In filling their place and doing their work, they must call to their aid and make subservient to their ends suitable domestic animals. In the past, as farmers have provided a better class of food, advancement has been made in all the attainments of civilization. Progress in agriculture has been leading men to better lives through all the ages. While people live solely upon roots and fruits, they are on the confines of barbarism. Civilized peoples subsist upon more varied and substantial diet. Bread without butter does not satisfy. Meat of some sort must accompany potatoes; and so through the whole bill of fare vegetable foods are supplemented by animal products. To provide these latter of the most acceptable and nutritious kinds in the most economic way is the purpose and place of dairy farming. As farmers produce an increased quantity of superior food per acre, they make it possible to support a larger population. Population is the only element which gives value to property; hence, successful dairy farming means an increase of value in all property in a country or section where it is followed.

**Man's Servant, the Sun.**—Many parts of plants cultivated by farmers in a rotation of crops are entirely unsuitable for direct consumption by man. By

making animals consume such plants or parts of them as are indigestible by the human species, there may be obtained from the animals, appetizing and nourishing products suitable for his table. That is the true place of dairy animals in farm economy. In order that animals may be kept with advantage and consequent profit, the farmer's skill and judgment should provide plants suitable for their maintenance. The sun is the working power that elaborates soil-food, commonly called manure, into serviceable form in the shape of plants. The sun is the source of all the energy which does all the work in the world. It is the veritable working power on all the farms, though too often its value and use are unknown and neglected. Plants are contrivances of nature, whereby and wherein the sun stores up his own strength and warmth for man's service and comfort. He should be kept at work all day long. When enough suitable material for the sustenance and increase of plants by their growth is present in the soil, the sun never fails to exert his energy for the service of man. When the soil is devoid of, or deficient in, the supply of these substances, simply from the want of the raw material upon which alone it can work, the sun is kept "loafing" over the fields day after day. No farmer can afford to have the hired man "loaf" around the kitchen stove while he himself toils outside. Much less can he afford to keep the sun idling over his fields. The

farmer's duty is to see that the soil of his fields contains all that is needed for the upbuilding of plants, and then, by proper management of the soil and selection of the seed, he may in fact harness the sun every morning and make it do his will. His occupation demands a brain, a judgment, a will to rule, in order that he may justify his birthright in being given dominion over the earth and its plant and animal life.

**The Air**—Is the source of a large per cent. of the substances that go to form the structure of plants. From it the sun is able to appropriate to the plant the very elements wherein he can best accumulate and store his strength for man's use. The corn plant is one of the best aids and means whereby this can be done. That it may be done most efficiently, corn should be planted thin where sunlight can shine and air circulate freely.

**Dairy Farming Enriches Land.**—

Water is nature's universal vehicle for the carrying of the particles that compose the food of plants and animals to the proper places in their bodies for the sustenance of life and the increase of weight and size by the vital process of growth. The presence of too much water will hinder it from performing its peculiarly necessary tasks. Neglect of drainage will frequently leave such an excess of water around the plant roots, that they are literally drowned. The absence of sufficient water in the soil may cause the plant to starve in the midst of plenty. [The soil, besides its function for the retention of food for plants, also is the mechanical means for the holding of plants in position during their growth. Drainage and cultivation are treatments of it for the rendering of that food more easily available by plants.] In carrying on his work, and in the disposal of his product, three elements of cost to him-

self should be reckoned and remembered by every farmer. In the sale of every article of farm product he disposes of a part of the substance and fertility of the soil. To that he gives an increased value by the application of his labor and skill. In fact, in every article he parts with, he sells a three-fold commodity, namely, substances from the farm, labor and skill. Dairy farming will enable him to market much skill without the need for impoverishing his farm by selling its enriching substances—the elements of fertility. It also offers opportunity for selling skilled labor, which brings a larger return to the salesman with less permanent exhaustion of his powers. The following table will represent the gist of this idea.

\$200 worth of	Substances of Plant food.	Labor and Skill.
Wheat at \$1 per bu. ....	\$48.00	\$152.00
Milk at 85 cts. per 100 lbs. ....	22.00	178.00
Cheese at 10 cts. per lb. ....	18.00	182.00
Beef at 5½ cts. per lb. ....	17.00	183.00
Pork at 5½ cts. per lb. ....	13.00	187.00
Horse. ....	7.00	193.00
Butter at 25 cts. per lb. ....	25	199.75

**Results of Skillful Farming.**—

When only ten bushels per acre of wheat are grown, the farmer receives but \$152 for all the labor and expense involved in the cultivation of twenty acres of land with the harvesting and marketing of its crop. Such labor does not bring him quite thirty cents per day. If by application of skill to his work he enriches his soil, drains and cultivates his lands and selects the kind of seed best adapted to his circumstances of locality and climate, he may obtain thirty bushels of wheat per acre. In that case he will receive an equal amount, namely, \$152 for labor and skill involved in the cropping of but seven acres of land. When a dairyman keeps cows that bring him \$15 worth of product a year, when he sells lean steers at 30 dollars per head, when he markets hogs that weigh 200

pounds at one year old, when he sells a horse for \$75, and when he takes or sends to market strong butter that is dear at fifteen cents per pound, he gets hardly thirty cents a day as remuneration for his labor. If he will put skill into the selection, breeding and feeding of his cows, steers, hogs and horses, and into the handling of their products, he may make one-fourth of the labor bring him much higher money returns. For example, there will be left for labor and skill in the feeding of three cows \$178 as compared with an equal sum representing the labor for the keep of thirteen cows. So on through the list, skill alone is the element that gives the value greater than thirty cents per day. The more skill that is exercised the higher and more certain will be the satisfactory remuneration.

#### Cows Should Pay for Their Board.

—Reference has already been made to the plant which enables the farmer to use the sun's willing power for his own benefit. To a Wisconsin audience I will not venture to speak with any attempt at instruction upon the best methods of corn culture. Canada has been learning from you in this department. But in order that the plants grown may yield the best return of which they are capable to the husbandman, his skill should be exercised to provide animals which can return to him the most in products or service for the food which they consume. It is possible to keep animals which yield so much less in food than they eat, that they are veritable burdens upon the man whose property they are. Instead of being his servants, living and laboring for him, he sometimes becomes theirs and apparently lives to keep and feed cows, hogs, and horses. The cow in all civilized countries is always a boarder upon some person. She

should be made to pay for her board at such remunerative rates as will leave a profit for the boarding-house keeper. If she fails in that, she should be made to render a service which she will not willingly contribute. Her carcass should be made into beef and her hide into leather. She should not be slyly sent to board upon some other unfortunate man. A cow with the business habit of keeping her accounts with the world paid up through the man who owns and feeds her is a good business cow. That is the kind of cow I recommend. Her power of service will be indicated by certain external points. She should have a large long udder of elastic fine quality; a mellow movable skin, covered with soft silky hair; a long large barrel, hooped with flat ribs, broad and wide apart; a broad loin, spreading out into broad long hind-quarters; an open twist with rather thin hips, and a lean neck of symmetrical length, carrying a clean-cut fine face with prominent eyes. A cow with these points has ability to serve a man well, if she gets a fair chance. That her calves may have powers equal to or rather better than her own, care should be exercised in their breeding. The best blood, of the breed adapted to the farmer's purpose, should be used to enlarge and not to lessen the working capacity to be transmitted to her calves.

**Feed.**—The milk of cows being a direct elaboration from their blood, whatever interferes with a healthy condition of that fluid will also affect the quality and quantity of the milk secreted. Too much care cannot be exercised in providing feed suitable, succulent, easily digestible, wholesome and nutritious. The grass of early summer is too watery and weak in nutriment for its bulk, to be fed alone to the greatest advantage. A judicious allowance of

bran, peas and oats, oil-cake or cottonseed meal will increase the milk supply and fortify the cow's system for the larger production of milk during midsummer, fall and winter. Fodder-corn, sown broadcast, does not meet the needs of milking cows. Such a fodder is mainly a device of a thoughtless farmer to fool his cows into believing that they have been fed when they have only been filled up. The same plant when grown under conditions favorable to its attainment of mature size and quality—in rows or hills 3 feet apart with from 2 to 6 seeds per foot in the row—yields a fodder by means of which cows are enabled to produce the largest amount of milk, butter or cheese per acre of the land required for their support. Fodder corn is not a complete ration for the most economical production of the best milk. When supplemented by feed rich in albuminoids, such as those already mentioned, better returns for the feed consumed are realized. Last summer one of our leading Canadian dairymen, feeding 18 cows upon fodder corn to supplement scant pasture, furnished milk to a cheese factory. In course of time he provided a supply of bran, and by the end of the first week thereafter he found by an examination of the factory books that he was credited with enough extra milk to pay for the bran consumed ( $2\frac{1}{2}$  lbs. per cow per day), and to leave a balance of \$2.43 of extra profit for that week.

**Water.**—Water is nature's vehicle for carrying about most of the matter which she requires to move from place place. The great boulders were quietly clasped in her arms and without apparent effort brought from the northern ridges to the southern parts of your State. The tiniest specks of nourishing matter needed to replace the worn-out tissues of the body are likewise carried

to their proper places in this wonderful omnibus. The identical water swallowed by a cow to serve as a carrying medium in her blood for the equable distribution of the elements of nutrition throughout her whole body is made to serve a like function in the milk which she yields. If that water be impure in the first place, it is liable to continue so throughout its whole mission, from the drinking by the cow until after its consumption by the creature consuming the cow's product. Water which has been contaminated by decaying animal matter is especially likely to retain its impurities. The milk from cows drinking such water is a menace and danger to the public health, and interferes greatly with the commercial value of all dairy products. There should be an abundant supply of pure water, easily accessible by the cows during hot weather. It should be furnished at a comfortable temperature during the cold weather of winter. I have not found that cows which are denied access to abundance of water will give as much milk or milk of as good a quality as when plenty of water is provided with wholesome satisfying feed.

**Salt.**—Dairy cattle should have access to salt every day, and salt should be added to all their stable feed daily. A series of experiments has convinced me that when cows are denied salt for a period of even one week they will yield from  $14\frac{1}{2}$  to  $17\frac{1}{2}$  per cent. less milk, and that of an inferior quality. Such milk will on the average turn sour in 24 hours less time than milk drawn from the same or similar cows receiving salt, all other conditions of treatment being equal.

**Shelter.**—Comfortable quarters are indispensable to the health and well-being of cows. Stables during the winter should have a temperature constantly within the range of from  $40^{\circ}$  to  $55^{\circ}$  Fahr.

In summer-time a shade should be provided in the pasture fields, or adjacent thereto, to protect against the bristle-making influence of July and August suns. In all the management of cows such conditions should be provided and such care given as will insure excellent health and apparent contentment.

**Milking.**—When practicable, milking should be done by the same person, and with regularity as to time. He only that hath clean hands should be allowed to milk a cow. I say “he” because I think the men of the farm should do all the milking, at least during the winter months. I have exercised the right of changing my mind on that subject since I left the farm. It is no more difficult to milk with dry hands than with them wet. It is certainly more cleanly, and leaves the milk in a much more desirable condition for table use or manufacture. Pure stable atmosphere is indispensable to prevent contamination from that source. Immediate straining will remove impurities which otherwise might be dissolved to the permanent injury of the whole product.

**Aeration.**—After the straining is attended to, the milk should be aerated. Too often it is poured into one large can and left there just as the cows have given it. That neglect implies three things that are very injurious to its quality for cheese-making: (1) The peculiar odor which the cow imparts to the milk will be left in it until it becomes fixed in its flavor. (2) The germs of fermentation that come in the milk and from the air have the best conditions for growth and action when the milk is left undisturbed. (3) Then the milk will become almost unfit for thorough coagulation by rennet. Hence it is needful and advantageous to aerate it for three reasons: First, because by pouring, stirring, dipping or by trick-

ling it over an exposed surface there is eliminated from the milk by evaporation any objectionable volatile element that may be in it. Secondly, because, as has already been stated, the milk contains germs of fermentation. Some of these are called vibriones. A strange peculiarity about these microbes is that they become active only in the absence of free oxygen. When warm new milk is left undisturbed carbonic gas is generated, and that furnishes the best condition for the commencement of action by these almost invisible creatures. After they get started they can keep up their decomposing work even in the presence of oxygen. It is impossible to coagulate such milk so as to yield a fine quality of keeping cheese. Coagulation by rennet of milk that is ripe can never be perfect unless it has been thoroughly aerated immediately after taken from the cow. *Neglect of aeration will increase the quantity of milk required to make a pound of fine cheese.* Thirdly, because the airing seems to give vigor to the germs of fermentation that bring about an acid condition of the milk, without producing the acid. So much is this so that *it has been found impracticable to make strictly first-class Cheddar cheese from milk that has not been aerated.*

**Cooling.**—The subsequent cooling of milk retards the process by which it is turned sour. Certain germs of fermentation exist in milk which in the act of multiplication split one molecule of sugar-of-milk into four molecules of lactic acid. By delaying the operation of these germs the milk is kept sweet for a long period. The cooling of milk should never precede the aeration. A temperature of from 65° to 70° Fahr. will be found cold enough for the keeping of milk over night, when it has been previously aired.

**Protection.**—Milk is a liquid of ab-

sorbent proclivities. It should be protected against injury that would result from exposure to impure air. A general-purpose milk-stand is a device specially adapted for the spoiling of milk in that way. Such a stand serves as a milk-stand and also a carriage stand, both of which are legitimate uses. Sometimes it is also occupied as a hog bivouac for the convenience of these animals, the end of whose whey trough furnishes one step for the stand. Both of these latter extensions of its uses and hospitalities are all wrong.

**Honest Milk.**—The employment of inspectors promises to improve the quality of the milk furnished by some patrons, whose highest moral aspiration is limited by an effort to keep the self-appointed commandment, "thou shalt not be found out." The adulteration of milk by the addition of water, the removal of any portion of the cream or keeping back of any part of the stripings is forbidden by statutes. Any person who is found out so doing should not escape lightly.

**Matters Most Needful of Care.**—In the following short paragraphs I have ventured to gather helpful advice on the matters most needful of care:

1. Milk from cows in excellent health and apparent contentment only should be used.
2. Until after the eighth milking, the milk should not be offered to a cheese factory.
3. An abundant supply of suitable, succulent, easily digestible, wholesome nutritious food should be provided.
4. Pure cold water should be allowed in quantities limited only by the cow's capacity and desire to drink.
5. A box or trough containing salt to which the cows have access every day

is a requisite indispensable in the profitable keeping of cows.

6. Stagnant impure water should be prohibited. The responsibility for the efficacy of that beneficial prohibition rests wholly with the individual farmer.

7. Wild leeks and other weeds common in bush pastures give an offensive odor and flavor to the milk of animals consuming them.

8. All vessels used in the handling of milk should be thoroughly cleansed immediately after their use. Washing first in tepid or cold water, to which has been added a little soda, and subsequent scalding with boiling water, will prepare them for *airing*, that they may remain perfectly sweet.

9. Cows should be milked *with dry hands*, and only after the udders have been washed or thoroughly brushed.

10. Tin pails only should be used.

11. All milk should be properly strained *immediately* after it is drawn.

12. Milking should be done and milk should be kept only in a place where the surrounding air is pure. Otherwise the presence of the tainting odors will not be neglected by the milk.

13. All milk should be *thoroughly aired* immediately after it has been strained. The treatment is equally beneficial to the evening's and the morning's milk.

14. In warm weather all milk should be cooled to the temperature of the atmosphere after it has been aired, but not before.

15. Milk is the better for being kept over night in small quantities, rather than in a large quantity in one vessel.

16. Milk-stands should be constructed to shade the cans or vessels containing milk from the sun, as well as to shelter them from rains.

17. Only pure, clean, honest milk should be offered. Any deviation from that will not always go unpunished.

## THE ELABORATION OF MILK AND BUTTER-MAKING.

By PROF. JAS. W. ROBERTSON, Guelph, Ontario.

All milk, like some butter, is fearfully and wonderfully made. With reference to the elaboration of milk I mean all that the sentence expresses; and, as a people earnestly progressive in the search after further information concerning dairy husbandry, I find the people of Wisconsin earnestly anxious to learn. While I admire the progressive earnestness of your people, I have no words of commendation for that quality of butter which can be shortly defined as "progressive." It goes on from strength to strength continuously.

**Milk Elaboration.**—Milk is secreted by and in two longitudinal glands, commonly called the udder. These two are separated by a fibrous partition, which is attached to connective tissue under the skin. That tissue also spreads through the udder, apparently for its support in position. The udder is spoken of as having four quarters. That is popularly correct, although the division between the two quarters on each side is not definite or distinct. The gland stripped of its covering, is a reddish grey substance. In dry cows the deposit of fat in the connective tissue gives it a yellowish appearance.

The internal canal of each teat opens into a milk cistern. The total quantity of milk held in the four cisterns or reservoirs at the top of the teats will seldom exceed one quart. Numerous ducts arise from these and branch into all

parts of the udder. The ducts and their branches become smaller as they spread, until each one ends in a vesicle, or "ultimate follicle," about one-thirtieth of an inch in diameter. Into these cavities, the serum of the milk—its water, casein, sugar, albumen, etc.—seems to pass from the arterial blood through capillary tissue. A change in the cell albumen of the blood is believed to take place during that transition. The inside of each vesicle is studded with innumerable cells. Through these the fat is produced, supposedly by budding. There are ordinarily over 1,000,000,000 of these globules in a cubic inch of milk. They have no organic pellicles or so-called skins. The activity of secretion depends largely upon the vigor of the blood circulation. The production of fat depends mainly upon the temperament of the cow, gentle handling, and feed rich in protein. Violent disturbance of her nervous system has a disastrous effect upon the cell action and capillary activity in most cases. Arteries, veins and nerves together pervade the whole of the udder structure. New ducts are formed by sprouting or spreading out from the others. Rubbing of the udder, rapid and clean milking will promote their growth and development until the sixth year of the cow's age. A pressure of fat in the connective tissue on the gland interferes with and hinders the secretion of milk.



**Separation.**—It is practicable to separate cream from milk, only because the fat globules which should mainly compose the cream, are lighter than the serum of the milk in which they float. The means for separation may be spoken of as natural and mechanical. In both cases the globules are made to travel in a direction opposite to that of the force which is exerted upon the serum or heavier portion of the milk, which is a solution. The fat globules are in the form of an emulsion in that solution. The setting requirements are a falling temperature of from 90 to 40 degrees Fahr. When milk has become colder than 90 degrees before it is set, the rate of separation is proportionately slow in all milk, except that wherein the fat globules are extra large. To raise the temperature to the required point, water as high as 125 degrees may be added to the milk. Such an addition of water will also reduce the viscosity of the serum, and thus permit the fat globules to have an easier passage through it to the top. Prof. Babcock has done the dairy world admirable service by his researches into the constitution and physical nature of milk. Wisconsin has acquired world-wide fame, more through the work and triumphs of some of her citizens in dairy matters than by all other achievements of her people, which erstwhile had alone been accounted worthy of public mention. When the milk is set, all disturbance tends to retard the separation of the cream.

**Cream.**—Cream is merely that part of the milk into which a large proportion of its fat globules should have been collected. They have not been collected into the average cream of hotel tables. Occasionally in butter-making difficulty is experienced in effecting separation between the globules of fat and the serum of the cream, which is the

whole endeavor and aim of the operation of churning. To make that easier, about 25 per cent. of pure water may be stirred into the cream while it is still sweet. Thereafter the cream should be ripened by souring before the churning is commenced. Taking a quantity of cream containing 100 pounds of butter fat, it is possible by proper souring to recover 97 pounds; while, if an equal quantity of cream of equal quality were churned sweet, not more than 77 pounds of the fat would be recovered in the butter. While the cream is ripening under ordinary conditions, frequent stirring will prevent the formation of any thickened part on the top which is apt to result in leaving white specks in the butter. If uniformity can be secured without stirring, it may be omitted, but not otherwise.

**Churning.**—The range of churning temperature for ordinary practice is from 57 to 64 degrees. For some time after the milking season of a cow begins, the fat globules are of a softer quality than they become some months after parturition; hence, during that period and in the early summer, the churning can best be performed at from 57 to 60 degrees. Later in the season, and in the other case as to length of time after the calving of the cows, it may vary between 60 and 64. No one can afford to try to make butter without the possession and proper use of a reliable thermometer. The churning, by which the globules of fat are impacted into each other, should not be continued after the particles of butter are half as large as wheat grains. It is usually preferable to stop when they are smaller. A small quantity of water should be added; and the churn revolved a few times before any attempt is made to withdraw the buttermilk. Then, after the removal of the buttermilk, water

should be added at a temperature of about 55 degrees. The washing will thus be effected in the granular state; and all subsequent rubbing and working for the expression of the buttermilk may be avoided. The working of the butter should be effected by pressing and not by rubbing. The temperature should be from 55 to 60 degrees. The movement of the butter is after all less likely to make it greasy or to destroy its grain than its working at an unsuitable temperature. Salt should be added to suit the demands of the market to be supplied. For immediate consumption, half an ounce per pound of butter, will give a mild flavor very acceptable to most eaters. One ounce of salt per pound will preserve the butter for a longer period; but not much more than half an ounce of salt is retained in the butter in a dissolved state. The reworking of butter is of some service in removing any speckiness and also in increasing the waxy quality of the butter's texture. In preparation for the

market, the rolls, prints or packages, should all have a neat, attractive appearance. The less crimping, or attempt at such ornamentation, the better will be the taste of the butter and the taste of the maker.

**Conclusion.**—In conclusion, the winter season is certainly the time of the year for butter-making in the northern part of the American continent. Our adaptation is for cheese-making during the summer and for butter-making through the winter. By such means stock-raising is encouraged instead of hindered; and the highest market price is realized when the production is greatest. By making butter upon the co-operative plan, six times less capital will be required for machinery equipment, and six times less labor for the manufacture and marketing of the product. In butter-making, he who makes good butter does a good thing, for fine butter is practically the materialization of sunbeams for the comfort and sustenance of man.

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## FEEDING HOGS TO PRODUCE BEST RESULTS

By THEO. LOUIS, Dunn County, Wis.

On the subject of food supply for swine there exists much difference of opinion. I can only give my own views from a practical standpoint, as a farmer.

**Feeding for Fat.**—The prime object in feeding swine is often to accumulate fat as rapidly as possible on those intended for market. Too often this proves a failure, when in the bill of fare clover and pasture are omitted. To keep stock hogs in healthy growing condition, and to have brood sows in the best condition

for bearing and suckling their young, the stomach must be kept healthy and not overloaded; the food must be in variety and in suitable quantities. The hog cannot thrive on an exclusive corn diet and mature, and green clover as an exclusive diet is as far wrong as dry corn. To feed sour slop, for instance, with clover would be another error. Clover contains acid enough in itself. If we could have roots, at that time of the year, such as beets, rutabagas, or man-

golds, which contain large quantities of soda salts, it would prevent an undue acid condition of the stomach; therefore, we have found that a feed of corn with clover gives a better balanced ration. Let all grain rations in whatever form they are fed while swine are on clover be sweet, for the best results.

**Soiling With Clover.**—The advisability of soiling hogs with clover has been advocated. I admit, that when in the fattening process a daily ration of cut clover is given, especially when corn meal is used, there is advantage gained in receiving greater returns from food consumed. Great profits may be derived from soiling, and one may be able to feed at least 14 head of hogs to the acre, as I know from actual test in soiling several score each season; but with comparatively cheap lands, and high prices for labor, the question as to profit remains doubtful as yet. Another consideration: There would be a lack of exercise for the development of the young and growing animals, and if permitted to run in a large and roomy yard, the losses of manure would largely offset the profits. I do not as yet find any other method superior to the division of fields with moveable fences, so as to have new, fresh fields alternately during the season. I have found, also, that a mixture of grasses is preferred by the swine. They love a change and variety. The feeding value of clover has been estimated all the way from 600 to 1,000 pounds of pork per acre; my experience leads me to conclude that the former is nearest correct.

**Figs Good Grassers.**—It is often disputed that pigs, when nursing the dam, and liberally fed night and morning, eat much clover. I have found that they are not only good grassers, but that they make larger growth and are more vigorous than when reared on

grain alone. The storing system is largely practiced in our State, to keep pigs and shotes during winter. Prof. E. W. Stuart says that if pigs were like a wagon, a bin of grain, or a mow of hay, they might be kept without expense over winter; but when we reflect that two-thirds of a full ration is used merely as food of support without adding any weight or value to the pig, the practice is indefensible.

**Clover Hay for Hogs.**—Clover hay, especially that from the second cut, if stacked in a sunny and sheltered place, and care is taken that around the bottom of the stack the ground is kept clear of snow and the coarser refuse, will be found a great aid to the man who adheres closely to the proverb, "root hog or die;" but for the intelligent, thinking farmer, there is a still wider field of profit. By cutting, and moistening the hay with either steam or hot water, all will be eaten with considerable relish, giving growth and health to the pigs, and fitting them for successful, rapid fattening animals, either for spring or summer market. I have found it better not to cook or steam clover hay, as it becomes tasteless, and pigs largely refuse it, and also that shorts mixed with clover are not so readily eaten as cornmeal, the former containing nearer the same food relation to clover. The pig is a good chemist, if you give him a chance. If clover hay is either cooked or steamed, unless the entire quantity is cut fine or short and mixed with sufficient grain to absorb the water, it will be better to use only the so-called hay tea, which is of a strong and pleasant odor. I have found it an excellent substitute for water to prepare swill for farrowing sows.

**Clover Ensilage.**—Last, but not least, comes the clover silo. It has been conclusively proved, during the last

season, that the silo has been a greater success in preserving clover in a sweeter condition than corn. It now only needs perseverance and intelligent application, to show to what extent we can use clover ensilage as food for hogs. Undoubtedly our dairymen will give it their attention another year, for surely their discussions on corn ensilage this winter lead me to think that it is not often a balanced and succulent ration. I fear, from a breeder's standpoint, that the result from an all corn ration may become disastrous to them in time.

**Feed Judiciously.**—I am in favor of the clover field and a clover ration, but safe and judicious feeding must go hand-in-hand with them, and I feel that I am far from the true problem of cheap and profitable food rations. The ever increasing fertility of our soils produces more, cheapens our rations to meet the

ever increasing competition of cheaper meat products, and adulterated lard.

**Value of Experiments.**—It is fortunate for our State, and the agricultural interest, that our experiment station has come so bravely to our aid. Prof. Henry, assisted by an able corps of assistants, has advanced some ideas that are often contrary to the experience of most of us, but he has figures to substantiate his assertions. Every intelligent citizen recognizes the supreme importance of our agricultural interest, and that its development imperatively demands that accurate experiment be made for the settling of mere opinions, and for the development of new truths.

In conclusion let me say, with F. D. Coburn: Pasture—let this word be written in capitals by every man who raises swine; it is the secret of success. Permit me to add clover.

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## THE SCIENCE OF PIG FEEDING.

By GEO. MCKERROW, Sussex, Wis.

**Cost of Producing Pork.**—Sir J. B. Lawes, of Rothamsted, Eng., found by experiment that cattle utilized 8 per cent. of the dry substance of their food, the sheep 12 per cent., and the hog 20 per cent.; but as the hog's food is of a more concentrated, valuable kind than that of cattle or sheep, we do not claim that his meat is produced at less than half the cost of beef, or at nearly half the cost of mutton. But we do claim that the hog, when properly handled, is among the most economical machines for changing coarse grains, grasses, and roots, into a valuable meat product. Now, the question arises, how can we

profitably feed this animal so as to meet the stringency of the times and the demands of the markets.

**To Secure Early Maturity.**—Fellow farmers, this is an age of early maturity. It has been clearly demonstrated that it is the young animal that gives the best results in increased weight for the food consumed. To secure this early maturity requires careful thought and good judgment, which every feeder should exercise to the best of his ability. He should study carefully the food, care and comfort, of the animal, so that a high, muscular condition may be developed, which will in-

sure health and vigorous digestion, both of which are necessary to profit.

**Ration for Young Pigs.**—Whole milk, nature's most perfect food for the growth and healthy development of young animals, should be our food standard for them while young, and the more approximate to new milk we can make our ration for the young pigs the better will be the results. This ration must be so formed as to be rich in muscle-forming or nitrogenous elements, and, as Prof. Henry demonstrated, in his much quoted experiment of 1885, that the bone and muscle of the hogs fed on a muscle-forming or protein ration were on an average nearly 50 per cent. stronger and larger than those fed on fat and heat producing foods, rich in carbohydrates, and that those very important organs, the liver and kidneys, were much larger in the protein fed hogs, we must conclude that for the sake of health and vigor we need such muscle-forming rations.

**Folly to Stick to Corn Alone.**—To stick to corn, and corn alone, in the face of these facts, is the height of folly. Our experience has taught us that an entire corn ration soon damages the organs of digestion; and the main secret of good feeding is to get the animal, when intended for the market, to eat and assimilate all the food possible. This can only be done by feeding a proper amount of a balanced ration, for if we feed too much carbohydrates we not only lose a part of the food but overload the organs with useless work, and the same is true of too much albuminoids.

**A Good Ration for Young Pigs.**—As a food for young pigs, we have found a mixed ration of 50 per cent. middlings, 25 per cent. corn meal, 15 per cent. bran and 10 per cent. oil-meal, wet up to a creamy consistency, and fed three times daily in such quantities as

they will eat up clean, and at the same time appear to be satisfied, gives us the best results. In addition to this, a few whole oats on a clean plank floor and a few roots in their season make valuable adjuncts. As they grow older, we increase the corn meal until, at 5 to 9 months old, 50 per cent. corn, 25 per cent. middlings, 15 per cent. bran and 10 per cent. oil-meal form their rations.

**Pasture for Hogs.**—Believing that the hog's stomach needs a fibrous food, as a divisor we aim to give them pasture in summer, and some hay and roots in winter. You may question the profit in using some of these foods, and ask, why do you feed bran, clover and clover hay? I answer because, first, they act as a divisor for the more concentrated foods, and allow the gastric juices a better chance of permeating the whole mass, and, second, they are all nitrogenous foods; and, again, you may ask, why buy costly oil-meal?—to which I will answer, first, it has a highly stimulating effect on the digestive organs and the whole system, without any reaction; second, it is one of the best nitrogenous foods that we can use. When hogs are well grown, from seven to ten months of age, they will stand heavy corn feed for one or two months, and lay on weight quite rapidly, but even then they will do better with a good supply of clover or roots.

**Ashes—Charcoal—Salt—Sulphur.**—We have found wood ashes, charcoal, salt and sulphur, as well as coal slack, to be relished by our hogs, and therefore believe them to be good, when carefully fed, as appetizers and assistants of digestion.

**Skim-Milk.**—Skim-milk, which is too rich in albuminoids, should be balanced with corn-meal. Prof. Stewart recommends 1 lb. corn-meal to 2 lbs. of milk, while Prof. Henry 1 lb. corn-meal

to from 1 to 1½ lbs. of milk. In one of Prof. Henry's experiments, of 1887, where he fed 1 lb. of corn-meal to 1.1 lbs. of milk to 37 pigs, I have figured out that his pork cost him \$2.82 per cwt., allowing milk to be worth 25 cts. and corn-meal 75 cts. per cwt.

**Sweet Whey.**—Sweet whey, which is rich in carbohydrates, or heat and fat-formers, should be balanced with a mixture of 50 per cent. middlings, 40 per cent. bran and 10 per cent. oil-meal. Mixing this with whey at the rate of 1 lb. of meal to 5 lbs. of whey, will give fairly good results, but if your whey is sour you had better mix the meal with water. We once fed a lot of shotes on a mixed ration, buying all the feed consumed, when the price of feed was higher than at present, and produced pork at 3¼ cts. per lb.

**Comfort.**—The comfort of the animal has much to do with his development, and to be comfortable he must have clean, dry, moderately warm, well ventilated quarters to rest and sleep in. To have this comfort, it is not necessary to have an expensive hog-house. In fact, most of these expensive hog-houses are acknowledged by their owners to be a sad disappointment.

A number of small, moveable houses suit our ideas best, for several reasons, among which are, first, cost; second, they can be moved to the pasture in the summer, and when the soil of one yard becomes foul from use they can easily be moved to another; third, in case of contagious diseases there are not so many under one roof.

There are many plans for these small houses, all of which have their advantages and disadvantages. The one we use is made eight feet square on the bottom, with roof slanting from the outside of floor on each side to peak, rear and front boarded up, with door in the

center of front. This pen costs less than \$5 when completed, can be moved anywhere on a stone-boat and will accommodate anything, from a brood sow and litter to 6 or 8 shotes. We use common 16 feet boards, cut in two, for both floor and roof, and four two by four scantlings, eight feet long, for sills. A window above the door to let the sun's rays in to warm up pigs and bedding is also essential.

We also have a small moveable yard 6 by 6 feet, 3½ feet high, boarded up on three sides, with floor, that can be placed in front of these houses when we wish to confine the occupants.

**Exercise.**—Exercise is necessary to promote the health of the growing animal; therefore we prefer to give the pigs the liberty of a yard or pasture, and induce them to work by scattering a few oats or shelled corn on some hard spot of ground or plank floor.

**Breeding Stock.**—In the rearing of breeding stock, I would not force them quite as much as those intended for the market, but would endeavor to keep them rapidly growing, not allowing them to become stunted, for once allowed to contract the unthrifty habit, no matter how well fed and cared for afterward, they never will get back to their original habits of assimilating food, and thereby turning it to the best advantage.

**Health.**—The health of the animal requires all these precautions in feeding. Why is it that the swine plague has never appeared in Canada, where no corn, comparatively speaking, is fed, but such foods as oats, peas, bran and middlings make up the ration? My friends, if properly fed and cared for, the American hog can produce Irish bacon good enough for the epicures of Europe, and he will be muscular and healthy enough to again enter the ports of Germany, although he may have to carry Bismark out of the way on his broad muscular back.

## CARE OF BROOD SOWS AND YOUNG PIGS.

By GEO. WYLIE, Leeds, Wis.

**Points of the Brood Sow.**—The first consideration should be that the animal is worthy of the best kind of care. In selecting my brood sow I want a good, frank, open, intelligent countenance. Did you ever see a hog with that kind of a face? If not, the sooner you begin to look for it the better; that is if you are in the hog business. I want constitution, substance, vitality, good, hard, flinty bone, and plenty of it. Proper discrimination must be made between this quality of bone and bone that is coarse or soft and spongy. The general outline of the animal must suggest ranginess and plenty of room. I want limbs of medium length, strong foot and pastern, length, breadth and depth of body; a well sprung rib, a full deep flank. She must be naturally a good feeder, with strong powers of assimilation. I don't care how large she is, provided she is symmetrical in form, and does not show coarseness. I will not object to this kind of an animal, though her ear may be a trifle "off" from the standard. She may even have a well defined "swirl" in her back, or be lacking a little in the regulation markings. In passing, let me say that this class of swine can't be produced on a diet of corn. Such animals are the result of long-continued selection from animals that have been properly bred, fed and cared for for many generations.

**Selecting the Brood Sow.**—The prospective brood sow should be selected generally before attaining the age of

four months. She should be allowed to run with the rest of the herd as long as the feed is made up of bone and muscle-forming constituents. When the finishing process begins on the rest of the herd, and the feed is carbonaceous in its character, your brood sow should be kept apart from those intended for market.

**Feeding.**—To crowd pigs intended for breeders on fattening foods as you do those intended for pork is simply ruinous. When the assimilating powers of the growing pig are taxed to the utmost on fat-forming food, the breeding qualities, the vitality and future usefulness of the animal are sure to be impaired. A growing pig will seldom get too fat for breeding purposes if properly fed on bone and muscle-forming food, even if fed all it can eat, provided it can run around and take plenty of exercise. It is after it has attained its growth that injury may be done by overfeeding or by keeping it in too narrow limits while growing. Skim-milk, shorts, oats, grass and exercise, with a very limited amount of corn, are among the principal requisities for the successful growth of a young brood sow.

**Age for Breeding.**—No brood sow is at her best as a brood sow until she is two years old, or over. When fully matured, they give more milk, have a greater capacity for assimilating food and, as a consequence, their pigs are stronger, healthier and grow faster.

**Good Milkers.**—We must insist on

breeding only from sows that have proved themselves good milkers, or that are descended from good milking strains. These milking strains in swine are just as pronounced as milking strains in Jerseys and Holsteins.

**One Litter a Year.**—In summer, after the pigs have ceased running with their dam, let her have a run on grass with very little grain. Don't fatten her up, but let the system get rested preparatory to raising another litter. One litter per year is all she should raise, if you want to keep up the vitality of the stock.

**In Winter Quarters.**—We prefer to have mature sows go into winter quarters in rather thin flesh, but still in good heart; and then, during gestation, keep them gradually gaining up to farrowing time, which, in this latitude, should not be much before the middle of April. During the winter they should not be crowded for room; not even four or five mature sows should be allowed to sleep in one apartment. Those of like size and disposition should be kept together. Some sows as they grow old acquire an over-bearing disposition, and make life hardly endurable to the rest of the herd. If such animals are too valuable to dispose of, they should be kept by themselves.

**Feed During Gestation.**—During gestation the feed should be of a bone and muscle-forming character. I have found oats, shorts and corn, in equal parts, with roots enough to keep the system cool, free access to charcoal, wood ashes, and salt, with an occasional lump of hard lime mortar, and plenty of exercise, to give as good satisfaction as any combination I have ever tried.

**The Farrowing Pen.**—For a mature sow should be not less than 8×10 feet in size. It should have a tight floor, with a fender placed around the sides. Pens

should have plenty of sunlight, good ventilation, and clean dry surroundings generally. Very little bedding should be given, and that preferably of cut straw or chaff. Damp bedding, or dampness of any kind, is very injurious to young pigs, and should be guarded against. Brood sows thrive better and are really more valuable if you make pets of them. When you find one disposed to cultivate your acquaintance, always notice her—the chances are that she is a good one.

**Treatment at Farrowing Time.**—In regard to the treatment at farrowing time, opinions differ. We formerly placed our brood sows in pens by themselves a week or two previous to farrowing; but for a number of years past we do not give them a pen apart from the rest of the herd until from 6 to 24 hours before farrowing. In separating a sow for a week or two, there is a tendency to restlessness. She is anxious for the companionship of her mates, is usually deprived of her accustomed exercise by being confined in smaller quarters, and the general result is feverishness of the system, which is just the condition of things, above all others, that should be avoided. If she is quietly separated when she instinctively desires to be alone, all danger from feverishness will be prevented.

**After Farrowing.**—Give her nothing until she appears hungry, and then only a light feed of thin, warm slop, made by stirring a handful or two of shorts or bran into less than half a pailful of water. Do not encourage her to eat. A few roots and free access to charcoal will have a cooling effect on the system, the condition of which should be carefully watched for the first few days. Be in no hurry to crowd her with feed, as for the first week or two the pigs require very little for their nourishment. Exer-



cise and sunshine at this age is of the first importance. When they are four or five days old, they should be out-of-doors with their dams every pleasant day. They should not be let out in the morning until the dew is off the grass, and should be returned to the pens

early at night. A little fresh earth is conducive to health in the young pig. In this respect he differs materially from a certain other animal that nothing short of "the whole earth" will satisfy.

## FEEDING SWINE FOR MARKET.

By THOS. CONVEY, Ridgeway, Wis.

**Give the Pig a Good Start.**—Few feeders recognize the necessity of giving the young pig a good start. If through want of judgment, or want of care in changing it from the milk of the sow to other food, liquid or solid, it suffers from impaired digestion or defective nutrition, it may get a set-back from which it will never fully recover.

### Food of Support and Production

—The principal part of our hog crop is marketed when they are about eighteen months old. The average weight at that age could be easily attained by a pig nine months old, the amount of food consumed by the former being nearly twice as much as that eaten by the latter, the younger pig receiving more during the early, and the older requiring more during the latter part of its existence. A certain amount of food is required to keep an animal in its present condition. This is termed the food of support. All food given in excess of the food of support is termed the food of production, and in feeding should go to increase the weight. The food of support constitutes about seven-tenths of a full ration, but the food of support for a restless, irritable hog may very nearly approach the food of production for a

well-bred, well-fed hog, the cravings of the appetite of the former causing him to take a needless amount of exercise, and all muscular exercise is at the expense of food. The poor hog also becomes the prey of internal parasites, when placed upon full feed, as he must be, to prepare him for market. He over-eats, there is over-distention of the stomach, causing comparative inaction of that organ, and he can only digest and assimilate a portion of the food he consumes.

### Points in Favor of Early Maturity.

—The younger hog is converted into a more edible product, commands a better price, is generally ready for a better market, gives quicker returns and requires less attendance. He can be fed when on pasture, the droppings are not wasted, and food is not expended in keeping up animal heat during the entire winter.

About the only argument that can be made in favor of keeping the older hog is because our daddies did it. Profitable hog-feeding for market is not possible after the first year. You not only have to provide for additional growth, but also for organic waste in the growth already secured, as mutability is one of

the inexorable laws of nature. This waste is presumable greater in a large animal than in a small one.

**Feeding to Produce Gain.**—Repeated experiments have demonstrated, beyond a doubt, that the most profitable feeding is during the early period of an animal's existence. This is especially true of the hog. The modern hog, with liberal feeding, will reach maturity in about two years.

Prof. Sanborn, of Missouri, in more than one hundred feeding tests, determined that to make a certain amount of gain, pigs weighing 220 lbs. required 18 per cent. more food; pigs weighing 270 lbs. required 50 per cent. more food, and pigs weighing 325 lbs. required 78 per cent. more food than pigs weighing 70 pounds.

Prof. Hunt, of Illinois, determined, by actual experiment, "that the gain for the amount of food consumed decreased during fattening." Also, "that an insufficient food supply for two weeks caused a very considerable loss in feeding thereafter."

**Feed Young Animals.**—Chemistry informs us that the younger animal utilizes more of the elements contained in the food than the older animal does.

Prof. Henry says of feeding cattle: "You cannot be too careful about putting your feed and money into young cattle, and avoiding old ones." This is more applicable to hogs than cattle, as the hog reaches maturity in about one-half the time cattle do.

**The Right Kind of Food.**—Another essential of successful hog-feeding is to give the right kind of food. All the substances that enter into the make-up of an animal are derived from its food. No single article of food is capable of supporting a healthy hog, except for a limited period. Grass, es-

pecially clover, is one of the best of hog foods, but is too bulky for the stomach of a hog to produce the best results. It should always be supplemented with grain. One bushel of corn fed to a hog when it has access to a good clover pasture, will produce more growth than three bushels when corn is fed exclusively. All foods consist of certain elements. All farm animals consist of about the same combination of food elements. The right combination of nutrients to promote the most successful growth of an animal is not found in a single article of food. The different articles of food are generally divided into two classes: First. Protein foods, also termed flesh-formers. Second. Carbohydrates, also termed fat-formers. Clover, oats, peas, beans, bran, shorts, skim-milk and butter-milk belong to the first class, as they are rich in bone and muscle-forming elements. Corn, barley, whey, roots and acorns belong to the second class, as they are rich in heat and fat-producing elements.

**What and How to Feed.**—Corn should never be fed as an exclusive ration except at the close of the fattening period, and then only for a limited time. Whey should always be fed sweet, as the small amount of solids it contains consists mainly of sugar of milk. In souring, the milk sugar is converted into an acid, and has little or no value as a food. Whey should always be supplemented by a nitrogenous food. Butter-milk has twice the value of whey as a food. It should be fed as fresh as possible, and can be very profitably fed with corn. Skim-milk should always be fed sweet. Sour feed of any kind is of questionable value; a slight degree of acidity may not be injurious in some kinds of food, but this does not apply to feeding skim-milk and whey.

**Give a Protein Ration.**—Pigs usually receive a ration too rich in carbohydrates and deficient in protein. The necessity of giving a nitrogenous or protein food cannot be overestimated, especially to young pigs, as they require twice as much nitrogen as old hogs; yet feeding for health or profit is not subserved by feeding protein foods alone, as they are constipating, and, except clover, costly. An experiment has demonstrated that one bushel of corn will make as much pork as three bushels of oats; yet good oats are an excellent hog-food, being rich in nitrogen, and the ash that is necessary for the formation of bone.

**Give a Balanced Ration.**—The advantages of giving a properly balanced ration, suited to the age of the pig are: You secure greater growth with a given amount of food. You also obtain a better quality of meat. There is a more perfect growth of bone, and greater muscular development, both being promoted by a moderate amount of exercise. A high degree of muscularity indicates a condition of the system the least liable to disease, also the most perfect condition for breeding animals. Prof Henry says that pigs should not be confined to close quarters for more than sixty days. This is certainly long enough.

**Cooking Food.**—While I am satisfied that the tests carried on by our experiment station prove that giving hogs cooked food exclusively does not pay, yet I believe, for fall feeding, where hogs are taken off the pasture, it is very advantageous to feed once a day on cooked food. For this purpose, roots, cooked about the same as for table use, should be mixed with ground oats, rye or other nitrogenous food. Sugar beets are very valuable for fall feeding, but turnips, raw or cooked, are better for

winter feeding, as they are better keepers.

**Peas and Oats.**—Peas and oats sown together are a very valuable crop. They can be sown at the rate of one bushel of peas, and one and one-half bushels of oats per acre. This crop can be cut with the binder, and threshed as readily as oats alone. Care should be taken not to sow on ground where oats lodge. They should be sown early. I raised last year forty bushels per acre, weighing 44 lbs. per bushel. When ground, they are a good substitute for bran and shorts, but may be fed whole to hogs. The object of improved agriculture is to obtain the largest amount of nutritious and life-sustaining substances from the smallest possible space. This, to a considerable extent, is secured by retaining and increasing the fertility of the soil, and by skilful feeding; but the customary way of hog feeding is as great a robber of fertility as the much condemned wheat raising. Grain and milk are largely fed to hogs in pens without regard to saving manure, for it is leached out and washed away, and only a small portion of the least valuable part returned to the soil. Added to this is the loss occasioned by washing away of the surface soil in corn-fields, where the land is rolling, this being augmented by not observing a suitable rotation with grass.

**Skillful vs. Poor Farming.**—The person who causes two blades of grass to grow where only one grew before is regarded as a public benefactor. Too many of us not only fail to produce the two blades of grass, but, on the contrary, expend two blades, or its equivalent, to secure results that the skillful feeder, with a well-bred animal, can obtain with one. Is it any wonder that the good farmer can make money every season, while the poor one is complaining of weather, crops and prices?

### Valuable Experience with Hogs.

[Discussion of Preceding Papers.]

PROF. HENRY. — Two years ago we took pigs of the same litter and fed one lot in one way, and the other in another way, exact rations, and have followed out the experiments later in such a manner that we know we can do the same thing again and produce the same results. Chas. W. Garfield, of Michigan, said: "That is very nice work, but I don't believe you can do it again." We have done it again and again. Last summer we killed pigs at the farm where one lot had been fed upon these carbohydrate feeds, and another lot on protein feeds. We found that there was a difference in the solid matter of the blood—there was twenty-five per cent. more dry matter in the blood of one lot of pigs than in that of the other; we found that the bones were stronger, that there was an actual difference in the strength of the bone. We have gone over the work in another direction since last summer. I am now trying the effect of feed upon bones, to see if by feeding ashes we can get strength into the bones, feeding wood ashes with corn.

I heard a farmer say the other day, at a meeting: "If my pigs get too fine bones I send off and get a large boned sire, and in that way I keep up the strength of my pigs." Suppose the Arabian horse-breeder should send out of Arabia to get a large-boned horse to keep up his herd of horses! When you have to send off your farm to get other stock, except for the purpose of changing, your system of farming is wrong in some way. If the bones of your pigs become smaller, there is something wrong. Your soil is against you, your feed is against you. If a country cannot make people grow up to their normal stature, and be strong and vigor-

ous, there is something wrong with the soil and the climate. I say when the American farmers are feeding any line of stock so that that stock is degenerating in size or in constitution, they should stop and say: "What is wrong?"

Another point. I meet a farmer and he says: "I get twenty-five cents a pound the year around for my butter. I don't sell my butter at the corner grocery; I have customers, a picked trade. They are people who eat good things in this world, and pay me for my butter." That is very well; but, my friend, where do you sell your hogs? "Oh, I sell my hogs to the hog buyer, drive them in a wagon and they go in the cars with Tom, Dick and Harry's hogs, and they go to Chicago and are sold." Now, the cases are not entirely parallel, but in a degree they are, and people living as near to good commercial cities as you do here, ought to think of this thing. Here is Milwaukee with a couple of hundred thousand people, and Chicago with some eight hundred thousand. There are people in Milwaukee and Chicago who pay high prices for all the pork they eat. The bacon that supplies many of the wealthy people of Chicago comes from Ireland. They are not Irishmen; they don't care to help Ireland out, but they say: "The bacon is better flavored," and they don't care if it costs several times as much as it would here. There has a large trade sprung up at one of the stores in that city for that kind of bacon. Some people will buy high priced things because they are high priced. We have "got onto" this idea in butter, and make it for that kind of a market, but we have never thought about it in pork.

There was a college boy years ago who went out and took his father's farm in Massachusetts, and the first year he care-

fully cured the meat from eight hogs. He sold or gave away that meat to his friends in Boston. The next year they came back, and said: "We want some more of that sausage," and that year he put up thirty hogs. Now he puts up over three hundred hogs a year, and last January, when I was at the Reade Hotel in Chattanooga, Tennessee, I had the pleasure of ordering from the bill of fare sausage from that farm in Massachusetts. Now, why should Massachusetts hogs have to go down to Tennessee to be eaten? Why should we allow the trade to come in that direction? At one of the institutes we stopped at a hotel at Mazomanie, and a farmer came in with his sausage to sell. Three or four workers gathered around him, and the hotel man told us how the farmer made the sausage, and brought it in to sell, and we bought some and took it home in our grip-sacks. The landlord says that man was once poor and in debt for his farm. He began to peddle sausage, has now a large trade, his sausage is known all over the country, and people are glad to pay a little extra for it. This is just a hint which I think is worth following up. We might just as well shut out this Irish bacon, and have these people pay us two prices for this product as not to get it.

My friends, I hope you will think of these matters. Every time one of us steps out of the ordinary, we leave a little more room for the crowd that is left behind. We will get a little more and the crowd will be better off.

MR. SHERWOOD.—Do you suppose that I could get one-tenth of a cent more for a hog raised on the more approved plan than I could for a hog raised in the ordinary way?

PROF. HENRY.—Probably not at first; but if you had taken your butter to the corner grocery without striking out in

any other direction you would still be getting corner grocery prices. The hog buyer won't give you any more, but there is somebody in Chicago who will. Somebody will pay you a special price for lean-meat sausage, another for fat sausage that he knows is carefully made. Of course, it will cost something to find the customer, but that is true in the butter trade or any other kind of business.

MR. LOUIS.—On that point I want to say that last winter Mr. John Plankinton, after he had shown me through his slaughter-house and packing-house, said to me: "Mr. Louis, if the farmers of the State of Wisconsin, or any set of farmers, will give me the assurance that they will find us a few car-loads of hogs that are fed to lean and fat, we will give a large money premium, and will advance the price of the pork on such a product. That shows that there would be a market for specially bred and fed hogs. It is very easy to raise that kind of pork for the market, and it is just as cheap to raise it for the market as it is the fat pork.

It merely exists in the brain of a man that he makes cheaper pork out of corn alone. I am feeding a lot this winter a right balanced ration, which will give me a lean and fat hog. In fact, I have put forty-eight hogs on the market in Eau Claire to one of our packing houses, which were deemed the finest hogs that ever entered upon the block in Eau Claire. They were just fed on clover and corn. At the same time in the fattening process their swill consisted merely of shorts alone, and I find that these hogs are very far superior; they contain a greater proportion of lean meat. That was at least the judgment of the packer.

QUESTION.—Did you get any more for them?

MR. LOUIS.—Yes, I was paid nearly three-quarters of a cent more a pound than the general market was giving then.

MR. HIRAM SMITH.—It seems to be the opinion of many here that it costs something extra to make this pork and sell it. They are laboring under a great mistake. The last four or five years I have made this pork because I could make it the cheapest, and after a few local butchers found out that this pork gave better satisfaction to the retail trade, and made more sausage from the same cost of food, they told me to sell no more pork to Chicago buyers; that they would always give me a little more than I could get to ship it upon the markets of the world. They wanted it for their local trade.

MR. GORDON.—I know the Deerfoot farm pretty well. I know Mr. Burnett pretty well; I have been there a good many times and studied out that question. It is largely a matter of curing with the Deerfoot people. Mr. Burnett buys the average pork of his own neighborhood and cures it. I remember some years ago going to England and sitting down to breakfast the first morning and admiring the bacon. I said: "If I could only get such bacon as this for breakfast in America, I would eat it every morning." I was a little surprised when they told me it came from Milwaukee, and showed me the brand. The trouble with the average bacon as found in the village grocery store, is that it is improperly cured.

Now, isn't there right in this vicinity a market for such a product? Isn't there a big reputation for the Oconomowoc sausage in the Chicago market? The Oconomowoc people make a market for that kind of pork. Last summer they asked me if I had not some nice lean fed hogs, and told me, if I had, to

ship them down and they would pay considerable more for them than the ordinary corn-fed hogs.

There are butter and cheese factories at almost every corner in this wide State. The making of butter has been systematized until Wisconsin creamery butter will outsell any creamery butter in the world. Why not have some co-operation or system in connection with the bacon-curing process? Why should not the farmers who live near together get together and put in a curing establishment and start a business? I believe it would not be long, if the product was what it ought to be, before a good trade would be established in Chicago. There ought to be a chance in this State for an industry in curing pork, and it is, after all, as much the curing as the feeding.

PROF. HENRY.—My main point in this work is not that we shall have all lean meat, or all fat meat. It runs in the direction of breeding. I don't believe you can feed lean meat into a mature hog any more than you can feed constitution into a man. Muscularity is something that comes from constitution. You cannot feed muscle into a prize fighter. When he goes into training he does not increase in muscle; he trains water and fat out of his body. What I want is that our breeding stock should have the proper proportion of bone, muscle and fat, and you can't make muscle and bone with corn only. If you want to fatten, you can feed corn exclusively for a few weeks, but do not understand me that you want to go into producing that kind of hogs. I want you to have fair judgment in raising your breeding stock, and not be satisfied when your hogs die and prove unsatisfactory, but look into it and find out what is the matter. There must be something wrong in the

way we feed if we have that kind of result.

MR. LOUIS.—I want to say this about the Milwaukee bacon: When I was at Mr. Plankinton's slaughter-house I saw one thousand selected hogs—selected for the purpose of going to the English market. Their cellar is about one hundred by one hundred and eighty feet, and the pork was piled up about four feet and a half high, all in process of curing. I asked the manager of the packing house if this pork was the same as the hogs that were killed to-day by selection. He replied: "The majority of it is, because we can only get that kind of bacon, or that kind of cured pork, out by selection, because our hogs, as a general thing, are corn-fed hogs;" so you see even the packing-houses have an eye to selection.

MR. HOXIE.—I have two neighbors. One of them put his shotes into a clover pasture in the spring and kept them there and fed and fattened them in that same field. He had enough to make two car-loads. They sold in the Chicago market for fifty cents a hundred more than any hogs that came in that day, because they were strong of muscle and bone. The others were fed on corn and did not have the strength and muscle to bear the shipment. That was sometime ago. Since then, Prof. Henry has shown us the reasons why these results would follow, and I, for one, as a Wisconsin man, feel proud that the State of Wisconsin has the the experiment station that we have, and that we have a level-headed man to work it.

MR. MCKERROW.—The Oconomowoc sausage factory has been mentioned here. Mr. McDowell runs this establishment, and a friend of his was at my place last fall, and looked over a lot of nice healthy hogs, and he said: "If you want to sell those hogs, Mr. McDowell

will give you a cent a pound more than the market price, and he told me if I saw any such hogs as this to tell the owners to drop McDowell a card. He wants nice, young, thrifty hogs, not very fat. There is a gentleman named Nye, who lives between Appleton and Green Bay, who told me, two years ago he had built up a good trade on this pork. He started with a couple of six-months-old pigs that he tested. He sold them to a gentleman in town at the market price; the next fall he wanted more, and then he began to sell in Green Bay, and he says he cannot furnish enough hogs for the business. He gets two cents a pound more for them than his friends get, and he thinks in time he will raise it three or four cents. In this audience I see a Waukesha County farmer who has been treating hogs in this line for some time, and I believe that he gets more for the hogs that he sells in Milwaukee than the going price. I wish you would tell us, Mr. Hodson, don't you get more for these pigs of yours?

MR. HODSON.—Yes.

MR. HARDY.—The question with the farmers is, is there any more profit in selling these hogs? Is there any more money in it to the farmer if he sells a hog weighing 200 pounds and gets  $\frac{3}{4}$  of a cent more a pound for it than if it weighed 250 pounds?

PROF. HENRY.—With the average breed of hogs that we handle here, there is very little profit after the hog weighs 300 pounds. The most pork is made with the least feed immediately after the pig is weaned. A pound of feed will produce more pork then than at any time in the pig's life. As that pig grows older he costs more every day. You can see that when he is a 100-pound hog he has to keep up that 100 pounds every day; he has to vitalize it, and then he has to add his weight to that. Up

to the 275-pound or 300-pound point, in some cases the hog does not grow much more expensive, but after you touch 300 pounds it goes up very rapidly. For instance, when a hog weighs 100 pounds it will take, say,  $3\frac{1}{2}$  pounds of food to carry him for a certain time, but after 300 pounds it will take 7 pounds to carry him for the same length of time. If our pigs are worth so much, my judgment is we will not carry them over 200 pounds; but the way we raise them we have to carry them further, up to 300 pounds. If we can buy pigs for the same price, we had better sell them when they weigh 200 pounds, and put that money over into another animal. There is no place more unprofitable for a farmer to put his money than into a big hog or steer. We are weighing steers at the farm every day, and we are weighing their food and I can make more money with a little calf for a given weight of food—with a 200-pound calf—than I can with a 1200-pound steer. I have had my students figuring on that thing this winter, and they are pretty well satisfied.

MR. THOM.—I have in mind a steer 5 years of age, that weighed 2000 pounds, fed for 365 days the same feed that he received the years before, and he didn't gain a pound; weighed 4 pounds less.

MR. WYLLIE.—There is no time in the life of a pig that you can make pork so cheaply as you can between the weights of 50 and 75 pounds. After leaving 75 pounds your feed is costing you a little more right along until you get up to 250 pounds. At 250 pounds their feed and every pound you put on is costing you 25 per cent. more than it did between the weights of 50 and 75 pounds.

I would consider about 15 pigs, of the age Mr. Van Dusen speaks of, as many as should be allowed to feed and sleep together. Pigs can be grown far more

evenly and with less liability to disease if divided up in this way, each lot having free access to pasture with a dry place to sleep and a clean place to feed. With protein food and proper sanitary regulations, the danger from disease will be so reduced as to practically cut no figure in swine raising.

SUPT. MORRISON.—The great fact that a certain amount of food goes to support, and all that is consumed and appropriated above that to growth and profit, must be kept in mind by every one who expects to make a profit in growing or feeding stock. It is the idea that underlies all successful feeding operations. It follows, then, that the animal which can turn the most surplus food into marketable flesh is the most profitable animal to feed. Sir J. B. Lawes found by experiment that cattle utilized 8 per cent. of the dry matter of food consumed, sheep 12 per cent., and swine 20 per cent. As the difference is slight in the amount of food required to support life, in proportion to weight, in these three domestic animals, it is clear that the hog is by far the most profitable machine for converting food into marketable meat, and the large percentage appropriated accounts for the rapid gain in flesh under heavy feeding. It should, however, be borne in mind, that the quality of the food consumed by the hog is more valuable than that consumed by either the steer or sheep. But, with all due allowance for the difference in food, there is still a handsome margin in the hog's favor, as the cheapest producer of meat on the farm.

MR. SAWYER.—Through the great corn belts of Illinois, Missouri, Kansas and Nebraska we have immense corn crops, and an immense quantity of hog cholera. That point comes in right here. It is a great question whether our hogs are likely to have hog cholera or any other



disease by our present way of feeding. If the pig's blood is 25 per cent. stronger by feeding, as Prof. Henry suggests, and the liver is heavier and the kidneys are heavier, the question is whether that will not make the animal less liable to disease. A good many of our hogs eat up our corn crop and then lie down and die, and we don't get anything. The stations have offered immense rewards for cures for hog cholera. I believe Prof. Henry's theory is working toward a solution of that problem. You cannot take an animal that has fed on corn for two years and cure it of hog cholera, but improving the breed is the best cure for the hog cholera that this country has ever seen.

MR. VAN DUZEN.—I have had some very severe experience with that disease in buying Western hogs, and I am satisfied that we cannot expect to fight it, even by feed. I will say that my experience has been that pigs are the ones that I have made money on, not wintered hogs, although I paid more than 10 cents a pound the next year to try to do the same thing. I bought about 150 pigs from 4 to 8 weeks old. They were well raised, all on one farm and about one age, and the animals were fed from the silo, together with bran and middlings. They grew very nicely, but these pigs, after they got to be about 3 or 4 months old, took the hog cholera from some wintered hogs that were kept in a separate field. I was so careful as to have separate men attend the separate lots of pigs. I put the pigs in separate pens, 25 or so in a pen. They never had a bit of grain or corn meal. They had been fed on middlings and other grain in connection with butter-milk, and were very thrifty and strong, but I lost from 30 to 40 per cent. of the lot, some from each and every lot that I had. I speak of this to show that while

I do not doubt that, according to Prof. Henry's theory, we can make stronger pigs, and that they will be less subject to hog cholera than pigs fed upon corn alone; nevertheless, it is not safe to expect to fight the disease in this way. I can bear out the other statement that is made that it is more profitable to feed young pigs. Those pigs that I fed from the spring until September, I got 7½ to 9 cents a pound for, and when the ordinary time came for selling ordinary hogs, dressed pork was down to 6 cents.

MR. WYLLIE.—It makes no difference how your hogs have been fed, if they are exposed to cholera, they are liable to catch it; but with this system of feeding that we are talking about, the cholera will not originate in your own herd.

MR. LOUIS.—We receive hog disease, as a rule, from infected districts; that is certainly true. Four years ago a gentleman bought two brood sows in Eau Claire, from a car-load of hogs that came from Kansas, and which were diseased. He bought only these two, and, being confined in a pen nine days, they became sick with hog cholera, or hog fever, or whatever we may call it, and the disease spread down the Chippewa Valley, and across the Chippewa river to the West line of Dunn County. Then a large lumber firm keeping 800 hogs sent for me and asked: "Mr. Louis, what will be our preventive against the disease?" I said: "Don't feed any meat from your slaughter-house; keep your establishment clean, that is, your hog-yards and the like; have a high, sanitary care and don't buy any live hogs or any pork." My caution was not heeded. They bought live hogs, and in November disease broke out in their yards. The disease was brought fourteen miles by importation. I was asked to

come over and see what I could do with the hogs. Of course they could do differently from any farmer; they could give me twenty men at a moment's notice. I had the hogs passed through, one by one. Every hog that showed disease was killed, and the others were transferred to new yards. Mr. Knapp gave these hogs, by actual weight in the drug store, ten drops of carbolic acid for a week in succession. They lost one hundred hogs, but the disease stopped.

MR. STICKNEY.—The question was asked here whether it didn't cost something to find customers for these better products. Of course, for the first customer, or the first ten customers, it does cost something, but after that those better products find their own customers. If they are used, they are appreciated, and every customer finds others, and in a very brief time it becomes much easier to market those better products than the common ones. In a load of fruit brought in the market to sell, the finer fruit sells, while the poorer is rejected or sold at a price that does not pay. Every farmer knows that a better product of any kind will sell when he can't sell the poorer at all.

MR. FLEMING.—Is it possible to feed a hog for eight months and make him weigh two hundred and fifty pounds or over, and at the same time have him fed for lean? If it is, this can be done and done in such a way that the extra price that is received from that pork makes it profitable. I believe you are a unit in believing that the profitable time for disposing of pork is at about eight months. I do not believe that is invariable; I think the surroundings a man has for raising and feeding those hogs cuts a material figure. He can do it if he is a dairyman. I believe with the aid of the silo he can winter hogs and sell

them at about a year old weighing about three hundred pounds and at the same time feed for this much desired lean.

MR. CONVEY.—The gentleman has answered his own question. Where the by-products of the dairy are used, there is no difficulty in securing the lean meat and the growth too; that is with good breeds of hogs.

For my part, I do not think it requires any particular skill to cure pork properly. Every man has the means at hand of very cheaply curing meat and putting it on the market. In my neighborhood I have noticed what they call breakfast bacon, which sells for fourteen cents a pound. One gentleman near us sells several thousand pounds at that rate.

MR. R. FARGO.—Mr. Fleming, how do you feed your hogs?

MR. FLEMING.—I feed largely on skim-milk, being a dairyman, and considerably on grass in the summer time. I feed young hogs three times a day, and older hogs I would not care to feed more than twice a day; but my rule would be to feed them as often as they showed an ability to utilize the food. I feed my milk cold in the summer time, and without freezing in the winter time.

MR. BEACH.—I buy my hogs, keep them about sixty or ninety days and then sell them. I buy them at about 100 to 150 pounds and feed them and sell them at 200 pounds, any time when they will bring the highest market price. I feed milk and give them all the green feed they will eat. I cannot always feed the milk sweet in the summer time, though I think it is better sweet; but the hog will eat it sour if you give him meal enough. I think there is no profit in feeding a hog after he weighs 250 pounds.

QUESTION.—Does the fellow of whom you buy them make any money?

MR. BEACH.—Yes, he makes more than I do. He can make more on the first 150 pounds than on the next 150.

MR. HARDY.—It seems to me that the supply and demand has something to do with this. I have known the time when a 300-pound hog would bring very much more in the market than a 200-pound one.

MR. HODSON.—We find the best results by feeding young pigs three times a day. If we feed oftener they seem to be more restless. When they get to be three or four months old, we feed them twice a day and give them all they need. We send them to market when they weigh 175 to 200 pounds. Our winter pigs we sell in the spring. Our March pigs we sell in August or September.

MR. LOUIS.—I would like to know what is the use to kick against the pricks? In a late swine-breeders' convention in the State of Indiana, one of the members was appointed to make inquiry at the different packing houses what kind of a hog was wanted in the present market. The answer from six of the largest packing houses was: "We want a hog that weighs 250 pounds." Now, why should we kick against something that is to our profit?

MR. TOOLE.—I think it is plainly indicated that we in Wisconsin may open up not only in our near cities, but in the markets of the world, a better product and better prices for our product; but certainly with all this breakfast bacon and all this sausage, the lard will be on our hands. Still I want to call your attention to the encouraging fact that in all the towns of Wisconsin, the people, if they can buy farmer's lard will not buy Chicago lard.

MR. VAN DUZEN. — Simmered right down to the real question, we must suit the product, whatever it is, to the market we have to supply, and if we be-

lieve there is the most money in supplying a certain kind of butter or a certain kind of hog, then we must find the market that wants that kind of butter or hog, and if the farmer hunts out the market that wants an article that he is preparing, and prepares that article in a way to get a reputation out of it, and it deserve a reputation, he is certainly going to make money out of it. I have some doubts about three times a day being often enough to feed young pigs. We know that they are in a habit of getting their dinner whenever they want it before they are weaned, and feed oftener than that. Just before I left home I sold twenty-five pigs, all just eight weeks' old; they each weighed close to twenty-five pounds. I fed them about as near right as I knew how, and sold them for five dollars apiece, to go into a creamery just for their feeding value.

PROF. HENRY.—I want to call the attention of the farmers to the wonderful changes that are going on in regard to the development of this country. A Massachusetts farmer said to me, coming on here: "There are farmers over a vast area of this country feeding hogs on corn worth from fifteen to twenty cents a bushel, on land worth twenty dollars an acre, farmers living in cheap houses, without many of the comforts of life that Eastern farmers have. You are competing with these on \$40., \$50 and \$60 an acre land. Down here are two vast cities with men worth all sorts of fabulous sums, and eating all sorts of good things." This has come up within the memory of many. Now, shall we throw everything into the hands of a few Chicago monopolists in the way of this hog business? Shall every hog come into town and go into a car and into Phil. Armour's packing house? You make a fuss about binding twine monopolists, or something

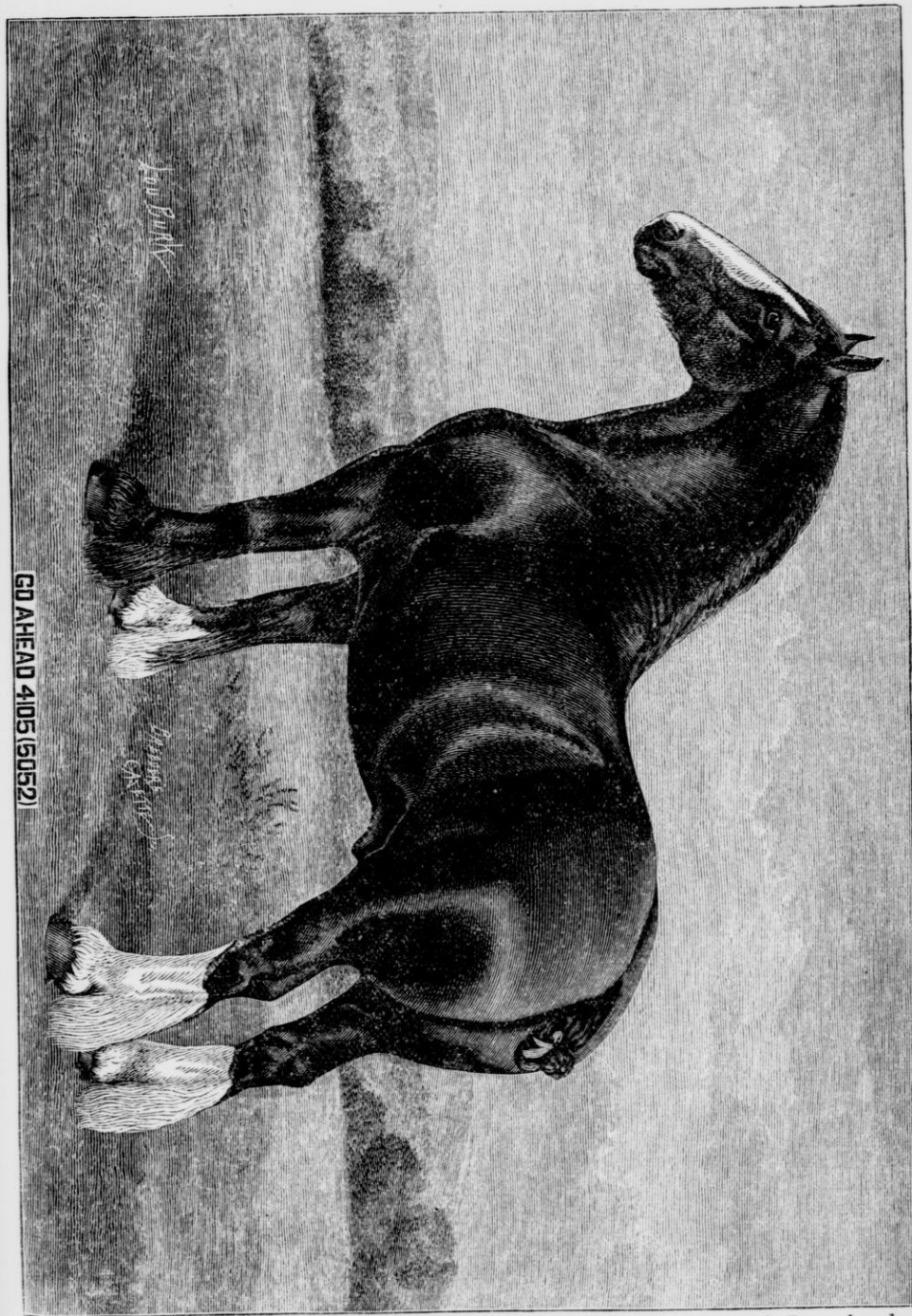
of that sort, spend lots of time and talk and money at it and yet you stick to this same plan with your hogs. Wisconsin pork and Wisconsin cheese ought to go down to New York and sell on its merits and reputation, so that the New York folks will look for the Wisconsin brand every time. Let us boycott the way that the general hog business has been running, as much as we can, in a business-like manner. If your neighbors here in the city have money and will pay fifteen or twenty cents a pound for sausage when ordinary sausage is sold a little cheaper, let us make the money. I don't say this to you old farmers. Many of you have done your work, but don't stop the boys. Because the old man wants to haul the hogs to town on a wagon, don't think the boys must do so. You bought land at \$1.25 an acre, and you have done well because you have held it, but remember your boy has to take the farm at \$50 or \$60 an acre. You see the times are changing, and if there is anything in it, let us get it out of it.

MR. WYLIE.—Altogether, figures and experiments go to show, beyond a doubt, that the largest returns for food consumed are made in the young and growing animal. There are other conditions connected with swine raising that farmers do not study close enough. One of them is the markets. A study of the pork market for twelve years past will show the highest price each year, without variation, during the months of July and August, and the lowest generally during November and December. April pigs can hardly be ready for the July or August market, but are usually sold when packers are getting all they can handle, and are "bearing" the market. Thus the profit of early maturity is frequently lost by the lowness of the price. Under certain conditions, farmers could

have the pigs farrowed in June or July. At this season the brood sows and young pigs will almost take care of themselves, and a larger per cent. of pigs be saved than if farrowed earlier in the season. The pigs can be kept gradually growing through the fall and winter, and in spring given a run on clover or bluegrass for a month or two, and then, with a crib of old corn, they could be got ready for market when pork is highest.

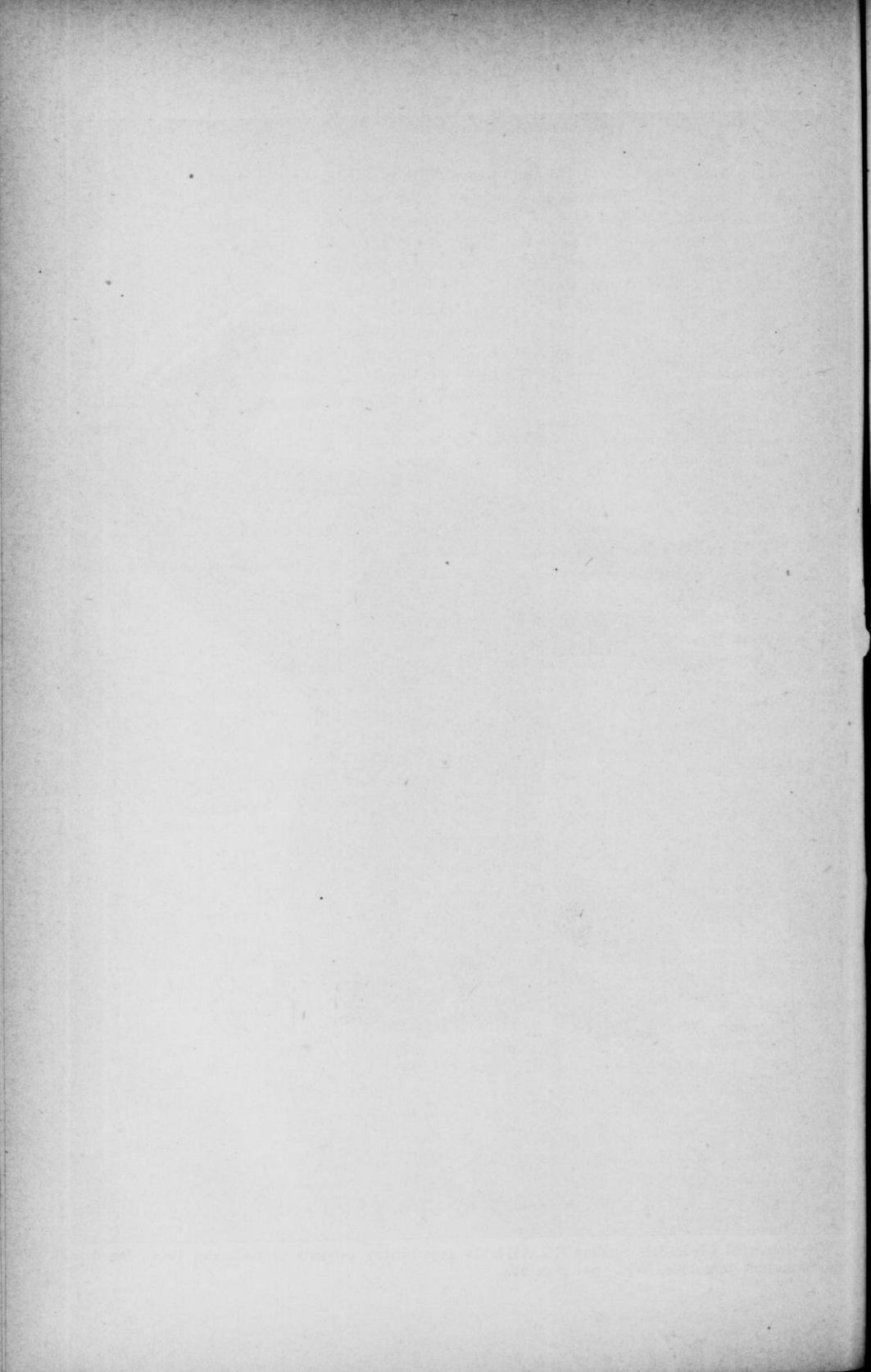
The main objection to this system is wintering the pig, and as pigs are commonly wintered in this State, they do not pay for the food consumed; but with proper shelter and care, pigs farrowed in June, July, or August, can be wintered in Wisconsin, and wintered at a profit. The principal advantages of this method are selling when pork is highest, and the benefits derived from a month or two of pasture in the spring. Grass, it must be remembered, is the cheapest feed in the whole list, and pigs that have been wintered are in just the right condition to make the best kind of gain on it. They have the advantage of making the most of the grass at a season of the year when it is at the best, and after this run on grass their stomachs and general system are in just the right condition to make the largest possible returns in pork for the corn consumed.

Your April pig, although he eats a little grass during the summer (and what he eats tends to keep his system in condition and so far helps him), yet a pig under four months old will make no substantial gain on grass alone. By the time he is old enough to utilize grass profitably as food, the best pasture is gone. Of course, conditions and circumstances, the kind of farming you are engaged in, have something to do with whether you adopt this method or raise an April pig (March pigs are too weak), and sell him in the fall. The



GO AHEAD 4105 (5052)

The Imported Clydesdale Stallion GO AHEAD 4105 (5052), property of Galbraith Bros., breeders and importers, Janesville, Wis. See page 284.



wintering system is more applicable to farmers who raise car-load lots, than to dairymen or those who raise but a few.

MR. THOM.—I want to say one word in the same line. We ought to begin to do our own business instead of having somebody else do it. Even if it don't pay on the start, we have the comforting assurance that we are doing it ourselves. For instance, seven-tenths of the farmers of Wisconsin are carrying their butter down to the corner grocery and taking what the grocer has a mind to give for it, and he puts the price on his own goods and makes you take them in trade. You have milked the cows, done the work, and he fixes the price and you take it. I have not anything against the grocermen, but before I would patronize that kind, I would see him hanged higher than Hamaan. I remember about the first money I ever had—\$12.50—for working two long, hard months in

harvest. The proprietor gave me a \$10 bill and \$2.50 in change. I walked home four miles and lost it on the way, but I hunted around and found it, and the next day I walked to a village store and threw that ten dollar bill very independently down on the counter and said: "Can you give me two fives for that?" Then I went across the street to another store and threw them on the counter and I said: "Can you give me a ten for them?" It was the satisfaction of doing my own business.

So I say, a man who don't eat his own dinner never can grow in size, and that man who does not do his own business never can grow in breadth and power, and it is time that you and I stood on our own rights and asserted them and had something to do with the business that is going on in this great commonwealth.

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## CAN WE GROW BEEF PROFITABLY ON HIGH-PRICED LAND?

By H. C. THOM, Madison, Wis.

Slip-Shod Handlers of Scrubs.—So long as the beef market needs a float, and Wisconsin owns men who hope to foster a profit dollar, slip-shod handlers of scrub stock may join hands and fortunes with Milwaukee's almond-eyed citizens and "take a walk." It is with fear and trembling that I pronounce that fatal word "scrub." It is like unfurling a red rag before Mexico's idol. Some wise individual is wont to spring to his feet and carry an assem-

blage from the winding paths of the sage-bush plains to the Arabian sands in a vain and inglorious search for a thoroughbred. This blooded solon who is indigenous to the stamping grounds of agricultural societies and State institutes, feels keenly that if he can command the attention of one man in an audience of 2,000, for ten minutes, he has the unbounded gratitude of the remaining 1,999, whose ten minutes each represent about three days' time. Suf-

fice it to say that we mean a class of cattle that does not grow poor from dragging about what they eat.

**A Lesson from Low Markets.**—In our opinion the low market referred to is of value to Wisconsin feeders who are not driven from the business. The man who jumps from one line to another when he sees a red flag flaunting over his market, deserves but little sympathy. It is well that the eternal fitness of things gives him a low price, in his new venture, just when he gets ready to turn off the largest product.

When the low market does come, the intelligent feeder and business man does not waste his vitality in trying to raise prices by grumbling about the times, but immediately turns his attention to producing an article at less cost.

**Wasting Forage.**—The severe drouth of two years since drove the truth home, that Wisconsin farmers had been wasting nearly enough forage to carry the stock through the winter. Men of straitened circumstances fell down on their knees before a corn stalk and lifted their hats respectfully when they passed a straw stack.

**Feeding Steers for the Block.**—One who contemplates feeding steers for the block need go to no great expense. We venture a maxim here. When no one wants an article, buy. When people are tumbling over each other to get it, sell. A thoroughbred sire, a registered animal of the beef type, is the only change that need be made. This will place you in possession, in a little time, of grades that will get more of a bushel of corn on the outside of the ribs than would stick under the pelts of a dozen scrubs. (A humble bow to the man who says, "what is a scrub?")

**Hints on Feeding Calves.**—A calf should be taken from the dam at two days of age. It is unwise to withhold

the first milk of the mother from the calf. The calf should get whole milk for one week, and then skim-milk may be introduced by degrees, thus getting him on skim-milk entirely when two weeks old, and none the wiser for the change. Some may say that wiser is not applicable to a calf. Calves have been known to play with a feeder, and take every trick. As a rule, the trouble is we try to feed calves when they are not hungry. Then, too many have a blind idea that a calf can draw milk through a finger. It is an easier operation to probe the finger. Give the calf two fingers, and we have a machine, as good for the purpose as a nursing tube.

About the time the calf is on skim-milk entirely, whole oats placed before him will stick on his nose, and he unconsciously learns to eat. The ration of oats should be increased to keep pace with the assimilation. Another advantage in feeding oats is that, in eating them, saliva is absorbed, and he never gets that pernicious habit of pulling another calf's ear. A calf shows best treatment when fed three times a day. Two or three quarts of milk will answer.

Fresh water should be within easy reach. A calf will do better turned in a lot without a blade of grass than he will on the freshest of pasture. A shed from the sun and a lock of dry hay are essential to rapid development. Milk should not be fed sour or cold. The finger is a good thing with which to point out neighbors' faults, but does not serve well as a thermometer. One can get along with his wife much better by heating water than he can by burning milk to the bottom of a kettle. A kettle of boiling water will raise enough milk to blood heat to feed twenty-five calves. More calves are spoiled by over-feeding than by starving.

The oat ration should be continued



until the calves are a year old and turned to grass. Feed milk as long as you have it in the fall. Calves that are intended for the block should never be introduced to a stanchion.

**Sheds — Dehorning — Stables.** — A good shed, liberal bedding and liberty, make a good match for fat calves. Ensilage, oat straw and bran or oats make a growing ration for yearlings. Horns should be taken off before turning to grass, in spring, when one year old. Upon reaching eighteen months, steers should be fed in barn or shed with no floor. If the manger is raised two and one-half feet above the floor, it is not good economy to clean the stables from fall to spring. More straw can be converted into manure in this manner than by any other process. One need not fret about how much evaporates or how much leaches. All, both liquid and solid, is saved. Stables can be kept sweet by the use of land plaster. Steers that are coming two can be kept gaining on ensilage and straw.

**Finishing for Market.**—When warm weather comes, the cattle can be finished for the June market on corn and grass or corn and ensilage. Too much trouble? Do you know of any thing that is too much trouble for your acquaintances, if they can see money in it? If treated as suggested, these steers will weigh twelve hundred pounds, and are just what buyers want.

**Cost.**—What is the cost? A calf will drink twenty hundred of milk, which, at twenty cents, is four dollars. He will eat fourteen bushels of oats, which at thirty cents, is four dollars and twenty cents, and one dollar and eighty cents of dry forage, making a cost of ten dol-

lars. A ton of ensilage in the silo costs one dollar. The calf will eat two tons or two dollars worth. He will eat ten bushels of oats, or three dollars, making a total cost, at one year, of fifteen dollars. The rental of a good acre of pasture is five dollars, which will support two yearlings, or two dollars and fifty cents. A steer coming two years will eat six tons of ensilage, or six dollars, making total cost when he goes on grass, at two years, of seventeen dollars and fifty cents. A steer of two years, on grass, will eat ten cents worth of corn, per day, for ninety days, or nine dollars. An acre of good pasture will support two steers, fed on corn at the same time, for ninety days, which, at five dollars per acre rental, is one dollar and twenty-five cents, making a total cost of thirty-three dollars and seventy-five cents. One hundred and sixty acres of good plow land will carry twenty milch cows and turn off fifty steers a year.

**Swine—Shorthorns.**—Steers should be fed whole corn to finish them. While fed on corn the cattle should always be followed by shotes or breeding sows. By careful selection and good treatment, cows can be readily found among the Shorthorns that will give two hundred to two hundred and fifty pounds of butter; and although I have seen raving maniacs among Jersey, Guernsey and Holstein men, I have never found one who was so thoroughly demented as to advocate throwing that amount of butter away, even if it did come from the patient Shorthorn, that animal which has done more to educate and enrich the English speaking people than all other breeds combined.

## MANAGEMENT OF PREGNANT ANIMALS.

By V. T. ATKINSON, V. S., Milwaukee, Wis.

**The Fœtus.**—The fœtus is nourished from the mother, though the fœtal circulation is distinct and different from that of the mother, that is, the blood of the mother does not circulate directly into the vessels of the fœtus. The fœtal circulation is made up entirely distinct and when the blood is placed under a microscope, it discloses the fact that the corpuscles of the fœtal blood are a great deal smaller than those of the mother. After half the period of gestation is passed, the fœtus takes on life. The fœtal heart may be heard beating, and the pulsations are a great deal more rapid than those of the mother, showing that it is entirely separate from that of the mother.

**Periods of Gestation.**—Of the different periods of gestation, I have made a little table which has been carefully compiled by some of the best authors. In the mare 340 to 350 days is the average, or between the two extreme periods of 300 to 400 days, according to Fleming; in the cow, 283 to 288 days, or from 250 to 300 days; in sheep, 147 to 151 days; in pigs, 120 days, as an average, or from 110 to 130; in the dog, 63 days, or from 55 to 70. The male fœtus is generally carried a few days longer than the female.

**Care.**—The pregnant animal should be kept in a condition tending to promote health in the ordinary condition of the animal, that is, there should be no particular pampering on account

of the particular condition. Animals should have exercise and good nutritious food. The conditions of the surroundings in each case may call for slight variations, but the general rule should be such as would preserve health under ordinary circumstances.

**Pasture—Stable—Medicine.**—Hilly pastures should be avoided as much as possible, and slanting stable floors or deep gutters in which the animal is obliged to stand with the hind feet. An unbalanced position of the body, particularly during the later period, by which the hind feet stand lower than the fore feet, will tend to bring on complications at the time of delivery. The doors of the stables, of course, should be so wide as to prevent any possibility of bruising. The animal should not be subjected to any undue excitement or worry by dogs. Surgical operations should be avoided, and when medicine is necessary, it should generally be administered under the care of a veterinarian.

**Symptoms of Pregnancy.**—Of the symptoms of pregnancy, the most characteristic is the enlargement of the abdomen. Another symptom that is mentioned by most of the authors is a particularly quieting effect that it sometimes has upon the animal, lately illustrated under my own observation in the case of a little mare that was brought to the farm, and used for some time, being perfectly quiet and easily managed until after she dropped her foal, when she became a perfect vixen, and I

understand that that is her usual temper.

Another symptom that is described sometimes, is an enlargement of the udder, sometimes so far that a small amount of milk is found. That enlargement disappears and will re-appear again about the end of the period of gestation, when the milk will be secreted to nourish the foetus.

About the middle of the period the foetus takes on life or has power of motion. That motion is most noticeable in the morning, and may be made more violent by giving the female cold water to drink before she has any food; the cold water acting as somewhat of a shock on the foetus. This is not a good practice, however.

When it becomes necessary to decide whether the animal is pregnant or not it can only be done positively by inspection, which can be made in the larger animals by introducing the hand through the rectum.

**Delivery.**—In the delivery of animals a great many obstacles are met with. When the period is complete, and the foetus is ready for delivery, nature generally takes care of that itself. However, in many cases complications are likely to arise. I have brought with me some charts that illustrate those which are most common.

[Dr. Atkinson, by the aid of these charts, made many valuable and useful suggestions.—Ed.]

#### Discussion.

PROF. NORTH.—Can you tell us what causes abortion in cows; and is there any cure for it?

DR. ATKINSON.—Professor Nocard, of France, has made a very careful study of that subject, and seems to establish beyond doubt that it is due to a particular germ that infests the

uterus. He has found that same germ in the lining membrane of the uterus, and also in the base of the brain of the foetus. He explains how this is the germ which causes what is called the bellowing calf. It is on much the same principle as that on which Pasteur explains his hydrophobia. When the animal aborts in a stable, she should be immediately separated from the other animals, and the stable disinfected. The foetus and foetal membranes should be destroyed, perhaps burned. For disinfection, he prescribes a regular formula, of which carbolic acid is an important feature.

QUESTION.—In regard to breeding mares, do you think there is any virtue in inserting the arm and opening the mouth of the womb for mares that are hard to get in foal?

DR. ATKINSON.—It is possible that induration may be the obstacles to impregnation, and it might be overcome in that way. There is no doubt that some good may be accomplished by opening the *os uteri*. It may be done by introducing the hand into the vagina and passing it slowly with the fingers, or introducing the speculum. The fibres will gradually relax and the mouth expand. That may be assisted by smearing the fingers with a little extract of belladonna.

QUESTION.—In case you find the mouth of the womb firmly closed, would you advise bursting it open?

DR. ATKINSON.—Impregnation cannot take place unless the mouth of the womb is open. Of course, in order to operate intelligently there should be a speculum introduced to see exactly what is the matter. You might apply force in some part that might do injury.

QUESTION.—In case of advanced pregnancy of the mare, after the milk starts, there is a common impression that at that time the colt should be

born. Have you had any experience with reference to aiding this by manipulation?

DR. ATKINSON.—No, I have not. My observation and my teaching all lead me to give nature its own course. I do not think we would be justified in interfering.

QUESTION.—Is it injurious to the mother to work her, up to a certain time?

DR. ATKINSON. — Pregnant animals

should not be used for very violent rapid or heavy work in the later stages, nor should they be alongside of a wagon pole that might strike the side of the abdomen.

MR. CONVEY.—What method of removing the placenta would you recommend?

DR. ATKINSON.—There are two troubles likely to occur. One is the retention of the placenta, the other is the inversion of the uterus.

## CARE OF THE BROOD MARE.

By A. O. FOX, Oregon, Wis.

### Demand for First-Class Horses.—

Concerning brood mares and their management, I shall speak only of their ordinary farm care, and must be allowed to draw freely from my own experience.

Before entering upon the brood mare question, I wish to say a few words about horse-breeding in general. The statement needs no demonstration "that an enormous and healthy demand exists for all horses that are each first-class of their kind." It is only the common sorts—the little low-necked, narrow-chested trotter that don't trot, and is too small and insignificant for business purposes; or the pig-headed, soft-jointed, sunken-eyed, lifeless sort of a cart horse—that will be left behind, eating their heads off waiting for a purchaser.

The American is a man of tremendous energy, and he wants his horses, like his wife, good looking, strong and energetic. In the draft horse, he does not want a great big beefy, lunk-head. He must be large, but full of character,

clean-cut and flat in his bones; he must be deep in his body and muscles, and well ribbed up; he must be prompt and willing, and above all a good walker.

If a trotter, he must be not only a trotter in pedigree, but in performance, to be acceptable to the intelligent purchaser.

If a coacher or carriage horse, he must have all the essential qualities of tip-top breeding, a pleasant disposition, good size and color, with superb style and action.

### Quality, Greatest Consideration.

—Now, it is for the farmer who contemplates horse breeding, to suit his own taste, to investigate his individual resources, his capital and location, in order to determine which of these sorts are best suited to his requirements.

The splendid location of Wisconsin renders the breeding of horses one of the most certain operations that can be followed by her farmers. There will probably never be a time when a good horse will not sell; but I wish to extend

this timely admonition, that there is a vast amount of capital invested in this horse business, and the number of breeders are constantly increasing. The time has come when quality must be one of our greatest considerations, if we wish to keep at the head. The State of Wisconsin is not yet classed as in the front rank among horse breeding States. Nevertheless, according to our State census, the value of the horses of Wisconsin is nearly equal to that of cattle, sheep and hogs all taken together. So you see we are not alone in this business, and remember, when we stand in close competition, it is quality that will size the buyer's pile.

**The Great Key-Stone.**—As to what breed may be the most desirable, that does not come within the limit, or purpose of this paper; but as the selection and quality of our brood mares are among the essential elements which go to make our success or failure, I cannot forego one or two suggestions. I regard the brood mare as the great key-stone, upon whose strength and quality depends the lasting character of the entire superstructure. This is especially marked in the short, but resplendent history of the breeding of the American trotter. It makes little difference how well bred the sire may be, if the dam is lacking in rich trotting top-crosses, there may be little expected from the produce. It is the wanton neglect of this principle which has made disastrous so many attempts, and it is a keen appreciation of it, and close application of it in practice, which has marked the success of other of our more advanced breeders. This same principle holds good all down the line. No matter what sort of horses we wish to produce, we must look for the prime factor in the dam as much, if not more, than in the sire. Let us, therefore, look care-

fully to the character of our mares; let us begin the weeding process and reserve for future breeding purposes only such as conform most nearly to our desired type. With such definite purpose in view, we can not fail to produce horses which will always be sought at top prices.

**The Index of the Nerve.**—A sluggish, lifeless sort of a mare will never produce much of a colt. She must have nerve, muscle and endurance. This is fully as necessary in a draft mare as in one designed for breeding roadsters or coachers. The bold, prompt walk, the index of the nerve, is of all the most serviceable gait. Without this quality, any horse, for whatever purpose bred, is at best a mere "dogan."

**Getting in Foal.**—Now, in reference to the management of our mares, we will first undertake to get them in foal. (Right here arises the many important questions relative to the care and management of the stallion, but as it does not come within that portion of the subject which has been assigned to me, I must leave it for others to discuss.) In Wisconsin, the majority of the mares are bred in spring. I do not approve of breeding earlier than May 10th, as my books show that the majority of mares bred prior to that time have been returned. The reason is probably found in the inclement weather, and a lack of that open condition of the mare's system which seems necessary to conception. I do not approve of breeding any mare that has not been a regular breeder, until she has been run to grass from three to six weeks, and has become what is ordinarily called "grassed out." I then take her up and put her to harrowing or plowing corn for a week or more, until she looks a little down in flesh; she is then given light work, or even complete idleness, in a box stall or paddock, giving

her three full feeds a day of oats. In a short time she will begin to feel very bright and playful and to take on new flesh.

Just at this time she should be carefully observed, and upon any indication of heat, should be allowed to see the horse, and to be teased a little, but not to aggravation. I would "fire" a groom at once who would stand idle and let a stallion go to chewing up a mare. The stallion should work at the neck, back and loins never under the tail or at the nose, the latter being a frequent place of transmission of dis-temper and various nasal diseases.

If the mare is found in season, don't breed her until satisfied that the heat is well upon her. Then before breeding her, the mouth of the womb can be easily examined with the hand. If found closed, it must be carefully opened with the fingers, and treated with any simple penetrating oil, sweet oil or melted lard. In case of much contraction, we have used an ointment of belladonna with good success. After receiving the horse, she is better tied up for the day in a dark, quiet place, with plenty of fodder to pick at, so as to divert her mind from herself. I do not approve of a long drive after breeding, although a short warming up before service may be of some use.

This may not be considered scientific treatment, but it has been attended with marked success upon our farm, and with some mares that had for many years been considered barren. After being bred, we now try to favor the mare for the next 21 days, to her first trial (we try our mares on the 21st day after breeding); if not found in season we then try her once a week for four consecutive weeks, after which, if not found in season, she may be considered in foal.

**Working.**—Meanwhile she goes into

a regular work team until the bulk of the fall plowing is over. We then turn out to pasture all the mares that are supposed to be in foal, and leave them there until the middle of February. I think, as a rule, in the attempt to do well by our mares, many of us are apt to give them the very thing which should be withheld from them.

**Winter Feeding Periods.**—Our winter feeding periods last six months, during which time our mares are dependent upon whatever provision we may have previously made for them. They are usually stabled too much, and fed too much grain and other concentrated food; their blood becomes thick, and a general condition of congestion throughout the whole system follows. They become sluggish and inactive. The result of this folly is told the following spring, when the colts begin to come weakly, sickly and dead.

**To Avoid Losses.**—To avoid these losses we must furnish abundance of exercise, with mild laxative kinds of food. During my first experience with brood mares, about 13 years ago, we used to breed three to five mares annually, and from these we usually raised about two colts. We have good, comfortable barns. The mares were worked hard and fed liberally on hay and grain. During the winter, if not worked, they were let out to exercise in the cow-yard day-times, and taken up nights. In spring, at foaling time, the foals would come large and limp as a dish-rag. More than half of them died. I like to see a colt come like a good lamb—thin and bony, but vigorous and lively as a cat. They will then take on all the necessary flesh, as they are possessed of vitality and strong digestion. This vital condition of the foal is largely governed by the habits of life of the dam, as well as by her temperament. We must, therefore, elimi-

nate from her surroundings such forces as tend to these unprofitable results.

**Exercise.**—In the first place, I regard absolute freedom of exercise as imperative. That kind of exercise which she gets by being let out of the barn occasionally is not of much account, and may be, at times, a source of serious trouble, because of her disposition to run and play and caper about, and of other beasts to quarrel with her.

**Feeding.**—Too much concentrated food, too generous keep and too nice and comfortable stables are the sure fore-runners of disaster to brood mares. The plan which, in my experience, has given the best net results, is to turn the mares out early in the fall, so that they may get thoroughly accustomed to it. Then, instead of taking them up when winter sets in, we turn them into a field of reserve pasture, composed principally of blue-grass, or June grass, which has been previously set apart for them about July 1st. They are very fond of this feed, and keep in good condition on it. This reserve pasture is located near timber, in which the mares find their principal shelter. They soon learn to paw away the snow from the long cured grass underneath, and help themselves. Here they usually remain until about the middle of February, when the snow becomes so hard and crusted that they can not get to the grass. We then take them into large yards, in which are located common open sheds. In the middle of the yards are covered mangers, each of which holds one good load of straw. We fill these as often as required with oat straw, and supplement this with corn fodder. Towards the latter part of the winter we also feed ground oats and bran freely. When near foaling time, each mare is removed to

our breeding barn, which is centrally located to three or four small fields or paddocks. In these paddocks they are always within close observation of the man in charge, and here they receive their daily exercise, with plenty of soft, nourishing food until the foals are about two weeks old. They are next turned into a field adjoining the railroad, where the foals become car-broken before they are a month old.

**Diet.**—The item of diet is very important, as it goes largely to determine the condition of the digestive organs of both dam and foal at foaling time. Anything approaching a heating or corn diet is absolutely destructive to both. Bran, crushed oats, oil-cake and moderate quantities of tame hay are among the best of foods at this particular critical period of foaling. Avoid the use of clover hay and rye meal. Unless the mare foals late in the summer she must have a good, dry, level bed to lie on; this simple precaution will tend largely to avoid bowel trouble in the foal, on account of getting damp or chilled. The closest of care should be given to the condition of the bowels of the colt for the first 48 hours after birth. Avoid allowing it to fill up with milk at one time—a little taken often is much the safer plan.

#### Care of Foals

**The Bowels.**—As soon as the colt stands and begins to run about the mare and suck freely, then the bowels must move freely. They ought to move within 6 to 8 hours after birth—this is imperative. The first excrement is very gummy, and it is sometimes impossible for the colt to void it without assistance. The straining brings on inflammation of the bowels very rapidly. The outward indications of constipation are switching of the tail, pointing toward the flank with the nose, labored

and quickened breathing, with heaving of the flanks, and uneasiness of the hind legs. I have found the safest plan is to make it a rule to inject each colt during the first half day of its life, with about half a tea-cup of raw linseed oil in a pint of warm castile soap-suds; or warm molasses and cream, mixed half and half, will answer the purpose. If in great pain it may be allayed by an injection of half a teaspoon of laudanum in a tea-cup of warm water, and outward applications of hot flannel cloths or mustard and vinegar paste rubbed into the hair on the belly. Laudanum must not be given to a new born foal, through the stomach unless the bowels are free and open.

**White Scours**—During the first two weeks the foals are apt to be attacked with the white scours, especially if the mares have been kept in high flesh through the winter and foal early in spring. This is a very fatal disease and must receive prompt and careful treatment. The symptoms are generally a sour, white, watery diarrhoea, white fur on the tongue; irregular appetite, sometimes very ravenous; dry unthrifty skin. If the mare has been kept up on dry feed give her a dose of raw linseed oil with a tablespoon of laudanum. If the colt has good strength, I have found the following treatment very satisfactory:

When the first scour makes its appearance give, through the stomach, in a half tea-cup warm water, one flowing teaspoon of pure castor oil, 20 drops laudanum,  $\frac{1}{2}$  teaspoon carbonate of soda (or common baking soda). Apply at once on the outside of stomach and bowels a mustard pulp made by mixing mustard and vinegar into paste; rub into the hair with the hand or a flat stick; if the mustard is old or weak sprinkle a little cayenne pepper into it. The ob-

ject is to heat but not to blister. Flannel cloths wrung in hot water will do, but require more attention, and the colt is apt to take cold after their removal. After the oil has operated and emptied the bowels, then give the following:

Make a tea of the inner bark of white oak. Give  $\frac{1}{2}$  tea-cup white oak tea, 20 drops laudanum,  $\frac{1}{2}$  teaspoon carbonate soda. This dose may be given 3 or 4 times daily until the bowels are checked. Care must be taken not to stop the bowels abruptly, the object being only to have control of the bowels and check them gradually.

**Give Little Medicine.**—Do not give any more medicine than is absolutely necessary. The colt should be kept from sucking too much, as most of the milk it takes is not digested, and only goes to clog up the stomach and bowels again making more trouble. The easiest way to manage this is to keep the mare milked out as dry as possible by hand. If the colt is weak, when it begins to mend a tonic may be given, composed of tincture of gentian one part, whisky one part, ginger tea four parts. Dose of mixture, one-half tea cup, three to five times a day. If stomach is still sour, add a little soda. We pay close attention to these small details for the first few days of the colt's life, and then he is generally no further trouble.

**Results for Six Years.**—This is, in substance, the plan which we have followed for the past six years, with particular reference to cheap management, and practical net results in strong, living foals. We have annually about 20 to 25 mares to foal, and our total loss of foals at birth, either foaled dead or dying from weakness immediately following birth, has been for the past three years just one colt per annum.

**Ensilage.**—To those who may not be so situated as to be able to furnish the



above pasture, there may be a substitute for the green ration there supplied, in the use of ensilage. Of this I can only speak from observation, which is to-day in a very superficial form. I have this winter seen some 300 horses being kept on almost an exclusive diet of ensilage and oat straw. The ensilage was the B. & W. sort, very juicy and quite sour to the taste. I have never seen store horses in winter with softer, nicer coats than these; but it is yet quite a question whether this is just the right sort of food for the brood mare, and for the development of a strong, bony foetus.

**At Weaning Time**—We find it most desirable to teach the colt to eat bran and oats by its mother's side before separating them. The colt will then wean easily without loss of flesh.

**Maturing.**—Now that we have our colt the next question is, what shall we do with him; what shall we make of him; for what purpose shall we mature him? I think the demand of our best buyers (those who pay the top prices) is for a large, active horse, with clean, flat bone, and well-muscled throughout; that while size is one of the prime considerations it is second to quality and finish. Assuming this to be the fact, then how shall we feed and mature our colts, so as to conform to these requirements? How are we to avoid the beefy, lifeless, soft-jointed, round-bone sort? If we expect to develop the bones and muscles of our horses to the greatest strength and soundness, we must see to it that our colt's food is of the bone and muscle-forming sort. My favorite ration for weanlings through the first winter is equal parts by weight of oats, corn and rye, or barley, ground together and mixed with one-third bran, by measure. In addition to this, I feed good hay. When first weaned, we feed four times a day, beginning about 5:30 in the morn-

ing and dividing into four equal periods. This plan is kept up until about Christmas, when we drop to three feeds a day, keeping up or perhaps increasing the daily ration. This winter I have, for the first time, begun feeding ensilage at noon. (The ensilage is made from the ordinary dent corn, fully matured.) I have nothing to say in its favor yet, as it is purely experimental.

**Water—Exercise.**—Weanlings ought to have a constant supply of water before them in order to drink, as has been their former habit when with their dam, "a little and often." My weanlings are allowed to run at liberty day-times, and at night they are shut up in the barn. A few tops of poplar trees, in convenient places for them to go and nibble the branches, are much enjoyed by the colts, and much disliked by any worms which may infest them. In this manner they are carried through the first winter.

**The Second Winter.**—When they are yearlings coming two, they are kept in feeding lots provided with open sheds and covered straw racks. They are fed twice a day. The first feeding in the morning is corn fodder without ears, usually thrown in bunches on the ground, as we find that in fair weather they eat it cleaner in this way than any other. At noon they get a liberal feed of corn or oats and bran and as much oat straw or hay as they will eat clean before night. At night, if cold and stormy, they are given a little more hay or straw. The treatment for the third winter varies according to the purpose the young horse is about to fill, some going among the brood mares, some into the yards to finish the breaking and some to be stabled and fitted for market.

**Breaking.**—In breaking our colts we use the little Jockey cord in its various forms, our system being mainly that of

Prof. York. We have not used a biting rig for ten years, nor would I allow one in use on my farm. Our constant endeavor is to breed the necks up, rather than to try to raise them up by mechanical power; but if high checking must be resorted to, we prefer to do it with the ordinary bridle and by slow degrees. We break our colts single first, in a low cart made of white oak grubs, after which they are driven double by the side of a gentle mare.

Colts should be thoroughly handled before they are a year old, halter-broken, and taught to lead up promptly, and their limbs all handled. They will be pleasant and tractable always afterwards, and right here is one of the chief secrets of having gentle horses. Find me the farmer who always handles his colts when

weaning, and I will warrant you will find a lot of gentle horses about him, and, furthermore, a year ahead of those of his less careful neighbor.

**Marketing.**—When we are ready to market our horses, let us do it as our trusted merchant sells us a suit of clothes. Let us represent them just as they are. The dealers will soon find us out, and we will more than make up on the sale of our best horses what we may have sacrificed by telling the truth about the poorer ones. Then, when we meet the grim face of death, and pray to God to save our souls, and begin to hunt around to find them, we shall not be confronted by the awful apparition that we have sold our souls to sell a horse.

## BREEDING DRAFT HORSES.

By S. D. THOMPSON, Wayne, Ill.

**A Growing Industry.**—Draft horse breeding is a growing industry that is rapidly assuming a prominent position among the agricultural pursuits of the Northwest, and especially in Wisconsin, with her great pineries and ore fields to the North, and four of the most important cities of the nation adjacent to her borders—sources of demand that can be depended on at all times, to offer a market for high quality draft and carriage horses. With this great demand open before the people of your State, but slight attention has been given to the breeding of draft horses, except in a very few localities, until within the last five years. There are, however, unmistakable evid-

ences of a growing interest commensurate with the importance of the industry which has manifested itself in the eagerness of the people for information as to the best breeds to accomplish the desired purpose, and also the readiness with which all breeds of heavy horses offered upon the market have found purchasers, regardless of their adaptability to your uses.

### **The Loss From Breeding Trotters.**

—The general farmer cannot afford to breed for speed, for do we not all know that breeding a "real trotter" is a chance result, a bit of gambling luck, a fortunate ticket from the lottery whose wheel in revolution throws out a hun-

dred blanks to one numbered card? Now and then comes a prize—a trotter that trots down in the "twenties," or below, and the press of the country heralds his fame, and the fame of his breeder or owner; but the press, I notice, does not tell the miserable story of the multitudinous failures which came before and after the one brilliant hit; of the thousands of dollars, the years, the study, that were spent in the effort to produce the one trotter; and of a landscape full of colts and horses that could neither trot in "twenty" nor anywhere else to the watch that gave them any value, and which could not "road" twelve miles an hour for three hours together on a country road, to save their own lives or that of their breeder. Verily, what a farce and loss this wild, frenzied effort on the part of our people to breed trotters has been. The loss from this unbusinesslike ambition has fallen heavily enough on the breeder himself, as all who understand anything of the subject know, but the private loss is as nothing to that far heavier one which has fallen, because of it, upon the country at large.

#### The Roadster and Coach Horse.

—The general farmer cannot afford to breed for speed, but if it is his desire and ambition to breed to a light horse, there are two styles of horses for which there is a genuine and earnest demand in this country to-day, and for this demand there is no supply, and no source of supply. The first is the roadster, and the second is the coupé, or coach horse. The former must be of good size, handsome to the eye; docile, and able to pull two persons from ten to twelve miles an hour, and burst out, when called upon, to a three-minute gait. The latter must be of larger size, of fine form, of good, solid color, gentle in stall and harness,

of high, showy action, and able to pull a coupé or carryall eight miles an hour. Such horses will sell at good prices, and whoever breeds them will find himself breeding to a profit, and a good round one at that.

There is in France a race of horses, some of which have been imported to this country, which crossed on our native stock will, I believe, give us the people's horse, or the horse of the future. His appearance is noble, his form handsome, his temper gentle, his spirit high, and his blood, through many clearly-defined and well-known channels, flows clean and straight from the desert. Centuries of governmental supervision and controlling authority have placed his pedigree beyond dispute, and made him the embodiment of prepotent forces, to a degree unmatched in the world beyond the limits of the Arab. From the use of these stallions I premise that, in a few years, the finest carriage horses in the world, and a noble class of roadsters, will be seen on our city and suburban roadways, and the breeders of the country will have what they need—a horse that will sell, and sell for a good price, and sell as soon as he is educated to go safely to harness. That is the kind of horses gentlemen want and are ready to pay for.

**The Wants of the Yankee.**—I am assured that the farmers of Wisconsin are clearly convinced that they must breed heavier horses; that the only information that they want is to know what breed of stallions to buy in order to produce the best horses for the market they have to supply, as well as to perform the labor to be done on their own farms.

The wants of our people are peculiar to themselves, as no country is exactly like ours. The rapidity with which everything moves is a marvel to all who

have not become Americanized. The civilization which we Americans are building up on this continent is such as the world never saw before. At least, neither the history of letters nor that written fragmentarily in ruins, gives us the least hint of one like it. The base of it is material development; above this, as a foundation, is a mental development wholly unprecedented.

Hitherto, electricity has been of the earth and air; in the American it is incorporated. Lightning in the clouds is an old thing, but lightning in human brain-cells is a new thing under the sun. As Lowell says, in Bigelow Papers: "They didn't know everything down in Judee," and Solomon, wise as he was, never mentally forecasted a Yankee.

As business men, we all belong to a "fast set." We eat fast, drink fast, drive fast. There is, therefore, a certain poetic harmony in the way in which we come into the world, act in it and get out of it. There is not a slow pulse in an American. He is all vitality. He thinks as he eats, and is a mystery to himself, for not one of us can tell ten minutes after eating, what we have swallowed. An American is like an arrow in full flight, flying so fast that he sets himself on fire and burns himself to ashes by the fierce rapidity of his own motion.

That everything to succeed, must adjust itself to this high-pressure principle, no one will deny; therefore, in prosecuting our research for information, it is indispensable that we keep our peculiar methods in view, and the natural conclusion will be that the breed of horses that can most nearly approximate our ways, is the one that will ultimately succeed; whereas, the lymphatic, sluggish or inactive breed will surely fail.

Let us then for a moment examine the characteristics of the different breeds of draft horses that are being imported

into this country, and it is certainly fair to accept the descriptions of well-established authorities of the countries in which the respective breeds are bred.

**The Suffolk Punch**—Youatt, who is an accepted authority on matters pertaining to English horses, says of the British breeds: "Horses for slow draft and sometimes for the carriage are produced from the Suffolk Punch, so called from his round, punchy make, and descended from the Norman stallion, and the Suffolk cart mare." The true Suffolk, like the Cleveland Bay, is nearly extinct. It stood from fifteen to sixteen hands high, of a sorrel color; was large headed, low shouldered, and thick on top; deep and round chested; long backed; high in the croup; large and strong in the quarter; full in the flank; round in the legs and short in the pasterns. It was the very horse to throw his whole weight in the collar, with sufficient activity to do it effectually, and hardihood to stand a long day's work.

The present breed possesses many of the peculiarities and good qualities of its ancestors. It is more or less inclined to a sorrel color. It is a taller horse, higher and finer in the shoulders, and is a cross with the Yorkshire half or three quarters bred. The immense power of the Suffolk is accounted for by the low position of the shoulder, which enables him to throw so much of his weight in the collar. Although the Suffolk Punch is not what he was, and the Suffolk and Norfolk farmers can no longer boast of plowing more land in a day than anyone else, this is undoubtedly a valuable breed.

**The Clydesdale**—Is a good kind of draft horse, and particularly for farming, and in a hilly country. It derives its name from the district of the Clyde in Scotland, where it is principally bred. The Clydesdale owes its origin to one of

the Dukes of Hamilton, who crossed some of the best Lanark mares with stallions which he had brought over from Flanders. The Clydesdale is larger than the Suffolk, and has a better head, a longer neck, a lighter carcass, and deeper legs; strong, hardy and pulling true.

The Southern parts of Scotland are principally supplied from this district, and many Clydesdales, for agricultural purposes, find their way to the central, and even southern counties of England. Dealers from almost every part of the United Kingdom attend the markets of Glasgow and Rutherglen.

**The Heavy Black Horse**—Is the last variety it may be necessary to notice. It is chiefly bred in midland counties, from Lincolnshire to Staffordshire. Many are brought up by the Surry and Berkshire farmers at two years old, and afterwards send to the London market.

These horses are adapted more for parade and show and to gratify the ambition which one brewer has to outvie his neighbor, than for any peculiar utility. They are certainly noble looking animals, with their round, fat carcasses and their sleek coats, and the evident pride which they take in themselves, but they eat a great deal of hay and corn, and at hard, long-continued work, they would be completely beaten by a team of active, muscular horses, an inch and a half lower.

The only plea that can be urged in their favor, besides their fine appearance, is that as shaft horses over the badly-paved streets of the Metropolis, and with the immense loads they often have behind them, great bulk and weight are necessary. Weight must be opposed to weight, or the horse would sometimes be thrown quite off his legs. A large, heavy horse must be in the

shafts, and then little ones behind him would not look well.

**The Flanders Cross.**—All our heavy draft horses, and some of the lighter kind, have been lately much crossed by the Flanders breed, and with evident improvement. Little has been lost in depth and bulk of carcass, but the forearm has been raised, the legs have been flattened and deepened, and very much has been gained in activity. The slow, heavy black, with his two miles and a half an hour, has been changed into a lighter and yet exceedingly powerful horse, who will step four miles in the same time with perfect ease, and has considerable more endurance. Sidney, Manager of the Agricultural Hall Horse Show, in his book on the horse, says:

“According to the agricultural writers at the commencement of the present century, there were distinct breeds of draft horses in at least half a dozen English counties. At present, all such distinctions have been effaced and until quite recently it was only the exception that the purchaser of a plow or wagon team made any inquiry as to breed or pedigree, unless it was of the Chestnut or Suffolk breed.”

**The True English Draft Horse.**—For all practical purposes, the true draft horse of England, may be classed into the London Dray, the Shire horse, the Clydesdale and the Suffolk Punch, the Cleveland Bay having become extinct or nearly so

It is only within a few years that the Scotch have taken the lead in establishing a Stud Book for Clydes, and it was not until the year 1778, that the breeders of Suffolks followed the sound example.

The Shire horse is the final result of the improvement of agricultural horses commenced early in the first half of this century. He is found in the Shires, where the strongest class of plow horses

are required—a breed (if it is a breed) which has superseded the Lincolnshire black horse.

As late as 1840, Mr. Burke, who was one of the editors of the early volumes of the Transactions of the Royal Agricultural Society of England, wrote in a note on cart horses: "A Lincolnshire black of the pure breed stands foremost in the rank of every cart-horse race in the Kingdom."

These are not my words, but come from the highest authorities in England. They claim nothing more for these horses than simply heavy draft at a walking pace; they are not made to move fast.

**The Clydesdale.**—As a breed, is but a descendant of the heavy Dutch horse, and from him has inherited his lymphatic nature, and slow-going pace, and the Shire horse, according to the highest English authorities, is scarcely a breed at all, being simply a modification, through the Clydesdales, of the heavy Lincolnshire black horse that Youatt says, "were adapted more for parade and show and to gratify the ambition that one brewer has to outvie his neighbor, than for any peculiar utility."

**The Percheron.**—Certainly, with our peculiar methods of doing business, neither of these horses is adapted to our uses; but there is a breed of horses that fully meets the requirements of our people, and that is the quick, active Percheron. Although English and Scotch horses have been much the longest on the market, the Percherons have completely superseded them in popular favor, as is shown by the unimpeachable evidence of nearly all the city buyers, verifying the oft-quoted saying of the great Talleyrand, that "nothing succeeds like success." Charles Du Hays, the veteran French equine historian and

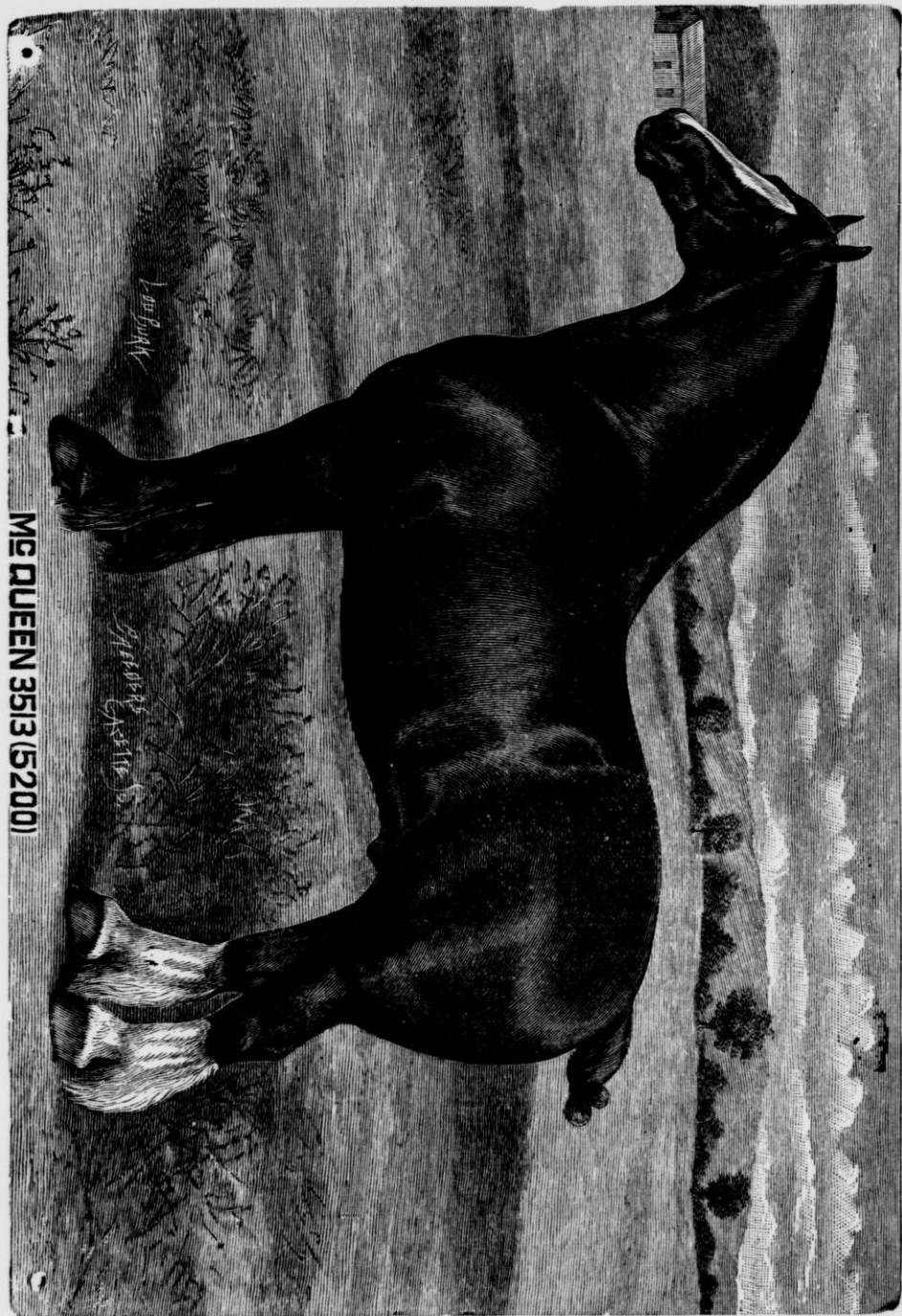
master of the horse under Napoleon III, says of the Percheron:

"To no ordinary strength, to vigor which does not degenerate, and to a conformation which does not exclude elegance, it joins docility, mildness, patience, honesty, great kindness, excellent health and a hardy elastic temperament. Its movements are quick, spirited and light. It exhibits great endurance, both when hard worked and when forced to maintain for a long time, any of its natural gaits, and it possesses the inestimable quality of moving fast with heavy loads.

"It is particularly valuable for its astonishing precocity, and produces by its work as a two-year-old more than the cost of its feed and keep. Indeed, it loves and shows a real aptness for labor, which is the lot of all. It knows neither the whims of bad humor or nervous excitement. In the Percheron, we recognize the heavy Arab, modified and remodeled by climate and peculiar circumstances. He has remained mild and laborious, like his sire. He is brought up like him, in the midst of the family, and like him, he possesses, in a very high degree, the faculty of easy acclimation. He acquires this, in the midst of the numerous migrations in the Perche, the counterpart of those that the type-horse makes upon the sands of the desert. A final comparison, which, perhaps, has not been sufficiently noticed, is that, like the Arab, he has no need of being mutilated in order to be trained, managed, and kept without danger. In a word, the Percheron, notwithstanding the ages which separate them, presents an affinity as close as possible, with the primitive horse, which is the Arab."

Professor Andre Sanson, of the National College of Agriculture and National Institute of Agriculture of France, says:

"The Percheron is a draft breed of the most superior quality, and for this reason it enjoys an enviable reputation. It possesses an active, quick, energetic temperament; the right one to pull heavy weights at a rapid gait. Fast steppers are common in this race. Before the establishment of railways, it was this breed that was used for our stage coaches and diligences. Now-a-days it is used more than any other for



THE MATCHLESS McQUEEN—Property of R. B. Ogilvie, Madison, Wis.

The best known Clydesdale Stallion and most famous show horse in America. For the past three years he has been first in his class and sweepstakes winner wherever shown. At the great American Horse Show, held in Chicago, November, 1889, he won four firsts; medal offered by the Clydesdale Association of Great Britain for best Clydesdale Stallion, any age; *Farmers' Review* medal for best Clydesdale, any age, and *Breeders' Gazette* cup for best stallion and three of his colts, all breeds competing—a record not equaled by any draft stallion in Great Britain or America. See page 274.

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our omnibuses. Its great feature is rapidity combined with great strength. This is the reason why the Percherons are sought after by all the nations who are trying to improve their draft horses or to create a breed for themselves.

"Indeed the Percheron is one of the breeds that enjoys in Europe, and even in the whole world, the highest consideration. It has, on account of its incontestible merit, carried all over the world the fame of the little French province where its nearest center of production is to be found. This fame of the Percheron horse is only to be compared with the thoroughbred horse of England, for the Percheron is to the draft breeds what the English Thoroughbred is to the light breeds—a generator and improver."

Another noted French writer says:

"The Percheron is a breed that has been moulded to the necessities of the different periods of its existence for hundreds of years. Under the vivifying influences and climatic effects of the Perche, as well as by the inimitable processes of educating both males and females from the earliest age, and with the most judicious care possible, by the actual performance of the work they will be called upon to do during their lives; thus, slowly and surely developing their physical capabilities and instinctive aptitudes into hereditary and transmissible forces, which have been exerted with such prepotent power in the amelioration of all races with which it has come into contact."

**The Percheron to the Front.**—The Clydesdales and Shires were imported to this country and Canada, many years ago, but the demand of our people for a horse of equal substance and bone, and more activity, caused the Percheron to almost supersede the British breeds, as is shown by the evidence of the accumulated knowledge of years of experience of those who perhaps furnish 40,000 of these horses annually to the people who wear them out.

Bahlman, Murback, Chamberlain, Oakly & Smith, Hayman, Stein & Co., New York, Newman & Ritchey of Brooklyn, Heineman of Mansfield, Ohio, Henry,

Newgass, Cooper & Lamb of Chicago, all state their emphatic preference for the Percheron. They say they are possessed of more endurance than any other breeds, give good satisfaction, and wear well; have better feet; last better on our pavements, and are more easily acclimated than any other breed. This is not the evidence of men handling one or two horses, but men who handle thousands annually.

**Ten Thousand Imported.**—Ten thousand pure-bred Percherons have been imported in a very few years, and although a number of English and Scotch horses have recently been imported, but few of the produce of later importations have had time to go upon the market, or in any way demonstrate that they are superior to the English and Clydesdale horses bred in this country years ago, and which were displaced by the Percherons. The British breeds are perhaps suited to the British people, and their British ways of doing things, but, as I remarked before, there is not a slow pulse in an American, and he don't want any slow pulses in his horses, and this will be more and more felt as you breed up. As the mares become larger, the more necessary it will be for you to cross them with strong, active stallions; otherwise, you will, in a short time, possess a heavy, clumsy race of horses, fit, as Youatt says of the Lincolnshire black, only for parade and show. If you want a quick, active worker, one that can do a day's work and come up smiling at night, breed your mares to the Percheron.

#### Discussion.

**QUESTION.**—What horse do you breed principally?

**MR. THOMPSON.**—I am Secretary of the Percheron Horse Breeders' Association and the French Coach Horse As-

sociation, and represent a number of breeders who breed those horses.

MR. GORDON.—What is the difference in weight of the standard-bred Percheron of forty years ago, and that of today?

MR. THOMPSON.—They are breeding them much larger. It is a mistake that is being made. You have a big horse weighing 2,000 pounds with less activity, and you can't help it. Forty years ago the horse of the Perche would not weigh more than 1,500 pounds.

MR. GORDON.—Wasn't it owing to the demand from America for a large horse that has caused breeding in that direction?

MR. THOMPSON.—That is the only reason, sir. The demand for the heavier horses in America has caused them to breed heavier animals, and I think it detracts from any breed if you make them too large.

MR. VAN DUSEN.—Isn't it your judgment that that demand is going to see its best day very soon, and that we are going to come back to the 1600-pound horses?

MR. THOMPSON.—I think that people will soon see the error of breeding to

1,900 and 2,000-pounds-weight horses.

PROF. HENRY.—What do you consider the best weight for draft horses?

MR. THOMPSON.—We have bred up these horses from very small ones. We have a lot of good-sized mares here now, and a 1,700 or 1,800-pound horse is fully heavy enough to cross on any of them.

MR. MCKERROW.—Isn't it true that a team of first-class quality, weighing 3,000 pounds, will sell equally well with a team 400 pounds heavier?

MR. THOMPSON.—They will sell more readily on the market.

QUESTION.—Is there any difference between the Percheron and the Norman?

MR. THOMPSON.—There is no significance in the term Norman as applied to the French horse in France. There is no breed known there as Normans. Some of the earlier importers, either through ignorance or something else, called all breeds of French horses Normans. As a matter of fact they are called after the district in which they are bred. These people went over there and bought some in Normandy and called them Normans.

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## THE FARMER'S HORSE.

By JOHN M. TRUE, Baraboo, Wis.

**The Horse the Markets Demand.**  
—The profitable horse for the farm must combine a good degree of adaptation to the required farm work, with qualities that demand recognition in the best markets. A small proportion of the horses produced on the farm are required for continued farm labor, but it is a fortunate fact that the best and

most reliable markets call for such horses as may be produced from a class of mares best adapted to the diversified wants of the farmer. No clear-sighted breeder will be contented to raise the animal that in common parlance is denominated the general-purpose horse. He is a compromise between the two types that are required to furnish three-

fourths of the market requirements, and fails to give, in any considerable degree, the distinctive merits of either. The idea that the horse that at maturity will weigh from 1000 to 1300 pounds, possessing a semi-draft, semi-roadster formation, but wanting the weight of the former and the style and action of the latter, is a typical horse for the farmer to breed is a delusion and a snare. This idea has sacrificed the best available blood in the country, ignored the demands of the best markets, and filled the land with unsalable, because undesirable, stock.

**Appreciation of the Morgan.**—Had that appreciation of the grand old Morgan that now seeks to gather up and strengthen the scattered remnants of that family, found proper expression and action fifty years ago, much valuable effort would have been spared, and a well defined and valuable breed of horses, peculiarly American, would now be in our hands. But blind to the requirements of the principles of breeding, by illy-advised crosses, even in the original home of this now much prized horse of our fathers, very few animals are now found possessing strong indications of the old Morgan stock.

**In the Way of Successful Work.**—This same disposition to mingle bloods, to ignore line breeding, and to cater to the general-purpose idea stands squarely in the way of the best results with the average farmer of to-day. The cheap grade, the miscellaneous-bred scrub, and the little roadster sire debar the horse-breeding farmer from successful work. With indifferent stock now on his hands, the future holds out no inducements to his misdirected efforts. The only financial idea that his mind seems capable of grappling with, is the difference between five and twenty dollars in the price of the service of the

sire. He is blind to the fact that his neighbor readily sells his surplus stock for twice the money that he vainly seeks to get for his own. He does not realize that it costs as much for him to raise his unsalable product as it does his neighbor to mature his better-bred colt, and fails to see that the difference in profit between them is merely the price of the intelligent thought and skill of his competitor.

**Results of Systematic Work.**—It is a matter of much satisfaction that systematic work is making rapid strides in developing and fixing the type of our grand American-bred roadster, and in the near future we may confidently expect that in this class speed, to a reasonable extent, may be as surely bred as form and weight in the draft class. This is being attained by a recognition of blood lines, and breeding from standard-bred sires and dams.

**Breeding for Speed Only.**—The general farmer will find little time and small inducements for engaging in this expensive and skilled department, where speed only is sought and other qualities ignored. This breeder and handler, like the horse he pins his faith to, if he makes a success of his work, must be "one in a thousand."

**The Farmer's Roadster.**—The combination of speed, style and weight, so often found in the roadster stallion of the present, gives us an animal entitled to the careful consideration of a class of our farmers. A standard-bred roadster stallion of superior style and finish, and weighing in proper condition 1200 lbs. or upwards, is a grand acquisition to a community of discriminating farmers. From such a sire, and well-bred clean-limbed, good styled roadster mares weighing 1100 lbs. or more, a class of colts should be produced that will always be in demand

for carriage work in our cities, as well as adapted, to a certain extent, to the wants of a class of our farmers. In many parts in our State I find a large number of mares good enough to breed roadsters or carriage horses from, while in other parts there is almost a total lack of such material. The attempt to breed roadsters from grade draft mares should be discouraged. The farmer's roadster should have form, size, style and sufficient speed to render him an attractive, pleasant driver, though a 2:40 "clip" is less important than a "trappy" movement necessary to perfect the stylish driver.

**The French Coacher**—Is strong in the desirable points of the carriage horse. In attractiveness of form and movement he is a remarkable exhibition of the skill and intelligence of French breeding that first gave us the Percheron, and now with the additional Coacher promises to fill the measure of the requirements of the American breeder to a remarkable extent. He only needs to establish his power to transmit his excellent qualities when bred upon our mixed-bred mares. No animal can displace the draft horse from its strong position as a horse-motor in the work department of the civilized world.

**The "Big Horse" Industry**.—Regardless of misrepresentation, ridicule, and a general lack of appreciation, the "big horse" industry in our country has within the past ten years outstripped any other live stock venture in importance and financial success. Remarkable as has been the development of this work, equally remarkable has been the constant and undiminished demand for its product. A complete revolution has been effected in the scale of weight in our work horses. Where, ten years ago, 1200-pound horses were tolerated, now

1400 or 1600-pound animals are required, while greater weights command larger prices. The farm, the mines, the lumber woods, and the cities, call for such horses as can be produced by crossing our strongest, heaviest-boned mares with full-blooded draft stallions. These grade colts are raised as easily and surely as steers, make the best of returns for feed given, are orderly and easily handled, and susceptible of early maturity. When, at three or four years of age, they go upon the market, they give a percentage of profit equal to any stock investment on the farm.

**Good Prices Obtained**.—The strong point in the heavy horse industry is the uniformly good prices obtained in the aggregate of sales. The brood mares best adapted to the production of heavy colts are those best suited to the largest requirements of our farm work. Indeed, the grade draft weighing 1400 pounds comes nearest to my ideal of a farm horse. The farmer's mare may be, then, the animal fitted for the performance of farm labor by formation and size, and may also combine qualities that, when she is judiciously mated, will produce colts that are in demand at highly remunerative prices.

**The Degree of Success**.—The largest profit clearly lies in raising either carriage or draft horses. The degree of success will be dependent upon the adaptation, intelligence and skill of the breeder, manifest in his judicious choice of the line of horses he will breed, the careful selection of sires, and the proper handling of breeding stock and colts. It is fortunate when communities of farmers can unite in raising the same kind of horses, as by the number and uniform quality of the stock offered, buyers are attracted and better prices are obtained. I have endeavored to show that my farmer's horse is not the mythical gen-

eral-purpose nag. The horse market is not exempt from the general conditions which, with a close competition, surround all our farm enterprises, and in common with other lines of work, success lies only in the path of intelligent, persistent work, that will place our product beyond general competition by virtue of its excellence. So the farmer's

horse must be bred for a special purpose, and that purpose the putting of the most possible money in the pocket of the owner. The poorest results, in individual cases, that may come from such work will still be superior to what may be expected from the thoughtless and penurious methods of the past.

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## RAISING SHEEP FOR MUTTON.

By GEO. MCKERROW, Waukesha, Wis.

**A Wide Range in Prices.**—If you have noticed the mutton markets for this past six or eight years, as I have done, you will notice that the range of prices quoted in Chicago, New York and other markets has been widening. During the past winter sheep have sold in the stock yards at Chicago, all the way from \$2.00 to \$7.00 per hundred.

Now, is it the Merino sheep that are bringing this seven dollars per hundred? I answer, no. The best lot of Merino wethers that I know of sold in Chicago at about five cents a pound, while I know of two at least, if not more, lots of grade mutton sheep that were sent in from the State of Wisconsin, that have sold for over six cents per pound on that same market. I believe in breeding to a purpose, but as a dairyman breeds up his herd to a Jersey or Guernsey or Holstein standard, so the sheepman can grade up his sheep toward a Downs standard or a long wool standard.

**Sheep Giving Good Results.**—I meet many sheepmen, and men who are following diversified farming, who have sheep and cows and horses and

hogs, and they all tell me that the sheep are and have been giving them as good results for the past two or three years as any of their other stock. I know of but one experiment that has been tried on this side of the Atlantic to find out how cheaply mutton could be produced, and what profit there was in producing mutton, and that was carried on at the Ontario Experiment Farm, under the direction of Prof. Wood, for a period of five years. He experimented with all the pure-breeds; but to bring it down to the practical farmer of Canada, he took the common sheep of the country and gave them one cross with these pure-bred animals, feeding them until they were a year old, pasturing them and selling the carcasses. He did this for five years and then balanced accounts. Following is a summary of the accounts:

**The Half-Blood Southdown**—Cost six dollars for its keep, and this included all the items, the shepherd's care and the use of the mother, over and above what her fleece brought in for the year previous. Every item was reckoned in, so that this six dollars is the actual cost

of keeping that sheep until he was sold, which was at a little over a year old. It shored six pounds of wool, bringing \$2.40. Its carcass weighed 147 pounds, live weight, and it sold at 6½ cents a pound, bringing \$10.20, and giving a total profit of \$6.60.

**The Half-Blood Shropshire**—Cost \$7.00 to keep, shored nine pounds of wool, which sold at 38 cents a pound, bringing \$3.40. It weighed 160 pounds, live weight, which sold at 6 cents a pound, making a net profit of \$6.32.

**The Half-Blood Oxford**—Cost \$7.40 to keep, shored eight pounds of wool, which sold at thirty-five cents per pound, bringing \$2.80; weighed 177 pounds, which sold at six cents per pound, bringing \$10.62, or a net profit of \$6.02.

**The Half-Blood Leicestershire**—Cost \$8.10 to keep, shored eight pounds of wool, which sold at twenty-eight cents, bringing \$2.24; weighed 198 pounds, which sold at five cents per pound, bringing \$9.90, or a net profit of \$4.68.

**The Half-Blood Merino**—Cost \$5.50 to produce, shored seven pounds of wool, which sold at forty-two cents per pound, bringing \$2.94; weighed 145 pounds, which sold at five cents a pound, bringing \$7.25, giving a net profit of \$4.04.

**The Common Grade**.—The native which was tried side by side with these, cost \$5.00 to keep; it shored five pounds of wool, which sold at twenty-five cents per pound, bringing \$1.25; weighed 150 pounds, which sold at five cents per pound, bringing \$7.50, a net profit of \$3.75.

**The Half-Blood Cotswold**—Cost \$9.31 to produce, shored nine pounds of wool, which sold for twenty-eight cents per pound, bringing \$2.52; it weighed 199 pounds, which was sold at five cents per pound, bringing \$9.95, giving a net profit of \$3.17

You see by these experiments that all

these sheep paid a profit, and a handsome profit. You can draw your own conclusions regarding breeds. You will see it was not the heaviest shearing sheep that produced the most profit; so there are more things than the weight of the wool or the carcass to be taken into consideration in settling upon a sheep breed.

**Mutton Produced at a Profit**.—On this side of the line we can produce mutton at a profit. If you will figure out the cost of some of this mutton, as I have done, you will find that the lowest cost at which any of this mutton was produced was two and two-tenths cents per pound. If we can raise mutton here in Wisconsin at that price, and sell it at six cents per pound, which it has readily brought in Chicago the last year, we are making a good profit.

I, for one, would just as soon try to raise wheat, oats and barley for the straw, as to endeavor to raise sheep for the wool, under existing conditions.

**Profit In Early Lambs**.—I have some Oxford lambs that were dropped the first week in March, averaging, I think, about twenty-three or twenty-four days old, which weighed, just before I came here, from thirty-two to thirty-three and a half pounds each. The Shropshire lambs are a week younger and weigh from twenty to twenty-two pounds; the Southdowns about the same. As to the breeding qualities of these sheep, I will say we have thirty-eight ewes, and beside them are fifty-four lambs doing well and thriving nicely. I don't know what those lambs are worth now, but lambs that will weigh forty pounds the latter part of March and the first of April have sold readily in our part of the country, other years, to Milwaukee butchers, at from \$3.50 to \$5.50, and sometimes even a little more.

**Money in Raising Mutton**.—I be-

lieve it is possible for the farmers of Waukesha County to make some money out of raising mutton, but I believe that we must raise the standard of early maturity just the same as beef producers and pork producers raise it. I believe we cannot do as we used to do, keep a wether until it is three years old and make his fleece pay for his keep, because every year that we keep him he is going in debt to us, and when we sell him we have to make that up, and it doesn't leave much; but if we will feed from two to fourteen months there is a profit in a well-bred and well-fed lamb.

#### Discussion.

•MR. GORDON.—How can you make the American eat more mutton?

MR. MCKERROW.—Give him better mutton. There is a gentleman sitting in this room who told me he used to be a Merino man and he didn't like mutton. Last summer he got a taste of Down mutton, and he ordered the butcher to bring some more of that kind, and he said he couldn't; there wasn't enough in the country.

MR. FLEMING.—Do you think washing wool on sheep practicable?

MR. MCKERROW.—No, sir; I think they should be shorn unwashed.

MR. CLINTON.—Is it possible to pursue sheep husbandry as a specialty on land worth \$100 an acre, and get a decent living, either for wool or mutton, or both?

MR. MCKERROW.—I think it is. These

experiments I have just read show that there was a clear profit of \$6.00 and over per head made on three of those half-bloods. Allowing six sheep to the cow, your profit at \$6.00 per head would be \$36.00, clear.

MR. HIRAM SMITH.—That was five years ago. At the price wool and mutton are selling for now, would it leave that margin?

MR. MCKERROW.—Good mutton is selling for more in our markets than it was six years ago.

MR. SMITH.—Could you get a living on an eighty-acre farm with sheep?

MR. MCKERROW.—I would be willing to try. I was speaking, however, of sheep raising with mixed husbandry.

QUESTION.—Do you let your sheep have access to salt at all times?

MR. MCKERROW.—Yes, always.

MR. AINSWORTH.—Which will cost the most and which will be worth the most, two Merino sheep that will shear twenty-five pounds of wool, and weigh one hundreds pounds apiece, or one coarse-wool sheep that weighs two hundred pounds and shears eight or ten?

MR. MCKERROW.—Those two hundred pounds coarse-wool sheep generally shear more than that amount of wool, to begin with. I can show you flocks that will average over twelve pounds of wool. I believe I can make as much money out of the large sheep that will raise two good mutton lambs that will give me ten dollars, and if your Merino will raise one I think she is doing pretty well.

## POULTRY ON THE FARM.

By REV. J. E. TURNER, Sussex, Wis.

**Progress in Fifty Years.**—The poultry interest of this country has scarcely kept pace with the progressive age in which we live; yet wonderful progress has been made in the breeding and management of poultry in the last fifty years. To-day thousands of chicks are hatched and reared by water and steam that never hear a mother's cluck. In an American poultry book, published in 1843, we find there were but few—not more than one dozen—distinct breeds of poultry known. Now in the American Standard of Excellence there are nearly 100 different distinct varieties of land and water fowls recognized. Now we have a great variety of incubators, brooders, artificial hatchers and mothers, that relieve biddies largely of weeks of monotonous sitting, brooding and rearing little chicks. One man in our own State (F. G. Underwood) runs a hatchery of 10,000-egg capacity, hatching thousands of chicks at one sitting, and rearing them for market.

**An Important Industry.**—The importance of poultry on the farm in this country must not be overlooked. Its production shows it to be one of the most important American farm industries. Flocks of fowls are reared on town lots in our cities and villages quite extensively—in some instances at the rate of 2,000 or more to the acre in a season. A few fowls are kept by the day laborer to supply his table with fresh eggs. Every farm, if containing only a few acres, has its flock of poultry, large or small.

**Keep Profitable Fowls.**—The farmer considers farm stock important only as it yields him a fair income on the capital invested. The horse must do good service on the farm or sell for a good price, or he is unprofitable. The cow must produce a fair amount of butter, or your dairy farmer will not have her. Sheep must produce a fair amount of good wool and raise good lambs or the sheep farmer will not have them. Hogs must fatten easily, on as little food as possible, or the pork-raiser will not feed them. So if poultry yields no eggs, meat or feathers, you don't want them on your farm, even if they do scratch their own living. Hence, poultry fanciers at our fairs are constantly asked: "Are these chickens good layers?"

**Poultry on a Large Scale.**—Poultry is important if one considers it as farm stock for profit. There are men who have made large sums of money producing poultry and eggs. James Rankins, Southeastern Massachusetts, runs a duck farm of a capacity of 10,000 ducks per annum, or 50,000 lbs. of ducks, which bring him from \$10,000 to \$15,000. He has said that a duck can be made to pay more than a cow. He has a large dairy farm, too.

A. C. Hawkins, Lancaster, Mass., has the largest poultry farm in the world. He keeps from 2,500 to 5,000 breeding hens, and raises from 10,000 to 12,000 chicks annually. His sales from eggs in 1885 amounted to \$15,000, 90 per cent.



of which was profit. Then, he sells large numbers of fancy breeding poultry.

One man in this county tells how he made \$1,276 out of poultry in 1885. He says his poultry paid him better than all other farm stock, all things considered.

At Lochsberryville, Pa., is a famous egg farm—Pennsylvania Incubating Co.—consisting of not more than an acre of land devoted to chickens. The buildings cost \$4,000. The manager is a boy, who does all the work. The profits for a year from 625 hens were \$1.00 per hen on eggs alone, after deducting those used for hatching purposes. The total profit on eggs and fowls was \$1,680, on an investment of \$4,000.

The poultry farmer is often sneered and laughed at, if he exhibits a little enthusiasm in his business, yet the poultry and eggs consumed in New York City alone, in 1884, was as follows: Dressed poultry, \$25,000 worth; eggs, \$10,000 worth; total, \$35,000, and, with all these large figures, poultry is about the only product we do not send abroad, but market entirely at home. France and England send large quantities of eggs to this country, and receive a ready market for them. China furnished America in one year, 1,000,000 dozen of eggs. In 1882 we received 13,000,000 dozen eggs from foreign countries; still we were not satisfied. Poultry outranks any other single product raised or sold in this country; yet many think it is a small business—that only men of small intellect are fit to engage in it.

**Actual Profits.**—But as to actual profits: One says his profit was 300 per cent., and another 90 per cent., another 500 per cent. In a report of 10 farmers, keeping from 10 to 120 common fowls, 500 in all, a net profit is realized of \$2 per head (1.98), making a profit after deducting 50 or 60 cents each for cost of

fowls, of about 400 per cent. If 10 farmers can do that, why cannot many more do the same thing? Making large allowance for extra care and feed, there is still a profit of 100 per cent. to 300 per cent. in poultry and egg production on the farm, which shows conclusively that it is a profitable business, hence important to farmers. The fancy poultryman, like the fancy stockman, finds the business still more lucrative; reaps very large returns, often, for money invested.

**Money in Broilers.**—The broiler poultryman, too, like the sheep-raiser who raises early lambs for market, finds a very large profit in raising broilers that weigh from  $\frac{3}{4}$  lb. 2 $\frac{1}{2}$  lbs. each, to be sold from March 1st to June 10th. This class of poultry brought in the Chicago market in 1886, from March 3 to June 3, from \$5 to \$10 per dozen. The cost of a chick until 10 weeks old is estimated at 10 cents, or \$10 per 100. At a low price—25 cents each—it yields a profit of 60 per cent. At Chicago prices, 40 to 80 cents each, the profit is 120 to 240 per cent., not such a poor profit after all. Farmers don't generally realize such figures out of their farm products.

**Requisites of Success.**—But we are told all poultry farmers do not make such a success with poultry generally, as has been made in the instances given. Do all farmers make the same success out of any particular farm product or stock? Certainly not. It depends largely on skill, talent and the interest taken in any farm product, as to what success will be achieved in it. If one don't like the poultry business, takes little interest in it, letting his poultry look out for themselves he must blame himself, not the poultry interest, if it is a failure.

**Important Points**—In conclusion, let me say: 1. Put up suitable buildings for the business, not the same as you would for horses, cattle or sheep, but

such as meet the wants of poultry in summer or winter. 2. Get some one of the fine breeds of American poultry, so that if any are wanted for breeding purposes you can supply the demand at good prices. 3. Take care of them as you would other farm stock; they will bring you as good returns, some say better, than you get from most other stock on the farm.

A large amount of poultry raises itself, scratching its own living, roosting

wherever it can find a little shelter. The farmer says it pays about as well as anything he raises on his farm. Surely there is a great saving in poultry on the farm for a little needed attention to its wants. Fowls will gather up and make profitable what would otherwise be wasted. The possibilities and importance of poultry on the farm, when rightly considered, are very great. It is high time that farmers gave this interest the attention that it justly deserves.

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## LIFE ON THE FARM.

By MRS. H. H. CHARLTON, Brodhead, Wis.

**How Opinions Differ.**—A farm may mean so much or so little, and life means such widely separated things to different individuals! Yet there is a common ground. To each mind it means life away from the city or the village; it means tilling the ground and living by the fruit's thereof. To one man the words open an interminable vista of long days of hard work, rising before sunrise and toiling after sunset; of work without leisure, of plain clothes, little cash and less pleasure.

To another they mean long days of communion with nature, as following the plow he notes each hint of the coming glory of the spring-time, the soft and varied hues of the trees with buds just swelling or bursting into blossoms, and the sudden changes of light and shadow—days as glorious as the radiant dawn with which they begin, as peaceful as the soft, gray twilight which brings them to a close, because health and strength attend his steps; days spent not amid the whirl of machinery,

nor amid jostling crowds, in the close and stifling atmosphere of shut-in city walls, but out under the broad expanse of heaven where the silence is broken by the song of birds, the drone of insects, by the rustling of leaves and the sound of loving voices; days of glorious liberty when he treads his own soil, cares for his own property and follows the dictates of his own will.

They mean long breaths of clear, pure air; long drinks at the cool, refreshing spring; they mean the woods redolent with the perfume of flowers and fruit, or the same woods in winter when through the interlacing net-work of boughs he catches glimpses of the blue heaven above, and the ringing song of his axe keeps time to the psalm on his lips; they mean comfortable clothing for the body, and rest for the soul, freedom from all the entanglements of politics and the tricks of trade, the freeman's true independance of thought and action.

Some such vision as this dimly out-

lined rises before the man who is truly called to the vocation of farmer. He sees clearly the work in it, but he does not fear it, for it is work under conditions he loves, and there can be no real living for the honest, healthy soul without work. He who seeks to live in city or country without work of some honorable sort belongs to the class of beggars or thieves.

**Dislike for Country Life.**—But all people do not see these things alike. In a group of ladies gathered at an afternoon tea, a young lady remarked:

“I heartily despise farms and farmers; everything indeed connected with farming.”

Silence fell on the room, and a conscious blush rose to the face of every person present. At length some one said:

“I was brought-up on a farm, and I cherish the memory of my childhood’s home. My parents stood high in community, and although my later days have been passed far from farm scenes, I do not know that I am to be the more respected for that.”

The conversation following revealed the fact that all the older people present were born on the farm, and some of the younger ones. The young lady herself had spent her childhood on the farm, and the first wealth which flowed into her father’s coffers had come from the rise in the value of his farm lands. She apologized for her ill-considered remark, but added: “I do not like country life.” For this she was not to blame. She had been educated to think that life in any village or city was preferable; that the end of life on a farm was to get money enough to get away from it; and she showed only the weakness of ordinary human nature in despising that which she had made a stepping-stone to something she deemed better. Her

mistake, and that of her parents, was the common one, that great possessions indicate success in life, whereas, a man’s life is to be measured, like the life of the tree, by the growth it has made. We are all prone to forget that it should be our purpose not so much to obtain as to attain, for in the life beyond the grave our worldly possessions will avail us nothing, while any mental and moral worth we may have acquired will still be ours.

**Educational Advantages.**—But the city offers the best advantages for education! Perhaps so, if by education you mean a knowledge of books, and acquaintance with the achievements of art and science. But amid the multiplied trophies of the intelligence and handiwork of man, one is apt to lose sight of a higher intelligence in admiration of his own. The pursuits and occupations of the present hour absorb him, and become to him the highest good. The finger of omnipotence is constantly writing its lesson of infinite love and wisdom; but it writes it not on the brick walls and stony pavements of the city. You will find it written on the hill and stream, on the sunny meadow and in the sheltered groves; on the mountain top and in the forest glade; on field and wayside.

In the city library you may read the thoughts of great men, and be helped thereby; in the country you may read the thoughts of God, and with your ear close to nature’s heart you may learn of infinite love.

**Who Works in the Dirt?**—“Don’t talk to me of country life,” says one, “I can’t endure working in the dirt or walking in the mud. I like to live where there are side-walks and things are kept clean.” Who works in the dirt? Not the farmer, for his work is amid living, growing things. He works not in the

dirt, but in the soil, that wonderful loom where nature weaves the sunshine and the dew into form and color. Call the grease and grime of the machine shop, the dust and fuzz of factories and stores dirt, if you will, but not the soil which gives back to man the smile of God in grass and flowers. The farmer would never set out a plant in the dirt, for it would only die, and his labor would be lost; but he breaks the surface of the ground, he stirs the soil, and to its warm and mellow depths entrusts the seed which shall return to him golden harvests.

A little country training would teach you to know soil from dirt, my friend. Would you see who live and move and revel in dirt, follow some of the filthy city side-walks out into the by-ways and alleys. The poorest farmer in the poorest hovel ever called a farm-house has kingly quarters compared to the inmates of the swarming tenement house, for all around him are light and air and sunshine. He knows the scent of wild flowers, and the color of a June sky. Scavengers may clean the city streets of their filth every night, but the springing turf upon which the farmer walks, wet with the evening dew, is fresh each morn and sparkling with a myriad of gems.

#### **The Most Comfort in the Country.**

—Why is it when we speak of farm life that we always picture to ourselves the hard worked farmer, and when we speak of city life there arises before us a picture of gayety and ease, of handsome horses, elegant carriages, brilliant assemblies and costly raiment. We measure one by its narrowest limitations, the other by its widest possibilities. Yet life for the mass of mankind in country or city means constant labor, and the same diligence will insure more real comfort in the country than in the

city, if we look below the surface of things. Measure both by the same standard, and let that standard be the best opportunity for physical and spiritual growth, and the balance is in favor of the farm.

#### **Moral Worth and Mental Culture.**

—True, frequent association with others quickens the intellect and gives to one an ease of manner attained in no other way; but these are often superficial, and not always indications of moral worth or mental culture. I remember a vine in my father's garden which bore clusters of grapes of unusual size and beauty. Tempting, indeed, they were to the eye in their purple coloring, but oh, so sour to the taste, for in the longest season they never seemed able to gather in enough sunshine to perfect and sweeten them! Climbing on the same arbor was another vine whose clusters were straggling in appearance, and the grapes small by comparison; but I have plucked and eaten them with delight before the sun had given them scarce a tint of ruby color. The former ripened from the outside in, and took on all the bloom and beauty of perfection while still immature; the latter ripened from the inside outward, and had all the richness and sweetness of maturity while still appearing green. Need I say that the perfect character must ripen from the heart outward, and that otherwise all outside polish of manner is worthless.

**A Good Book of Etiquette.**—There is a book of etiquette which all may possess, the following out of whose precepts will give a charm to both mind and manner, of which the polished grace of city drawing-rooms is too often a mere imitation. It counsels as follows: "Be courteous; be kindly affectioned one toward another, in honor preferring one another. He that ruleth his spirit is

greater than he which taketh a city." The very acme of culture is self-control; the secret of all true politeness is forgetfulness of self, and grace of manner may flourish in the plainest farm-house as well as in the palace—aye, flourish more abundantly, because more likely to spring from the soil of sincerity. Churlish people may decide manners, but everywhere in life the old maxim holds good: "Politeness is to society what the cushion is to the rocking-chair. It adds nothing to its strength, but makes it more comfortable."

**A Mistaken Idea.**—But, says one, farm life is looked down upon. We are a young nation, and do not yet rightly measure the sources of our power nor properly estimate that sovereignty of the people which is our constant boast. Proud of our self government, asserting on every side our independence, we forget the first principle of that personal liberty for which our fathers fought, and cling to the traditions of the old world as if they were the legacy the pilgrim fathers fled to this country to preserve. The word farm means a piece of land set apart for a tenant, and when a lord owned the land and all who tilled the soil were his dependents, warring or keeping peace at his will, farming may have been an occupation below par; but in this land, where our fundamental doctrine is that all men are born free and equal, where the lord of the manor is himself the tiller of the soil, farming is lifted to the highest place among all occupations—to it, in effect, all other occupations bow. Art enobles it, science aids it, literature crowns it. How long shall we, forgetting all the dignity of the free-born citizen, forgetting all the rights of humanity for which the race has struggled from *Magna Charta* until now, go

on talking about looking down upon farming.

**The Farms the Nation's Wealth.**—We boast of being a nation of homes. The little farms which dot the landscape are, indeed, the nation's wealth. Our agricultural interests far outweigh in money value the commerce of the country.

**What Thought Has Done.**—In every direction thought has been given to lessen the labor and increase the profit of the farmer's toil. Here is costly and complicated machinery which cannot be trusted to the ignoramus; the man must be intelligent who can properly use and care for it. Here are high-mettled thoroughbred horses which must be exercised, fed, watered and groomed with much more care and thought than the average parent gives to his children. Here are imported cattle which must be tenderly treated, housed warmly and fed properly. Time and attention has been given to devise the best plan for a barn, the best method of training a horse, the best way of preserving feed for winter use; to ascertain the proper temperature of drinking water for cattle in winter, and the best and cheapest ration of food. Last, but not least, the commonwealth is turning its attention to the farmers themselves. State universities have opened agricultural departments, as it has come to be recognized that farming is a learned profession. Indeed, so vital to the interests of the Republic is agriculture that it has, what no other single vocation can boast of, a special representative in the cabinet of the president of these United States. Can honor, father, go? Who will talk now of looking with contempt on farming? Did not our own State show its appreciation of the fact that its own prosperity went hand-in-hand with the prosperity of the farming com-

munity when it established these Farmers' Institutes? Formerly the school teacher "boarded round;" now the farm school passes round from county to county, answering questions, arousing thought, and diffusing needed information.

But the nation and State may do what it will—the dignity and beauty of the vocation will depend upon the character of those who follow it. Ignorance and carelessness will depress it; learning and faithfulness will uplift it.

**The Farmer's Home.**—As the farmer looks over his fertile lands, and ponders on the hard cash the growing crop will bring, let him remember that the farmer's home is as much an index of the man as that of the banker and lawyer. Let him take a little time from growing crops for money to make his home beautiful. A well-kept lawn, a thrifty garden, fruit ripening in the sun, flowers nodding to the breeze, vines

clinging to the casement, are more truly the birth-right of the farmer than of his wealthy city neighbor. If the latter will spend his money for these things, shall not the farmer spend a little money to obtain them? In the farm home, too, should abound that love and sympathy that fills out the joy of childhood; that healthy literature which will tend to develop the noblest character, for the farm home is the recruiting station for all the high and noble vocations.

As agriculture is the sure foundation upon which the prosperity of our country must depend, so is agricultural life the key-stone of the arch of our civilization. Rough and unpolished it may now be, but it shall yet be fashioned into glorious beauty by the hands of a pure patriotism. Around it shall cluster not only the flowers of nature but all the bloom and beauty of varied culture, and farm life in this Republic shall challenge the admiration of the world.

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## THE COMING FARMER.

By REV. C. E. GORDON, Koshkonong, Wis.

**He is Coming**—From our agricultural schools. One can hardly measure yet the value that the agricultural college, the experiment station and the work-shops and forges at Madison, and elsewhere, are to be to this race of coming farmers. I remember going back to the old world a few years ago and finding a mighty change in the farming interests of England; finding the farmers who used to be pretty well off poor; finding that it is very difficult for the English or Scotch farmer to get a living, but finding, all about the coun-

try with which I was familiar, men who were doing well and getting rich; men who had studied in the English Experimental School and in the German schools. They are not only outstripping the old school Englishmen, who are getting poorer and poorer every day, but are making money and getting on.

**From the City**—Is coming the new school farmer. It is one of the most remarkable phenomena of this country that the best and most successful farmers—those who are doing most for agriculture and for themselves and other

farmers—are men who have retired from city life to take up farming, sometimes at an advanced age. The city men are making, some of them, the very best of farmers. I found last year out in the far West, in Idaho and Oregon, a great many retired merchants, tired of city life, who were most successful farmers.

#### Average Farmer, Intellectually.—

From those three principal sources, then, are we to look for this new school farmer. He is to rise out of the present position in which the farmer is placed. What is the average farmer to-day, intellectually? He is intellectually a man who inherits the carelessness, the slovenliness, the shiftlessness of the Eastern farmer of the last forty years, and of the Southern planter, with the terrible wastefulness of the Western grain-grower. Those three elements have combined to make a representative man all over these United States who stands before us as a typical farmer. He is a wasteful man; he is a shiftless man and a most slovenly man. Unfortunate it is, but still it is a fact, and nothing but the new light of such institutions as this; nothing but the new light that is to be thrown upon this whole farming question by the great movement for the improving of the condition of the farmer, is to raise him out of the condition into which he is sinking, slowly and gradually—almost into the position of the European peasant. It is a very sad thing to ride through these fields of Wisconsin and find them taken up by men a little better than peasants. It is a terrible thing to see the hills and valleys of New England covered by men little better than peasants; but the change is coming. We live in a virile and vital age, and the time is upon us when there is new life; when men who are now but little better than grubbers of the land, are to rise into dignity, and

tillers of the soil be farmers in the true sense. The farmer is coming; he is pretty nearly here.

**The Old School Farmer.**—It would be idle for me to say anything more about the old and new school. We know that these old school farmers are men who sneer at everything new; who do a little this way and a little that way, and nothing in any particular way; men who sell all they can from their farms and return nothing to them; men who sneer at those, who, like my friend Mr. Smith, are fools enough to grow corn without ears and call it ensilage. The old school man works against all legislation for improvement. Last week we asked the legislature to pass a bill fixing a standard for milk, asking for three per cent. only of fat, and many of the farmers said: "What are we going to do with our cows, are we going to go home and kill them?" They thought three per cent. was too rich.

#### What Will the New Man Be?—

What is the new man to be? He is to be a combination of the theoretical and the practical farmer. We can look back now and see the result of practical farming with next to no theoretical knowledge. We see the folly and the mistake and the mischief of this constant practice, practice, practice without the theory behind it. No, farming is a theoretical thing first, and then a practical thing, and the coming farmer shall be grounded in the meaning of the soil, in the word that the crops say to him about the laws of chemistry; in the meaning of the animal that he is to tend, in its functions, its peculiarities, in its wonderful powers of development. A man must be educated in the next twenty-five years not by the word of his father before him, but from the school of the farm, from the education of the university and of the training school and of

the experimental farm, and all those agencies that go to make a man an intelligent man in his own profession. That is the education necessary to compete with the combinations that are to be against the farmers of the next fifty years. The old scratching of the ground might as well be done with the old Egyptian plow, and a woman harnessed alongside of the mules, as to be done in the way we are doing it now on a large number of farms. First, there must be the cultivation of the brain, then the cultivation of the hand, and then we shall have the farmer of the future.

**Special-Purpose Farming.**—Forty years ago the general store was all that was necessary. It kept a little molasses, a few groceries, a few boots and shoes and rubbers, and this, that and the other; but now we have a special store for the shoes, and a special store for the sugar and the tea and so on, the special drug store, and every other kind, and we are better served and hundreds are getting a living where one only used to get a living. So it must be with farming. The special-purpose has taken the place of the general-purpose store, and wherever you find a thrifty neighborhood in an agricultural community in the western part of this country you find following upon the heels of a general-purpose store, instantly a special-purpose store. So in farming, we must change from general-purpose to the special-purpose. The general-purpose farmer must give way to the special-purpose man—a man with the most earnest purpose to be a specialist in the position in which he is placed, A man cannot breed a few colts and a few sheep, and a little grain and a little milk successfully. It cannot be done any more than a man can do it in selling merchandise.

**Land—Tools—Crops.**—In Wisconsin we have offered to us, I think, about

four things for the coming farmer. We have special-purpose land. A man who knows what he is doing will find land adapted to his work. We need special-purpose tools, that is, special-purpose machinery and buildings. They will be absolutely necessary to the successful farmer. We need special-purpose crops. I do not believe that a man who is dairying or a man who is raising beef has a right to think of raising anything on his farm that does not go through the stomach of an animal to come out as butter, or as a well-bred calf. Let us leave it to Siberia, the greatest wheat-growing country that the world has seen, to grow wheat, and let the dairyman raise such stuff as shall go through his cow and come out in butter.

**Special-Purpose Stock.**—Then, he needs special-purpose stock; that is absolutely necessary to the successful man of the future. I have read a great deal this last winter, and have been to many meetings of farmers, and have heard resolutions passed on the election of the president, and complaining of the railroads and this, that and the other, but I have yet to hear of a single resolution passed in any farmers' convention sending forever to the butcher's block, and to oblivion, the scrub bull. I tell you that the scrub bull in Wisconsin is a deadlier loss to the farmers than all the schemes of the railroads, than all the intrigues of politics, than all the disturbances in the social condition in the State in which you live. I tell you he is a deadly enemy, social and political. So I say, the coming farmer would no more think of having a scrub bull on his farm than he would think of introducing a scrub bull into his church.

**Fruits for the City.**—The special-purpose in Wisconsin, I think, will be, for the present, fruits for the city. We heard to-day that Wisconsin is admir-



ably adapted for the growth of the delicate and delicious fruits that bring such tempting prices in the city. Then, it is one of the special duties of Wisconsin farmers and horticulturists to raise those fruits in their most perfect condition, and to make a specialty of doing it and marketing them in the best market.

**Horses for City Use.**—It is also one of the special businesses in Wisconsin to raise horses for city use. I do not believe it is the special business of the Wisconsin farmer to raise trotting horses for the country fairs. I do not believe it is possible for the average Wisconsin farmer to raise a decent horse for road purposes from the class of mares he uses upon the farm; yet I think that the special-purpose farmer can raise horses for city use—big draft horses from fancy draft horses; the best road horses from the best road stock. But the average farmer has no right to touch horse-breeding except he does it in a thorough and systematic special way, and horses can be raised in Wisconsin just as cheaply as anywhere in the world. We have a little shorter fall on the blue-grass and a little longer winter, but we have the best climate, the best land and the best water in the world to raise horses, and Kentucky men have told me that if we only chose to get the stock here, we could raise better horses than they can in Kentucky—horses with better qualities, sounder and better constitutions.

**Hogs for Fine Tastes.**—Then, of course, a most important purpose is the raising of hogs for fine tastes. I do not believe Wisconsin is destined to raise hogs for the lard pail; I think that belongs to the great southern belt. But to raise the fine hog for the fine taste, for a Deerfoot Farm Sausage, for the clean cut handsome ham, for the nice tasting breakfast bacon, for those things that bring a high price, it seems to me

Wisconsin is admirably adapted for that purpose as a specialty.

**Dairying for Profit.**—Then, at last, we come to the great specialty of all—Wisconsin dairying. We are destined in Wisconsin to be the typical dairy State, if we only mind what we are doing; if we only guard carefully, by law and by injunction, our dairy interest; if we shut the door forever against Chicago fraudulent butter and Chicago fraudulent cheese; if we shut forever and keep always under foot the fraudulent cheese factories of our own State. If we can put our foot on these things that have, during the last twelve months, lost to Wisconsin \$900,000 from the fall in the price of cheese alone, we will rise to be the leading dairy State of the world. We have every facility for it. We will have to protect ourselves against fraud, we will have to work earnestly with the best methods to produce fancy cream, and fancy cheese, and standard cheese and the best butter, to bring Wisconsin where she really ought to be to-day, and can be in a short time—the leading dairy State of the United States, and that means the leading dairy corner of this hemisphere.

**The Farmer's Wife.**—But the coming farmer will probably marry. He ought to marry pretty early, I think, if he can find anybody who will join him. I cannot say a word about the coming farmer unless I say a word about the farmer's wife. Familiar, as I am, with the squalor and misery of the city, the most pathetic misery of all, it seems to me, is often found in the life of the average farmer's wife. She sees her husband buy every tool to lighten his own labors; she sees him hire the help that is needed to aid him on the farm, and she is a slave of the oldest fashion. Her tools are the tools that probably were used at the time of the

settlement of Canaan. Sometimes I go into farmers' houses and I see tools in the kitchen that, it seems to me, must date back to the time of Abraham; nothing new or convenient, while the farmer has his modern binder and reaper, his tearer and scratcher, and everything to lighten the labor of the land, and nothing to lighten the labor of the house.

But the coming farmer is to provide his wife with every modern convenience to make her life just as rich and large and full and happy as his. She is to have co-operative washing, and save that terrible horror of Monday morning in cold weather, on the farm, where she has not a nice laundry and soapstone tubs, and hot and cold

water. This is only a sample of what the rest will be. The farmer's wife is to be as good as he in respect to this matter of convenience.

**The Balance Wheel.**--So shall we turn once again to the country for the statesman, the soldier, the philosopher, even as we did in the early days of the Republic, before the fields of the East had been worn out by carelessness, before the plantations of the South had been ruined by shiftlessness, and before the magnetic attractions of cities had drawn the best blood of the farms. We shall again turn to the country to find there an educated, conservative, loyal constituency, which will be the balance wheel of the country.

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## THE NEEDS OF OUR PUBLIC SCHOOLS.

By H. C. THOM, Madison, Wis.

**At the Bottom of True Progress.**—Down at the bottom of all true progress in this great country of ours is the little common school. Seventy-five per cent. of our men and women go only to these schools, and it should be for your interest as citizens of Wisconsin that they should be lifted by your moral and educational sentiment to as high a standard as possible. The business men must have children who come from these schools, the professional arenas are filled with them. I tell you, my friends, the professions demand men who have girth of lungs and are broad shouldered, to stand the vicissitudes of life which are found in their ranks.

**Trouble With Country Schools.**—In my short experience with the coun-

try and with the city schools, my observation has taught me this: In the large cities we have spacious rooms, well furnished with every appliance to teach a child with, apparatus of every kind to hurry along his progress, while away out on the hillside, in the country, there is a little house that cost \$600 (perhaps that is too high), furnished only with knife-eaten desks and an old dictionary with half the leaves torn out of it. We have in the country schools a set of teachers who come in in the fall and stay until spring. A new set come in in spring, and stay until fall, and then we have another set, and so it goes all the time. We have a teacher spending one-third of his time in trying to find out how little the teacher just before him knew, and the pupils are not long

in following suit. What is the trouble that our schools are not as good as they should be? Is it the district board? This district board has been "cussed" and discussed, and every Monday in July they turn out and raise \$200 to pay the teacher with and pay the running expenses of the entire district, and so the board is handicapped all the way through.

Let us turn to the superintendent. What kind of a man is he? Has he that invention which is so necessary to a good guide, namely, a back-bone? Has he courage enough, when he goes around and finds that a teacher is a poor one, and that teacher a lady, to stand up and say: "Here, my dear young friend, you can wash dishes a good deal better than you can teach school, and you had better do it?" The superintendent must have moral courage to do his duty by the county that has put him in office. Is the trouble here? Perhaps it is the teacher; perhaps it is the sentiment in the district; but let us see.

We pay a school-teacher from sixteen to twenty-five dollars a month. Does that hold out any inducement to a teacher to go into a proper training school and there fit himself so that when he comes back he may get the munificent sum of sixteen dollars a month? It will not do; we are not holding out the inducement. If you get a good teacher you have to pay money for him. You know very well that if you get a piece of five-dollar cloth, that it is five-dollar cloth, and if you get a twenty-dollar teacher, he is a twenty-dollar teacher, every time. We must pay more money if we are to get good service. We, out in the district, demand too much for sixteen or twenty dollars. We want the teacher to be as wise as Solomon, as patient as Job, and have the executive ability of Grant, all for twenty dollars a

month. He must answer every imaginable question, and always stand glass side up for twenty dollars, and the man and the woman in the country, as a rule, who finds the most fault with the teacher because he can't manage twenty or thirty or fifty children is the man or woman who cannot run work well at home.

**A Word about Text-Books.**—Another thing: If we go into the city we find a text-book here and another one above it and still another above that in a graduated series; but if we go into the county school we find as many text-books of as many colors as that coat we read about. Wisconsin is a wealthy State—a State of wealthy farmers—and many of them have tenants on their farms, and no matter whether they raise a large crop of barley or wheat, they are generally successful in raising a good crop of children. Whenever a tenant changes farms he has to provide text-books for all the way from eleven to eighteen children, and it is quite a burden. We might make a change that would not cost a dollar more than our present system.

**The Character of Teachers.**—In regard to the character of teachers we employ, if we set our standard a little higher, and raise our wages a little, we might be enabled to get a better line of service. If you hire a man on your farm, about the first questions you ask him are: "Dan, can you stack grain? Do you know how to milk? Can you save hay in the field? Can you break a colt?" You ask him all these questions, and at last you ask him how much he wants a month.

If your boy climbs a tree on Sunday afternoon and falls down and breaks his leg, you will drive twenty miles to Waukesha, or elsewhere, in order to get a doctor who you know is a skilful man at

the business; but you will take that boy of yours, whom you love so well, who has a character as tractable as clay, that can be molded in any form, send him away to the school-house and put him into the hands of a teacher who is to mold and build his future; and you never know a thing about where the boy is going, or under what kind of teaching he lives. If you have a blooded colt, you will take him out-of-doors three times a day, exercise and water him, drive him and do all those little things that make a fancy, "toppy" goer; but if you have a boy you will say: "John, take your books and go to school and get back just as soon after four o'clock as you can." And you don't know anything about the school, only what the children say, and that is the most unreliable thing in the world.

We owe our boys and our girls more than this. If you write letters just as deep as the knife can send them into a piece of marble, the hand of time will efface them; but if you place a boy under the hands of an unskilful master, he will grow under those hands, and there is nothing that will show the evils of misdirected effort so quickly as the character of a boy, and there is nothing, on the other hand, that will grow and develop and bear fruit as quickly as a boy's mind under a skilful hand. You owe it to your boy, it is a duty that should be sacred to every heart here, to see that he is properly educated.

**The Kind of Teachers to Hire.**—What kind of teachers shall we hire? First of all, they shall be men, they shall be women, they shall be living exemplars of what they teach. There was a young lady in our district who came to me a short time ago and said: "What kind of a school do you want taught?" I replied: "I would have that boy of

mine taught the little courtesies of life. I would rather have these deeply instilled into his mind than that he should know all the rules of arithmetic and all the lives of the governors of New York." I will tell you how that came out. In about three weeks that boy came home. We sat down to dinner, and I cut off a piece of meat and put it on his plate. He turned and looked at me and said: "Papa, I don't like fat." I said: "Son, if there is anything on your plate you don't like, leave it there and say nothing." His sister sat next to him, and he looked at her, handed her the plate, saying: "Ladies first." That boy learned courtesy with a vengeance.

**A School for Every Nationality.**—

Since we have a common school, let us make it in every sense a common school except in name. It should be a school that shall open its doors to every nationality. I want my boy to sit by the side of an Irish boy, and I want him to sit by the side of a German boy and a Norwegian boy; I want them to grow up from the same bench together; I want them to understand that we have a government in which there is no platform over men's heads to keep merit down and demerit up; that we are living under a constitution which recognizes merit in its truest sense; that good will rise to the top and that bad will sink to the bottom. Men in this country do not meet you with the question, as they do in England—"who is your grandfather?"—but they look you squarely in the face and say: "Who are you, and what are you good for?" I would no more wish to have my boy separate himself from the German or the Irish boy than I would that there should be separate seats for the Methodist and the Presbyterian and the Catholic boys; but I would have them all sit upon one common seat, and as they grow up in knowl-

edge and have a judgment of their own, they would recognize that there are good men and true men in every denomination. The worst problem that we have to meet to-day, is the fact that we have sectional feeling all over our broad land and under the same constitution. I would see the boys grow up together, and I would have them develop into good men and good women who will make good citizens, and while they are there together I would have them study that we have a government representing the underlying principles of good citizenship; I would have them learn patriotism in the truest sense of the word; I would have them understand that we are living in a country that is a little better than any other country on God's green earth, and that there floats over us a flag which is the best flag that floats to the wind.

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## DOMESTIC ECONOMY.

By MRS. J. A. CLARK, Waterloo, Wis.

**Fruit for Breakfast.**—I will confess that I dread breakfast most of any meal during the day. It is not quite so hard to prepare an appetizing meal for a man who has been up and about for an hour or two doing his chores, and brings his appetite with him when he comes in, but for the brain-workers it is more difficult. For such I would provide, first, fruit of some kind. In melon season, nothing is better than musk-melons. If these are properly started in the hot-bed, the season is a long one, and we can have them each morning for many weeks. In fall, winter or spring, a baked sweet apple with plenty of cream on it is delicious.

**Cream—Bacon—Eggs.**—Cream, unless our farmer happens to sell his milk to the cheese factory, is one of the things he should be lavish of, and is one of the greatest of edible luxuries. After this, bacon and fried eggs are another of the farmer's specialties. These, with buckwheat cakes and maple syrup, coffee and plenty of cream, make a good farmer's

breakfast, and nearly all raised on your own farm.

**Maple Syrup.**—The only extravagance about this meal is the maple syrup. I was fortunate enough last year to get pure Vermont sugar at ten cents a pound. If you read, as I suppose you all do, the reports of the Experiment Station, you will see that certain of the foods excel in certain elements, and are valuable accordingly, namely, some in albuminoids, others in carbohydrates, protein, etc. You doubtless understand all this, or if you do not, Prof. Henry can easily make it clear to you.

Chemists have demonstrated, that in filling certain of the requirements of the human body, a pound of sugar is equal to three pounds of beef; so you see that sugar is about the cheapest food you can get. Honey, if you have it, makes a good substitute for maple syrup at this meal.

**Broil Your Beef-Steak**—Beef-steak may be substituted for bacon, only do

not fry your beef. There are kind hearted people who will not eat flesh, because the animal has been killed. I do not go as far as that, but when a steer has been killed and his flesh fried in the pan, there has been an additional murder committed, besides the original killing of the beef. I do draw the line at that crime. Broil your steak, on a gridiron or wire toaster, over the coals. Cook it rare, serve on a hot platter with salt, pepper and butter on it, and you have your steak as it should be.

**Fried Potatoes—Toast—Cheese.**—Fried potatoes and nicely browned toast go well with beef-steak, and milk toast, and scrambled eggs are a temptation to a flagging appetite. Dutch or Cottage cheese, eaten with cream, is a favorite dish at our house.

**Soups.**—In killing a beef you have to take the good and the poor, and in no way can you utilize the poor beef so well as in soups. The French, our greatest cooks, excel in this respect. A recent article in the New York Tribune on this subject closes as follows:

"It is so good and cheap, it is a part of the daily food of rich and poor. A soup supplies the place of the stimulants, to which too many working men in this country are driven, by food which is so greasy and poorly prepared that it is of little or no food value, and fails to supply the waste of tissues caused by daily work. The good table of a good housewife does more for temperance than a thousand eloquent homilies by a thousand wise men."

**Vegetables.**—I would recommend the using of a greater variety of vegetables. Try one or two new kinds every year. Not every farmer raises "Brussels' Sprouts," but I think all should. They are a kind of a glorified cabbage, without the objectionable features of that vegetable.

**Puddings and Pies—Cake.**—Puddings and pies are a good thing to have,

especially puddings, and salads are a great addition to any table. Cake is a vanity, and the only kinds called for in a farmer's family are a plain cake with ice-cream, and a wedding cake when the girl gets married.

**An Abundance of Good Things.**

—The ordinary every-day farmer has at his command a continued abundance of good things in the eating line. At our house, just now, we are picking the first fruits of our hot-bed, in the shape of deliciously tender radishes. Next week we will have lettuce, and shortly spinach and beet greens. It is astonishing with what little trouble and expense these things are grown. A half-day's work of our man, at a time when his work is of no account, prepares the hot-bed. The only other expense, except the original charge for sash and box, is the seed and an occasional broken glass.

**Ice.**—So with our ice. It is the one crop in this country that never fails, and it is harvested when there is nothing else doing. At an annual expense that is not noticeable, it gives us an enjoyment that we otherwise would not have for half a year. I will acknowledge one drawback to these luxuries. Before we had ice, once or twice in the course of the season we would go to the village restaurant and buy a dish of ice-cream. I confess that this, under these circumstances, tasted much more delicious to us than much better ice-cream does now, when taken more commonly at home.

**Celery.**—In those days, before we had celery all winter long, we used to go to the garden of an old German friend of ours who was so fortunate as to have lettuce fit to eat about the first of June, and none that I ever raised equaled that, flavored as it was, with a six months' abstinence from a fresh vegetable diet. Nature gives its compensation,

though I hardly think it pays to go without six months for the sake of acquiring an additional zest to our appetites.

**Woman's Special Province.**—To provide this food and have the proper arrangement of our domestic affairs is woman's special province. Her education should tend to this. Her business in life is to make some home happy, and to do this, she must have a thorough understanding of the needs and requirements of domestic management.

**A Farmer's Wife's Education.**—I believe in the highest education for woman. There is no danger of any one knowing too much or being too accomplished, but this higher education, especially for a farmer's wife and daughter, must be built on a solid foundation of *practical every-day household knowledge*. It can detract nothing from the attraction of a farmer's house, if his daughters are good musicians. If they know Latin and Greek, it will do no harm, but rather be a distinction than otherwise in their later days. But, in addition to this, if they are to be farmer's wives, they must know how to take care of a slaughtered hog. They must understand souse, and comprehend cheese, and have a realizing sense of the merits of spare-ribs and pickled pigs' feet, and all the mystery of sausage. In the education of our daughters we make a great mistake if we neglect these things.

**Mothers Favor Their Daughters.**—There is a tendency on the part of some mothers to favor their daughters at their own expense. They will wash the dishes rather than have these young ladies soil their hands; they will take care of the milk and make the butter while the girls sit in the parlor and practice on the piano. This is a wrong to both of these parties—to the mother, in that she sacrifices herself to one who

is under obligation to her, and to the child, because by thus taking her duties from her, you make her selfish, and render the work that must eventually— if she marries and has a family—come doubly hard. How will her children fare without a mother competent to either help or teach them? is the question that should be asked. I do not think there is much of this, but yet every one must have noticed instances.

**Conveniences.**—Mr. Morrison, when he wrote me in regard to my subject, said: "Even the simple matter of making a delicious cup of coffee is a sealed secret to the great majority of ladies. It seems to me," he says, "that there is about as much stupidity in this direction as can be found in any of the callings of life."

I gather from these remarks of our excellent Superintendent, that in the course of his perigrinations through the State this winter with his institutes, he has put up at the country hotels rather than with the farmers, and I am sure that there he has made a mistake. I can well understand his complaint, if he has tried the hotels; but let me recommend to him another year the hospitality of the farmers. I think he would find that he had improved on his quarters, and that the farmers and farmers' wives would maintain the reputation, that I think they have, of being bountiful and tasteful providers to the best of their ability. I say here, to the best of their ability, and I say it in reference to the farmers' wives. For it is a fact that, in the march of improvement, the great advance in machinery, inventions and in all conveniences, comfort and their means of doing things have *not* advanced as have other kinds of work on the farm. I regret that this is so, for I believe that the *truest* domestic economy consists in furnishing con-

veniences for the wife and house-keeper, so that she may economize *her own strength*.

**Arrangement of the House.**—First, the house should be so arranged that she can perform her various duties without too many useless steps. In many houses the cellar is under the "upright," and the kitchen in the farther end of the "L." The well is apt to be on one side of the house, the cistern pump on the other, and the wood-pile far away. Properly, the inside cellar stairs should lead directly from the kitchen—and there should be outside stairs for the carrying in of vegetables in the fall, and for milk in the summer, if the milk is kept at home.

**The Sink.**—Every farmer's kitchen should be furnished with a sink, into which both hard and soft water should be brought by pumps. It is not always convenient to have the well water thus brought, but there is no reason why the cistern water should not be. This sink should connect with a drain for the carrying away of waste-water. If water must be brought into the house in pails, it surely is too much to ask that it be carried out in the same manner and thrown on the ground to make a spot offensive to sight and smell, and a breeding place for flies. At one end of the sink, a long, broad shelf makes a good place to put dishes as they are wiped, and under this should be drawers for dish-wipers and kitchen aprons, and a cupboard for tea-pot and coffee-pot, tea canister and coffee-mill, and under the sink a place for pots and kettles.

**The Wood-Box.**—A wood-box built in the partition, between kitchen and wood-shed, opening directly behind the cook stove on the kitchen side, and so arranged that it can be filled from the wood-shed, is a great convenience and saves many steps and much dirt.

**The Cooking Room.**—A small room on one side of the kitchen to be used as a cooking room is another labor-saver. In this a large flour chest, with partitions, can hold flour, corn meal and rye meal. If of the right height, it makes a good place to rest the molding board upon, while in use. Over it are rows of shelves for spices of all kinds, boxes of raisins and currants, sago and rice and other groceries; near by the sugar bucket, molasses jug, lard jar, baking tins, pie plates—in fact, all and everything that one needs to use in the making of bread, pies and cake, should be in this one room, where it could be reached with scarcely a step.

**Cupboard for Dishes.**—The cupboard for dishes, built between dining-room and kitchen, with door in either room, will be found a great convenience. Underneath the cupboard, drawers should be placed for storing table-cloths, napkins and extra knives, forks and spoons.

**The Sewing Room.**—A most desirable room is one which could be used in summer for a sewing room, large enough to contain sewing machine, cutting-table, work-basket, lap-board, a low, easy rocker and an old-fashioned lounge, where the tired mother can take her afternoon nap. If she has such a place, where all her making and mending can be reached at a moment's notice, the time for the nap is much more easily found than it otherwise would be.

**Bed-Rooms.**—Bed-rooms on the lower floor are a necessity in a house where children are reared. My summer bed-room has an outside door, which I find a convenience and a luxury.

**The Living Room.**—The room for rest and recreation should be on the south side of the house, into which the sun can shine all through the long winter. It should have a coal stove, or



a good wood base burner, and a fire night and day, a little less than eight months of the year. This room should be made as pleasant as one's means will allow. There is no need for costly furniture, but let it be comfortable in every way—light, warm, a place where the children can play on the floor, and the older people rest in easy rocking chairs, with pictures, if you can afford them; books, by all means; playthings for the smaller children, games for the older ones—a room hard to keep in order, perhaps, but one that the children will remember with pleasant recollections all their lives through.

**Tack-Puller—Carpet Sweeper.**—There are many things for lightening the labor of women, which many of you may have, and others never have heard of. There are no agents to go around and sell them, probably, because their cost is so small that they could not live on the commission they would get. Many a woman this coming spring will get down on the floor and pull tacks from the carpet with a screw-driver or a butcher-knife, when there is a little tool made for this purpose, costing twenty-five cents, called "Little Jack, the Giant Tack Puller," which not only pulls the tacks from the floor, but from the carpet. Any small child can use it, and it saves its cost in tacks every two years. A carpet-stretcher, costing seventy-five cents, brings the carpet easily to its place, and saves a great many times its cost in lame arms and aching shoulders, every year. A carpet-sweeper is as much ahead of the ordinary broom, as the ordinary broom is ahead of the hemlock ones I remember seeing one of our neighbors use when I was a child.

**The Sewing Machine.**—Every one has a sewing machine, but I doubt if any of us ever have our sewing as well

done as our mothers had before sewing machines were invented.

**The Washing Machine—Ironing.**—If any one has a washing machine worth the house room it occupies I wish she would let me know of it. A folding ironing board is very well for children's clothes, skirts, shirts, etc., but I had a little table made, two feet wide, four feet long, set on castors, which is easily moved, and is much better for ironing sheets and long table cloths. The uses to which this little table is put are innumerable, and it is astonishing how much the burdens of life are saved by placing many things on little wheels. Few women are so constituted as to be able to lift much, but their ability to *push* things is something wonderful.

**Truck for Moving Stoves.**—Speaking of wheels reminds me to say, that with five pieces of 2x4, thirty inches long, and a set of castors costing a dollar, we have a frame upon which we put our coal stove, when not in use, and a woman or child can push it from one end of the house to the wood-shed, and by means of this device the taking down and setting up of the coal stove becomes an easy matter. Most *men can* lift a good deal, but I notice that few of them seem to enjoy carrying around a coal stove.

**Cleaning Vegetables.**—Every one has an apple parer, and I have tried potato parers but always return to my little knife. If potatoes are well cleaned with a brush, the paring is an easy matter. The various brushes now made for cleaning vegetables are good things to have, and an ordinary scrub-brush for wood-work does the work much better than can be done with a cloth, and is not nearly as hard on hands and arms.

**Folding Dish-Rack.**—A folding dish-rack, costing twenty-five cents, is for sale at crockery stores. By using

this only half the towels are needed that are required when the dishes are drained in the ordinary manner. A wire dish-cloth for kettles and tins is a necessity in every kitchen.

**The Lightning Chopper.**—For the making of mince pies, plum, and hasty puddings, and various other things, many people use the ordinary wooden bowl and a chopping knife; but there is a machine called the "Lightning Chopper," which makes play of these otherwise laborious tasks. The knife is carried up and down, in a revolving pail, by means of a crank, and is so easily worked that a small child can use it. It costs about five dollars and is, apparently, indestructible. Mine, after the use of many years, seems as good as new, and has been worth fully the cost of it each year that I have had it. It does not make quite as much noise as a threshing machine, but enough to delight the children, and to let the farmer know, if he is within easy distance, when he may expect something *fine* for dinner. A lemon squeezer and a potato masher are also convenient articles, and cost but little money.

**Necessary Tools.**—Many things about the house are often destroyed for want of a skilfully-driven nail, or a well-turned screw. It is said that a woman cannot drive a nail, but how can you expect her to if she has only a flat-iron to drive it with? I well remember the first shelf I put up. My tools were a wood-saw, a butcher-knife, and a disabled monkey-wrench. I know more now than I did then, and have a saw, hammer, screw-driver, chisel, two gimlets, a box of screws of all sizes, nails of all lengths, tacks, linen twine, and many other handy and useful things, in a cupboard in my kitchen. I find these a great convenience, as do also the men folks, judging from the number of times

they come to the house to ask if they can borrow some of these things, taking care to explain that theirs are laid away under the snow, or in some other equally inaccessible place. They are always careful to return them, and recognize them as belonging entirely to me, and you know it is a comfort to a woman to be absolute owner of something, if it is only a saw or a hammer.

**Reserve Supplies.**—There are many other branches of domestic economy which I have hardly time to touch upon. The importance of keeping a good supply of reserves, can not be too strongly urged. My mother used to say that sheets and table-cloths should never be worn out, but when about half worn, new ones should be purchased and the old ones laid away for extra occasions. Unexpected and long-continued company often cause us to need large supplies of table linen and, when sickness comes, there can hardly be too much bedding.

**Plan Systematically.**—Eternal vigilance must be the price of good house-keeping, but eternal drudgery need not be. If we will systematically plan our work; if we will intelligently plan our houses, life will be much easier for many of us. I know many women complain that they cannot rebuild their houses, and cannot procure the conveniences they desire; but I believe that if a woman *knows* what she wants, and will make her husband *know* that *she knows*, in nine cases out of ten she will get it. It is always well to submit to the inevitable with grace and philosophy; but we don't want to get into the habit of accepting as inevitable things which might be changed by a little persistence on our part.

**Too Much Work.**—It is said of America, by a recent visitor, that here every one works, and it is also said that

work without ceasing is making this country one of the most prosperous, but one of the most unbeautiful countries imaginable. No one here has time to be idle; yet it is only in idleness and leisure that the beautiful can be developed, either in the brain or by the hand. We, the farmers' wives, as a class, are true to our work. We will not only do our duty ourselves but we will bring up our daughters to take our places in the next generation. Nature has done her share in giving us a beautiful State. In no other country does the sun shine on a lovelier landscape. Can we then be blamed if we wish to make our homes beautiful and fit for the situation in which we find them placed? To do this we should have leisure, and if by defects in our domestic arrangements we are compelled to spend the time in *useless* labor which is needed for giving us a higher education and a greater beauty in our surroundings, it is a crime on the part of those whose

duty it is to provide for us and for whom we perform our unflinching share.

#### Buy Your Wife Labor-Savers.

—Let the farmer, when he congratulates himself that by his wind-mill he has saved himself the labor of pumping water for his stock; that by his binder, he now does not have to sweat in the harvest field; that by his hay-loader and horse-fork, and mower, and self-dumping rake, he has freed the hay field of its terrors,—let him, I say, when he contemplates all this labor-saving machinery, use equal energy and wisdom in providing smaller labor-saving implements for his wife, and I will promise, on her part, that she will do her duty, not only in providing for the wants of the house, but also in making a farmer's home what it should be: a place of refreshment, a home where culture and comfort dwell, where elegance and beauty are cultivated, a fit dwelling for that best specimen of humanity, the Wisconsin farmer.

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## THE FARMER AS A CITIZEN.

By W. D. HOARD, Governor of Wisconsin.

**About Calves.**—Mr. Thom has spoken about calves. From my earliest infancy down to to-day (I am not paying much attention to calves now) I was brought up along with bovine babies. I have had a deep interest in the little animal called the calf, and, as a consequence, at an early age I made something of a study of the animal. Calves are very much alike, whether they come from one breed or another. As a rule, those who have had experience in dealing with them discover that a thorough-

bred calf is the most intelligent. There is a long line of heredity in its behalf but the most provoking thing on this green earth at times is a calf. He will stand and regard you with a look of mild and innocent baby-like wonder, and a stupidity that is unfathomable.

**The Deacon and the Calf.**—I am reminded of an incident in the history of good old deacon Coolidge, a neighbor of mine in New York, and I tell you this story now for the purpose of explaining somewhat, it may be, certain

derelictions or deviations from the strict orthodox pathway that men may be pardoned for indulging in who have the handling of calves. Deacon Coolidge was one of the best men I ever knew, with a heart overflowing with love to his fellow-man, to his Maker, and to all things that his Maker had made. He was a thrifty farmer, and his wife was like him. Aunty Coolidge was one of the best women who ever lived. Sunday morning came. The old man had just hitched up the old mare and started for church, three miles distant. He had driven into the road and turned back to shut the gate, when the old lady said: "Pa, I declare for it, that calf hasn't been fed, and the milk is in the brass kettle on the stove, all warm for him." "Well," the old man replied, "well, well; this is a pretty time to think of feeding the calf, I declare, with my best clothes on. Maria," he said, "what are you thinking of, not to speak of it before?" "Well, pa, you know that we claim to be Christians, and if we should go off to church all day long and leave that poor calf without anything to eat, we couldn't pray enough nor sing enough to make God forgive us for such an act." "Well," said the deacon, "I guess you are right." So he started back, took the brass kettle from the stove, and gathering up his Sunday meeting coat as snugly as possible, he walked along with the milk to the calf, who was impatient and eager and hungry, with expectancy standing right out in his little eyes. The old deacon says: "Bossy, bossy, come along, come up here, come along." And so he inserted his finger, no, two fingers, for he was a shrewd old deacon and knew better than to try to feed that calf with one finger. He led that calf down into the pail, and it began to taste good, and the calf be-

gan to get very much engaged in it, and his tail began to show just how he felt. He plunged his nose down below the drinking point, when suddenly (he must have breath) he gave a snort that spurted the milk all over the deacon "I knew it would come to this," he says, "I knew it would come to this, just on account of Maria's forgetfulness. Bossy, bossy, bossy." The calf gave another snort, and the good deacon could stand it no longer, and straddling the calf's neck, he seized both ears and plunging the little fellow's neck in the kettle he said: "If it wa'n't for the love I bear my blessed Lord and Master I would punch your cussed head off."

Well, there are people in this world who would have taken good old Deacon Coolidge in that hour and measured him by one of the seventy articles; but I have an opinion that the Lord had considerable sympathy with Deacon Coolidge on that morning.

**Calf-Rearing.**—One thing I want to say soberly, now, in regard to the rearing of the calf, and that is this: It is said that the women of Holland are the most successful of any people in the world with cattle. Why? Because they come to the contemplation of the needs of these babies from the standpoint of their own motherhood. They understand that this is a *baby* calf. The women of Holland rear the cattle of Holland. I have noticed a great many men in their management of young stock, and have thought thousands of times that if they would delegate it to their wives they would save many very costly mistakes.

Now, one of the points that I would make is this: The calf comes into the world with a baby stomach. No mother attempts to take a puling infant and immediately to pour solids into its little stomach. Nature handles

this question from her own standpoint, and if we have an ear attuned to nature and an eye clearly visioned to nature, we can go along, even though we do not read Sanscrit. We can understand the things that belong to us.

This calf is a baby, and for the first four weeks in its history it has what is called a rennet stomach that must take food in the form which nature has designed; it passes then slowly out of the rennet stage into the ruminant stage, when the calf begins first to chew the cud. This varies from four to eight and ten weeks. Now, an observant rearer of calves will easily notice when a calf shows a disposition to commence to chew the cud, and he will never force solids upon the little animal until he shows a disposition of this kind. We should commence carefully with the calf in this way, and also take another lesson from nature. Nature when left to herself turns the baby calf out with his mother, and he will take his food from ten to twenty times a day. I have studied and watched these little animals many times and noticed how many times they will take their food. If you will follow that law and give the calf his food as often as possible, give it to him in small quantities and give it to him as his mother gives it to him, sweet and warm, you will come as close to nature as you can. Nature don't give a calf sour milk unless it is a Texas cow, and she is ugly enough to give sour milk. I would maintain that practice with the calf till he is six months' old. Feed the calf at least three times a day. Don't let him get so hungry that the stomach is filled with a gnawing gastric juice; then he gorges and bloats himself and brings on dyspepsia. Never allow a calf to occupy wet or damp quarters; that is one of the most important things.

**Organized Efforts.**—My friends, we have to-day before us, in Wisconsin, a very encouraging state of affairs. You don't know how gratefully comes to me the prospect of seeing the great agricultural thought and intellect of the State awakening in vigorous life to the importance of a stronger and better intellectual condition in behalf of our calling. We are in a most favorable condition; these organized efforts are taking hold of our minds and gradually making them homogeneous. There are, of course, men in the State without thought or idea of the value of rubbing against their neighbors, but the Institute work has come and has come to stay and to tell in every community through which it passes.

**Beginning of Institute Work.**—The other day, at Lake Mills, at the Institute there, I sketched for a few moments the feeble beginning in Wisconsin of this Institute work. Let me follow it now for a moment. The first beginning of practical Institute work was in the little basement of the church in Lake Mills, in 1870. It was the organization of the Jefferson County Dairymen's Association. From that, meetings were organized and held in a few places in Jefferson County, and one day in 1872, at a meeting in Jefferson, your humble servant was authorized by a vote of that little association to issue a call throughout the State, asking the people who felt an interest in these matters to come together at Watertown and form a State Dairymen's Association. Six gathered there, and they deliberated and established an organization—and then commenced the first practical organized effort under State auspices for the growth of knowledge, and for the improvement and betterment of our ideas and practices.

—That association had a very tedious

and hard road to travel for years; but gradually it began to force conviction upon the people. The people began to see that there was a Messiahship in this work; that men had come with ideas to offer to each other, and you remember the meeting of the association a few years ago in this city.

Now, that was the first practical effort, and we have gone on from the organization of the State Dairy-men's Association to take a wider and broader understanding of our duty to each other.

**The Almoner of Wisconsin.**—Some of those duties have been touched upon practically here. We have been engaged in discussing the money-making side of this work, but there is a broader side to the farmer than simply his pocket. He stands to-day not alone a money-maker in Wisconsin, but the almoner of her destiny; he stands as the repository, to a large extent, of the moral and political conscience of this people. To him must be referred, year after year, as a grand juror, the questions that are to effect the well-being of this people, and these meetings are doing more, my friends, to get us to understand and expand the broad relations we bear to each other, than anything that has happened in the course of our lives.

**Wisconsin's Population.**—We are a peculiar State. We have absorbed into our body politic so vast an amount of foreign material that it is a question whether the process of assimilation shall take place in a harmonious and intelligent manner or not. We have in Wisconsin a population composed of representatives from almost every nation on the globe; our population to-day is 70 per cent. foreign born and their descendants, and we have not thought of this as we ought to have thought.

By the census of 1880, there are 40,000 more foreign born voters in Wisconsin than native born, and they are welcome here to our best citizenship. But we need some process that shall take hold of them; that shall make the German feel that he is no longer so much a German as he is an American; that shall make the Englishman feel that he is no longer so much an Englishman as an American; that shall make every man feel that the grandeur of American citizenship stands before him, and that citizenship is the stamp that gives to all character its true value in this country.

**The People's College.**—Now, to the farmer is delegated to a large extent the growth of this principle, this idea of citizenship. I want to see the farmers of this State take hold of the question of education in a grand and substantial manner. I want them to see to it earnestly that the little district school shall become the people's college as it ought to become; I want the country school-house raised and dignified. We have our colleges and our high schools, and the University, and God speed them all, but the country school, the farmer's school, lies at the root of things, and too often is weak and expressionless. My friends, I want in this Institute work that we shall see the necessity of establishing a ground-work of intelligence. How are we to become intelligent farmers; how are we to carry on our business; how are we to make money; how are we to form ourselves as worthy citizens of a most worthy State unless it be by intelligence?

**"By the Sweat of Your Brow".**—God says "by the sweat of your brow shall you earn your bread." He did not say by the sweat of your back; he did not say by the sweat of your hands, but he has put that very action and that very place of struggle where it be-

longs—in the head. Read between the lines and see if he does not mean that if you don't think you shall not have much bread. We need thought and we need encouragement; we need to encourage each other, we need to stand by each other.

**Good, Hard Thinking.**—The agricultural interest is attacked on all sides, but let me say to you, in all conscience, I believe to-day that the farmer himself in Wisconsin is his own worst foe to his own well being. It is not the monopolists, it is not the politicians, it is not the capitalists, but it is the fact that the farmer himself has not seen the broad gauge to which he should attain for the purpose of emancipating his own business from the thralldom that has encircled it. That thralldom is a lack of good, hard thinking, not hard work.

**What Education Does.**—Go where you will in Waukesha County, show me the man who is intelligent, the man who reads and studies, the man who follows the lines of thought connected with his pursuit, and that man I will show you almost invariably is the successful man of his class. Now, then, if intelligence is a stepping-stone to success, we need to understand that we must lay broad and deep the foundation of intelligence.

I read a little story when a boy that touched me deeply, concerning John Philpot Curran, the noted Irish barrister. At a banquet to which he was invited by the Prince of Wales, the question went around: "What has education done for you?" Education is not schooling, it is thinking; it is the assimilation of knowledge, not putting on a man a veneer; it is not cramming; it is not polishing a man on the outside, by filling him with digested thought and digested understanding, making him

capable of doing something. The question went around the board, and finally it came to Curran, and he rose and said: "Education has done this for me, my lord—It has enabled the son of a poor Irish peasant to sit at the table of his prince." And it is recorded that the Prince of Wales took offense at that statement, and never again was Curran asked into the presence of royalty. More shame be it to royalty!

I am glad that my own country gives me a thousand such examples as this. The poor boy who has struggled with thought, who has struggled with ideas, who has struggled with undertsanding, who has reached up and asked day after day, "Oh, Lord, give unto me understanding," in prayer as honest as ever went out of the human heart—that boy has a right to feel that on him has been stamped the insignia of God's best grace, the hunger and thirst for knowledge. The man in the old story was asked which would he have, wisdom or riches, and he chose wisdom and God gave him both.

**The Country School-House.**—We need in our relations as farmers, in our neighborhood relations, in our school-district relations, to stand by our little institutions with more loyalty, and that is the reason I made a short plea for the country school-house, standing "like a ragged beggar by the roadside," the desks scarred with the rough touch of the rude jack-knife, the only temple of knowledge that I ever found, and the only temple that ever gave me a start on the road to a better understanding. I see it to-day as it stands upon the rugged hillside in New York; I see the different teachers who came and went to the last day of my school-boy life. I remember one teacher who took hold of my understanding and held my heart, and who, I am sorry to say, found

no answer in the thought or conviction of the people of that district. He taught me things; he taught me to understand animals; he taught me to understand the plants by the road-side; he taught me to look out into the arcana of nature, as far as I could go, and said to me: "Remember, my boy, that all these things spread out before you are yours, and given to you for your use." That man started within me a thirst for knowledge that no other man ever did, but it was said of him, by the rude neighborhood, because he took the boys out in the afternoon and let them down into the secrets of nature, took them down into the meadow and showed them the difference in grasses—it was said of him: "He is a consarned fool, and don't half earn his money." Out of that little rude neighborhood there grew a class of boys who will feel to their latest breath the stimulous that man gave them. Now, we ought to make our little country school-house the center of our civilization. We ought to encourage all these things that shall take hold of the boy.

**The Boy and the Book.**—A poor German boy came into my office about six years ago, with a gentle, kindly face and a mild blue eye, and stepping up bashfully, said: "Is this Mr. Hoard?" The moment I saw him my heart was drawn to him. He drew a long breath, and I could see in the thin clothing on that cold December day the beating of a stout little heart. He was about sixteen years old, and he said: "I came to ask you, sir, if you would lend me a book?" Why, do you know, at that very moment it seemed as if the boy and myself were welded together. Then I remembered in the diary of my grandfather, written on the 10th day of October, 1788, this little entry: "Rose this morning at four

o'clock, went into the woods and burned brush; went back to breakfast at six; had mush and milk. Father sent me over to Uncle James' to borrow his almanac to see when the moon changed. Mother said she "*wished I had a book.*" Poor boy, away back there in 1788 laying the foundation of the knowledge of to-day. Out of his ignorance have we reaped grand results; out of the poverty of those men has been builded this nation, and shall we not religiously and conscientiously develop and maintain these institutions and promote knowledge? When the child asks for a book shall we give him a stone?

When the boy stood there I questioned him and asked: "What kind of a book do you want?" and it seemed as if it were the return of my grandfather's request, "I want a book." He said, "I would like a book, I don't care what it is—a book that will teach me something." So I led him to the book case and asked him what he wanted, and what his desire was, and he said that he wanted to know something about cattle. Well, he touched me still closer, you know. I asked him if he couldn't get any books at home and he said no. "Father says that I know enough now, and mother said (oh, I tell you these mothers help the boys out grandly) that she knew you would let me have a book if I came down here, but not to tell father anything about it." Now, the mother reached into the boy's heart; she knew his longing. I gave him the book he wanted and he came back and wanted another and another, and I say to you that that poor German boy will some day be a pride to his mother and to the State of Wisconsin.

**The Hope of This Nation.**— These things make me glad because they make together for peace; they are encouragements; they help us in our work. We



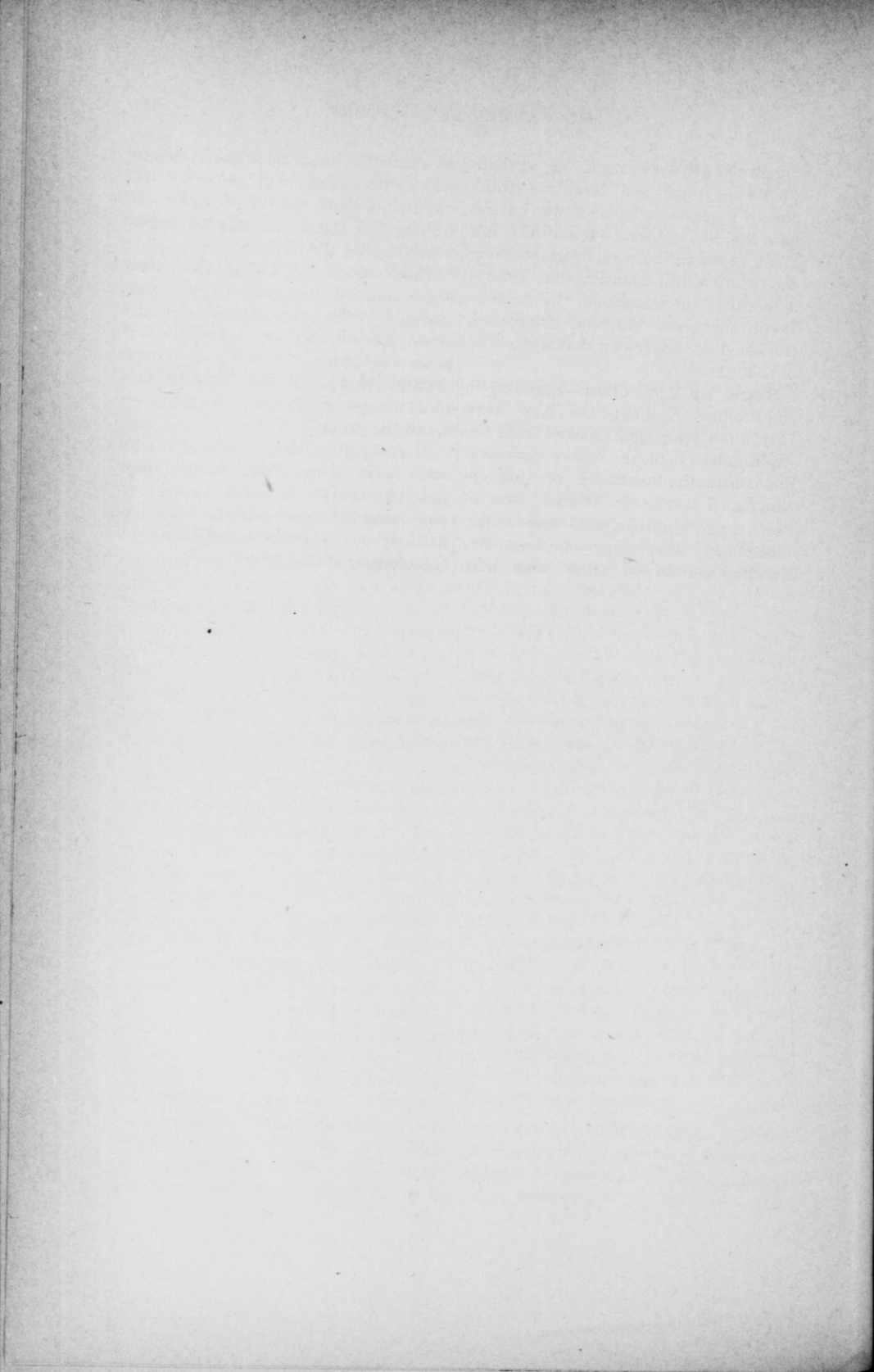
sometimes get discouraged as agriculturists out upon the farm, we think nobody appreciates us and we have a hard life; but remember that out of this great, broad agricultural heart is coming the future of this country; that from it is recruited the statemen, the managers of the great business enterprises, the blood and the brawn that is the hope of this nation.

**Stand by Your Own.**—Standing in the Produce Exchange in New York City, a few years ago, I looked over the five hundred men who to-day represent and control the commerce of this nation, and I said to Mr. Armour, one of the Armour Brothers, who was a farmer's boy: "How many of these five hundred men do you think were born

on a farm?" I was astonished when he told me that eighty out of every one hundred of these men who were controlling the commerce of the nation were born on the farm.

Then I asked him, "what about their sons?" and he shrugged his shoulders and said: "Degenerate sons of worthy sires. The city is a great maelstrom; it is a great hopper; it grinds up human flesh and blood, but the farmer's boy, of all other boys, is the boy who can stand the grind."

Stand by your own. Stand by your own farm, your little school-house. Stand by everything that belongs to you; magnify your calling; don't belittle it but magnify it, and thus shall the blessing of God follow.



# MISCELLANEOUS PAPERS.

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## ONE WAY TO INCREASE FARM PROFITS.

By PROF. E. S. GOFF, Madison, Wis.

**The Plan Suggested.**—You will all agree that if there is one thing that the farmer needs to know more than any other at the present time, it is how he may increase the profits from his farm. Prices of produce rule low. Labor and taxes are high. The profits on staple farm products are becoming so small that many farmers are anxiously inquiring how they can support their families and keep out of debt, or still worse, how they can meet the interest on debts already incurred.

If I were to offer a plan with the claim that, by observing it, you could grow wealthy in five or ten years, you might well question the soundness of my views, for fortunes are not often legitimately made in that time. But I have no such plan to offer. I shall, however, suggest a means by which I think it will be possible for some farmers to reduce their cost of living, and at the same time increases the comforts of their homes, and which, if wisely carried out, will, in certain cases, enable the farmer to materially enhance the net income from his farm.

**The Cost of Living**—On the farm depends largely upon the proportion of the articles consumed that is produced at home. The ordinary farm supplies the family with flour, meat, potatoes,

and dairy products. These are the bare necessities of life. If the housekeeper has no other place from which to draw, she will find it very difficult to supply her table with a pleasing variety of wholesome dishes during the whole year. In early summer the salt meat and shriveled potatoes are poor supplies to the grainary and dairy, and the palate tires of sameness at any season. Either the farmer's living will have to be narrowed down to an unpleasant and unhealthful monotony, or else there will be a great void in the bill of fare, that must be filled from some source. This void may be, and very often is, filled from the grocery. Here the housekeeper may select from a large number of preparations that are convenient to use, and which make very palatable dishes. There are oranges, lemons, figs, dates, bananas, pineapples, raisins, prunes, dried currants, coconuts, rice, chocolate, tapiaco, sago, and other products of tropical climates, that modern commerce brings almost to our door. But have you ever stopped to count the cost of the food preparations that we buy at the grocery? Let us take for example raisins and dried currants, produced, we will suppose, in the islands of the Mediterranean, and which have been transported nearly 5,000 miles before reach-

ing our table. The grower of these products has been paid for raising and marketing them—not very well paid, it is true, but perhaps quite as well as is the farmer when he sells corn and potatoes at present prices. The packer has been paid for assorting, packing and labeling them. The steamship and railway companies have been paid for carrying them nearly a quarter of the way around the earth. They have been through the custom house and paid Uncle Sam a tariff. The importer has taken a slice for his profit, and the retail dealer who hands them out to you has had his share, and all of these margins must come out of the consumer. By using these products you are permitting several men and corporations to reap a profit out of your hard labor. Can you afford this? Will you buy all these good things that the family needs? Money is not always plenty, or you do not have time to go to market as often as things are needed for the table. You do not enjoy taking out your purse and emptying out a part of it on the grocer's counter every time you go to town. The result is you are tempted all the time to scrimp, and the housekeeper is compelled to do without much that she would gladly have. We sometimes know better than we practice.

#### Reduce Your Grocery Bills.—

What I am about to say is not new. You have doubtless all heard it before, and some of you have probably already guessed what I am about to urge upon you. There is a way by which you can reduce your grocery bills, and at the same time increase the comforts of your homes, and the wholesomeness of your diet; and this is by providing on the farm a first-class garden. This will furnish you with an agreeable and wholesome variety, for every day in the

year. There will be a very small void to fill from the grocery. For instance, as soon as the ground thaws out in the spring, we may have parsnips and salsify from the open ground. These may be followed by fall sown spinach, and this by asparagus and lettuce; these in turn by green peas, and these by string beans, early cabbage and cauliflower; these by sweet-corn and melons, and these by turnips and celery, the latter bridging over winter and lasting until the ground thaws out again in the spring. I have by no means exhausted the list of vegetables, but we will take another example: Strawberries come in about the middle of June. These are followed by raspberries and currants and gooseberries, these in turn by blackberries and the autumn raspberries, the latter lasting until hard frost. Then if the surplus of all these delicious fruit, has been prepared by drying, canning or made into jams or jellies, as the good housekeeper knows how to do, it will furnish an extensive variety of most wholesome and palatable delicacies until June comes around again, and fresh strawberries are once more available. I mentioned only the small fruits I might have added others, but I have chosen these because the small fruit garden may be started very quickly, and the plants with proper protection endure the winter in all parts of Wisconsin.

**Buying or Raising.** — But perhaps some of you are saying without words: "This all sounds well enough on paper, but we know that we can buy these things cheaper than we can raise them." Are you sure? Have you figured upon it? Let us see. The market gardner's land is worth twice or thrice as much as yours; he pays about twice as much per acre for labor and fertilizers as you do; he sells his products for about half what you have to pay for them at the grocery,

and then, as a rule, makes more money on his investment than you do. Otherwise how can he support his family on a few acres, while you require a whole farm to do it? There must be a mistake in your computations. I do not know why the garden should be such a bug-bear to the farmer. As a matter of fact, no one else can have a garden so cheaply. He has the land, the tools and the fertilizers already. All he needs is the will. The old idea that the garden must be cramped up between four short fences, and that all the work in it must be done by hand is a relic of barbarism. Next to an energetic man, the horse is the most valuable tool ever put into the garden. With a very few exceptions all garden crops may be cultivated freely with the horse. The garden should be laid out with long rows, and a good broad space be left across each end, to turn the horse on. Arranged in this way, but a few minutes will be required to cultivate it out, and by watching chances, the weeds may be kept down with very little interference with other work.

**Profits of the Garden.**—I will not here take your time to go into details of culture of the various garden crops. Valuable as the discussion may be, this would form a lecture of itself. As a matter of fact, but little knowledge is required where the will is right. The average garden crop demands no more skill than the average farm crop. Our florist was once asked by a lady: "How do you manage to make your Chrysanthemums blossom so?" "Why, I don't make them blossom," he replied, "the Lord makes them blossom. All I do is to give them a chance." It is just so with the garden. If we but give the things a chance to grow, the kind providence that satisfies all our wants will attend to the rest. I do not wish to say

that the garden requires no labor. You and I know better. It does require some labor. So does every crop the farmer grows. But I assert what I can prove, when I say that no half acre on the farm will yield an equal return in dollars and cents and comfort to the one devoted to the garden, provided it is managed in a business-like way. We must, of course, provide for the labor of the garden the same as for the farm. Above all, do not make the mistake, so often made, of feeling that the hired man can never be spared for working in the garden. The boys should be expected to do their share, but should not be compelled to do it all. The boys, and girls too, should be made to feel an interest in the garden, and not to despise it, as they so often do. With this end in view, give them a chance to see something of the bright side of gardening. Buy them seeds of the novelties that are advertised in the catalogues each spring, and let them grow them for themselves. Offer them prizes for the best vegetables, or encourage them to exhibit their products at the fairs. Subscribe for a good horticultural periodical for them, and induce them to grow seedlings and make crosses of their own. Let them dip a little into botany, if they will, and do not cause them to feel that flowers are beneath the dignity of the farmer. And right here let me say that the pursuit of horticulture offers a field for a life work that is worthy the aspirations of the most able and ambitious youth. It has many problems still to be solved that may well engage the highest genius of any age. How may we increase the hardiness of our fruit trees, so that these great Northwestern plains, soon to be the abode of millions of people, shall be able to produce their own fruit? How

shall we be able to conquer the host of fungous diseases that menace our orchards and gardens in such increasing numbers? How can we master the swarms of destructive insects that work such havoc with our crops? How may we infuse wild vigor into our improved cultivated varieties? These and other equally important questions cry out for reply, and he who answers one or more of them is no less a benefactor of his race than he who teaches us how to harness steam or electricity.

**Special Garden Crops.**—In almost every locality there is an opportunity to make some garden crop more profitable than staple farm crops. Either the market demands it or the soil or climate is specially adapted to it. Sometimes this special crop is celery, sometimes it is early potatoes, sometimes it is strawberries, currants, cauliflower, sweet-corn, asparagus or something else. It should be the farmer's effort to discern by careful watching what special crop he can make specially profitable. Here is where the garden may work another great good. Its surplus products will naturally be sold, and a revelation of profits possible from fine early vegetables will thus be made. The real profits of a good garden do not stop at reducing grocery bills or providing home comforts. They often do not stop until

they have turned what was a losing into a profitable business, and rolled back the mortgage that was fast enveloping the home.

**Don't Neglect the Garden.**—Let me urge upon you, my rural friends, no longer to neglect this most important adjunct of the farm. Better, if need be, have fewer bushels of corn and potatoes to sell. You cannot afford to sacrifice any of the comforts or rewards that naturally belong to the farm. Your wife and children need the garden; common sense and good judgment demand it; all sound arguments favor it. The garden was the parent of the farm and can never be divorced from it, without entailing damage, if not positive disaster. Supply your own family first, with all the delicacies that your soil is capable of producing, then take the surplus to market. This is the normal condition of agriculture, and we cannot wisely ignore it or depart from it. Whether business is prosperous or not; whether produce is high or low, the garden continues to grow days and nights and Sundays, manufacturing by its own mysterious processes food for your table out of nature's dead materials. It demands no compensation, but asks only opportunity to confer its benefits upon you. Can you afford to do without it?

## WORKING COUNTRY ROADS.

By ROBERT FARGO, Lake Mills, Wis.

**Mud and Mire.**—In this practical age why do we plod on over worse roads than we had forty years ago? Within two miles of where I stand there are places where the roads at this season are almost impassable from mud and mire, and yet with abundance of gravel almost within a stone's throw. Not a mile from this hall, not long since, the overseer covered a good gravel road with clay from either side, making it, later on, impassable for a load, and the public were forced to take another road into town. He put almost the whole tax into that mud. It was lucky there was no more tax.

**How Roads are Worked.**—Lake Mills levies about \$2,500 annually for road taxes. The town is sub-divided into sixteen or eighteen road districts by drawing arbitrary lines here and there, to suit the whim or caprice of the supervisors or the tax-workers, with marsh and bogs in one district and fairly good roads by nature in another; with perhaps abundance of gravel, and having in each from two to seven miles of highway "*as it happens to come.*" After dinner, town meeting day, with a hoot and a howl, we choose overseers for each of these sub-divisions, not for their special fitness, and for variety we change them annually, so that in ten years we can have 180 overseers. Nice, is it not? This \$2,500 is apportioned to each district not according to needed work on the highway, but according to the valuation in each district, so the best lands, and naturally the best roads, get the lions' share of the tax. Why? The tax is worked out by the owner of land on which

the tax is levied. Then, instead of making or repairing the roads as we do our other work, when and where it is needed, the overseer calls out the tax-workers all at one time and season, and at a season, too, when every man's time is almost invaluable on his own farm. In nine cases out of ten the roads are made no better, first for the reason that the overseer does not know the first lessons in road-making, and, second, if he does, he has a shirking, time-serving crowd to handle, whose chief desire is to get the tax out of the way.

**Collect the Tax in Money.**—Now, what does this \$2,500, represent? So much solid cash judiciously laid out in making roads? By no means. It is represented by ruts and mud-holes in the spring, holes, sags and snags in summer and hubs in winter. What would this \$2,500 have done if collected in money and laid out as it might have been? It would have macadamized the 45 miles of road in the town *twice*, at a cost of \$1,000 per mile, and \$10,000 would have been left for repairs, in the last forty years. Get out your pencils and figure what could be done with \$2,500! It would employ three double teams and three men at \$3,00 per day, and five men at \$1.25 per day, for six months (156 days), with no let-up for rainy days, and leave \$141 for extras. I venture the assertion that they would accomplish more than has been done in the last ten years.

**You Can Stand the Tax.**—But you say, "we can't stand the tax?" In this county the taxes have grown from \$25,131.64, in 1880, with a population of 30,438 to \$93,547.97 in 1888, with a popu-

lation estimated at 33,000, and you seem to stand that, and don't get any returns, either, except in school moneys. Is your time on the road *pretending to work valueless*? Would not good roads minister to your comfort and improve the value of your lands?

**Civilization and Good Roads.**—It is said the history of civilization is the history of good roads. Then, measuring ours by the "Appian Way," or the later work of McAdam and Telford, the wheels of civilization have taken a backward motion, and we may soon look for the sun worshippers in high places.

A recent writer on roads and road-making, says: "Roads form a primary element in the advancement of a nation being essential to the development of the material resources of the country." Notwithstanding these axiomatic truths, so terse and vivid, that should appeal to the average farmer for the best methods along this line, we find a hardened indifference that can be explained only on the theory that familiarity breeds contempt. He plods his weary way to the town or railway with his load of produce, thinking by contrast of the "happy land" and "golden streets", when, perchance, a smash-up transforms this saint-like citizen into a low-down "cussing" fellow. He will "cuss" the roads, "cuss" the road-master and "cuss" his luck; but when "those days in June come round to work out the tax," he is the last man there; the first to leave, the biggest shirk; he can tell the best story and cheat himself.

I am here to plead for better methods in road-making. Will some hard-fisted farmer who has lived here for the last forty years tell me how much better the roads are now than then (save the sluices and bridges)? In that time steam and lighting have been chained and taught to do our bidding. We cannot turn in any direction without being confronted with devices to minister to human comfort, except the roads we travel on.

**The Only Remedy.**—There is only one remedy, and that is to *collect the tax in money*, and have it expended by a commissioner appointed by and under the direction of the town supervisors. Any town that will, can adopt that method by a vote at their annual town meeting. If the people are timid, begin with a one or two mill tax, and when the result is seen there will be no trouble with those who have eyes and nerves. This will be no experiment. It has been in successful operation in some of the New England States for years. The town of Whitewater is a notable example of this method. They had formerly some of the worst roads in the country; they now have the best I know of in the State and it has been done with an annual tax of from two to three mills, about half what most towns pretend to work out. The work is there applied where and when it is most needed, and mud-holes are not allowed to remain from the first of August to the first of June to "get their fill," and there is no nonsense in road-making.



## TILE DRAINAGE ON THE FARM.

By C. P. GOODRICH, Fort Atkinson, Wis.

**Importance of Drainage.**—The subject of drainage is of very great importance to all parts of the State, both as regards the health of the inhabitants and the value of land for agricultural purposes. There is not a county, not a town and very few farms in the State that would not be benefited far more than the cost of the work by a judicious outlay of money in draining low, marshy, malarious and disease-breeding tracts of land, and transforming them from unsightly and repulsive blots on the otherwise fair face of our delightful country to valuable pastures and meadows, and, in many cases, to the most valuable and productive fields to be found for the raising of any kind of grains. The draining of a swamp or marsh in a town benefits every inhabitant of the town by making it a more healthful and desirable place to live in, and in consequence the selling value of every farm in the town is raised even though none of the drained lands are situated upon or even contiguous to it.

**Difficulties to be Met.**—One great difficulty in the way of drainage has been that it seldom happens that any one man owns all the land that would be directly benefited by, or that lies along the course of, any particular drain, and it would require concert of action and a mutual expenditure of money by those interested to accomplish the work. This concert of action is often very difficult to obtain, owing, in some instances, to the inability of some men to fully realize the importance of the work, and in other cases to the natural selfishness of men who, though

they would consent to be benefited, would refuse to bear any portion of the expense, claiming that it would be of no benefit to them. To obviate this difficulty, laws have been passed in this State, whereby town and county boards can lay out and construct such drains, and the cost of construction can be assessed upon the lands directly benefited according to the amount of benefit to each tract.

In some parts of the State considerable attention is being turned, of late years, to this subject of drainage, and much benefit has accrued to the people by the application of this law. Still, I do not think it advisable to resort to the law if amicable arrangements can possibly be secured without resorting to it, for the expense will usually be less if done by private enterprise, and will generally result in better feeling between neighbors. But where it cannot be avoided, men should promptly take advantage of this very just law rather than longer delay work so important.

In my own town several town drains have been constructed with very obvious benefit, and although, in some cases, they were opposed with an energy and determination worthy of a better cause, still, when they were completed, and the improved appearance and productiveness of the land became apparent, all, even those who had been most bitterly opposed to the scheme, were constrained to admit that it was a "good thing."

**Tile Draining.**—Tile draining has been practiced in Europe many years; but the first done in this country

was in the State of New York, in 1835, and the tiles were imported from England. The first manufacturing of tiles in this country was done in 1838, by a Mr. Johnston, of Geneva, N. Y., for underdraining his own land. They were molded by hand over a stick, and he claimed that notwithstanding the great cost it proved profitable. Since then tile machines have been introduced and perfected, so that they are now made very cheaply, and great quantities are used in all the older States where land is valuable, and even in Wisconsin they are rapidly coming into use, and generally with great profit.

**Lands Benefited by Tiling.**—All heavy clay lands with a retentive subsoil, especially if lying nearly level, must necessarily have the productive soil thin, because it is saturated with water and the roots of plants can not penetrate much below the surface, so that when drouth comes the ground bakes and cracks and the plants look yellow and sickly because they have but a feeble hold on the soil. Such land will be made immensely more productive by underdraining, for that removes the excess of water and makes the soil deeper, more porous and mellow, and better able to withstand either wet or dry weather. It may seem a mystery to you, as it did to me, how water can find its way from a distance of a rod or two underground through such apparently impervious clay to the tiles. I might say, as did the workman who was putting in my first tile drains: "I don't know how, but I *do know* that it does it." And I found that it did do it. It did it much more effectively the second year, and drew the water from a greater distance after the ground had been deeply frozen during the winter, and it did still better the third year. My theory is this: The tiles are and must be laid below the line

of frost. When land saturated with water freezes it expands, or, as it is said, "heaves." If it is thawed out with all the water still in it, it soon settles down to its former compact state; but as it thaws in a great measure from below, the water is partially drawn out from below as fast as the ground is thawed, thereby preventing its becoming again so compact, and the water forms small channels whereby it can get to the tiles. Then little channels increase in numbers after each year's frost, till the character of the soil seems completely changed, so that instead of being cold, sodden and water-soaked till late in spring, or after heavy rains, it can be worked with ease as early in spring or as soon after rains as any land.

Another kind of land that can be greatly benefited by tiling are our lowlands, some of which have inclination enough for surface drainage, but are kept cold and wet by water rising from below.

The greater part of the rain which falls on the uplands where there is a porous subsoil sinks down into the earth, and this water must find its way out somewhere. Much of these lowlands of which we are speaking is underlaid with a thin stratum of clay, through and below which are streaks of sand and gravel. Now, if the water line through the porous earth under the uplands is higher than the surface of the lowlands, the pressure of the water on the higher level will tend to force the water under the lowlands up through this thin stratum of clay. This it does, sometimes in the form of springs, but more commonly all over the surface, or, it might be said, in an infinite number of very small springs. Some lands that seem quite solid and dry and were never suspected of being springy, but for some unaccountable

reason are cold and unproductive will, by close examination, be found to be of this class. Now, if a sufficiently deep outlet can be secured and such land tiled, say four feet deep, or deeper if you can—the deeper the better—with lines from three to four rods apart, it will intercept this cold water and carry it away before it rises high enough to injure vegetation, and transform land which will produce nothing but the poorest kind of marsh grass, into the most productive land in the country, which will bear large crops of any kind of grain or grass in any season, whether wet or dry.

I have tiled some such land as this. It is the first land I can plow in the spring and the first I can cultivate after a rain, and produces larger crops, no matter whether the season is wet or dry. Water has constantly discharged from the tiles for four years, not ceasing in the severe drouth of last fall. Frequently water oozes out of the ground at the base of a hill by the edge of the lowland and soaks out upon it, keeping it wet for a long distance. In such cases a line of tile run along the base of the hill at a good depth will cut off this supply of water and dry the land for a long distance. I have one such place as this where the land has become solid and dry ten rods below the tile where formerly it was frequently too soft for horses to go on.

One kind of wet land it will not, in my opinion, ever pay to tile—that is where it is composed of nothing but peat to the depth of three or four feet. It can be dried out, but then it will be so light that it will produce nothing. The best that can be done with such land is to drain off the surface water and then pasture it or mow what little poor grass may grow on it.

**Manner of Doing the Work.**—First, a good outlet into an open ditch or brook must be secured, at least 4 feet deep; then lay out the lines for the tiles where, in your judgment, they will do the most good; but they must have a little fall through the whole length of each line. It might be convenient to have an engineer do this, but the owner of the land, if he has good judgment, and has observed the flow of water over the surface in times of heavy rains, can do it without the help of an engineer. One inch fall in 100 feet will do; if no more can be had. The distance apart of the lines necessary depends on the kind of land. If very retentive clay, they should not be more than two rods; in some other lands four rods will do as well. The ditch should be made as narrow as possible, and give room to work in, say 18 to 20 inches wide at the top and 6 inches at the bottom. The bottom of the ditch can be smoothed and fitted for the tiles with a true, even grade, with a scoop made for the purpose. If there is a little water running in the ditch no trouble will be had in getting the grade correct. If there is no water some kind of a level will have to be used. Lay the tiles in so they will fit as closely at the joints as possible. If there is water running in the ditch you have to begin at the upper end to lay them, otherwise the running water will carry mud and sand into the tiles. If there is no water you can begin at either end. Cover the tiles with a little marsh hay or straw or something of the kind, and then put on a little earth (clay is preferable) and pack it down well. The rest of the filling can be done quickly with a team and scraper or plow. Three-inch tiles are large enough for short lines, but if they are more than 60 yards long, or are in places where considerable water is likely to run, then larger ones should be used.

**The Cost of Tiling.**—It has cost me 25 cents a rod to get tiles put in  $3\frac{1}{2}$  or 4 feet deep. Last summer I paid 30 cents for some but a part was through a cut 5 feet deep. Tiles cost at the factories in the southern part of the State \$10 per 1,000 feet of 3 inch and \$15 for 4 inch. At this rate it would cost to tile an acre with 3 inch tile, 4 rods apart, \$16.60; 3 rods apart, \$24.90 and 2 rods apart, \$33.20.

Now, the question for each one to ask himself is: "Have I any land that it will be profitable to tile drain?" The correct answer will depend on circumstances—the value of good land and the

cost of labor and material in your locality, as well as the kind of land you have. If the cost will equal or exceed the value of good land, then the decision would doubtless be against doing the work except in special cases, such as where there is a wet place in the middle of an otherwise good field of plowland; or where there is a narrow strip of wet land running through and dividing a field in such a manner as to make it very inconvenient to work; then it may well pay the cost even though the value of an acre is no more than the expense of tile draining it.

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## GRAPE GROWING AS A PROFESSION.

By WM. FOX, Baraboo, Wis.

**Not Acquired in a Day.**—Successful grape growing is not acquired in a day, a month, or a year. It has to be learned gradually, and by patient observation and practical experience, line upon line, precept upon precept, here a little, there a little, year after year. This makes the grape culturist proficient in his vocation, and then he can continue to learn something new and important in regard to it during the whole of his life-time.

In the last ten years it has been demonstrated that we can raise grapes as well as any other Northern State.

**Location.**—The location of the vineyard should be on a hillside sloping preferably to the south, although the earlier varieties succeed well on a northern slope.

**Soil.**—It used to be said that grapes would grow on the poorest soil, but in my experience it takes the very best, which also needs to be fed liberally from

year to year. All soils are not good for all kinds of grapes. Delaware, Brighton and Lindley, when once thoroughly established, do their best on clay soil; they also do well on heavy clay loam. Concord and its seedlings do very well on most soil but best on clay loam; Catawba, Diana and Roger's Hybrids, sandy loam, or dry and porous soil, with a good, healthy exposure to plenty of fresh air and sun; Iona and Cumberland, on black muck soil. I speak of these points from my own experience. All our grapes do best on land well cultivated and properly drained. Grapes should not have wet feet, nor will they do well with them, for with the ground wet it is cold and unhealthy which causes the vine to decay, and they soon die from premature old age. This will not be the case on land that is well drained so that heat and air can penetrate to the roots. If land is wet I would advise tile laying.

**Preparation of Soil.**—The next im-

portant step is preparation of the soil, which it is to be presumed is drained. Deep plowing is best, following in the same furrow with a good sub-soil plow, breaking the ground as deep as you can. The object is to loosen, so that the fine, tender roots can penetrate it and make a healthy growth in the first year, which they will not do if this plan is not followed.

The old way of plowing shallow leaves the sub-soil hard, and then, too, the hole is often hardly large enough to admit plant and roots. The young roots cannot penetrate the hard walls of their cell; consequently they will seek the softest and most accessible spot, and climb on top of the soil unless, perchance, there is a crevice near-by, into which they will dive down and seek what they must have to live and thrive on, namely, moisture, and they will go down until they find it. All these means, of course, apply to land of heavy clay sub-soil and to light loose soil.

**Selection of Varieties.**—Next comes selection of varieties, which the vineyardist must determine for himself by carefully noticing how early frost comes, and what variety will mature in an average year. I find, with me, that Moore's Early, Early Victor, Worden, Concord, Red Brighton and Delaware, for summer, very seldom fail to mature; for winter keeping, Vergennes, Roger's No. 3, 9, 15, 53.

**Planting and Rearing.**—The next highly important step to be taken is the selection of roots. I would have a first class yearling root in preference to any other. I cut the tops to buds, and have them ready to set. The hole should be dug as deep as cutting is, so that the crown of cutting will come a trifle below the surface when the ground is leveled. I would then set perpendicular, laying in the roots carefully and straight. Any carelessness will not make a good, healthy vine. Cover the roots with loose, fresh surface soil. Well rotted manure or fertilizer will be beneficial.

**Cultivation.**—Cultivate and hoe during summer, and cut back to buds. Cover the vine in winter, and do it well. The second year keep them growing. Cultivate and hoe. Do not let them get stunted. Break away all but two canes; let them grow, and tie them up. Take care that you get ripe wood in the fall. I cut back to two buds and cover again as the year before. In three years the roots will be strong, and you can leave more canes. Be careful and cut away all unripe wood; also take care to not let your vines over-bear. When they do cut them off. I do not believe in extreme checking. Check only for the benefit of vine and fruit. I also cannot see any benefit in breaking off leaves. I find more a lack of leaves than too many. I begin to prune in October, and lay down in November from four to twelve, according to weather.

## BUTTER-MAKING ON THE FARM.

By MRS. A. H. DARROW, Brandon, Wis.

**Beginning the Work.**—When dairying first went into effect on our farm, it was from necessity as well as choice. My husband had raised wheat so long, and was growing poorer each year (and the land no richer), that it became evident a change must be made. The milk was taken to the cheese factory for a number of years with quite satisfactory results at first, but the receipts grew less each year, which was not, of course, very satisfactory. Having become somewhat enlightened, it was decided to procure a creamer. A well of good water close by the house, and a wind-mill to do the pumping, made it quite convenient. The creamer and pump were inclosed in a small building, and we proceeded to the business of manufacturing butter.

**The Right Kind of Cows.**—The right kind of cows is one of the essentials to success—those that will manufacture the food they consume into milk of a butter producing quality. The feed given should be the very best the farm can produce. The care of these cows is of great importance. This includes warm stabling in cold weather, warm water to drink, dry shelter at all seasons of the year, and regularity of feeding and milking. Too much stress cannot be placed on the latter point, also on the cleanliness practiced in caring for the stables and all utensils used in caring for milk and butter.

**Care of Milk and Cream.**—Milk should be taken from the stable as quickly as possible after being drawn from the cows, for the double reason of getting it away from the odors of the stable, and that it may be strained before hav-

ing a chance to cool. In spite of these efforts, in winter, the temperature will fall to about 90 degrees. We add warm water (not scalding) to raise the temperature to 100 degrees. Prof. Robertson gives as a reason for so doing: "It washes off the fibrine, caseine and albumen which accumulate on the fat globules and permits them to rise more rapidly through the milk. Cream from milk thus treated will also churn more rapidly than cream in which these other substances remain." Our reason for adding the water was to procure all the cream. The cans are then submerged in ice-water. The greater the number of degrees through which milk falls while cream is rising, the more perfectly does it rise.

Wishing to ascertain if we were getting all the cream, we took, some of the skimmed milk, after having been treated in this way, and warmed it again to 102° and re-set it, to obtain the rest of the cream if any should remain in the milk; but not a particle was to be seen.

**Ripening the Cream.**—The cream is kept at a low temperature until enough is obtained for a churning, then all ripened together. This is done by warming to 60° in the morning and letting it remain at a temperature of about 70° through the day, and the following morning it is ready to churn. The degree of ripeness is indicated by moderate sourness. To mix sweet cream with sour before churning is a mistake, for the sweet cream will not churn in the same length of time as the sour, and what butter the sweet cream contains will be left in the buttermilk.

Warming the cream as mentioned is a sufficient "starter," and the cheapest to be obtained.

"New Fangled" Articles.—I believe we are through investing in new fangled articles until knowing something of their good qualities through some one who has sufficiently tested them besides the inventor, and I know of no better place for these experiments to be tried than at the Experiment Station, where those in charge are paid for services and are unprejudiced in decisions. We have had some experience in this line, hence the advice. Being desirous to learn just the good or poor qualities of our cows, we invested in apparatus. Not being successful at first, I wrote to the parties of whom it had been purchased, received more minute directions and tried again. Everything worked well, and, according to the test, it required 200 lbs. of milk to make  $5\frac{1}{2}$  lbs. of butter; or 36 4-11 lbs. for 1 pound of butter. We were sure this could not be correct. We then set the milk of the two cows we had been trying to test, to ascertain how much it really did require, and it took 25 lbs. of milk for a pound of butter.

**Churning the Cream.**—The cream is churned at a temperature of  $66^{\circ}$  in winter and  $62^{\circ}$  in summer. The use of a thermometer is all important, that we may be accurate in the temperature. Perhaps some will inquire: "Why be so minute in the small particulars?" Well, it is usually the case that the smallest things are those that perplex us most. Your butter might have brought the highest price had it all been colored alike, but as the tryer is withdrawn it displays yellow, yellower, yellowest, and on that account you lost from 5 to 10 cents per pound. Now, had the same amount been churned each time, and the color dropped instead of being measured in a spoon, the "gilt" would all have been

the same shade. So the rule proves itself that it pays to look well after small things. When color is used, it should be added when the cream is ready to churn. When the cream has been churned until the butter begins to separate, which is readily detected by the welcome sound, reduce the temperature to  $60$  degrees by adding cold water, which will also serve to thin the buttermilk. Then churn a little more until the buttermilk will run off free from butter and still leave the butter in small granules. Next wash in weak brine, then in clear water until the buttermilk is washed out.

**Salting the Butter.**—Now leave to drain a few minutes and weigh salt, allowing  $1\frac{1}{2}$  oz. to the pound, more or less, as those wish for whom it is made;  $1\frac{3}{4}$  oz. is as we salt ours, for that is as our customers wish it. After the butter has drained, we salt it in the churn, revolving it a few times, then let it remain draining for about an hour, when the salt will be dissolved; then take it to the butter-worker and press out the brine by the use of the lever. We have tried the plan of discarding the worker, and at times it worked well, and at others left too much brine in the butter, while if placed upon the worker one can see just the condition it is in. We have no desire to sell our customers brine, as they can make it cheaper if they wish it, and we have the consciousness of selling the genuine article.

**Packing — Marketing.**—After this process, we pack in tubs which have been soaked first in scalding brine then in clear water and afterward rubbed with salt, and the "gilt-edged" butter is ready for market. This method of making butter has given perfect satisfaction to our customers whom we have supplied a number of years; have lost but two, and this was on account of price;

they wanted cheaper butter. After considerable experience with commission houses, we have concluded the less we have to do with them the better, and find it much more gratifying to send directly to "gilt-edged" people who know and appreciate a good article when they get it.

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## HOW TO MAKE AN INCUBATOR.

By F. E. PARSONS, Lake Mills, Wis.

**Artificial Incubation.**—Although the hatching of eggs by artificial means has been proved a success by many people, there are still incredulous ones who fear the undertaking, chiefly because some one with whom they are acquainted has made the attempt and failed. It is generally admitted that if artificial incubation can be made successful it will be a source of profit to the poultry raiser, and as this question has long since been settled by successful poulterers we need spend no time in discussing the feasibility of the process, but devote it to the more profitable task of explaining the process, and in setting forth briefly the manner of its application. All that is needed to hatch eggs in the number of days allotted to the process by nature is to give them the correct number of degrees of heat, with proper airing for that number of days.

**Mode of Construction.**—Failing to reach success by the use of a highly recommended *incubator*, I took upon myself the task of inventing one, so that, if possible, I might prove the feasibility of the process. For the purpose of this, I secured a sound dry-goods box, with matched joints, three feet long, thirty inches deep, and thirty inches wide. I removed the cover, stood the box on end, with open side to the front. I then passed through it, from side to side, four half-

inch iron rods, equal distance from each other, as a resting place for a sheet-iron floor. These rods were eighteen inches from the bottom of the box, which, for safety, was lined with tin up to about two inches above the rods. The sheet-iron floor was cut to exactly fill the box, thus dividing it into an upper and lower room. One-fourth of an inch from the edge of this floor I punched half-inch holes, four on each side, and in the middle I cut a six-inch round hole. The lower room was intended for the heating lamp, and the upper one for the nest. I made the nest box two inches smaller than the inside measurement of the large box, and high enough to reach from the floor to within one inch of the top of the main box. The top of the nest was covered with a wooden top large enough to touch the main box on all sides, thus projecting over the nest one inch all around. To this nest I put no bottom floor, and left the front open except four inches at the bottom. I then procured at the tinner's a galvanized-iron tank four inches deep, just large enough to fill the inside measurement of the nest, so that when the nest was placed over it, both could be set upon the sheet-iron floor of the main box, and the tank be exposed to the heat from the lamp below. To close the open part of the nest in front, I



hung a door to the four inch piece in front of the tank, with a spring bolt to hold it at the top when closed. In this door I placed a window 6x3 inches, back of which was a thermometer, inside the nest, by which I could tell the degrees of heat at any time without opening the nest. Inside the nest, on the right and left were cleats, five inches apart, on which the egg-rack rested. In the top of the tank there were eight quarter-inch holes for the escape of vapor upward among the eggs, and one at the front top,  $\frac{3}{4}$  of an inch in size, for the purpose of filling the tank. I closed the front of the outer box with two doors; one hung at the side for the bottom room and one hung at its bottom edge, on a level with the top of the tank, held in place when closed by a spring bolt. In the cover of the nest-box there were half-inch holes, corresponding with those in the sheet-iron floor below, and also a few quarter-inch holes over the eggs for the escape of heat and draft. In the top of the main box I cut a four-inch hole to act as a chimney, and in the bottom a few auger holes to secure a free circulation of air.

**Results.**—With this incubator I received a better return in healthy chicks than I received from the hens which were incubating at the same time. By repeated tests I found that 95 to 100 degrees of heat is best for success, and that twenty minutes airing and a complete turning of the eggs every day is absolutely necessary. I found that removing the eggs from the nest, and keeping the incubator closed during the airing of the eggs, is the best method, and that by having an extra egg-rack to lay over the filled racks, an entire rack of eggs could be turned at once by holding them tightly and turning them over with the hands.

**The Brooder.**—When the chicks are

hatched they should be removed to the brooder when dry and strong, and fed a little yolk of hard boiled egg mixed with bread soaked in milk and squeezed as dry as possible; a very little food at once, but given often, is the way to feed them. A good brooder should be high enough from the floor or ground to admit a lamp underneath and a free circulation of cool air under its floor, as chicks must have their backs kept warm, and their home must be always dry.

A brooder is a box long enough to contain a tank for water, the bottom of which should project below so as to come in contact with the heat of a lamp, and the top should be tightly covered so that the heated tank will keep it warm and dry; a part of the top should be glass. At four days old chicks should go out into a pen where they can scratch in fresh earth. The lamps can be small both in the incubator and brooder, and the food after three or four days can be bread, boiled potatoes, corn bread, dutch cheese, etc., with clean, fresh water always within reach for drink. Never let the chicks get wet or cold.

**The Egg-Racks and Tank.**—The egg-racks are frames one inch deep, with cross strips about an inch and a half apart beveled on both sides at top and level with the frame at bottom, covered below with wire screening nailed fast to both frame and cross strips. In the gutters between the strips the eggs are placed, and will remain firm in place when another frame or rack is placed upon it bottom upward for the purpose of turning the eggs. The tank described will heat about a pail of water which will last for months. The water should be put in hot (to save time), and kept hot with the lamp, so that in the nest 97 or 98 degrees of heat will be found steadily. Too much heat is death, but 103 degrees is safe. Too

much cold is also death, but occasionally at 90° will do no harm for a few moments.

**Poultry for Profit.**—To raise poultry for profit the incubator is a great helper, for it saves the time of the hens, enabling them to return more eggs, and the brooder properly made and managed is much better than the mother hen. With the same number of hens to furnish eggs, it is safe to say that twice the number of chicks can be raised by artificial incubation and brooding, than can be raised by using hens from among the layers as incubators

and brooders. There are a large number of people in the United States making fortunes raising poultry for market, and the most prosperous ones have discarded hens as incubators and brooders, and resorted to the artificial process which enables them to enlarge their business almost without limit. Breeders of fancy fowls, who charge fancy prices for their stock and two or three dollars for a dozen of eggs, quite generally disapprove of the artificial methods, but those who make it a business to raise poultry for food think highly of the new method.

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## LOOK AFTER THE BOY.

By MRS. CARRIE S. HOBART, Jackson County, Wis.

**Entitled to More Attention.**—The boy on the farm is entitled to more attention and consideration than he usually receives. It is a common thing to find, not only among farmers but among others, people laboring under the erroneous impression that a boy who is likely to remain on the farm needs very little education in preparation for his vocation, and that a very limited amount of brain is absolutely necessary.

It frequently happens, as Senator Howe once said, that the smartest of a family is sent to college to become a lawyer or physician, and the dullard is thought to be fit only for a farmer, when, if this order of procedure were only reversed, better results might be attained.

Too many boys, owing to a disinclination for school, are allowed to remain away, or obliged to do so that their time may be given to the farm; and this

just at an age when they are most capable of applying themselves to study. They ought to be *obliged* to remain till our schools can at least have an opportunity to teach them the value of an education, and so interest them in it that they will never be content with the little knowledge acquired there.

**Have Good Schools.**—Look to it, then, that your schools are what they should be. If they are not, investigate the matter with a view to finding out whether the teacher deserves all the blame, or if, perchance, some of it does not rest upon the shoulders of each individual of the district. Are you sure the teacher receives from you the sympathy and support necessary to make her efforts effective? Keep this thought with you—all the responsibility of the education of my children does not lie with the teacher. Never take your boy from school because he knows as much

as his teacher; just get one who knows a little more.

**Qualifications.**—Can a farmer know too much? Perhaps of some things; but he can not know too much concerning his own business. Does that signify much or little? I would not discourage a small boy thinking to become a tiller of the soil, by reading him a list, at the outset, of the requirements necessary to properly qualify him for the business. What are a few of them? A knowledge of chemistry, something of feeding, drainage and breeding; some knowledge of the structure of domestic animals, how to prevent and cure diseases common to them; political economy, an idea of mechanics. Even if he be a specialist, there are many things he ought to know aside from his line of work, in order to add to his comfort. In addition to all these, he must be careful, painstaking, methodical and practical. What do you think of the length of the list?

Now, the father ought to see that the boy acquires a knowledge of these subjects. What advantages does he give him for such acquirement? Usually the benefit of his own experience. Well and good, if the father is a successful farmer and takes pains to train the boy; but how many, on this basis, feel competent to train him?

**Actual Experience.**—Some farmers who might do much for their sons, are too content to let the boy profit by his example in so far as he may by merely assisting with the work. Too few there are who give them *actual experience*.

Even at the risk of small pecuniary loss, let the boy have either stock or land and be made to feel the loss or gain derived from the use of his capital. Don't give him a pig, sell it, pay him back with another pig, sell it, and so on,

for this I know to be most tantalizing treatment, and not at all calculated to inspire him with very great solicitude for the welfare of the third or fourth pig, at the least.

**Means of Information.**—If you are not as successful as you ought to be (I will not say as you want to be) where then will your boy turn for aid? To your neighbors? No, that won't do, for I take for granted you have yourself profited by their experience as much as possible.

Farm journals come next. Do you take one? If you do, are you in the habit of reading and discussing it with your boy? If you have found it a little hard to interest him in your journal, have you tried having it or another sent to his address? It is wonderful what a difference that will make sometimes. Try it; it is a cheap experiment.

Suppose you don't possess the paper and your excuse is, "can't afford it." Did you ever try going halves or quarters with a neighbor, to secure the necessary; or are you one of those we hear of occasionally, who "don't believe in book learning, 'taint practical?" If you are, play Yankee and "figger" out why it is that the lawyer, doctor, teacher and men of *every* profession, except your own, need journals devoted to their work, to enable them to keep abreast of the times.

Take for granted that you have these helps, but are not quite successful yet. Are there any other means of acquiring information? Can it be possible there is a farmer in Wisconsin who does not know of the Farmers' Institutes? Possibly, for it was not a great while ago that I heard a teacher, who had for years taught in the country schools of Jackson County, say she had been in several homes where there was not a paper of any description.

Do you know any who stay away from these institutes, through indifference—for instance farmers who think these institute conductors are *rich, big* farmers and that their experience can therefore be of no use to them? Has this class been here and tested the practicability or impracticability of the information given? I hope they will, at least, give these rich gentlemen credit for not being monopolists. Think of it—rich farmers who don't want to monopolize the knowledge for acquiring wealth! It is a wonder the country does not turn out from mere curiosity to see this rich anti-monopoly band.

Can there be any farmers here who are so interested in the work of the institutes that they leave "bub" at home both days to do the chores? Can it be the boy is deprived of the privilege of hearing these new ways for himself? And think what the youth misses by not being able to tell his friends about what "I saw and heard at the institute." If possible, bring him both days—at least let him come once.

Is this institute the last resort for information? No, thanks to our wide-awake university regents, we have the twelve weeks agricultural course at our State University. Every farmer ought to know what are the advantages of this course, the expense of taking it and, if possible, avail himself of the benefits it may afford. Then, there is the long course in agriculture that the State University offers. Look this up with a view of sending the boy there another year.

**Wisconsin's Advantages.**—The superior advantages offered by Wisconsin to her farmers are appreciated abroad. The London Live Stock Journal of England, commenting on our agricultural system, among other things, says: "Neither bad seasons, depression of trade nor a faulty fiscal system can possibly keep

down a people so intelligent as the inhabitants of Wisconsin prove themselves to be." We find Canada taking great interest in our methods, and sister States marveling at and inquiring for reasons of the success of our institutes. Gov. Hoard says that last winter he received over one hundred and fifty letters, from Eastern gentlemen, all of this tenor: "What is the price of land in Wisconsin? We read much about your institute work. We think it must be a *grand State* to send a boy to occupy a farm, where men can amass information like that for the good of the farmer." When these advantages are duly appreciated by a majority of our farmers, then will be the dawning of a brighter day for the Wisconsin boy, and *not* till then—for it is not to be expected that fathers will be likely to give their sons advantages which they, themselves, do not recognize the value of.

**The Boy's Pleasures.**—As to the boy's pleasures: Provide him with interesting games, but don't think your duty ends there—take part in them. If he likes fishing—and what boy does not—fix up and go on an excursion for a day or two with him. You will enjoy it yourself.

Try to so manage affairs that either in your company or alone he can visit places of interest in his county or State. Get up a load and go to town when there is an exceptionally good lecture or entertainment to be enjoyed. Let him have plenty of company. In fact, devise every means you can to make him feel that all the good times to be had in the world are not prohibited the farmer.

**Good Literature.**—Too much attention can not be given the matter of supplying him with good literature. Let him *own* good books and papers. With much of standard literature to be purchased for from 10 cents to \$1.00 a vol-

ume, there can be no excuse for any one being without plenty of good healthful reading matter. Of all things don't have in your homes a newspaper of the Police Gazette style, such as many of our dailies have grown to be.

**Public Matters.**—Never let the boy hear you say there is no use of a farmer giving public matters any attention; but endeavor to impress upon his mind the obligations imposed upon him by citizenship and the desirability of his doing it honor. If you feel called upon to tell him of the poisonous political atmosphere, at the same time emphasize the fact that it will never be purer if good men hold themselves aloof from politics.

**Worthy of Respect.**—The boy should be made to see that farmers are as worthy of respect as men of any other vocation, and if he has ambition in other lines than farming he stands about as good a chance of succeeding as though he were of the city. Let him know Socrates was a farmer, and author of an immortal philosophy; that Burns could compose a poem while plowing; and in familiarizing him with the lives

of Washington and Jefferson, do not forget they were farmers. Lastly, do not let your boys have occasion to describe their life with you as a Yankee once vividly described his. Said he:

"Father used to say, when I lived on the farm along with him: 'Sam,' says he, 'I vow I wish there was jist four hundred days in the year, for it's a plaguy sight too short for me. I can find as much work as all hands on us can do for three hundred and sixty-five days, and jist thirty-five days more if we had 'em. We hain't got a minit to spare; you must shell the corn and winner the grain at night, clean all up slick, or I guess we'll fall astarn, as sure as the Lord made Moses.' If he didn't keep us all at it, a drivin' away full chisel, the whole blessed time, it's a pity. There was no 'blowin' time' there, you may depend. We plowed all the fall for dear life; in winter we threshed, made and mended tools, went to market and mill, and got out our firewood and rails. As soon as frost was gone, came sowin' and plantin', weedin' and hoein'; then harvest and spreadin' compost; then gatherin' manure, fencin' and ditchin'; and then turn tu and fall plowin' ag'in. It all went round like a wheel without stoppin', and so fast, I guess you couldn't see the spokes, just one long everlastin' stroke from July to eternity, without time to look back on the tracks."

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## SHALL I BUILD A SILO ?

By L. H. ADAMS, Wisconsin Experiment Station, Madison, Wis.

**The Silo a Success in Wisconsin.**—Shall I build a silo? is a constantly recurring question, and one that every year's experience, with drouth and early frost, is intensifying and bringing out in greater numbers.

The system of preserving feed by means of the silo has been in practical operation in Wisconsin nearly ten years,

and is, therefore, reaching an age which should enable it to speak for itself. Nearly every farming community in the southern part of the State now has a silo in or near it, which makes it possible for those who are considering the question of building, to study and familiarize themselves with the entire process, from that of filling to feeding

out, before undertaking the work, and they are, therefore, not called upon to exercise that degree of faith in the new departure that was required of the pioneers, who could do nothing but follow directions blindly.

**Some Causes of Failure.**—It is a significant fact that the men who have had the most experience in the construction and filling of silos speak favorably of them, while the objections come mainly from the persons who have never had anything to do with them. It is true that a great many made partial failure the first time they filled their silos, but in nearly every case it would be admitted that the difficulty was owing to faulty construction, or improper methods of harvesting and filling, and could be easily remedied the next time the silo was filled.

Experience has taught us how to improve the quality of our ensilage, by taking the corn at the proper stage of maturity, as well as the best manner of feeding; so that the objections urged against it in its early history—first, that it caused the animal fed upon it to scour, and, second, that it gave the milk from cows kept on ensilage a bad flavor—have been nearly, if not quite, overcome. It should be remembered that there is no single food that would give entire satisfaction if fed exclusively, and, therefore, the silo should not be held to account for our own ignorance of the proper use to make of it in order to obtain the best results.

**Value of Succulent Food.**—It is conceded by all intelligent and acknowledged authorities on cattle feeding, that one feed a day through the long winter months of some succulent food of the nature of roots is very desirable, if not absolutely necessary, to the proper assimilation of the mass of roughage and concentrated grain feed that is to be con-

verted into beef and dairy products, and to maintain the health and spirits of the animal. For this purpose there is nothing that will compare with the silo for practicability or economy. This point of excellence is conceded to ensilage by writers who oppose the general adoption of the silo system on the ground of excessive cost; but the cost of this system of preserving feed is not excessive when all the advantages made possible by the silo are compared with the wasteful and unsatisfactory manner in which we are obliged, by force of circumstances, to handle air-dried fodder that has been put up in stacks, or, more likely, left shocked in the field. Some one may ask: "Why leave the shocks in the field; why not stack the fodder, or, better still, mow it away in the barn?" To which I answer that the latest and most comprehensive views taken of our greatest forage crop, and chief dependence—corn—will not allow of its being grown in the same manner, or harvested at the advanced stage of maturity, that is necessary to its successful preservation in large masses, either in stack or barn. Instead of growing a crop of corn at the same outlay of labor, for the ear alone, as formerly, we are coming to prize the stalk equally with the ear, and steadily acquiring better knowledge of the proper time to harvest, in order to combine the maximum nutriment in the ear and stalk.

**An Important Factor.**—There is another economical factor of great importance that is seldom credited to the silo. where it properly belongs, and should always be considered in connection with the cost of filling the silo, and that is the reduced labor necessary to take care of a herd of cattle throughout the winter where the feeding is done from a silo that is conveniently located in or very near the stock barn. One man

will care for fifty head of cattle with less exertion and unpleasant experience with a silo near-by, than two men will the same number where it is necessary to haul the dry fodder in from the stack, or get it down from a distant mow and run it through a feed cutter. As it is impossible to keep a very large quantity of cut fodder in a mass, without its heating and becoming moldy, it is necessary that the work of cutting the stalks be done at intervals of two or three days throughout the entire winter. The consequent delay of hitching up and unhitching teams, bad weather and extra power required for cutting the dry as compared to green stalks, will carry the cost of cutting in the winter far beyond what it would be in the fall in the continuous work of filling the silo, with fair weather and all necessary facilities at hand for rushing the work. If, then, we offset the expense of cutting the dry fodder in the winter with that of cutting the green corn into the silo, the comparative cost of the two systems of preserving feed turn on the losses of dry feeding matter that each have to sustain; or, to put it in another way, will the silo save enough feeding matter over the air-dried system to pay interest on the money invested in the building?

**Loss of Dry Feeding Matter.**—Taking the latest data obtained at the Wisconsin Experiment Station, by Prof. F. G. Short, on this subject, we find the average loss of dry feeding matter for a series of silos during the winter of 1888 and 89 was 15.94 per cent., while that of the same varieties of corn cut at the same time and given extra careful attention was 16.54 per cent., a difference of nearly one per cent. in favor of the silo, and it should be distinctly remembered that the air-dried fodder that gave these results received extraordinary treatment, and the fall was very fav-

orable for preserving it nicely. It was allowed to stand in small shocks for a month after cutting, then lifted to the top floor of the barn, stood up carefully and examined frequently, to see that it did not heat or mold, which it was not allowed to do.

The ensilage, on the other hand, was preserved in silos 7×8 feet across and 14 feet deep. It will be readily seen that we had to contend with just as much loss in the four corners of these small silos as though the dimensions were three times as great, and, further, ensilage will not pack as readily in a very small silo as it will in a large one. It is plain, therefore, that while it would be a comparatively easy matter to duplicate the results we obtained with the silos, it would be extremely uncertain (and under the conditions that prevail on the average farm absolutely impossible) to preserve fodder in the dry state with as little loss as that found by the chemist at the Experiment Station.

**Silo Building Pays.**—I conclude, therefore, after ignoring the many other meritorious features of the silo, and assuming that properly-made ensilage is no better feed for stock in the winter than dry corn-stalks, that the mere saving of roughage and land necessary to keep a given number of animals will be sufficient to return a handsome interest on the money invested in the silo building.

**Directions for Building.**—I wish the reader to understand that the following directions for the building of silos are not offered as the best and only way of proceeding, but rather as one of the ways by which it can be done. It is not only unwise, but an actual hindrance to progress for any one to attempt to give definite and *fixed* directions, for we are constantly learning more and more, and have much yet to learn on the subject of

silos and ensilage that calls for modifications here and there in the details of construction and filling.

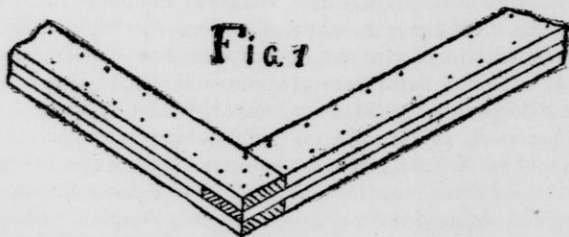
**Location.**—When possible the silo should be located in the feeding barn, since it not only brings the cost of building within the reach of everyone who is really in need of a silo, but greatly facilitates the handling of the ensilage when feeding it out. Depth in a silo is always preferable to breadth, so that in the case of basement barns it is advisable to let the silo reach from top of barn posts to the ground floor of the basement; a door or opening can then be made from the silo directly into the basement where the ensilage is to be fed. The next best location is adjoining the feeding stable. In most dairy stables the cows are stanchioned in two long rows facing each other, and, whenever it is possible, it should be arranged so that the silo can be entered from the end of this feeding alley; a wooden track can be laid along the center of the feed way and into the silo, upon which a low wheeled car can be operated to distribute the feed. If the silo building is located entirely separate, it should be planned to load the ensilage into a cart which can be driven into the feeding barn, thus delivering the ensilage with little labor directly to the cattle. The idea of convenience should not be lost sight of, for by exercising a little thought and judgment the labor of wait-

ing on the stock through the long feeding season can be greatly reduced.

**Form.**—In a square silo less lumber is required, and less ensilage is exposed to the walls in proportion to the capacity, than in a long narrow building; it is the part of economy to retain as nearly the form of a cube as the location and other circumstances will admit. Theoretically a circular silo comes the nearest to perfection, for this form requires the minimum amount of material, and does away with the corners, in which there is always more or less decayed ensilage, but as we have had no experience with this form of building, nothing can be said about it at this time.

**Building.**—The following detailed description of how to build will apply to the outside silo, built separately or as an annex to the stock barn.

It is always the part of wisdom to provide substantial foundations for farm buildings that are intended to be permanent, and the silo is no exception. An eighteen inch stone wall should be laid deep enough in the ground to be beyond the action of frost, and raised high enough above the surface to admit of sufficient grading to divert all surface water; if the location be a high and well drained one, there will be no necessity for raising the wall more than six inches above the surface. In digging the trenches, throw enough earth inside to raise the silo floor up to the

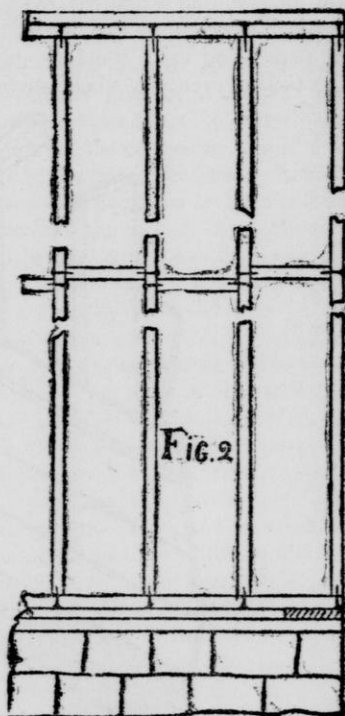


SHOWING HOW PLANKS OF SILL ARE JOINED.



top of the stone wall. Upon this stone foundation a sill made of three  $2 \times 10$  planks should be bedded in mortar (see fig. 1). In laying the sill the top plank should not be fastened to the others, but left loose for reasons soon to appear. The studding should be  $2 \times 10$  plank, preferably 18 feet long. After carefully sawing the studs to a uniform length and squaring both ends, arrange them in a horizontal position, resting on the edges, and placed sixteen inches apart; they should be supported on a level with and at right angles to the sill upon which the bent is to be raised. Then spike the loose plank of the sill to the foot of the stud; and when all have been firmly fastened, as directed, they should be secured at the top in the same manner. After fastening the studding to sill and plate-planks, the side or end, as the case may be, is ready for raising. After the bent has been raised in a vertical position to its place on top of the other two planks of the sill, the third one that was nailed to the foot of the studding before the bent was raised can be firmly spiked to the lower ones. This first bent can be held in place by temporary stays until the remaining sills are raised; the plates can then be nailed at the corners, and the skeleton frame is complete; two  $2 \times 10$  planks will give all the strength necessary for the plate. It will be observed that by following this plan the studs are securely fastened, top and bottom, and the full strength of sill and studding is saved, there being no mortises cut in the sill and no tenons on the studding. After the frame is up, the next thing to be done is to bridge the studding (see fig 2). This is a very simple thing to do, but of so much value in strengthening the walls that it ought never to be omitted in a silo. In case the silo is 18 feet deep, it would be advisable to put in two rows

of bridging. By thus spiking planks between the studs, it makes it just as impossible for the studs in the center of the wall to spring out as it is for those nearest the corners. We are now ready to commence lining the silo. Each one can follow his choice as to the outside covering, since it plays an important part in the preservation of the ensilage; some will prefer to use drop-siding or ship-lap, others common lumber, and in some parts of the State it is possible to put on a covering of low-grade shingles cheaper than any other way. It is not necessary, for the preservation of the ensilage, that paper be used on the outside of studding, but to keep out the frost it is advisable to use it, since it



SHOWING FASTENING AND BRIDGING OF STUDDING.

makes the silo much warmer. Since a good deal of moisture rises from the ensilage, it is well to provide for ventilation at the roof. This can be done by openings in the gable ends of the building, or a dormer window in the roof. It is much better to carry off the moist air by ventilation than to have it congeal on the rafters during cold weather, and drop back again when mild days come.

**Lining.**—Care should be exercised in lining the silo. The lumber for this should have no knot holes, and should be dressed on one side, and is better if edged so that the joints will be reasonably tight. The lumber need not be of uniform width, but boards from eight to ten inches wide are preferable. The inside of the studding is first covered with boards, laid horizontally (see fig. 3), ten penny nails being used; building paper is then tacked over the whole surface.

Upon the paper nail a second layer of boards. Care should be taken to break joints, which can be indicated by chalk marks on the paper. This double lining, with paper between, must reach from the top of the silo to the bottom of the sill.

The floor of the silo need be nothing but the earth. As already mentioned, it is a good plan to fill in the silo until the floor is on a level with the top of the stone wall; a layer of straw spread on the bottom before commencing to fill with corn will prevent the loss of any ensilage.

The silo should be tied across the top at two or three places with joists, or a cheap cable; this latter may be made by twisting three strands of galvanized wire which costs about three cents per pound; five pounds will make a cable sufficiently long to reach across an ordinary silo.

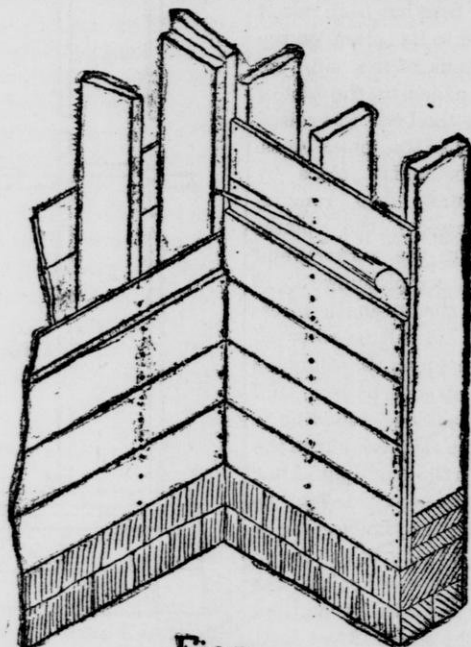


FIG. 3

SHOWING DOUBLE-BOARDING ON INSIDE OF SILO.

If the silo is more than thirty feet long the sills should be secured at two or three places with a cable of this kind, which, as it rests on the ground, is entirely out of the way. The modern silo will not tolerate partitions of any kind; they are relics of the past. There are several methods employed for cutting off the four corners of the silo. Perhaps the simplest plan is to bevel the two edges of a foot wide plank and nail it securely in a vertical position in the corner, and fill the space back of it carefully with sawdust or chaff closely packed. A dormer window in the roof of the silo affords a satisfactory means of getting the corn into the silo in the fall.

The doorway may be formed by cutting out a stud from the sill two-thirds of the way up to the plate. With large silos the doorway should be made sufficiently large to permit the entrance of a cart or some other vehicle for moving the ensilage from the silo to the cattle. There is no necessity for running the doorway to the top of the plate, since the ensilage always settles considerably, and even if it fills the silo above the top of the doorway there is little trouble in digging down just at that point and making an opening. Of the numerous doorways described, the simplest form is probably the best. Tack cleats on each of the studs which forms the sides of the doorway, so that boards six inches wide, running across the doorway come just flush with the inner lining of the silo. If the doorway is wide, set a stud in the middle to prevent the boards springing. Repeat the cleat and boards for the outside wall. During filling, as the ensilage accumulates, place a layer of paper across from cleat to cleat and tack on six inch boards until the doorway is closed; or it may be closed up at once when filling commences and the silo entered by a ladder reaching a doorway

on top of the plate. In opening the silo the boards can be knocked off as the ensilage is fed down.

**Paint the Inside Walls.** — Now that the silo is built the question naturally arises, what is the best and cheapest wood preservative that can be applied to the parts of the silo that come in direct contact with the moist ensilage. An examination of one of the Station's silos that had been treated with a coat of coal-tar shows that one season's exposure to the ensilage had not affected the wood in any manner. The coal-tar possesses another great advantage over ordinary oil paints, there being so much body to it that it readily fills up all cracks in the lining, and aids greatly to make the silo air tight. It is one of the waste products in the manufacture of gas, and can ordinarily be obtained in any quantity at the gas works at three or four dollars a barrel. As it comes from the gas works it is a liquid of about the same consistency as molasses, and it is necessary to burn off considerable of the oil that it contains before it is in a condition to apply to a wall. This burning is a simple process: Pour a quantity of liquid into an iron kettle, set fire to a handful of straw and throw it into the kettle. The tar at once flashes up and burns with great heat. In order to tell when it has become sufficiently reduced, thrust a stick into the blazing kettle, then take it out and plunge it into a pail of cold water. When the tar clinging to the stick has become sufficiently cool to handle, take a particle in the hand and pull it out; if it will string out in fine threads a foot or more long, it has burned long enough, and the fire can be put out by placing any tight covering over the kettle. It usually takes from one-half to three-quarters of an hour to reduce the tar to the proper consistency. This prepara-

tion must be applied hot, and it will be necessary to swing the kettle up from the ground, and keep a fire under it until the work is done. The odor and smoke from the hot tar is very disagreeable, but by taking small quantities of the liquid and applying it very hot with mops or whitewash brushes, the surface can be gone over rapidly.

A single season's experience with a wood preservative cannot count for much, but we think very favorably of the method here described, and intend coating the walls of a large silo with coal tar the coming season for an additional test.

**Handling Fodder Corn.**—The cost of putting corn into the silo depends largely upon the advantage we take of all the little contrivances that are calculated to lighten and reduce the labor of harvesting and drawing to the silo. By the use of the old self-rake reaper for cutting in the field, and conveniently equipped wagons for hauling, corn can be cut into the silo for from fifty to seventy-five cents per ton, and there will be no more hard work connected with it than there would be in harvesting a clover or grass crop. Many farms are supplied with low-wheeled wagons or trucks, but when silo-filling time comes there is usually a greater demand for vehicles of this kind than the ordinary farm can supply. A very simple and practical way of equipping the ordinary high-wheeled wagon is shown in fig. 4.

This rack was observed in use on the farm of Hon. Hiram Smith, of Sheboygan Falls, in the fall of 1888. It is made of 2×8 plank, 16 feet long, one end of each being placed on top of the forward bolster; the other ends pass under the rear axle and are chained or bolted up tight to it. These two pieces make the foundation of the rack. The wagon is coupled out as far as these planks will allow.

On top of the plank are placed four cross pieces equally distant from each other, as shown in the figure. These cross pieces are 2×4 and should be about 7 feet long; upon these are laid inch boards parallel with the wagon. The load is, of course, placed wholly in front of the rear wheels, but the rack is sufficiently large, and low enough to enable a man to put on a ton of green corn from the ground without having to climb up on the load, or hand it to a second person to deposit.

**Length to Cut.**—While it is true that ensilage cut fine may pack somewhat closer than that cut long, it is doubtful whether there is any material gain in the operation; by cutting fine more of the inner parts of the stalks are exposed to the air, and perhaps more fermentation induced than with longer cuts. So far as our experience goes, there is nothing gained by cutting fodder fine instead of coarse, provided that the cattle eat it equally well in both cases; the gain in cutting, which is often

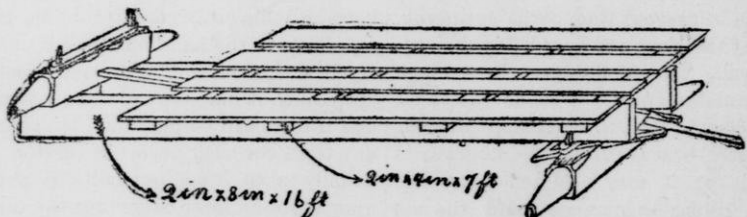


Fig. 4. RACK FOR DRAWING FODDER CORN.

very great, comes mainly from getting consumed that which would otherwise be wasted. In the case of ensilage, there being no necessity for cutting the fodder in order to have it eaten, the length of the cut appears to turn upon somewhat closer packing, on the one side, and extra expense of fine cutting on the other. It is recommended that cuts as long as two or three inches be tried with some of the fodder and the results reported; if such long cuts are satisfactory the expense of making ensilage will be considerably decreased. With ample power and a good feed cutter it will be more economical to cut fodder and run it into the silo by a carrier than to attempt to fill with long fodder.

**Use of a Chute.**—The carrier should deliver the cut corn as near the middle of the pit as possible. Until the silo is nearly filled a chute can be used to convey the ensilage still further toward the desired position in the pit. The chute should have sufficient slant so that the cut corn slides off readily. By changing the direction of the chute from time to time the labor of distributing the cut corn can be reduced to the minimum.

**Filling the Silo.**—When corn has reached the proper stage of maturity, it is not necessary that it be wilted before putting into the silo in order to make the so-called sweet ensilage; only the immature fodder needs wilting. Such should be wilted from 24 to 48 hours, if possible, before cutting into the silo. Varieties that mature, if left until the ears begin to glaze, can be put into the silo immediately after being cut, with satisfactory results, provided there is no outside moisture on the corn as it goes into the silo, nor is it necessary to suspend operations every day in order to let the ensilage in the silo reach a certain temperature before filling can be continued. If the corn is sufficiently ma-

ture, and is put into the silo without rain or dew, there need be no fear about the quality of the ensilage, whether put in slowly or rapidly. At the Station last fall we filled a pit with fresh, sufficiently matured corn in one day, and had first-class sweet ensilage. Recent experience has taught that there is a limit to putting dry or excessively wilted corn into the silo, beyond which we dare not go. When the corn has lost enough water to cause the leaves to rustle and break in handling, it does not pack closely enough in the silo to exclude the air, and, in opening the pit, it will be found that the ensilage is fire fanged and permeated all through with a white mold. There is another reason why the corn should not be allowed to become so dry, even if there was no trouble about its keeping in the silo; when we put dry corn into the silo we have lost the succulent feature of the ensilage that makes it especially desirable. Having once commenced to fill the silo the work can be crowded right along by observing the conditions mentioned.

The practice, each morning during filling, of removing the cold ensilage from along the walls and corners, and substituting that which is warm from the middle of the mass, seems a reasonable one and worthy of further trial. That it is not essential, however, to good sweet ensilage, our own experience has proved.

In the case of an accident or breakdown it will do no harm to suspend work for a day or two, but if left longer than this the ensilage, to a depth of two or three inches, usually begins to mold. When filling is completed a foot and one half of chaffed straw, marsh hay or corn-stalks will make a sufficient covering. The use of weights is now about obsolete. The silo should be examined daily for a couple of weeks, and the cov-

ering pressed down until the settling has ceased.

**Two Crops in the Same Silo.**—The question is often asked if one crop can be placed on top of another in the silo, provided that the first has only partially filled it? Most certainly, if one crop, as clover, for example, only partly fills the silo. When the corn crop has matured, the covering of the clover can be removed or left on as desired and the other crop placed on top of it. By filling at different times much more can be got into the silo than if a single crop is placed therein by rapid filling. Even with the slow filling, ensilage settles considerably after the silo is closed up; with very rapid filling it may settle as much as two-fifths or one-half. Under any system it is well to allow two or three days settling at the last and filling up again so as to get in all the feed possible.

**Clover Ensilage.**—Too much cannot be said in favor of clover for the silo. There has been considerable hesitation about preserving clover in this way: chiefly perhaps, on account of the extremely offensive ensilage which resulted from some of the first experiments in ensiling clover. As in the case of the first corn ensilage, the clover was put into the silo in a watery and immature condition. The result was a watery ensilage of very offensive odor. By allowing the clover to become more mature, and cutting it when the dew is off, it is found that a bright, sweet, palatable ensilage can be made. One of the silos at the Station was filled in the summer of 1888. The

clover was first growth, and owing to the drouth had become rather woody. The only precautions taken were to see that the dew was dried off before cutting, and that, in filling, the clover was evenly distributed, and well tramped down in the corners and along the sides. The silo was filled rapidly and immediately covered. On opening the silo the contents were found to be well preserved, with a slight aromatic odor, and but a trace of acidity. It was eagerly eaten by the cattle, and formed a valuable addition to their rations.

Profitable farming cannot be carried on without the help of this wonderful plant; we all know how difficult it is to cure into hay and get it just right, but by putting it in the silo the risk and expense of handling the crop is greatly reduced. Sunny days are not essential when putting clover into the silo. The mower can be started as soon as the dew has dried off in the morning, and by noon enough will be cut to keep two men with a team and wagon busy all the afternoon hauling the fresh cut clover and placing it in the silo. It is not necessary, in putting clover into the silo to run it through a cutting machine, so that the expense of filling a silo with this crop is very light. To those who appreciate the advantage of having a succulent food in the winter, and are willing to incur the expense of building a silo, but are restrained by the cost of the machinery necessary for reducing and elevating corn, we would say, build a silo and fill it with clover.

## HOW I BECAME A DAIRY FARMER.

By C. P. GOODRICH, Ft. Atkinson, Wis.

**The Key to Success.**—On looking about me, I discovered that of the great mass of those who were keeping cows the majority were keeping them for very small pay, and some at a positive loss, while a few were making a success of the business, and not only were enriching their farms but also filling their pockets. I noticed that the successful ones were the ones who had made the business a study; had learned all they could about it and attended strictly to all the minute details. No man need think of succeeding in keeping cows unless he is willing to give his attention to it, and care at least as much for the comfort of his cows as he does for his own comfort. He can't turn his cows out of the barn in the morning, go to town, and, because a snow-storm begins, stay there until night, awaiting for the storm to cease, and then when he gets home, cold and hungry, warm himself and eat his supper while his cows are shivering out-of-doors. If his conscience will let him do that he is no man for dairying.

**Seeking Information.**—Although I had milked cows and had the care of them, to some extent, since my boyhood, I found I was very ignorant on many of the most important points. I set myself the task of learning the business. I went to reading everything I could get on the subject, attended dairy conventions; talked with and learned much from those who were successful; obtained the results of experiments made by others, and experimented some myself. My progress was slow, but I kept learning. I improved my cows by care and

selection in breeding, and by better feeding; I learned something of how to handle the milk and how to make and market butter.

At first the yearly earnings of my cows were but little more than the cost of their feed, leaving but little for the labor. But there was a gradual improvement each year, until now, after allowing a good price for the feed and labor, I have a good profit. Besides, *my land is growing richer all the time*, and I hope I am not done yet. I have not learned it all by a long way. I firmly believe that if I continue in the business I shall still further increase my profits. One thing is certain, that if I am to hold my own I must keep learning—must keep up with the times—or, in this age of progress, I shall be left behind.

**Some Things I Have Learned.**—First, as to the kind of cows we must have for the production of milk: We must have those that have been bred and reared for that purpose. Among our common cows—they are a mixture of many different breeds—we may find some good dairy animals, and with such to start with, one may, by careful breeding and raising the heifers from only the best cows, and by *feeding* for milk, and milking and handling in a way to stimulate the greatest production of rich milk, obtain a herd, in time, having a fixed character as milk producers. It will be found that the longer this course is pursued, if in the selection regard is only had for performance at the pail, the further the type will be from the beef type. But why not start out with some one of the ~~muzz~~

breeds, that have been bred and used for generations exclusively for the production of milk, rather than spend a lifetime to create such a breed? Better by far to start at once with some animals of some one of the best milking breeds—Jerseys, Guernseys, Holsteins, or perhaps some other breed. I don't wish to advocate the claims of *any* particular breed, only that they must have a good milking record for generations back.

**The General-Purpose Cow.**—I used to believe somewhat in the general-purpose cow; believed it might be possible to raise such an animal, so many men said it was. I had graded up to some extent with Jerseys. They did well in giving milk but they were so small and scrawny, I did not feel satisfied. I did so like to see a good, large, smooth, square-built cow, that in an evil hour I determined to cross back to the Shorthorns to see if I could not produce larger and more beefy animals and still retain the milking qualities. I obtained an animal of what was said to be a remarkable milking family of that breed. The first year I raised seven heifer calves from my best cows. They were beauties, according to my idea then, and it would have taken a great deal of money to have bought them. I thought I had just struck it. Some of them came in before they were two years old. One of their calves I wished to make veal of, and it took two of the heifers to give milk enough to fatten him, and then he did not seem to have all he wanted. I fed them higher to try to stimulate them to give more milk, but it was of no use. After they had given milk two months I sold them for beef at \$4.50 per hundred, and they weighed nearly 900 pounds each at just two years old. They had not given milk enough to prevent their laying on flesh fast. Well,

they all, with one exception, turned out about the same, and they had to go.

I had another crop of heifers of the same kind that came in the next year, and they turned out about the same. There were just two out of both lots of heifers that proved worth keeping for milk, and they were both calves of a grade Jersey cow who seemed to have the power of stamping her progeny with her own qualities, both as to color and form and milk production. Now, this happened only four years ago and it has served to completely knock the general-purpose idea out of my head.

**Feeding for Milk.**—Whatever is produced by any animal comes from its food. It is plain that if we wish to produce milk, the food must contain all the component elements of milk, and to produce milk in the greatest possible quantity from a given animal, these elements must be in their just proportions and be fed in quantities up to the full capacity of the animal's digestion and milk-producing machinery. The chemist steps in now and, by analyzing different kinds of food, formulates a ration which, in his judgment, will produce the desired result. His work may be a great help to us by enabling us to experiment understandingly, but it takes practical experience to determine the correctness of his theories; for the appetite of the cow, her likes and dislikes, her ability to digest and assimilate certain kind of food in certain forms and under certain circumstances must all be determined by experiment. Another thing of the utmost importance to the dairyman is the relation of the cost of food to the value of the product. The proper elements of food must be obtained at the least possible cost in money and labor to make the business profitable.

**Variety of Food.**—I believe the cow herself to be a pretty good chemist, and



that nature will prompt her to select her proper food if she has opportunity. Therefore she should have as great a variety of food, both winter and summer, as possible. That she loves a variety could scarcely escape the notice of the most careless. If her pasture is all clover, except a little June grass, or prairie grass in the fence corners, see how closely the fence corners are gnawed down while the clover grows up tall and rank. If, on the other hand, her pasture contains but a small patch of clover, see how much closer that is fed down than the rest of the pasture. If, in winter, she is fed but for a short time exclusively on one kind of hay, no matter how good the quality, see how quickly she will leave it when offered some other kind — corn-fodder, or even straw,—and how greedily she will eat of the new kind of fodder, though its quality may not be of the best. Some otherwise sensible men signally fail in keeping cows, especially in winter, by not gratifying this very natural desire for variety. At pasture they have a better opportunity to obtain a variety.

Not long since I visited a farmer who keeps a large stock of cattle, some of them blooded stock, and he tries to farm it so as to make money. He casually remarked that he had fed no hay yet, although it was the last of December. He said he always fed his cornstalks first so as to get them out of the way before they were covered deep with snow. Next he fed his marsh hay, and when that was gone he fed his timothy hay. He liked to keep that till spring. He then remarked: "Somehow nuther I never could git nothin' like what you fellers tell o' gettin' out o' cows in winter, and still I've fed 'em lots o' corn-meal already." I thought, "no wonder," but said nothing. (I forgot to mention that his blooded stock were Holsteins, some

of which he paid \$200 and over apiece for.)

**Proper Quantity to Feed.**—The next question to be considered after having determined the kinds of food to be given and how to provide the necessary variety, is to determine the *quantity* it is the most profitable to feed. In my opinion, it should be the greatest quantity the cow will consume and properly digest and assimilate. Of course great care should be exercised in feeding animals that have been under-fed. Increase the quantity gradually, and at no time over-feed so as to injure the cow's digestion, for that would be ruinous. The best way is to accustom her to generous feeding while young, and *never* starve her.

It takes a certain amount of food to sustain life. It is said this is about two-thirds of a full ration. By full ration I suppose is meant all that the cow can consume and digest. Now, if just this food of support is given a cow each day in a year, there can be no growth, no increase in flesh, in fact, nothing produced. So that at the end of the year all you have is the same size of carcass, only it is a year older, and all the food and labor is worse than thrown away. If this view is correct, we cannot avoid the conclusion that the greater the amount of proper food that is consumed and digested above the food of support, the greater the ratio of the product to the whole amount of food consumed. You may say that all this is simply theory, but my own experience convinces me that it is a *correct* theory.

**My Dairy in 1875.**—The year 1875 was the first in which I kept any account of the proceeds of my dairy. That year my cows produced what was equal to about 150 lbs. of butter each, and the total proceeds were \$38 each. I kept my cows about as others who called

themselves good farmers did. They had good pasture, and gave a good quantity of milk while the grass was fresh, but shrank badly in the fall and dried up early in winter. I fed good hay and corn fodder, but little grain in winter. The cost of feed I estimated for the year at about \$25 each.

**My Dairy in 1876.**—The next year—1876—I fed better, feeding bran and grain during the fall and fore part of winter and early spring, and my cows produced 249 lbs. of butter each, and the total proceeds were \$77 each. I had produced about 100 lbs. more of butter per cow, and the increased cost of feed was not more than \$6 per cow. (Bran was cheap then.)

The next year I fed still better, with another increase in profits. I kept improving steadily, until now I intend to feed up to the full capacity of each cow; and I must say that, with every increase of feed, for every dollar laid out, I have got back *more than two dollars*. This, of course, would not be possible, if the cows were of the beef type and turned their food into flesh. In all my talk about high feeding I assume that the feed is to be given to a true dairy animal that will make it into rich milk.

**The Way I Feed**—My cows now is to let them have good pasture in summer, with a variety of grasses. At all times they have free access to good, pure water, which is warmed in winter. They have all the salt they want.

When they are put into milk, there is in the mangers some good early-cut-hay, of which they always eat a little, even when grass is the best. After milking they are fed bran. In the fall they have fodder-corn besides the other feed. During the winter they have all the clover hay (with sometimes meadow hay or millet), all the cut corn fodder and all the straw they will eat, with from 10

to 15 pounds of bran and meal per day. I drop off nearly all the grain ration about two months before calving, as I have found by continuing it too long there is more danger of milk fever. I think as good a grain ration as I can get, is one-half the weight wheat bran,  $\frac{1}{4}$  oats, ground, and  $\frac{1}{4}$  corn-meal; but if oats and corn are much higher than bran, they can be left out, and the whole weight be of bran, and be nearly if not quite as good.

**Increasing the Capacity for Milk.**—I do not wish to be understood as claiming that a cow can be brought up from 150 lbs. a year to 350 lbs. immediately as the result of better feeding. The improvement will be gradual, taking some years to reach the highest limit. Nor do I claim that the result in my case is *wholly* to be attributed to better feeding, though mainly so. Better handling and selection in breeding have done something toward the improvement. What I do claim is this—that the capacity of a cow for giving milk can, by the right kind of feeding and handling, be increased both as to quantity and richness in butter fat, from year to year, until she is at least 8 years old, and that a family or breed of cows, by the same means, can be so improved in this respect that each generation will be better than the preceding one, even without the introduction of any better blood. In other words, I will say that the more and the richer milk you manage to make a cow give, the more and richer milk she *can* give, as you develop the capacity to do so, and she will transmit these qualities, in some measure, to her progeny. Animal nature has the power to gradually adapt itself to its surroundings, and to the uses to which it is put.

**"Run-Out" Cows.**—As good care and

feeding will improve any breed, so starving and hard fare will cause the best breed in the world to degenerate. How often do we hear it said that the stock of certain men has "run out." A cow that has always been poorly fed, and is descended from poorly fed ancestors can not possibly be a good cow. Her ability to withstand hard fare may have been developed so that you may call her hardy, but it is at the expense of her milking qualities. Now, I don't want hardy cows in the sense that is generally understood.

**The Nervous Theory.**—A good dairy cow is a wonderfully delicate and sensitive piece of animal machinery. The brain and nervous system are so intimately connected with the milk-giving functions that whatever excites the nerves through the brain affects the milk, usually—but not always—lessening the quantity of milk, but *always* diminishing the per cent. of butter fat to a greater or less extent, according to the degree of excitement. This being the case, it is necessary that a cow to do her best must be *just as contented and happy* as it is possible to make her. She must not be exposed to storms or inclement weather, or any conditions that will give her discomfort or pain. She must have no anxiety in regard to food or drink, which should be given at regular times and in quantity and kind to suit her appetite and needs.

**The Milking.**—This I consider the most important operation in dairying. It should be done by the same person, in the same manner, and under the same circumstances every time. I care not whether you feed before, at the same time, or after you milk, if you do the same every time. I care not whether you take hold with the whole hand or strip with thumb and finger, or milk one side together, or milk diagonally, so

long as you do it in a way that will quickly get *all* the milk, and in a way that *best pleases the cow*, and so long as you do the same way every time. If there are several cows they must be milked in the same order every time. If you are in the habit of beginning at one end of the line and going through in regular order you will notice frequently, if the cows are giving a full flow of milk, about the time you get done with the first one the milk will begin to drop from the second one. She is then ready to be milked—expects to be milked. Do not disappoint her by going to the other end of the line. If you do so, and come back to her after half an hour, you will find that she will not "give down" as readily, and that you will very likely get less and poorer milk than if you had milked when her turn should have come.

You may sing or whistle while milking if you like, if you do the same every time. You may sing different tunes if you wish, but sing the same tune to each cow every time. If you sing "old hundred" to the "Yankee doodle" cow, your hands, which will be likely to keep time with the tune, will have a slower motion, your milking will be different, the cow not so well pleased and the yield of milk poorer.

**Effects of Excitement.**—Now, I know that some of you are saying to yourselves that you don't believe a word of such stuff, that it is all nonsense. Others are saying, "there may be something in what has been said, but this is getting down too fine." But you all know that it is the *fine* workman in any business who makes the most money and commands the highest wages; not the rough, coarse workman.

Every one who has been in the habit of testing the milk of cows has found an unaccountable variation from day to day in the per cent. of butter fat in the milk

of the same cow, and also that the butter churned from the milk of a herd of cows varies almost daily. In my opinion, these otherwise unaccountable variations are mainly caused by some worry or nervous excitement of the cows.

Now, this is not a theory that I have adopted *first* and then set to work to hunt up facts to prove it afterward. The *facts* came to knowledge first, and I have labored patiently to find the cause. I believe if *great* excitement will produce very marked effects, less excitement will produce similar effects, only in a less degree, on the principle that if two drinks will make a man drunk one drink will make him half drunk.

A few months ago I bought a seven-eighths Jersey cow of a man who said she gave remarkably rich milk. She was the only cow he had, and was well fed, so he had a chance to know. The next day after getting her home I tested her. It took 23 lbs. of milk to make a pound of butter. Two weeks after, when she had become well contented in her new home, I tested her again and it took but  $11\frac{1}{2}$  lbs. of milk to make one of butter. There had been but a slight variation in the daily quantity of milk.

Two years ago I had a fine cow that become, one day, terribly excited; in fact she was in a perfect frenzy. The

next day it took 40 lbs. of her milk (she was giving 40 lbs. a day) to make a pound of butter. Before that and three days after that, when she was perfectly quiet, it took but 14 lbs. of milk to one of butter. These were cows of a highly nervous organization. I could give many more similar instances, though not all of them so pronounced, but these will do.

Now, these are some of the facts in relation to this subject that have come under my own observation, and they mean something—they mean that the man who is kind and gentle with his cows and careful of their comfort will get well paid for it, and the man who is harsh and rough and cruel with his cows will find his profits small indeed. It is very costly having cows brought from pasture on the run with a dog at their heels. The angry milker who mauls a cow with his stool and raises a general excitement in the stable is knocking, it may be, a dollar out of the owner's pocket with every blow he strikes. You may not fully accept this nervous theory, but if what I have said will cause any man to think, observe and investigate in relation to it, I shall be satisfied, for he will learn some things by which he may profit immensely.

## SUCCESSFUL CORN CULTURE.

By O. STRAHL, River Falls, Wis.

**A National Crop.**—Corn is our national crop; it is king. Its acreage is about 55 per cent. of all the cereals, and in quantity it is four or five times that of wheat, averaging over sixteen hundred millions bushels for eight years past, and supposed to foot up to two thousand millions this year—a quantity so enormous that it would take 80,000,000 of teams at 50 bushels each, before shelling, to draw it, and which, on the road in a string, one to every two rods, would reach 500,000 miles, to the moon and back and once around the earth.

**Yield.**—The yield is much greater per acre in the northern States than in the southern. Ohio, Indiana, Illinois, Iowa, Wisconsin, Missouri, Kansas and Nebraska average about 26 bushels per acre, usually, while Alabama, Georgia, the Virginias and Carolinas, range all the way from 11 to 18 bushels. It is not an important crop in Europe; the United States produces three-fourths of all the corn in the world.

**Climate.**—Our climate here in Wisconsin, although quite well up north, is well suited to producing good crops; usually just enough heat and moisture to mature middling-sized corn in the highest degree of perfection.

**Success in Raising.**—In corn raising, success depends largely in getting good ready. We must lay plans and calculate beforehand; we must commence away back last year and save the seed out of that crop, long before any preparation of the soil begins—say about the first week in September. Just as it be-

gins to dent, and some of the outer husks indicate ripeness, is the best time to select, for we want those ears that ripen first, other things being to suit us; we want good stock, as in animals; we want a good breed of corn, to suit the climate. It must be vigorous and hardy, rather low and stubbed, with one good ear rather low down. Two or more ears are a failure; neither one is apt to be good. We select the kind of corn as to character of grain, cob, etc., that suits us; deep grained dent corn is my choice. I have the yellow deep grained Hackberry and the Powell Illinois white corn; the yellow is the earlier and yields about as much per acre. It is not quite so large but will bear to stand a little thicker.

**Saving for Seed.**—To ascertain my preference, I counted out representative ears of both varieties, weighed each, and shelled it, weighed cob and shelled corn, and found but little difference as to amount of cob and corn—about a half pound in a hundred in favor of the yellow; but I found a great deal more moisture in the white corn than outside appearances indicated, fully establishing the fact that the yellow is a week or more the earlier.

The seed gathered early is full of juice or sap, and must be dried out thoroughly, cob and all, before it freezes. To do this I tie it in bunches with twine or wire, ten or twelve ears together, and hang as near the kitchen stove-pipe as my wife will let me. If kept a little warm, in two or three weeks it will do to put away and, if thoroughly dry, freez-

ing will not hurt it. It may be shelled if it suits one best to take care of it in that way. It is all right now, and we can warrant it, as nothing but downright neglect will thwart its energy; next year's crop is there in embryo, snug and sure.

#### Preparing the Ground—Plowing.

—Now, then, we will get the ground in order. Either fall or spring plowing will do, as it may suit our convenience. The fall plowed land may become packed and hard by numerous storms; if so, it must be mellowed before planting by re-plowing, the use of the disc or spring tooth harrow, or something that will make it absolutely mellow, or else it will be mere chance if we get a good crop, for it is scarcely possible to thoroughly pulverize the soil after the seed is in without disturbing it.

Weeds do not seem to start quite so quickly and saucily on fall plowing unless re-plowed in the spring. Then look out, and hurry up, too, for of all the unwelcome guests of the young corn the early weed is the worst. It seems as if weed seeds after lying under ground for six months or a year, or it may be several years, being turned up to the surface, envy their neighbors who have had a better chance to grow and pester us, and start on in two-forty haste to make up for being kept under so long. Well, if a stich in time saves nine, a lick in a corn-field addicted to weeds saves 99 or the whole.

Any of our soils here will bring first-rate corn. We have quite a variety, too—sandy loam and absolute clay often on the same quarter section, and the wise farmer, in his course of rotation, handles one and the other to suit the dictates of good judgment. Therefore, we cannot write down a rule that

would suit for the handling of all these various soils in their several conditions. Some are thin and some are deep. We must be careful and not turn up much of the cold sub-soil in plowing, or it will injure the crops. Deep loam, porous away down, will bear deep plowing—up to the beam if the team don't object—but this land is good for a pretty fair crop with half a chance.

I would plow on my farm, which is between real loam and real clay, with clay sub-soil seven or eight inches, for spring work, when the ground is liable to be wetish; would be very careful to have it dry enough to work well and not pack under the horses' feet or against the mold-boards, or it will be cloddy, and clods give out no nutriment; consequently such amount of the soil as these clods contain is a dead loss until time or storm, or mechanical contrivances, dissolve them, which may not occur until late in the summer—after it is too late to benefit the crop. Therefore, we should handle our ground carefully so as not to make clods.

Early planting, is surest, say from the 5th to the 12th of May.

**Planting.**—Having worked diligently with plow, harrows, rollers and such implements as the occasion demands, we will mark the ground both ways, especially if there is danger of weeds, about three feet eight inches, and plant with the hand planter, probably four to five kernels in a hill, so as to be pretty sure of a stand of three stalks, on the average. Kernels of corn vary so in size, even in the same variety, that it is not possible to get a machine to do it as nicely as counting, but the machine-planted, if carefully done, comes up more surely and has a firmer foothold. At first, to withstand tough handling in case of harrowing, we should try to do

the planting in two days or less, so as to have an even start all over the piece.

**Harrowing.**—As we only left the slanting fine-tooth harrow when we had to, to mark the ground for the planter, we will put the team right to it again and go over it once each way, and repeat one way in a week or so, or just as the corn comes up. Then it must be harrowed once or twice more by the time it is up four or five inches. After this the fine-tooth single cultivator should do the work, running as close to the corn as can be without pulling it out, and very shallow, two inches or less. About four times with this cultivator at intervals of eight or ten days will put it up to the period of the tassel beginning to make its appearance, when it will be time to cease, and let it take care of itself. Bad weather may prevent the carrying out of this plan punctually.

**Stirring the Soil.**—If the season is dry, the oftener we stir the top soil so as to keep it loose and porous the more moisture it will receive by capillary attraction from the sub-soil and atmosphere and thus render more nourishment to the crop. We must also stir the ground as soon as it will do after every heavy rain, to prevent the formation of a crust on top.

I do not believe in cutting and breaking the roots. I think it injures corn or any plant to cut and mutilate its roots, especially in dry, hot weather, so as to

make the plant wilt and show signs of being crippled.

When I was a boy this deep stirring of the soil was thought to be the thing for dry, hot weather, but it looks to me now a little akin to cruelty to mutilate a plant and make it sick at the time when the recuperative resources of nature are temporarily withheld. I therefore say do your deep work before planting. Shallow culture and lots of it is safety.

**Smut.**—Some think that wet weather induces smut, but we read of frequent instances of its prevalence in dry seasons, at any rate it does not originate spontaneously but from seed or spores, as they are called. These spores are very light, even lighter than common dust, and thus float about in the air and light, and grow, retaining all the time, like the chinch bug, wonderful vitality. Barnyard manure, where infected fodder has been fed out, is a good medium for keeping the supply up, for even though it be eaten it will pass through animals, and retain its vitality. The remedy here, now, where it has but a slight hold on corn might be found in going through the corn before it gets dry and light enough to float off in the air, cut it off and collect and burn it; this would be practicable now, but not very effective without joint action all around the neighborhood. This smut is evidently on the gain, and may develop into a formidable injury. Let us beware.

## IMPORTANCE OF SHEEP ON THE FARM.

By S A. PELTON, Reedsburg, Wis.

**Getting out of Sheep.**—The census of 1885 gives Sauk County 37,680 sheep and lambs, or 17-10 to a person, at a valuation of \$1.54 per head. Wisconsin has 1,429,137 sheep, or less than one sheep to a person, at a valuation of \$1.64 per head. This surely is not an over-production for the county or State; but, nevertheless, there was a general outcry all along the line that sheep did not pay. The city papers took up the cry, and flock after flock was sold in Chicago, and the proceeds used to purchase Minneapolis bran and shorts, to fatten pork and beef at a far greater loss than was imagined to have been real in the first transaction.

**The Branch of Farming to Pursue.**—The farmers of Sauk County are engaged in mixed husbandry, and some are so badly mixed that they cannot tell which branch pays the best; but, judging from the experience of the past, that branch which for a term of years has yielded a fair profit above the general outlay is the one to hold fast to.

It is not absolutely necessary for a farmer to ape the methods of his neighbors. Location, soil, and liking for the occupation should, in a measure, determine his drift. No special scientific education is an absolute guarantee of success in any line of farming. "Where there's a will there's a way," "business experience is an apt teacher," are maxims that will apply with full force in practice. I would not advise any one to quit dairying, fattening beef, pork, or breeding horses, when one has buildings and apparatus necessary to produce the

requisite results. Occasionally changes must be made, but would it not be better to change methods than to change the line of farming?

**Sheep on Rough Land.**—If a person has a rough and broken farm, and small capital, he can hardly strike a better opportunity than to secure a few sheep. They will be a nucleus around which will gather, under good management, a large flock in a short time; an investment that will pay interest at shearing time at the rate of 100 per cent., and dividends from each lamb, besides leaving the pasture lot fertilized in the best possible manner for a crop of winter wheat.

**Mutton the First Consideration.**—Mutton first and wool second should be the aim of every flockmaster. While opinions differ as to breed, the farmer can illly afford not to heed the fact that the market demands that certain conditions be fulfilled. Feed influences breed to a great extent, and care likewise leaves its ear-marks unmistakably prominent in every flock.

**Yarding.**—Many farmers have lost the increase of their flock by yarding sheep, horses, cattle and hogs together. Lambs do not thrive well with hogs, nor do sheep come up to the standard of expectation when trampled on by horses, or hooked by cattle. I would not advise any one to turn a flock of sheep and lambs into a field in spring and leave them there until fall. The chances are that none will be found when the owner calls for them.



**Farming Requires Thought.**—Farming is a business that requires thought and forethought to manage skillfully the many problems that constantly arise as to the best methods of improving the fertility of our soils, and at the same time leave us a fair and living profit. It is an important consideration to keep stock that is best adapted to your peculiar conditions. When help is scarce, sheep offer opportunities to relieve one of a large amount of labor that is required in the proper management of the dairy and its kindred associations.

**Mixed Husbandry.**—Much has been said about special farming by the agricultural press, and by specialists, but often they neglect to inform the public that their start in business was peculiarly favored by various cir-

cumstances. I believe in mixed husbandry for the farmers of Sauk County. I also believe that the specialist has his place, and further, that no one method of farming followed for a great length of time is sure of the fullest success unless the power behind the throne makes it a success.

**The Hand at the Helm.**—Sheep husbandry, like any other industry, must have the right hand at the helm to make it profitable. One must have a liking for it and make it a study. Blood will tell, and feed will tell. One person may take a flock of sheep and make them pay, while another may lose by the operation. The shortest rule in application is to breed well, feed well and then sell well. There is profit in so doing; there is loss in the reverse.

## CHICKENS FROM SHELL TO GRIDDLE.

By W. H. ROSE, Boscobel, Wis.

**Care of Fowls and Eggs.**—If we depend on raising our own fowls, we must first get the eggs, and in order to get them we must first provide ourselves with the variety of fowls that are best adapted to egg production; then care for, and feed the proper food to enable the fowls to lay the eggs. If it be in the winter season, when the fowls are shut up all the time, great pains must be taken in gathering the eggs before they are chilled; also in giving the fowls some kind of green food, because eighty out of every one hundred eggs will fail to hatch when the hens are confined and no green food is provided. Right here is

where a great many living in villages fail. Even in the summer season they are obliged to shut up their hens to keep them out of their neighbors' gardens, and they either forget or neglect to throw them something green each day, and the consequences are lousy hens and infertile eggs.

**Feeding the Chicks.**—We find by careful study of the subject that the egg is composed largely of albumen and there is scarcely any albumen in corn, but a large per cent. in wheat. It lies just inside the outer skin of the wheat; consequently wheat bran is one of the best foods to produce eggs. Feed it hot

and wet, feed it dry—any way the chicks like it best. Oats are good; small, shrunken wheat is good and buckwheat is splendid. My plan of feeding is this: Take boiling water, add a little salt, a little cayenne pepper and a little sulphur; then stir in some ground feed, making a kind of mash, and add wheat bran until the mass will crumble and not be sticky. By the time you have stirred this up it will not be too hot and will be greatly relished. This makes a good breakfast and should always be fed early and in V-shaped troughs. For dinner I scatter a little shrunken wheat or screenings among the litter (previously provided) and let them hunt for it. If it occupies their time for three hours all the better. Exercise creates warmth and warmth means eggs, especially in the winter season, and that is when we want them. For supper a full feed of corn or wheat should be given just before they go to roost.

**Make Hens Lay.**—Some people suppose and even claim that if hens lay in the winter season they will lay less in the summer, or, in other words, that they will lay only just so many eggs in a year. It is a mistake. The hen is an educated being. In her native state she laid nine, eleven or thirteen eggs, became broody, sat upon them, hatched out a portion of them and then guarded the chicks for six months. Now we have hens laying 185 eggs in a year and rearing a brood of chickens besides. True, a hen will lay only a certain number of eggs and then become broody, but she can easily be broken up and made to commence laying again. Thus by a little study and care she can be made to contribute her share toward filling the egg basket three-fourths of the year. Of course, she must moult, and no power that I know of will induce her to lay any eggs during that period. It takes all

her vitality to produce the new crop of feathers. Hens begin to shed their feathers early in the fall and don't complete their plumage until about December 1st. You will readily see that if a hen lays no eggs in the winter, and does not begin before the middle of April, she has no time to lay her 185 eggs, laying usually one egg every other day. The fact is the hen is simply an egg machine, and if fed the proper food, and carefully cared for, she must either lay or die. Many of the wild birds lay an even number of egg—two, four or six—before if unmolested, they will become broody and set upon them. If you remove one of them, they will lay one more before beginning their incubation process, showing conclusively that all birds may be compelled to lay more eggs than nature intended they should.

**Eggs for Hatching.**—Remove all the eggs from the nest every day. They will hatch very well when three weeks old. This will prevent their becoming broken, or chilled by frost, and the hen will think every day she goes to the nest that she has just begun to lay her usual thirteen to fifteen eggs, and never knows when she is through. Eggs intended for hatching purposes should be kept where there is an even temperature and turned over every day. They will hatch very well when three weeks old.

**Hatching Chicks.**—To hatch chicks successfully you must have a place to set the hens in separate from the flock. Have it large enough to accommodate as many hens as you wish to set; make the nests large and smooth, on or near the ground. If possible, set three or four hens at a time, giving each hen nine, eleven or thirteen eggs, according to the size of the hen. When one week has elapsed go in the evening armed with an egg tester and a lantern; examine every egg, throw out the infertile ones and

give the fertile ones to one, two or three hens, as required to cover them, and supply the others with fresh eggs. Thus you may hatch with four hens as many chicks as you would ordinarily with eight. When broody hens are scarce (and that is the case generally in the winter), I sometimes compel them to set six weeks. Keep the setting hens quiet. Arrange so that whenever they come off their nests they may find a drink and a good square meal handy. If two or three come off at once, and on going back should make a mistake and get into the wrong pew it will make no difference. When they settle down to business they will make no mistakes, and then is the time you should give them the eggs you wish them to hatch. It is always well to give them some china or poor eggs to set on until all is quiet. It is often the case where biddy is too attentive to business, and sets on her eggs too long at a time, that the eggs are spoiled; or, in other words, the embryo chicks are killed. Watch her, and if she does not come off at least every other day, gently take her off long enough for the eggs to cool. If any of the eggs get broken there is no time to lose. Take some milk-warm water and wash them carefully, for if any of the broken ones should smear the good ones, it will effectually close the pores and the chicks will die. They must breathe the same as any other animal. From the 19th to the 21st day you may expect some of the little chicks to break the shells, and if you have sprinkled the eggs two or three times in the last week with slightly warmed water they will break them all the more readily. The better work the little fellow makes in getting out of his prison cell the better are his chances for life. If he pecks a crease clear around the shell and comes out spry his chances are good, but if he simply pecks a small hole

in one side of the shell and begins to peep until you remove the shell, the chances are he won't live a week. Well, better dead than alive, for who ever saw a sickly little chicken get well and grow?

**Care of Young Chicks.**—When the first to hatch are twenty-four hours old remove them to some dry place. Take one of the hens along and give her all she can hover conveniently. The more you give her the prouder she will feel. Perhaps twenty is about right for an ordinary-sized hen. Place the remainder of the eggs under the other hens, and as fast as there are enough for a brood take them out and so on until they are all hatched. Remember always that the little chick needs absolutely nothing to eat or drink for the first twenty-four hours of its life. After this feed very sparingly of something light. Perhaps the very best thing to feed for the first week is hard boiled eggs, chopped fine, shell and all, and the infertile ones we threw out two weeks ago are just as good for this purpose as fresh ones. Bread crumbs and crackers soaked in milk are also very good for the little chicks. In a few days small seeds, shrunken wheat, etc., are good. Sour milk, or clabber, as we call it, is splendid. In order to give some sulphur, salt, pepper, etc., we prefer to feed one feed a day of soft food. Always have your water boiling that you mix the feed with. After the long fast of the night, the chick needs something that he will not be obliged to wait for the gastric juice to moisten, and the gizzard to grind, before he can feel the effect of it, and for the same reason some whole grain is good to feed at night for the organs to work on. Furnish the hen with plenty of whole corn while hovering the chicks so that she will not be too greedy and eat up all the dainties you may place before her for her chicks. Shallow dishes are best for the little fellows to

drink from, and they should be often filled with fresh water. While caring for and feeding always keep in mind that all that goes to promote size, plumage, bone, sinew and muscle must go down the little fellows' throats. Keep them growing; much depends on their growth. At six weeks' old chicks of some of the varieties will be large enough for broilers, and if it is in March they will be worth, in any of the large cities, seventy-five cents apiece.

Young growing chicks need good ventilation. Impure air is destructive in more ways than one. They become lousy, scaly leg overtakes them, and they

generally begin to droop and fall behind the flock. They huddle close together at night and the droppings soon become filthy and cause disease. To guard against it, keep everything clean. Feed in small V-shaped troughs, and never on the ground. Keep "Douglas" mixture in their drinking water, and never feed more than they will eat up clean. Give them a varied diet of anything they like, except raw corn meal dough.

You will readily see by what I have written that the poultry business is made up of little things, minute in themselves but large in the aggregate.

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## THE BUSINESS FARMER.

By J. H. HALE, South Glastonbury, Conn.

**Figure the Expense.**—I start with the supposition that every farmer has a farm either owned in his own right, partially mortgaged, or leased—in fact, an investment of capital on which dividends must be earned and paid, either in interest on investment, or borrowed capital, or in the payment of rent—before he can receive any compensation for his labor. The business farmer will, before beginning operations on his farm, do just as every other business man has to do, if he is to make a success of his business, carefully figure how much will be required annually to pay this, with cost of labor, taxes, wear and tear on implements, ordinary repairs, etc., and thus ascertain just how much the farm must produce in cash returns, before he can receive any compensation in the way of profits.

**The Crops Best Produced.**—Having found this, it becomes his duty to know just what can be produced, to the best advantage, on his particular farm, and what line of work best suits his tastes and circumstances; last but not least what markets are to be supplied, and how he is to reach them. In fact, these two last points should be settled before purchase or lease of the farm. However, if that question is already settled, he must put time and thought to the study of the situation.

**Brain Work on the Farm.**—Don't pitch into heavy, hard work with the idea that in this way you are to make a success of farming. The business farmer, whether his capital be one hundred, one thousand or ten thousand dollars, in every case, is not so much a worker with his hands as with his brain, studying

and planning all his operations before putting them into practice. He has no more brain than the rest of us, but gets ahead by using his while we unthinkingly dig and delve day after day without method, grumbling that "farmin' don't pay," and that "ours is a hard lot." The fact is farming is the best and safest business of all. Were it not so, the slipshod, unsystematic methods many of us have followed in the past would have brought ruin long ago.

#### Habits of the Business Farmer.—

The business farmer is a successful farmer, and always will be, if we are to judge the future by the past. He is a student, not of books alone, but of good agricultural papers; of experiment stations and their work; of the work of other farmers, successful and unsuccessful. He is also a close student of the markets for the purchase of his supplies as well as the sale of his products. He may not be a thorough book-keeper, yet he keeps an account with the various fields and crops; knows the cost of each product of the farm, and is as prompt to drop those that do not pay as he is to try something new, that his judgment tells him promises good returns. In fact he is a brain worker rather than a common field hand. He knows that so far as brute strength is concerned, he must take off his hat to the old horse or the little brown mule, and he gladly does it, and coolly rests his brain that he may better direct their work, and thus reap greater profits from the farm.

His leisure time in the winter is not spent at the village store, or in talking politics at the railroad station, or on the street corners, but at home planning for future work.

As soon as the year's operations close in the fall, he is making plans for the coming year. Long before spring opens

he knows just what is to be planted on each field; where the seed, labor and manure is to come from. Every implement is in order, and enough extra repairs are ready at hand so that no time need be wasted during the hurrying days of seed time. The business farmer has learned that his farm is only a sort of manufactory, which, to be made profitable, must be run to produce that which the forges, looms and spindles of the soil are best adapted to; and that the finished product will depend almost wholly upon his starting operations promptly on time with a full supply of raw material in the shape of seeds, plant food and well-directed labor.

**A Standard for Goods.**—When the finished product is turned out, he knows that he must establish a standard for it in the market, and then maintain that standard, if he is to hold his customers and obtain satisfactory prices. One great trouble with us farmers is that we lack a standard for our goods. Ask any ten farmers to bring you a barrel of No. 1 apples or potatoes of a specified variety, and the chances are that you will get ten different grades of goods, the assorting having been made according to the judgment or honesty of each. Consequently "farmers' packings" in any line are almost always quoted at lowest rates in most markets, and it is often risky buying them at any price.

**Packing Goods.**—Farmers often get the credit of dishonest practices in packing and disposing of their goods, when no dishonesty was intended, the whole trouble coming from ignorance of business methods, and the requirements of the markets. It is the business of the farmer to know and understand this, and then conduct his affairs on a business basis. Reward will surely come. A business name and reputation is as valuable on the farm as in any other

profession. I will cite a few cases in point:

Some time ago I was in a market town, and saw a car-load of apples unloaded, all in second-hand barrels, some round and some flat hoops. On the heads were stencilled the names of the former contents, "crackers, flour" etc. of a dozen different brands. On these were tacked plain, white cards with the name of the variety which each barrel contained, written with a pencil, and marked No. 1. A few were opened and found to be large, bright apples but had no uniformity in grading, and they sold at from \$1.25 to \$1.50 per barrel. Another car-load from a business farmer was in nice new barrels, on the heads of which were plainly stencilled the name of the grower, with postoffice address, the name of the variety, followed by the words, *warranted* extra No. 1, or No. 2. An examination showed no better fruit than the first lot, but instead of being all mixed up and marked No. 1, they were nicely graded, as indicated by the outside marks. The average price obtained for the whole car was \$1.80 per barrel, or an average of 50c. more than the first named lot sold for, or more than twenty-five per cent. actual profit to the business farmer, who knew enough to pack his goods, guarantee them and put his name thereto.

**Business Methods in Dairying.**—A friend of mine who is producing milk for the wholesale market, from a herd of ordinary grade cows, takes the trouble to weigh the feed of each animal and the milk daily. By a careful study of this record he is able to know just how much grain ration he can afford to feed each cow; also just when an animal becomes unprofitable, and so dispose of her, replacing by one giving better returns. I might as well own up

that his neighbors call him fussy, but the fact remains that while they are complaining that there is no profit in making milk at present prices, he has a pleasant, happy home, with all the comforts and many of the luxuries of life, is yearly adding to his bank account, and the old farm is improved in productive capacity, for he is a business man, devoting, as he does, the best thought to his special line of work, and not unthinkingly drifting along, and then grumbling that there are no profits to be obtained in agricultural pursuits.

**In Fruit Raising.**—On South Water Street, Chicago, some years ago, I saw red raspberries selling for twelve cents per quart, from a number of different growers from Southern Illinois. One lot, carefully branded on the outside, the dealer asked sixteen cents for, and refused to open. "That name," said he, pointing to the stencil mark, "is a guarantee that they are all right. He is a thorough business man. We and our customers know they will prove to be just as represented."

Following up this lead, I visited the grower at the farm, and found, as I expected, a business farmer. He had learned that for firm fruit his berries must have sunlight and air while growing; hence they were not planted as thickly as was the custom of his neighbors. He had also learned that certain kinds of plant food effected the texture and quality of the fruit, and by a lot of plat experiments learned what to use and what not to use, to give him bright colored and solid fruit; also that if the fruit was cooled at once when it came from the vines, it would keep and ship much better than if not so handled. These and other questions he had studied out as a matter of business. All this had cost him time, money and labor

Doubtless his neighbors though he had better be at work instead of fussing so much, but he was a business farmer and knew he must thoroughly understand his business, if he was to make a success of it, and the twenty-five per cent. extra price obtained for his fruit was not good luck, but payment for value received in a higher standard of quality obtained by business methods.

**In Grain Raising.**—Farmer take-it-easy thinks "there ain't much money in wheat when you can get only about twelve or fifteen bushels per acre, or in corn at thirty to forty bushels per acre." The business farmer knows he must get more than that or be bankrupt in time. He will tell you just what it costs to produce a bushel of corn or wheat, and show that we must increase the yield or lower the cost of cultivation per acre; and as the latter cannot well be done, the one and only thing to do is to produce more, by a more thorough preparation of the soil for planting, and still better care for the growing crop. If it is possible and profitable to produce thirty-five to forty bushels of wheat per acre, and seventy-five to one hundred bushels of shelled corn, we should do so, and the business farmer, who is producing this class of farm crops, sets about doing it—first by cutting down the number of acres cultivated to the number he can thoroughly attend to, and then aiming to obtain the greatest results, or know the reason why.

**In Animal Husbandry.**—Beef, mutton and pork are staple crops on many farms, yet how many of us know what it costs us per pound to produce, and if, on the whole, a profit is made in the business, whether the profit comes from the young growing animal, or from fattening the more matured one? On this point the late Hiram Sibley, of Roches-

ter, N. Y., a gentleman who made a fortune at farming long before he went into other branches of business, in the course of a long chat on the train, told me that living in the dairy districts of New York he found the farmers so anxious for the milk product that all calves were sold or killed as soon as born, and that instead of growing their own cows they were continually buying new ones at high prices. Being a business farmer, he converted his whole dairy into a nursery for the raising of young calves, and brought them up by the hundreds. When a few months old, and a car-load was ready, they were shipped to his farm in Illinois, where feed was cheap, and were then fed and cared for in the best possible manner, to keep them growing all the time. When full grown, they were promptly disposed of to make room for other younger and growing animals, for, said Mr. Sibley, I had learned, after several years' careful test, that the only money to be made on an animal was in growing it. Not a dollar was ever made in fattening. Mr. Sibley has been called a fortunate man, but I am satisfied that had he not been a business farmer, and known from the start what was and what was not profitable, he could never have made the success in life that he did.

**Do Business for Cash.**—The business farmer does business on a cash basis, well knowing that he cannot afford to do otherwise. If he has capital of his own, so much the better, but be he rich or poor he always has cash on hand for the purchase of such supplies as are required for the proper conducting of his business, and also to be ready to take advantage of any good trade which may develop in the direct line of his work. The poor man who is a business farmer knows that the buying of implements,

supplies, etc., on credit, means buying at the very last moment before being ready to use them, and thus being obliged to buy such as can be had in the nearest market, and paying the highest retail price for them, which, on most farm implements, and many household supplies, is from thirty to fifty per cent. advance on manufacturers' prices. He is therefore as liberal a borrower of money as his credit will allow, and the legitimate requirements of his farm and home demand, just as is the enterprising merchant or manufacturer. He is thus able to watch the markets, and, knowing his future wants, has ample time to correspond with headquarters and obtain lowest quotations; and then, by buying out of season, get "bed-rock" prices every time, saving enough to pay the interest on his borrowed capital many times over.

**A Case in Point.**—Just one case in point: A business farmer, a friend of mine, who knows that it is to his advantage to subscribe for and read ten or more of our agricultural papers, learned last December that fine ground bone, potash, nitrate of soda, and other chemical manures, that he required for use on his farm in the spring, could be bought at very low rates; therefore, making out a list of just what he wanted, he wrote to six or eight importers and manufacturers, asking quotations on forty tons of goods for immediate delivery and for "spot cash," although at the time he had not the money to pay for two tons. All the dealers were glad to bid low for so large a cash order, four months before the usual time of making their sales. Consequently, he was offered No. 1. goods at extremely low rates, and accepted one of the bids, borrowed fourteen hundred dollars, and, when bill of lading was received, paid down the cash.

The fertilizers were carted at a season when his teams had little else to do, and thus quite a saving was made.

Four months later, when ready to use the goods, his neighbors, who do not practice business methods, were paying an average of nine dollars more per ton for the same goods, and as twenty-eight dollars paid the interest on his borrowed money capital, he made a net cash saving on that one trade of three hundred and thirty-two dollars—quite a little sum of money to be made out of one transaction, and yet honestly made by applying business methods to the purchase of farm supplies.

**No Use for Agents.**—The business farmer has no use for agents or surplus middle-men. He is not induced to buy every new thing that turns up, and pay a fancy price for it, but is his own agent, does his own thinking, and when, in his judgment for the better conduct of his farm or household operations, he counts the cost and estimates whether it will be profitable for him to invest or not, before he purchases.

**Brains Are at a Premium.**—In fact he is a man who minds his own business rather than to pay some one else for doing it for him. He is not averse to picking up all the information he can by association with others. He is therefore a worker and student in the local farmer's club or grange, is never so busy but that he can find time to attend institutes, Pomona granges, agricultural and horticultural meetings of all kinds that are within reasonable distance of his home. He knows that brains are at a premium on the farm, and while continually polishing his own by contact with others, his boys and girls are given the best possible education in the home schools, after which he will send them to the State University for a full course of scientific



training, if he is able, and if not (if a resident of Wisconsin), he will see that the boys take advantage of the short term course that is offered by the University at Madison. Not only the business, but every other farmer having boys, should eagerly accept this grand opening which has been made whereby his boys, even though required to be busy at home through the summer, need not be deprived of a classical and scientific education. There should be three

or four hundred such students at Madison every winter, from the farm homes of this State. Keep this up year after year, and the intelligent, successful business farmer will be the rule, and not the exception; farmers will take their proper position in society, and before the world, every farmer will be a business farmer, receive a just compensation for his labors, or know the reason why.

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## HOW TO FEED A FARMER.

By J. RHODES, Kansasville, Wis.

**The Best Brain Food.**—Observation has developed the fact that the best brain food is that which keeps the body in the best and healthiest condition. Body and mind are so linked together that an injury to one is usually a damage to the other, and a benefit to one an advantage to the other.

**The Process of Digestion.**—Is analogous to combustion. Its chemical changes generate heat from the food we consume, and supply warmth to the body. This heat is so wonderfully regulated as to remain about the same summer and winter, although the climactic temperature varied here last year about 130 degrees. There are some things about the generation of animal heat which are still a mystery, and must be left to the best talent of the land to explain. It seems, however, that digestion in some way eliminates carbon from the food we eat, and this carbon is carried by the blood to the lungs and here meets the oxygen of the air we breath. They unite to form carbonic acid. The union

of the two elements generate heat just as is done in the chemical process called fire.

It is evident, then, that we do not need large quantities of carbonaceous food during the heat of summer. Therefore the farmer's wife who puts fat pork, fried cakes, and corn-bread on the table, with the thomometer at 102° in the shade, violates a law of nature, and the stomach, the liver, and the hired man promptly rise up in rebellion. If the great Napoleon lost a battle through eating a bad dinner, how much are some of our Wisconsin farmers losing annually through a succession of poor meals—losing physical vigor, and mental activity.

**Providing Food.**—The husband who provides nothing but a dish-cloth for his wife to cook a meal from must not expect a royal feast, and if there is a man on the face of the earth who has the means to provide for his wife healthful, nutritious food for culinary purposes, it is the Wisconsin farmer. For meat he has poul-

try, mutton, veal, beef and pork—all of which can be kept fresh during the winter months, and much of it can be cured so as to be quite palatable during the coolest weather of summer. It is certainly poor economy for farmers to sell meat to butchers at five and six cents per pound, and then buy it from the grocer the next summer at 15 to 20 cents per pound. Farmers must learn to cure their own meat.

**Food From the Garden.**—But the best, most bountiful, healthful and varied supply of food for the farmer's table should come from the garden. In vegetables, the variety is legion and suited to all tastes. The crisp, rich and juicy samples growing in the farmer's garden one hour and gracing his table the next bear no resemblance to the wilted, half decayed truck which city people have to eat.

**Small Fruits.**—Next, look at the list of small fruits within our reach. Beginning with strawberries, they furnish a continuous banquet from June to November, and include cherries, currants, gooseberries, raspberries, blackberries and grapes. Without invading women's

realm, by telling how to cook them, all of these could be eaten, when fully ripe, with sugar and cream. Being consumed at home they can remain on bush and vine to distil from earth, air and sunshine, ambrosial nectar which would almost tempt St. Peter back to earth. The hard, sour, and immature fruits which are picked to ship, no more resemble those properly ripened than raw potatoes resemble Saratoga chips.

**Feed the Mind.**—In distributing the good things of earth to the millions of all nations, let the farmer not forget the family under his special care, and who are depending on him for physical growth. Above all let him feed their minds for the life struggle which lies before them, teaching them their responsibilities as future heads of the families and members of that great thinking, conservative body of farmers who must in the future even more than the past be the mainstay of the nation, upholding society and government against the selfish, brutal and chaotic schemes of the ignorant, irresponsible, floating population of our large cities.

## CLOVER FOR FERTILITY AND FEED.

By CHAS. V. GUY, River Falls, Wis.

**Barnyard Manure the Best.**—In the St. Croix Valley there are found all varieties of soil, from sand to clay, mixed often with vegetable mold, forming either a sandy or clayey loam. Each is adapted to the growing of a different class of crops, and each requires special treatment to increase or support its fertility. As barnyard manure contains in due proportions the essential elements of plant food, it is applicable alike to all soils—finely rotted as against green coarse, strawy manure, for dry, sandy land, while the reverse is suitable for clayey soils.

**Plowing Under Green Crops.**—The ordinary farmer finds, with all his care and pains-taking, the supply of manure, as obtained from the consumption of home-grown crops, quite too small to adequately fertilize his fields, and his only resort is commercial fertilizers, or plowing under green crops. The former, except gypsum and salt, are quite too expensive to repay the cost of \$25 to \$60 per ton in any field crop at present market prices. This leaves clover practically as our only remaining source of supply. How shall we apply it? is a serious question. The readiest answer is, feed it to stock and get a return in animal growth, and from two-thirds to three-fourths of its value in manure. But this requires more capital and labor, brains and energy, than the average farmer can command. Then let the earth act as consumer and feed the whole crop at once by turning it under with the plow. The results will be in proportion to the growth of the crop plowed under.

If the year's growth is too expensive, a crop can be taken off at the first blossom and left until the second growth is in bloom in the following August, when this may be plowed under. A large part of the value of the crop for fertilizing is in the root. This treatment leaves the ground in most excellent condition for any kind of crop. Land plaster has a very beneficial effect on the growth of clover on rather sandy or clayey land. An application of from one hundred to one hundred and fifty pounds per acre will increase the crop fifty to one hundred per cent., and its effects are quite noticeable for two or three years after sowing. It is not claimed that there is great manurial value in gypsum, but it is claimed, by the highest chemical authority, that it acts directly in fixing the ammonia, which is an essential plant food, in the soil just where the plants can use it; while without the chemical influence of the plaster the ammonia would be evaporated by heat and lost to the soil.

**A Valuable Experiment.**—An experiment is reported where a quantity of clover plants was taken from the earth in May, about a year after planting, the earth being removed by a stream of water. The roots were set in sand, or crushed rock, from which all plant food had been carefully removed, watered with distilled water for some two months, until the blossoms of the plants matured, and then analyzed. It was found that the organic elements had increased nearly three times and the ammonia nearly doubled. This result was obtained from the air and water alone. The ex-

periment goes to prove that clover will grow on our poorest sandy soils in a wet season and, by a system based on the result of this experiment, our poorest lands may be profitably cultivated.

**Sowing Clover Seed.**—It is claimed that a pound of clover seed contains nearly two hundred and sixty thousand grains. This estimate, I think, by an actual count of a weighed quantity, is very low. Twenty per cent. may be safely added to it. One pound, about a pint, gives, on this basis, six or more plants per square foot, if evenly distributed. This is quite as much as the land ordinarily shows one year after seeding. The practice of most farmers is to sow from four to eight quarts per acre, mixed with small grain at the time of spring seeding. Clover seed covered over one inch, it is said, will not germinate. If this is so, a great loss is sustained by too deep covering of all seed sown by mixing grass seed with small grain, and sowing with the ordinary drill or seeder.

**Cutting and Curing**—Of cutting and curing clover for winter food there are almost as many methods as farmers. If the weather is favorable the process is very simple. Cut when dry of dew or rain, let it wilt, turn with a tedder and haul the same day; put in a tight bay or silo, keep covered from air and, though much discolored, its nutritive properties are well preserved. Clover free from external moisture will keep in a tight barn, if put in very green. A peck of salt to a ton of dry hay will tend to prevent dust, and makes it palatable to all kinds of stock. From a single year's experience with clover ensilage, I should not recommend building a silo for green clover.

**Feeding.**—Contrary to general opinion, I have found clover hay the best coarse food I have ever fed. I have fed

it to all kinds of stock, and prefer it to any other hay for horses, except for driving horses, it being relaxing for quick driving. But for the work on the farm, or even heavy hauling, it has been entirely satisfactory. A patch of clover for growing hogs provides a very cheap and nutritious food; but of dry clover hay, they will not eat enough to perceptibly effect their growth. For a pasture for all kinds of stock, it is of little value. Being a biennial, it makes its seed the second year and ordinarily dies out. Other grasses must be provided to take its place, and it is best to plant them at the first seeding. Where clover winter-killed the winter after sowing, in two cases, I have dragged the ground and re-seeded in early spring with excellent results.

Clover hay, fed with corn ensilage and a small ration of wheat bran, has produced with me excellent results, as a food for dairy cows. In one instance I fed clover hay with dry oats to a horse badly affected with the heaves, and never had him do so well on any other feed.

**The Best Forage Plant.**—In my experience, next to corn, I have found clover the best of all our forage plants. Its deep running roots obtain their food from a lower stratum of soil than most other plants, and it will remain green and vigorous when many of the grasses, and nearly all root crops, are more or less injured by drouth. It derives a large proportion of its nitrogen from the air, and thus draws but lightly from the fertility of the soil. On our alluvial lands, it is quite practical, by a system of rotation with corn or potatoes, a crop of small grain and one of clover, the aftermath being turned under, with one

dressing of land plaster, at a cost of 40 cts. or less per acre, to raise a paying crop for an indefinite number of years, and not exhaust the soil. This can be done with no other plant with which I am acquainted.

## MONEY IN SMALL FRUITS.

By J. H. HALE, South Glastonbury, Conn.

**The Value of Money.**—My subject has a very pleasing sound, for who of us, tillers of the soil, does not jump at the chance of any honest industry that there is "money in?" Not that the gathering or accumulating of money is, or should be, the chief end of life, yet we all know and appreciate its value in securing for us the comforts and necessities of life, and should neglect no honorable opportunity to obtain enough of this world's goods, that our families may not be denied these things.

**An Infant Industry.**—The subject, "Money in Small Fruits," would indicate that the planting and cultivating of these choice gifts of nature were to be carried on for the sale of the products, and to this part of the question we will now turn our attention. Of course you will understand that the term "small fruits" applies to strawberries, raspberries, blackberries, currants, gooseberries, etc., and not to small or second-class apples, pears, plums, etc. It may well be called one of our infant industries, for it is within the memory of most of the middle-aged men here, that the first berries were offered for sale in any of our markets. The principal development of the business has all been within the past twenty years, and it is really only within the past ten years that all the small towns and villages of the country have

begun to have anything like a fair supply, while there are yet hundreds of towns and villages that are not one-half supplied, and those that appear to be well furnished now would use many more if better fruit were offered and in a more attractive style. So there is a chance yet for new beginners, if they are willing to live up to the requirements and demands of the times. However, before attempting the business it is well to know that not all cultivators of berries have found money in small fruits. In fact there have been some very serious failures.

**Requirements for Success.**—The requisites for success are:

1. A love of fruits for their own sake; a pleasure in their culture.
2. A soil fairly well adapted to them.
3. Good local markets, or convenient access to railway lines which center in market towns.
4. Extra laborers, near enough at hand to be called on, in case of emergency, in cultivating and gathering the fruits promptly and economically when ripe.

Having made sure of these things, if one is starting in business, care should be taken not to plan for planting more than can be cared for in the most thorough manner, or sold to good advantage.

**Strawberries.**—Of the various fruits,

strawberries will receive first attention, as it is from them that the quickest returns may be expected. Any good corn or wheat land will produce fine strawberries, but to secure the best results, it must be very rich in natural fertility, or made so by the application of manure in some form. My own experience has been that any soil rich in organic matter, or fertilized with stable manure or commercial fertilizers rich in nitrogenous matter produces too much foliage growth for the most profitable returns in fruit; and my best crops have come from a sandy or loamy soil, where commercial fertilizers had been used containing a large percentage of phosphoric acid and potash, but lacking in nitrogen.

However, as the use of commercial fertilizers does not, as yet, enter largely into the question of culture in this section of the country, it may not be well for me to say much on this subject.

**Preparing the Ground.**—Land that has been in cultivation for a year or two previous is best. Plow this as deeply as possible early in the spring; then harrow it over and over again until a perfect seed-bed is formed. An extra day or two spent by a man and team in a thorough preparation of the land, will usually show itself in ease of cultivation later in the season.

**Setting the Plants.**—When the ground is thoroughly prepared, with a corn-marker, check off rows three feet apart, and set the plants from twelve to twenty inches apart in the row, according to the vigor of the variety. If pistillate or imperfect flowering varieties are used, plant every third row with some strong, perfect flowering variety that blooms at the same time. Too many make the mistake of planting a greater number of rows of pistillates before adding the perfect bloomers to fertilize them, and also make the selection

of varieties without regard to the time of blossoming.

**Cultivating.**—Cut off all blossoms or fruit stalks as fast as they appear, and as soon as growth is well started, begin the summer cultivation, which should be kept up once in two or three weeks all through the season, until weed growth is stopped by freezing in the fall. On my own plantations the last hoeing is usually done in October.

**The Narrow Row System.**—Having been growing berries for market for twenty-five years and testing the various systems of hills, narrow rows and matted rows, as well as studying results obtained by these methods in all the Northern States, I am satisfied that the narrow row system is on the whole the most profitable. By this method, each of the spring set plants is allowed to root a few of its first runners, along near the line of the row, after which all the runners are cut off as fast as they appear. The advantages of this plan are that more of the work of cultivation can be done by horse-power, as in hill culture, and yet there are always young plants enough to form one continuous row, even if a few do get destroyed in any way. There is abundant room for sun-light and air to reach all the berries when ripening, which assures larger, better colored and higher flavored berries than can be grown in matted rows; also firmer fruit that stands transportation much better, and sells for higher prices.

There is another advantage in this plan. It costs but little to clean out a bed of this sort after fruiting, and so renew it for another season's crop at little expense, while in matted row culture it is seldom profitable to continue a bed in fruiting more than one year.

**Mulching.**—When the ground is frozen in the fall, cover the whole field

lightly with a mulch of old hay, straw cornstalks, or any coarse material that will protect the plants against the alternate freezing and thawing of late winter and early spring. This need not be removed, but when growing time approaches pass along the rows and partially uncover the crowns of the plants, that the new growth may push up through it. Thus the mulch can remain to keep the ground moist, and the fruit clean during ripening season.

**Importance of Moisture.**—This question of moisture at ripening time is a most important one. Many a field of strawberries that has received fairly good care during the whole year, has failed to produce profitable results, simply for the want of sufficient moisture, just at the fruiting season. Therefore, where it is possible, without too great cost, irrigation should be provided, if the highest results are to be obtained. Where the markets are large enough to readily handle, year after year, the product of five or more acres from one farm, I am satisfied that an investment of from one to two thousand dollars for irrigation purposes would pay handsomely. However, as such an amount of capital cannot well be so invested by many planters, and cheaper means of obtaining an abundant supply of water are not to be had except in rare cases, therefore, I urge a thorough preparation of the soil for planting, and frequent cultivation that the plants may root deeply and thus be able to withstand drouth, which comes so often just when we least expect it.

**Gathering and Marketing.**—In gathering and marketing the crop there should be one picker for each thirty or forty quarts of the daily product, and a superintendent to every fifteen or twenty pickers, to assign them their rows and

inspect their work from time to time; to see that they keep to their rows and do not trample on the vines. Pick the fruit clean and grade it according to the demands of the market to be supplied. Upon the thoroughness of this superintendent's work will depend, in a large measure, the success of the business.

Picking, except for local markets, should not begin till the dew is off in the morning, and should not be continued through the heat of the day. If pickers enough can be had to rapidly gather the crop, from four o'clock till dark is much the best time.

**Packing.**—The packing shed should be a cool, airy place, convenient to the field, and here all the fruit should be brought as fast as gathered. A general inspection of the fruit should be given by the person in charge, and it should be packed according to its grade, each variety by itself. Baskets or boxes should be new and clean, and made of the whitest wood that it is possible to obtain. All should be as rounding full as can be conveniently packed without injury to the fruit. There should be no inferior fruit put in, and that in the bottom and middle of the package should be just as good, or better, than that on top. Having made sure of this, these should be carefully packed in clean, bright crates or boxes of the size required by the markets where the fruit is to be sold. It is usually good policy to conform to the customs of the markets whose trade we seek. However, where we find those that have not attained a high standard, it may be well to humor them to the extent of sending second-class fruit in the old style, and market our best in the most approved packages obtainable. It will attract attention to our goods, and win favor and custom, especially if we guarantee every package to be as represent-

ed. We can not afford to spend eleven months in careful cultivation of our fruits, and then accept inferior prices, simply for the want of a little care in the details of marketing.

**Raspberries**—Red, black and yellow, following strawberries as they do, should next receive the attention of one who is after the "money in small fruits." These require much the same soil as strawberries, except that they may be grown with profit on land that is far richer in nitrogenous matter.

**Planting**.—Fall is the best time to plant all but the cap varieties. The ground should be as thoroughly prepared as for strawberries. For years I have planted in rows, six, seven or eight feet apart, according to the vigor of the variety, placing the plants two and one-half to three feet apart in the row; but I am now satisfied that larger, finer and better berries can be grown by planting in check-rows five or six feet apart, giving the plants more sunlight and air and admitting of more use of the horse and cultivator, thus securing better culture at less cost, while the yield of fruit is fully as large as from the hedge-rows.

**Cultivation**.—Cultivation should begin early in the season, and be frequent and thorough through the summer months, so as to stimulate a rapid growth early in the season, giving ample time for maturity of wood during the fall.

The new growth should be pinched back when fifteen to eighteen inches high. This will cause a strong growth of lateral branches, which should be allowed to grow at will, leaving all further trimming till early the following spring.

**Winter Protection**.—Few, if any, of the best varieties are hardy enough to endure the winters of Wisconsin without some protection, if you are to make sure of a crop annually. It is therefore best to lay them down and cover with

earth at the approach of winter. This can be done at a cost of from five to eight dollars per acre, and is a cheap method of insuring a crop, so far as the extreme frost might affect it. As soon as frost is out, and ground is dry enough in the spring, uncover and straighten up the plants; thin out and shorten in the laterals from eight to fifteen inches, as may be required to form a well-balanced bush.

Thorough cultivation may be given up to blooming time, after which it is not well to stir the soil till after fruiting.

**Gathering and Marketing**.—The gathering and marketing should be on the same general plan as for the strawberries, except that pint boxes or baskets should be used in place of quarts for the most delicate varieties.

**Blackberries**—Should next receive attention, and as they are generally inclined to make too much wood growth, it is well to select land of moderate fertility.

The high bush varieties may be planted either in spring or fall, the latter being the best; planting the same as the strongest growing raspberries, while the dewberries or trailing blackberries should be planted in the spring in rows ten feet apart, plants three to four feet in the row, and allowed to form a matted bed.

Close pruning and winter protection are essential to the highest success in blackberry culture, as with raspberries.

**Gooseberries—Currants**.—There is only a limited sale for gooseberries, but for currants the demand is still far greater than the supply.

**Soil—Cultivation**.—Strong, rich, fairly moist soil is best for the latter, they may be planted at any time after their leaves drop in the fall, or very early in the spring, in check-rows, four and one-half to five feet apart. The growth



is all made the first two months of summer. It is therefore essential that the cultivation be thorough and liberal early in the season, if we wish to stimulate the best wood growth.

**Pruning.**—The first two years only enough pruning will be required to form a broad open-headed bush, with bearing wood evenly distributed; but in later years a pinching back of all the new growth when two or three inches long will tend to develop a wonderful formation of fruit spurs and buds.

**General Principles.**—In a general way I have now outlined some of the main features of small fruit culture, and now lay down a few general principles that must be lived up to if you are to find the "money in small fruits."

**FIRST.**—Thorough culture.

**SECOND.**—The best possible shipping packages.

**THIRD.**—Honest packing of fruit from top to bottom, yet making as fine an appearance as possible.

**Varieties a Local Matter.**—As to the question of varieties, that is a local issue which it is best to study out for yourself. Study the markets that you are to supply, then visit growers in your county and State, learn from them what are the well-tested and approved varieties, and make the largest share of your plantings of these.

The world is improving all the time, and so are our small fruits; yet don't rush head-long into highly-praised new varieties. Test them all in a small way, and you will surely find some that are just suited to your soil and market, thus obtaining for yourself an advantage not possessed by others.

**Net Profits.**—With culture such as I recommend, strawberries should yield four thousand quarts per acre, should sell in your markets at about eight

cents per quart—a net profit of one hundred and fifty dollars per acre.

Raspberries should yield about three thousand quarts per acre, which, at ten cents per quart, will net about the same profit as the strawberries.

Blackberries should give rather more quarts than raspberries, but selling for less price the profit is not quite as great.

A good product of currants is from fifteen hundred to two thousand quarts per acre, and the price I suppose here is about six or eight cents; but as a field of currants may be kept in fruiting for an indefinite number of years, it is one of the most profitable of all the small fruits, as the cost of culture is so much less than any of the others. Strawberries have to be renewed every two or three years, raspberries and blackberries every five or six, for the best results.

#### The Family Small Fruit Garden.

—To get at bottom facts as to "money in small fruits," the family garden is the place to begin and end, if we are looking for greatest results. Every farmer should, and will have, when he awakens to a full sense of the duty he owes to his wife and loved ones, a family small fruit garden of a half acre or more, in proportion to the size of his family, and his real interest in their welfare, for right here he has a home market that will take at high prices every day in the week, quarts upon quarts of the choicest product of his plants.

**Fruit as Diet.**—The importance of fruit as an article of diet is at last beginning to be appreciated, and the sooner we all understand that every dollar expended on the fruit garden will save at least two dollars in butchers' and doctors' bills, the better. Three times a day the whole year round our tables

could and should be supplied with these refreshing and health-giving fruits of our own growing. How much better for the boys and girls at school to have a dish of fresh berries, a cluster of grapes, or a cup of raspberry jam, and good nutritious bread and butter for their dinner than to have the mother slave herself to death from day to day in preparation of some health-destroying compound of grease and spices in the shape of loaf-cake, doughnuts, or mince pie, to tempt the appetite and destroy the stomach, as well as a lot of good flour, eggs and butter that might be used to give health and strength rather than destroy it. I note with pleasure, in my travels, that fruit-growers and such farmers as have plenty of fruit, very seldom have pastry of any kind on their tables, its place being supplied by fruit, either fresh or canned; and since the improved methods of canning that have been adopted in the past few years, it is possible to have fruit at any season of the year, approaching in flavor that fresh from the vines, red raspberries retaining their flavor the best of all.

The taste for fresh fruit is growing fast, and while many of our farmers

know that they ought to supply it to their families, they still fight shy of planting, and say they can buy what berries they want cheaper than they can grow them; yet they will not buy one-hundredth part of what their families would use if it could be had for the picking. My own family is not a large one, yet we manage to dispose of from six to ten quarts of strawberries, raspberries, currants, and blackberries, per day through June, July, and August, and the next three months we worry along on peaches, pears, and the product of 116 grape vines.

A friend of mine having a half acre city lot, bought his fertilizers, hired the land plowed, and planted thereon, twenty-six dollars worth of plants, kept an account of all money paid out for labor for five years, and charged the family, at market rates, for all fruit consumed. He told me that this half acre paid him a profit of one hundred and sixty dollars annually. Such a half acre should be on every farm. Your wife and other loved ones will appreciate it, and you shall see that there is health and happiness as well as money in small fruits.

## BREEDING AND FEEDING SHORTHORNS.

By P. WAKEM, Manager of W. H. Jacobs' Premium Herd of Shorthorns, Madison, Wis.

**Selection of Cows.**—I would advise you, in making your selection of cows, to establish the foundation for a herd of Shorthorn cattle, to first make up your mind as to the kind of an animal you want; to inform yourself somewhat on pedigree; then go to what you consider an honest and reliable breeder. Herds of Shorthorns are so numerous that you should have very little trouble in finding one containing such animals as you would desire to buy. Then, if you wish to select a cow for beef principally, I would select a low-down, short-legged animal, a good mellow handler. Never mind what color, whether red, white or roan. If you wish a good milking cow, you would, of course, be sure to go to a herd that had been handled with a view to the development of the milking qualities. A great deal depends on the management of a herd as to whether they are good milkers or not. I think a man can develop that quality in the Shorthorn cow to a wonderful extent, by paying proper attention to the feeding and milking.

**About Pedigree.**—I would advise you not to be too particular about getting a so-called fashionable pedigree. Some one who, perhaps, does not know half as much about cattle as you do may say that they have an out or unfashionable cross in them, tracing back to the importation of 1817, over 70 years ago. You would naturally think it bred out before now, even if their breeding were not kept track of prior to that date, as it should have been. Nor

would I advise you to look too much to individual merit, as sometimes you will get a very good animal of great individual merit which will still be a very unsatisfactory breeder. For myself I would much rather have an animal with a good long pedigree, known to have come from a family of good milkers and great beef producers than one of extraordinary individual merit which I do not know came from a long line of great ancestors.

Be careful to buy cows standing squarely on their legs, wide between the fore legs, thick through the heart, with good crops, strong loins, broad hips—good mellow handlers. Observe these points, and, my word for it, you will have cows that will take on flesh rapidly, and prove good breeders, if judiciously bred.

**The Head of the Herd.**—After having bought the number of cows you wish to start with, select and buy a sire to head your herd. A great deal now depends on the kind and quality of cows you have bought. If they stand a little too high on their legs, be sure and buy a sire that is short on his legs. If they are not very good in fore quarters, get a sire that is well developed in front. If your cows are a little defective in hind quarters, be sure and get a sire that is well developed in this respect. Do not fail to get one with a good masculine head, as he will surely make the most impressive breeder. Did you ever notice, in your feeding lot, a steer with a long, fine head and really premium in looks? If so, was he a good feeder? Never.

You must get the short, thick head, with good strong jaws with the ability to crush an ear of corn, to be a good feeder; and you can never get such unless your sire has a good, strong masculine head on him. Be careful to get an animal with a good loose hide—a mellow handler—as that will tell you whether he is a good feeder or not.

Never forget in purchasing that your bull is half your herd, if not more, as every calf you raise from him, if an impressive breeder, will, in all probability, take more after him than the dam. Do not buy some overfed brute that has been kept in the stable and pampered from birth, but one that has been well fed and exercised. Do not be too particular about his color. You might, with good grace, be a little particular about your sire's pedigree, as it is much easier to breed on a good cross than breed out a bad one.

**Proper Age to Breed Cows.**—The proper age to breed your cows is at or about 24 months old, never allowing but one service. Then the cow should be tied up, or put in a box stall, and kept by herself for at least twelve hours after breeding. If cows are in good flesh and on grass, I would give no rations or grain until, perhaps, two months before calving, when I would feed a small ration of ground oats and wheat bran. Ten days before calving I would give a little oat meal, and, if in winter, I would add a little corn meal and roots, with hay, always being careful to allow plenty of exercise. After calving, I would feed very carefully, being particular to keep udder well milked out; after ten days I would increase her feed, always feeding plenty of roots in winter, as there is nothing our cows seem so anxious to get as their feed of Swede turnips once a day.

A cow, if in good flesh and health, will

usually come in heat four or five weeks after calving, when, if I were in shape to take care of her at calving time, I would breed her again. We like our calves to come in the fall, as we can take better care of our cows and calves in the winter than in the summer, and as it makes the bull calves about fifteen months old in a year from the next spring, when they meet with ready sales.

**Care of the Calf.**—The calf should be allowed to suck as often as it wishes, for the first ten days, and kept away from the cow after that, except to allow it to suck three times a day, at regular intervals of time. I would let it suck three times a day until three months old, when I would allow it with the cow only twice a day, and at the age of six months would wean it. Always have plenty of water where the calf can get to it, as it is very fond of a little water, especially after sucking. When your calf is about four weeks old, you should place a box with some ground corn and oats, a little wheat bran and some sliced roots, where he can get to it; he soon learns to eat it. If in winter, you should keep hay where he can get to it all the time. After they are three months old, I never have seen calves do better than they will on shelled corn and oats, wheat bran and sliced roots, always feeding two-thirds oats and one-third corn.

There is nothing more essential in successful feeding than regularity. If Shorthorn calves are fed regularly, and as I have described, you will have no trouble in putting one hundred pounds a month on them. After they arrive at the age of 12 months, I believe all grain rations should be ground and fed. In summer I do not believe in feeding much grain. Calves should, of course be fed, as they must be kept growing from birth, and never allowed to lose their calf fat. Taking the whole year, I

would, perhaps, feed stronger than some men, as I thoroughly believe there have been hundreds of Shorthorn cattle spoiled by not feeding enough to every one that has been hurt by feeding too much.

**Shorthorns as Improvers.**—The Shorthorn sire as an improver of all other beef breeds, as well as the native or scrub, has no equal. Some of the other beef breeds make a remarkably good first cross, but afterwards the improvement is less marked than in the Shorthorn. Take a Hereford sire and cross on the native or scrub cow, and your first produce will, most likely, be a white-faced calf. Then take the cow calf and, when at the proper age, breed her to a pure bred Hereford, and the produce is more likely to be a speckled or roan than it is to have a white face. For several years of my life I was connected with a ranchman who was the owner of ten thousand cattle, and I thoroughly believe one of the best informed men on breeding I have ever met—a man who had experimented and carefully studied, and amassed a fortune of nearly one million dollars and has it yet. He tried nearly all the beef breeds and finally discarded all but the Shorthorn. I have known him to take bulls worth to sell four hundred dollars each and turn them out on the ranch to breed his cows to, but he was careful to take them up when breeding season was over and feed and care for them until time to turn out again. He always claimed that where his cattle were located (Wyoming), they were better rustlers and made more improvement than any other breed, not only in the first cross but in each cross afterwards.

**As Mothers.**—The Shorthorn cow makes one of the finest of mothers, always ready to protect her calf, although so mild and apparently intelligent

when properly handled. I have heard that there are Shorthorn cows that will not give milk enough to raise their own calves, but in an experience of over twenty years I have never seen one of that kind. We have at present a pure bred cow only 3 years old, and weighing over 1900 cwt., and has had her second calf, that is giving twenty quarts of milk a day. She is not fed high, or in a way to make her give much milk. She was one of our show heifers for two years. In fact, I have seen hundreds of Shorthorn cows, and pure bred ones, too, that would give two 12-quart pailfuls a day when in full flow of milk. If a farmer can raise that kind of a cow, one that is a good milker, and when he is through breeding her he can turn her off for beef, at a great weight, what more does he want? I think he should feel satisfied with her.

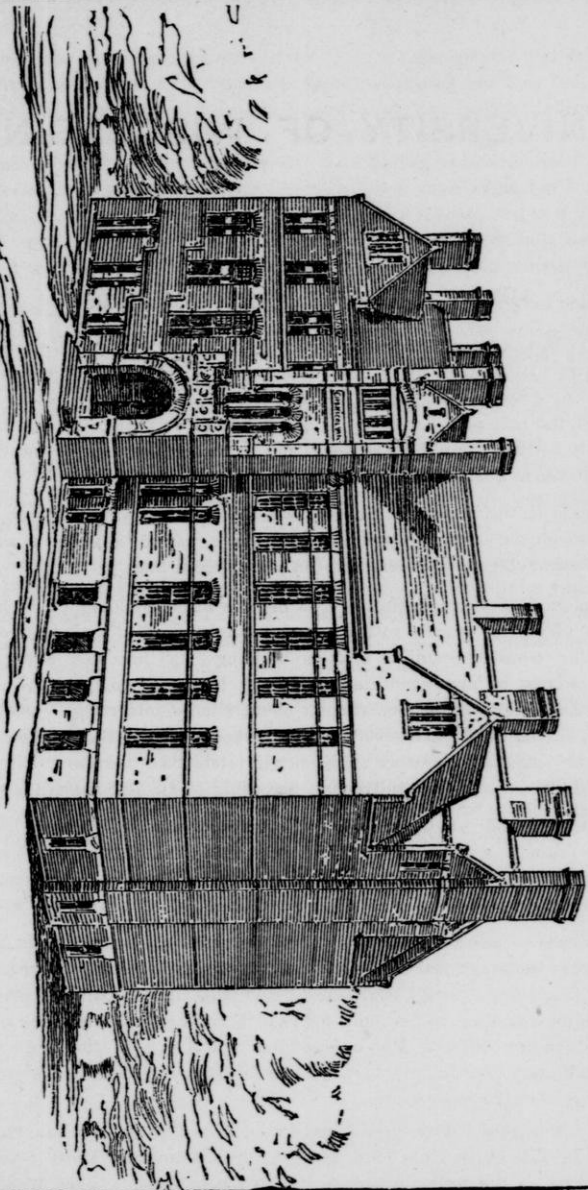
**Why Use Scrub Sires?**—Does it not seem strange that there are not more pure bred sires used? They are certainly cheap and plentiful enough. It is either ignorance or indifference that makes men use a scrub sire of any kind or breed of stock. They will not pay the small amount asked by the publishers of agricultural and live stock papers to read and inform themselves, and have no ambition to learn, believing in their own narrow minds that they know it all now. So they continue in the old ruts. Scrubs are good enough for them; they are scrub men.

**Buy Some Good Cattle.**—A short time ago we concluded to have more stock to eat up our surplus feed, rather than sell it off the farm, as we need all the manure we can get. Not knowing where we could get three or four carloads of high-grade steers in Wisconsin, we concluded to go to Chicago. We went into the Exchange building, to the

office of our commission man, and made our wants known. "Well," he said, "of course you want well bred ones? You will see very few coming from Wisconsin." It was really surprising to see the small number of good cattle there were among the twelve thousand on sale that day. Any farmer who will go to Chicago and see the difference in price between well bred steers and scrubs or natives and not go home and sell the scrubs and buy some good cattle, does not deserve to ever be able to own any. I would like to know

what better investment any farmer can make than to buy a Shorthorn cow or two, give a growing up son, and then advise with him as to the proper manner of breeding for improvement. Buy books to read about pure bred stock; take all the agricultural and live stock papers within reach, for him to read. How much better he would be employed than in reading a novel, or hanging around the village store, and how much better you would feel to see the mind of your boy trained in that direction.

H.C. Nash & Co. Architects.



THE CHEMICAL LABORATORY.

1891

# UNIVERSITY OF WISCONSIN.

## ADVANCES OF THE PAST TWO YEARS.

In our first BULLETIN attention was directed to the fact that the University of Wisconsin had grown faster than the people's knowledge of it, and that a true university of the higher order was developing in our midst more rapidly than had been realized. The growth of the past year has given added truth to this since it has been exceptional not only in the increase of students and in the enlargement of the facilities for instruction, but also in the introduction of new and important features.

The increase in the number of students was fully twenty per cent., and these were distributed through the several departments in such a way as to show a well-balanced growth, and not an exaggerated development in some special line.

The completion of Science Hall—probably the finest building of its kind in this country—has added very greatly to the accommodations afforded for scientific work, and, by relieving the crowded condition of other buildings, has benefited nearly all departments. The purchase of large quantities of the very best modern apparatus and the addition of choice collections in the departments of metallurgy, mineralogy, geology, zoology, etc., together with a careful selection of laboratory manuals, of technical and scientific treatises, and of documents adapted to the work of the newly established *seminars*, have greatly increased the facilities for advanced instruction according to the best modern methods.

There have been added to the ten regular courses of study previously offered, three additional ones, namely, a special course in science antecedent to the study of medicine; a civic-historical course—or rather group of courses—antecedent to the study of law and journalism, and a group of special courses for Normal School graduates.

There has been introduced the German *seminar* system of work, which is intended to vitalize and extend the range of study, and to develop the spirit of original investigation in the historical, linguistic, literary, mathematical and other departments. This system has proved its superior efficiency in Germany, and has been introduced in a few of the foremost institutions in this country. It is believed that it will greatly stimulate and broaden the work in the literary departments, very much as laboratory methods and original research have done in the scientific departments.

There have been established eight University fellowships, and a ninth has been endowed by the liberality of the Hon. John Johnston, of Milwaukee. These fellowships are not to be mistaken for the ordinary under-graduate scholarships, as they are liable to be, since this is the first institution in the interior to establish them. They are open only to



graduates from the regular courses, and provide for an extension of work at the University for two additional years. They will have the practical effect of elevating the range of the University courses to that extent. It is putting an added story on the intellectual edifice. The work will be of a higher order in kind as well as in subject, and will embrace original independent research.

There has been an enlargement of the facilities for independent and original inquiry in various lines, and this important phase of modern education has been industriously fostered. Notable additions to the equipment for such work have been made in astronomy and bacteriology, but the most important have been in the line of agricultural investigation. The equipment of the Experiment Station has been greatly increased. South Hall, which had been previously occupied in part by the agricultural department, has been wholly assigned to it, and has been, in large part, overhauled and refitted, and now furnishes very commodious apartments for it. The laboratory facilities have been fully doubled. New apparatus and a large invoice of important foreign works have been purchased.

A chair of agricultural physics, the first of its kind in this country, has been established, and work in this important department has been inaugurated. The professor occupying this chair will not only engage in original investigation, but will devote special attention to the development of the educational functions of the department, and will give instruction to agricultural students in the physical principles involved in farming operations.

That the growth of the institution is not tending unduly toward the professions and sciences is shown by the development during the year of courses in four additional languages as well as by the introduction of the *seminar* system and the post-graduate courses above alluded to.

Of like import is the establishment of a chair of experimental and comparative psychology — one of the very few in existence — through which an effort will be made to place the supremely important department of mental science in the foremost rank, and to introduce into this field, which has heretofore been so largely occupied with philosophy and speculation, the solid elements of experimentally determined science.

Some important changes have been made in the previously established courses, giving them greater elasticity and affording facilities for consecutive thoroughgoing study in selected lines. There has also been an enlargement of the number of elective studies, so that it is now possible for a student to modify any of the courses to suit his own mental characteristics and preferences to a very important extent. By taking advantage of elective studies there are really open to students an almost indefinite number of courses.

There has been an extension of the system of degrees corresponding to the extension of the University work, and the instructional force has been strengthened.

Some new regulations have been adopted regarding admission to the University, including a system of special local examinations. The standard of admission to the regular college classes, while not changed nominally, has in reality been raised.

## THE PROFESSIONAL COURSES.

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**THE LONG COURSE IN AGRICULTURE.**—For some years past the University has offered an extended course in agricultural science, embracing, also, long courses in the closely related sciences. If the opportunities thus afforded had been embraced and industriously followed up, it would have proved a most wise choice to a score or more of talented young farmers' sons. There is just now, probably, a greater demand for thoroughly educated talent in agricultural science than in any other branch of learning. The rapid development of agricultural experiment stations throughout the country creates an exceptional call for ability and skill in that line, and if a few dozen Wisconsin boys who had the native talent had embraced the opportunity, they might now be putting shekels in their pockets and doing the world good and their State honor, at the same time. This course has been reconstructed during the past year, and is now offered with increased and constantly increasing facilities. How long shall it wait for due appreciation?

**THE SHORT COURSE IN AGRICULTURE.**—To meet an entirely different educational need, a *Short Course in Agriculture* is offered, designed to give, in the briefest time and at the smallest expense, the most available agricultural information. A special statement respecting the course may be found elsewhere in this bulletin.

**POPULAR EDUCATION.**—But the University is not content to simply rehearse old agricultural doctrines. Its chief effort is to develop new agricultural science and to disseminate it. This it endeavors to do in the most direct and practical way; first, by careful experiments and exact analyses to determine the precise truth, and secondly, by conveying this directly to the farmers by publications and by Farmers' Institutes, so that the *farmers themselves* are coming into direct relationship to the University. It might be too much to say that they are becoming non-resident students of the University, but it may at least be said that they receive information and instruction directly from it. The work of the Experiment Station is best shown by its fruits, and the most of those who read this will, doubtless, also read its reports and know for themselves. As to the work of the Farmers' Institutes this BULLETIN is a witness. In many respects the Farmers' Institutes constitute the most important educational movement of the past decade. That which is taught in them is practical, stimulating, vitalizing, and is probably productive of more thought, observation, inquiry, experimentation and reflection than an equal amount of instruction in any regular educational institution; and, while the amount is limited, the very large numbers in attendance make the total result very great. An institution which directly reaches 50,000 interested truth-seekers is something phenomenal.

**LAW COURSE.**—The location of the Law Department gives it exceptional advantages. Provided with rooms in the capitol, it is right in the midst of courts, legislative halls and executive offices, right among law-makers, lawyers and judges. Besides its own library the state law library (20,000 vols.), and the great historical library (116,000 vols.), are immediately at hand. Under these conditions the Law Department has had a rapid growth and is attaining a wide reputation.

**THE CIVIL ENGINEERING COURSE.** A full four years' course, embracing practical field-work, is offered and shorter special courses are permitted. The facilities are of the first order and are continually being improved.

**THE MECHANICAL ENGINEERING COURSE.**—The University endeavors to meet the growing demand for mechanical knowledge and skill of the higher order, both theoretical and practical, by furnishing a full four years' course in mechanical science, embracing extended courses in drawing, shop practice and practical testing. It has been found difficult to enlarge the facilities for shop practice fast enough to meet the demand for this popular element of modern education coming, as it does, from students in all the courses.

**THE MINING ENGINEERING AND THE METALLURGY COURSES.**—A four years' course is offered in mining engineering and also in metallurgy and assaying. These courses have suffered for want of facilities since the burning of old Science Hall, but the new buildings more than compensate for this, and a growth in these departments commensurate with the recent development of mining interests is anticipated.

**THE PHARMACY COURSE.**—An excellent course in Pharmacy, embracing practical laboratory work, is presented and is well patronized.



## CULTURE COURSES.



**THE ANCIENT CLASSICAL COURSE.**—This course has demonstrated its merits through the experience of the ages and has so many warm friends and stalwart advocates that it needs no commendation here. It is a course in which Greek, Latin and mathematics form the chief agents of culture.

**THE MODERN CLASSICAL COURSE.**—In this, German, French and other modern languages are substituted for Greek, and thereby the gates are open to the intellectual treasures stored in the European languages, and the means of intercourse with the great peoples of the Continent afforded.

**THE ENGLISH COURSE.**—This is a comparatively new course, in which, while foreign and ancient languages are offered, the chief emphasis is laid upon our own tongue, the richness and disciplinary powers of which are often overlooked in our admiration of other great languages.

In all these courses mathematics holds a high place, and considerable attention is given to the various physical sciences. Through the electives offered the ratio of these may be largely increased.

**THE GENERAL SCIENCE COURSE.**—In this the leading place is taken by the natural sciences, embracing chemistry, natural philosophy, physiology, biology, zoology, botany, astronomy, mineralogy, geology and kindred branches, the value of which needs no advocacy in these days of extraordinary utilization of science. With these are also offered extended courses in higher mathematics and the modern languages, especially German and French.

The foregoing are general culture courses intended to give a broad and liberal education while differing somewhat in their chief tendencies. All afford a wide range of study, rich in knowledge and discipline. The three following courses have been introduced during the past year with a view to adapting this general culture to professional courses in medicine, law, journalism and teaching:

**THE PRE-MEDICAL COURSE.**—In response to a request from the Wisconsin State Medical Society, the University offers a special course in science adapted to those contemplating the study of medicine and surgery. It embraces long thorough courses in chemistry, physics, anatomy, histology, zoology, botany and kindred branches, which are intended to give a broad and solid foundation for the professional medical course, while at the same time they give a due measure of collegiate culture.

**THE PRE-LEGAL AND PRE-JOURNALISTIC COURSES.**—For the accommodation of those contemplating the study of law or journalism, extended courses in civil polity, economics and historical science, together with literary and philosophical branches, have been arranged so as to constitute the work of the Junior and Senior years of the collegiate course. Students are thus enabled to profit by an adaptation of their college course to their future work without essential deviation from the general purposes of collegiate training.

**SPECIAL COURSES FOR NORMAL SCHOOL GRADUATES.**—To afford graduates of the State Normal Schools facilities for extending their studies advantageously, and at the same time to attain a recognized standing leading to a degree, without loss of time or inconvenience arising from the want of adjustment of their previous studies to the standard college courses, special courses have been adopted by the University by which two additional years of successful study will enable graduates from the advanced Normal courses to graduate from the University with a degree.

**GENERAL FACILITIES.**—The Faculty embraces upwards of fifty instructors. The laboratories are new, extensive and well equipped, embracing the chemical, physical, metallurgical, mineralogical, geological, zoological, botanical, civil and mechanical engineering, agricultural and pharmaceutical laboratories. *Seminars* for advanced study in history, language, literature, mathematics, and other branches are being developed.

The libraries accessible to students embrace that of the University, 16,000 volumes; of the State Historical Society, 123,000 volumes; of the State Law Department, 20,000 volumes; of the City, 9,000 volumes, besides special professional and technical libraries, thus affording very exceptional opportunities for reading and special research.

# Breeders' Directory.

**ARNOLD, A. A.**—GALESVILLE, WIS.  
Shorthorn Cattle and Berkshire Pigs.

**ASHTON, ROBERT**—ARCADIA, WIS.  
Poland China Swine.

**DAMS, H. C.**—MADISON, WIS.  
Jersey Cattle.

**ANNANDALE STOCK CO.**—RIPON, WIS.  
Hereford Cattle, English Draft Horses,  
Chester White and Poland China Swine.

**BARKER, J. B. & SON**—MILLARD, WIS.  
Improved Chester White Swine.

**BARTLETT, W. B.**—EAGLE POINT, WIS.  
Shorthorn and Jersey Cattle and Poland  
China Pigs.

**BEATTIE, WM.**—ARLINGTON, WIS.  
Breeder of Clydesdale Horses.

**BIRKETT, WM. W.**—DARLINGTON, WIS.  
Hereford Cattle.

**BOWLES, HADDEEN & CO.**—JANESVILLE, WIS.  
Percheron, French Draft and Coach and  
English Shire Horses.

**BRIGGS, H. A.**—ELKHORN, WIS.  
Percheron Horses.

**BRINKERHOFF, F.**—BRANDON, WIS.  
Shorthorns, Carriage Horses, Merino  
Sheep and Berkshire Pigs.

**BROOKS, SEYMOUR**—EAST TROY, WIS.  
Standard-bred Trotting Horses and Span-  
ish Merino Sheep.

**BURNETT, G. P.**—RIVER FALLS, WIS.  
Shorthorn Cattle, English Shire and Road  
Horses.

**BLAKE, DR. S. M.**—LODI, WIS.  
Breeder of Hambletonian and Morgan  
Horses.

**BUTTLES, E. T.**—WATERFORD, WIS.  
Breeder of Merino Sheep and Poland  
China Pigs.

**BRADLEY BROS.**—HUDSON, WIS.  
Breeders of Jersey Cattle and Poland  
China Pigs.

**BORLAND, JOHN**—RUSK, WIS.  
Breeder of Chester White Swine.

**CARTER, E. D.**—HUMBIRD, WIS.  
Breeder of Thoroughbred Holstein Cattle.

**CASS, JAMES D.**—BELOIT, WIS.  
Shropshire Sheep, Suffolk Swine and  
Fancy Poultry.

**CLARK, C. M. & SON**—WHITEWATER, WIS.  
Bates Shorthorns, Registered American  
Merino Sheep and Standard-bred Trotting  
and Carriage Horses.

**CLARK, ISAAC**—GALESVILLE, WIS.  
Clydesdale Horses, Durham Cattle and  
Poland China Pigs.

**CLAPP, I. J.**—KENOSHA, WIS.  
Guernsey Cattle and Merino Sheep.

**CLELAND, C. S.**—JANESVILLE, WIS.  
American Merino Sheep.

**CHURCH, C.**—WALWORTH, WIS.  
Breeder of and Dealer in Jersey Cattle.

**CONVEY, THOS.**—RIDGEWAY, WIS.  
Poland China Hogs and Plymouth Rock  
Fowls.

**CRANE, W. W.**—WEYAUWEGA, WIS.  
High Grade Norman Horses.

<b>CRAWFORD, J. D.</b> — MENOMONEE, MICH. Jersey Cattle.	<b>FELLOWS BROS.</b> — FOSCORO, WIS. Shropshire and Oxford-Down Sheep.
<b>CRAWFORD, J. N.</b> — MUKWANAGO, WIS. Spanish Merino Sheep and Poland China Swine.	<b>FOOTE, M. H.</b> — SPRING PRAIRIE, WIS. Guernsey Cattle.
<b>CUPPEL, C.</b> — NORTH GREENFIELD, WIS. Jersey Cattle.	<b>FROST, ELLERY D.</b> — ALMOND, WIS. Holstein-Friesian Cattle.
<b>CURTIS, I. L., &amp; CO.</b> — POYNETTE, WIS. Holstein-Friesian Cattle, Victoria Swine and Plymouth Rock Fowls.	<b>GALBRAITH BROS.</b> — JANESVILLE, WIS. Clydesdale, English Shire, Suffolk Punch and Cleveland Bay Horses.
<b>DAY, C. L.</b> — HUDSON, WIS. Cotswold Sheep and Poland China Swine.	<b>GORDON, JOSEPH</b> — MINERAL POINT, WIS. Poland China Hogs.
<b>DUNHAM, M. W.</b> — WAYNE, ILL. Percheron and French Coach Horses.	<b>GORDON, G. E.</b> — KOSHKONONG, WIS. Guernsey Cattle.
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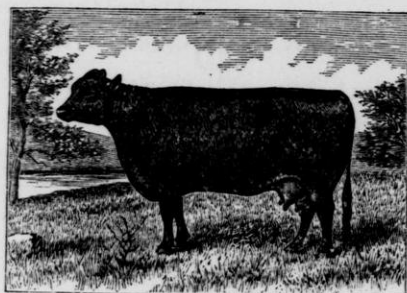
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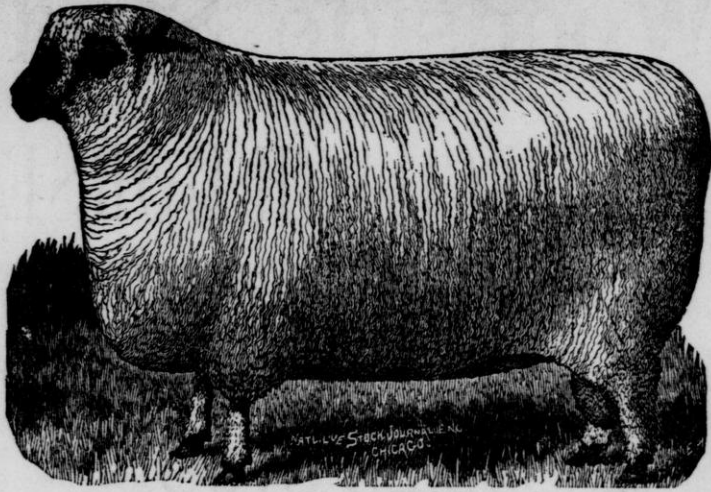
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Devoted to the Improvement of the Farm, the Dairy, Live Stock, etc.

Eighth Year. Madison, Wis., Nov. 2, 1889. Vol. VIII--No. 409.

PUBLISHED WEEKLY BY  
**The Western Farmer Co.**

EDITORS:

FRANK H. WILLARD. } No. 8, Democrat Block,  
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MILWAUKEE, WISCONSIN.

The following is a list of towns, classified by States:

## WISCONSIN.

Courtland (Irma), Tomahawk, Minocqua.

## MINNESOTA.

Mapleton, Minnesota Lake, Okabena.

## DAKOTA.

Ramona, Oldham, Erwin, Bryant,  
Naples, Elrod, Bradley,  
Garden City, Butler, Burton,  
Langford, Britton,  
Newark, Brampton, Sargent,  
Harlem, Monango, Edgeley,  
Orient, Millard, Hosmer,  
Hillsview, Eureka, Eden.

## IOWA.

Covington, Atkins, Newhall,  
Van Horne, Keystone, Vining,  
Gladstone, Ferguson, Haverhill,  
Melbourne, Collins, Maxwell,  
Huxley, Woodward, Jamaica,  
Bagley, Bayard, Dedham,  
Templeton, Aspinwall, Manilla,  
Astor, Earling, Panama,  
Portsmouth, Persia, Buck Grove,  
Bell, Kenwood, Charter Oak,  
Ute, Rodney, Charles City,  
Peru, Cedar Rapids, Highland Center.

## MISSOURI.

Powersville, Lucerne, Harris,  
Osgood, Laredo, Ludlow,  
Braymer, Cowgill, Elmira,  
Mosby.

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**ROSWELL MILLER, A. V. H. CARPENTER,**  
General Manager. Gen'l Pass. and Tkt. Agt.

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☞ For information in reference to Lands and Towns owned by the CHICAGO, MILWAUKEE & ST. PAUL RAILWAY COMPANY, write to H. G. HAUGAN, Land Commissioner, Milwaukee, Wisconsin.

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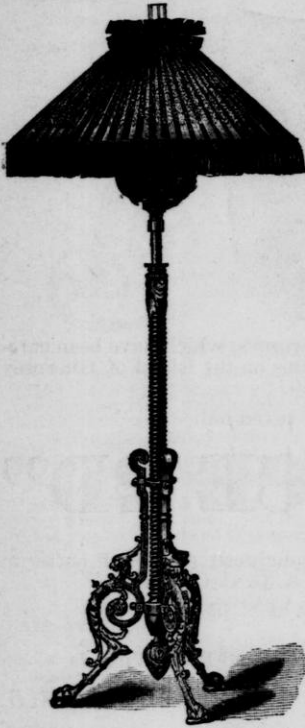
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414, 416 Milwaukee St.,

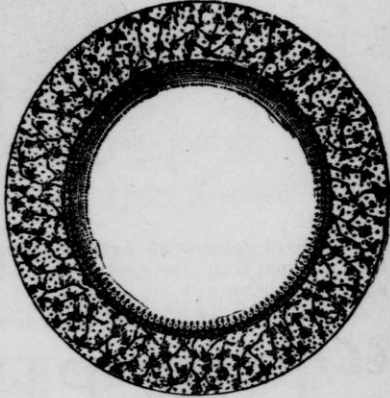
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DINNER SETS IN OPEN STOCK.

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PIANO, or FLOOR LAMPS,

Over 40 beautiful patterns in stock, from \$10 upwards.

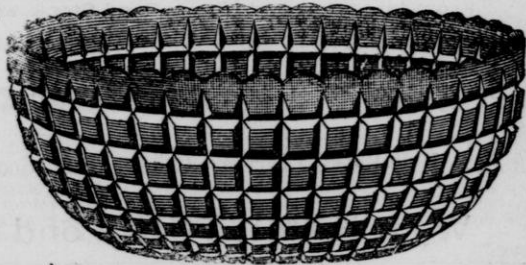
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CALL AND SEE US

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Prices Guaranteed  
THE LOWEST  
in the City.



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# Fond du Lac Guernsey Herd



My herd consists of sixty-five Registered Guernseys, which have been carefully selected from the best milk and butter strains on the Island of Guernsey and in America.

At the head of my herd stands the noted bull,

## “THE PRINCE 2D”

755, A. G. C. C.,

Out of Imp. Coraline 1790, A. G. C. C., that made eighteen pounds of butter in seven days on grass, and TRICK, 1656, A. G. C. C., out of Imp. Tricksey, 1760, A. G. C. C.

Among the cows are descendants of the noted Island Prize Winners,  
*SQUIRE OF LES VAUXBELETS, FAIR LAD, THE BILLEY'S HERALD,  
AND JESSIE OF LESTER MANOR.*

## YOUNG STOCK OF BOTH SEXES FOR SALE,

From Imported and Home-Bred Stock, at Reasonable Prices.

All questions cheerfully answered. Visitors carried to the farm free of charge.

## BREEDER OF REGISTERED POLAND-CHINA SWINE.

A Few Half-Blood Guernsey Calves, from Good Grade Cows, for Sale.

**W. I. HAMILTON, Fond du Lac, Wis.**

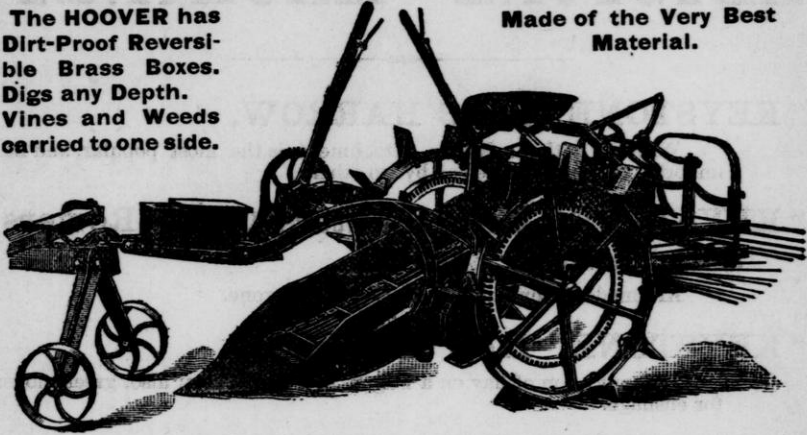
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# The Hoover Digger.

The HOOVER has  
Dirt-Proof Reversible  
Brass Boxes.  
Digs any Depth.  
Vines and Weeds  
carried to one side.

Made of the Very Best  
Material.



## T. B. Terry's Tribute to the Hoover Digger.

I want to say to my friends who read this that I have used an elevator digger for five years, and that the Hoover, which I consider the best, the past season, and that it is just as necessary a tool on my farm, and almost as perfect, as the mower or binder. My son and myself and three pickers dug and put in the barn as high as 400 bushels in a day this year.

Hudson, O., Oct. 9, 1889.

T. B. TERRY.

## From Hon. Matt. Anderson—A Good Word for the Sorter.

MESSRS. HOOVER & PROUT:

GENTS—I have used your Digger in digging 30 acres of potatoes. It does its work well, where the ground is level and in proper condition. The Sorter is a great labor-saving machine.

Yours truly,

MATT. ANDERSON.

(Mr. Anderson should have used our Side-Hill Spurs for his hilly ground.—H. & P.)

PINE BLUFF, WIS., Dec. 27, 1888.

## 140 Plus 200 = 340 Acres for One Machine.

HOOVER & PROUT:

GENTS—Our old digger has turned off 100 acres this season (it dug 140 acres last year) and it has 100 acres more before it, if weather holds good. I dug to-day in 5¼ hours, 1,066 bushels, and I would have given \$30 bill if I had had crew enough to have picked up as fast as I dug, and I would have dug 2,000 bushels in 10 hours. Will dig 3,000 bushels this year.

River Falls, Wis.

E. H. CURRIER.

## No Trouble From the Start.

GENTS—The Digger is perfectly satisfactory in every respect. I have dug over 30 acres this season. My potatoes were planted fully eight inches deep. The Digger placed them all on top of the ground, and in a row not exceeding 12 inches wide, save a stray one here and there. The capacity of the Digger is only limited by the distance a team can walk. My team weighed less than 1,000 each. We had no trouble in operating the machine from the start.

Very truly yours,

C. G. BOALT.

MESSRS. HOOVER & PROUT:

GENTS—We have given the Hoover Potato Digger, bought of your agent, C. T. Williams, a full trial; it did its work well in both rough and weedy ground; have dug over 4,000 bushels with it; can highly recommend it above the McCallum for both its good work and strength, as we have tried both kinds.

Yours,

PIPER BROS.

PERRYVILLE, WIS., Oct. 10, 1889.

The Hoover Digger I purchased of C. T. Williams, of Racine, has given the best of satisfaction. It is what I have been looking for for years. Have tried a number of others, but the Hoover has no equal. Have used it in weeds and all kinds of soils, having dug 20 acres for my neighbors, and they all say "bless the inventor." It is a complete machine in every respect.

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With or without Seeder Attachment, is the most popular, and has important features possessed by no other.

## **"KEYSTONE" Corn Planters, Check Rowers, and Ensilage Drills**

Are made in several styles. Can suit anyone.

## **"KEYSTONE" HAY LOADER**

Will put a ton of hay on a wagon in five minutes; also, green clover for ensilage.

## **"KEYSTONE" HAY RAKES.**

Our "Side Delivery" is new. Makes a continuous windrow around the field. Our "Easy Dump" has steel or wood wheels, pole or thills.

## **"KEYSTONE" CORN HUSKER AND FOD- DER CUTTER,**

A wonderful machine, and a success.

## **"KEYSTONE" CORN SHELLERS,**

ALL SIZES.

## **"KEYSTONE" HORSE POWERS,**

OVERHEAD AND DOWN.

## **"KEYSTONE" CIDER MILLS,**

TWO SIZES.


## **SEND FOR OUR NEW CATALOGUE,**

AND MENTION THIS BOOK.

## **KEYSTONE MANUF'G CO.,**

STERLING, ILL.

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# SILOING GREEN CLOVER.

You know what hard work it is to pitch onto the wagon by hand the green clover, and maybe you are tempted to give up siloing clover on account of this killing work. This hard work is ended for those who use the

## “Keystone” Hay Loader,

Which proves itself a great success at this work, as it has for many years in the hay field.

READ THIS:

ELKHORN, Wis., July 23, 1889.

*Keystone Manufacturing Co.:*

GENTLEMEN.—I have just completed the filling of my silo with green clover, and desire to acknowledge to you the great help we have had in the use of your invaluable Loader. In fact we should have been obliged to abandon it but for the Loader. No matter how green the clover, the Loader handles it equally well either in swath or windrow. I shall not attempt another haying without the use of your great labor saver. I am more than pleased with the Loader, and would not take double the cost if another could not be purchased.

Very respectfully,

ISAAC MOORHOUSE.

In the Hay Field too, you will find the Loader just as valuable.

**KEYSTONE**  
**HAY LOADER**

THE ONLY SUCCESSFUL  
ONE EVER MADE.  
PUTS ON A LOAD IN 10  
MINUTES OR LESS.

SAVES  
TIME, MEN AND  
LABOR

OFTEN PAYS FOR ITSELF  
IN ONE SEASON. MENTION THIS PAPER.



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It will pay you well to send for our Catalogue, which is sent free on application, and shows our large line of first-class machines. Address

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GRAND DUKE OF RIDGEWOOD 2d SIXTY.

IMPORTER AND BREEDER OF

## Shorthorn Cattle and Berkshire Hogs.

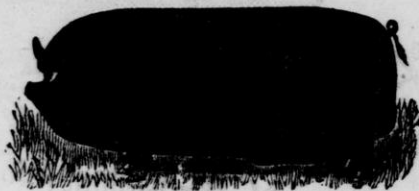
**Animals of Each Breed and Both Sexes for Sale at Reasonable Prices at All Times.**

My herd won at the **Iowa State Fair, Minnesota State Fair, Wisconsin State Fair and Dane County Fair**

## FORTY-FOUR PRIZES,

Nine of them being **SWEEPSTAKES**, four of them being for herd bred and owned by exhibitor. I bred all females shown by me this year. I have now **Thirty-five Young Bulls**, most of them ready for service and many of them prize winners.

SEND FOR CATALOGUE OF BULLS.



—I HAVE ALSO—

**A FEW CHOICE YOUNG REGISTERED BOARS READY TO SHIP,**  
And will be Sold Cheap, Quality Considered. Address

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Or apply to **P. WAKEM, MANAGER**, at Farm, Burke Station, 5 miles from Madison on Watertown Division of C., M. & St. P. R. R.

Ample Time Given to Responsible Parties Wanting Time.

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The above illustration, reproduced from photograph, shows Mr. Geo. A. Austin in his field of Ensilage corn, raised from "B. & W." seed furnished by Cornish, Curtis & Greene, of Fort Atkinson, Wisconsin, general western agents. Write for circulars.

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**Be Sure and Get the Genuine B. & W. Take no Other**—10,000 bu. sold last year.

**CORNISH, CURTIS & GREENE,** Fort Atkinson, Wisconsin,  
Manufacturers and dealers in everything pertaining to Butter and Cheese Making. Send for Prices and **Discounts**.

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**JERSEY CATTLE.**

The foundation of this herd was selected with great care, only animals of great dairy merit were admitted. No color foolishness was allowed to prejudice us in making selections. The five cows purchased were good for an annual average of 500 pounds of butter each. The herd is headed by the two

**PRIZE AND SWEEPSTAKES BULLS,  
JUMBO OF RIVERSIDE,**

Sired by **PEDRO**, A SON OF THE GREAT



**EUROTAS,**

AND OUT OF A GRAND-DAUGHTER OF JERSEY BELLE OF SCITUATE; AND

**FAITH'S PRINCE POGIS,**

Sired by the only son of the famous **MARY ANNE** of St. Lambert, and out of

**FAITH OF OAKLANDS,**

—SWEEPSTAKES COW OVER ALL CANADA.—

The aggregate weekly butter record of the dam and sire's dam of **FAITH'S PRINCE POGIS** is over 54 pounds.

These two bulls individually have no superiors and but few, if any, equals. They are large, symmetrical, vigorous, muscular and strong in constitution. Their breeding combines the blood of the great cows:

**JERSEY BELLE OF SCITUATE**, 705 pounds of butter in a year; **EUROTAS**, 778 pounds of butter in a year; **MARY ANNE OF ST. LAMBERT**, 876 pounds of butter in a year; **FAITH OF OAKLANDS**, 17 pounds, 4 ounces of butter in a week, 9,265 pounds of milk in 365 days.

Stock is the very best; not overfed or "doctored," and always gives satisfaction.

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**SAMPLES SENT ON APPLICATION.**

Goods ordered and left to our judgment to select, may be returned by express at our expense if not satisfactory, if returned immediately and in good order, and other goods will be sent in exchange or the money refunded, as the customer may desire.

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She will there find hundreds of useful things for the

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That she had never thought of, or had neglected to purchase,  
and which she will not be without when she sees them  
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Low Prices at which we are selling them.

**A VISIT TO OUR ESTABLISHMENT WILL BE INTERESTING  
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ROSS  
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CUTTERS and CARRIERS.

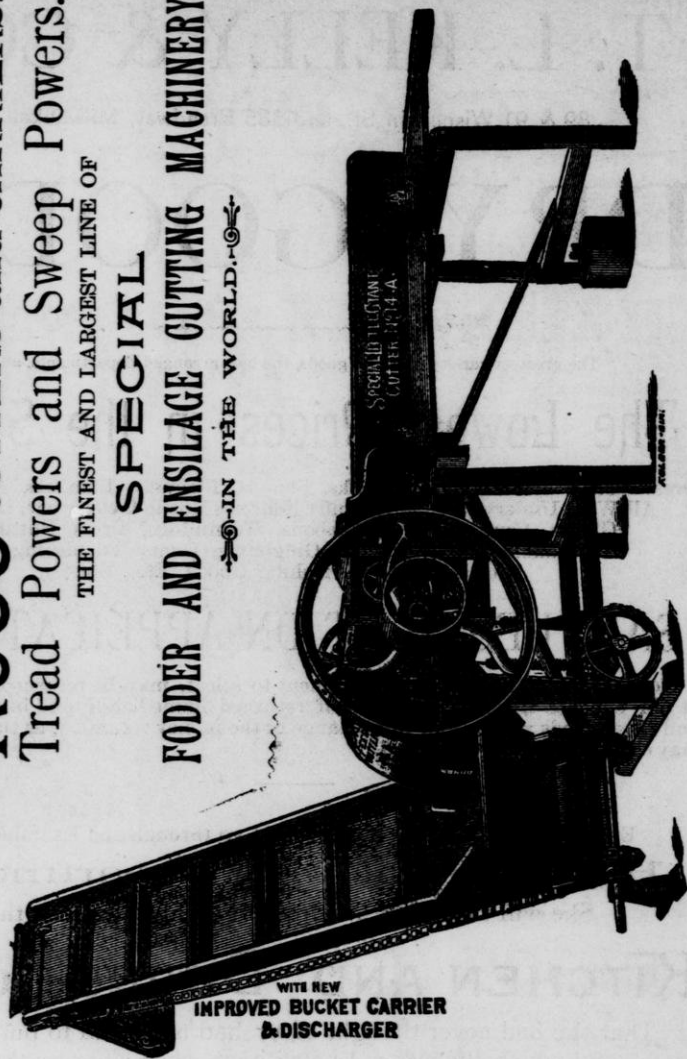
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THE FINEST AND LARGEST LINE OF

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**E. W. ROSS & CO.,**

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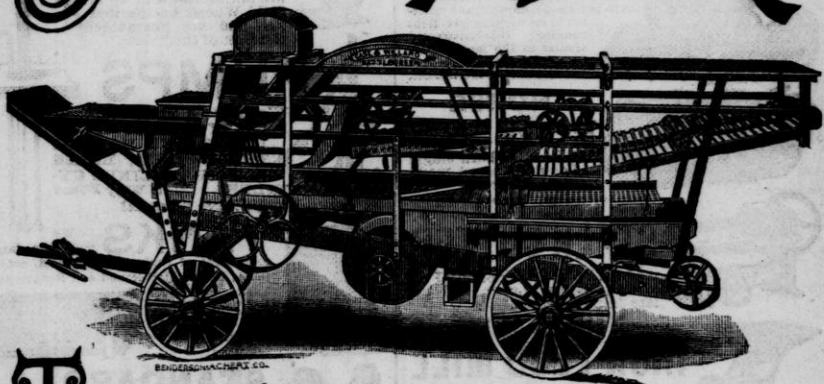
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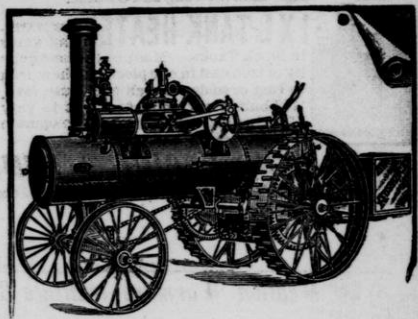
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Shelling and Grinding at home, saving tolls and teaming to and from the Grist Mill. This work can be done rainy, windy days when out-door work is suspended on the farm. The same Mill will cut corn stalks, saw wood, run churn, grindstone, pump water, etc. We make the **HALLADAY** Geared Wind Mill in 11 sizes, 1½ to 40 horse power, and **GUARANTEE** they have no equal for Power Durability and Storm Defying qualities.

34 Years Experience.



34 YEARS Experience.



**WIND MILLS**

**THE HALLADAY PUMPING MILL** is acknowledged the Standard Wind Mill of the World and is made in 13 sizes, 3 to 80 ft. diameter, 1 man to 40 horse power. It is adapted to pumping water for Stock and Dairy Farms, Ornamental and Village Water Supply and Fire Protection, Railway Water Stations, Irrigation, Drainage, etc. **THE HALLADAY** is made upon honor and guaranteed **THE MOST POWERFUL, DURABLE and BEST REGULATED, STORM DEFEATING** Wind Mill Made.

**1 X L 2-HOLE Corn Sheller**

Adapted to run by hand, horse, steam or wind power. Not cheaply made but strong, durable and effective in its working yet light running. It is constructed similar to the large Power Shellers and is the best 2 Hole Sheller on the market.



**HORSE POWERS** and JACKS, both single and double Geared, made heavy and strong.

**THE 1 X L STALK CUTTER**

made in 5 Sizes, with Safety Fly-Wheel, Safety Lever, and all late improvements.



**THE 1 X L IRON FEED MILL**

3 sizes, both Belt and Geared Mills. Can be run by any power and especially adapted to Wind Power. Will grind any kind of grain and is the lightest running and most effective Feed Grinder made.



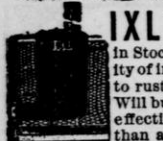
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Both Swinging and Sliding Tables. We make a Saw Table especially adapted to sawing long poles. Special care is taken to make these machines strong and durable.



**1 X L TANK HEATER** for warm-

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**U. S. SOLID WHEEL WIND MILL**

7 sizes, 10 to 22 feet diameter. Not cheaply made but heavy and strong in construction. These Mills are taking the lead of all Solid Wheels on the market, and are guaranteed the Best of their class.



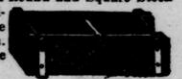
**PUMPS**

We make a very complete line of WIND MILL, HAND AND POWER PUMPS, IRON, BRASS AND BRASS LINED CYLINDERS. Our 3 Way Force Pumps have no equal.



**TANKS**

We make the largest assortment of Tanks on the market, consisting of Round, Half-Round and Square Stock Tanks, Milk Cooling Tanks, Storage and House Tanks. Special sizes made to order.



**STANDARD HAY TOOLS**



For stacking out in fields and mowing away in barns. The use of a good Hay Carrier and Fork a few hours before a storm, may save many times their cost. We make the most complete line of **Horse Hay Tools** on the market, consisting of Anti-Friction, Swivel, Reversible and Rod Hay Carriers, Harpoon and Grapple Hay Forks, Pulleys, Floor Hooks, etc.



**All goods guaranteed. Send for Catalogue and Prices. RELIABLE AGENTS WANTED in all unassigned Territory.**

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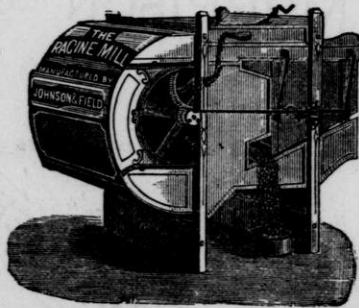
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MANUFACTURERS OF

## THE RACINE

FARM AND WAREHOUSE

The Mill is Guaranteed to do more and better work than any other.

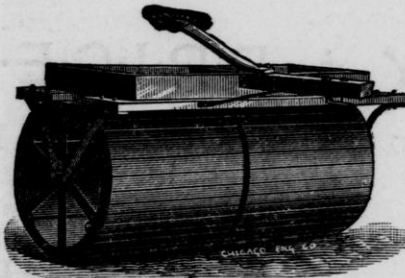


Will do more work thoroughly and has greater capacity than any other Mill. Warranted to give satisfaction Agents wanted.

## FANNING MILLS

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The Best, Cheapest and Strongest Land Rollers in the Market.



Send for Price List and Circular before you buy.

## Land Rollers.

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**MORRISON**  
SAYS:

*"The Plants I received from  
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FOR GARDENERS AND FARMERS.

Home  
Grown,

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Packets, 2 to 5 Cts. Quarts and Pounds at  
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Madison, Wis.

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For Setting Milk. Excels in Simplicity, Convenience and Durability.



Only ONE CAN and ONE FAUCET. The Milk Pan is constructed on a new and practical system. A large skimming glass extends the entire depth of the can, showing the cream distinctly all the way down. Having fewer parts, there is less liability to get out of order. It is an obvious fact that one large can of proper cooling surface can be operated at less expense and less labor than several small ones. Water circulates between the apartments, beneath, around and over the top of can, so that the milk is practically submerged, yet has proper ventilation.

TWO YEARS' TEST has proven these pans to be the best for the purpose ever invented. Made in all sizes, for the smallest DAIRY or the largest FACTORY.

Send for Special Introductory Offer.

CIRCULARS FREE BY MAIL.

→AGENTS WANTED←

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Flint's Milch Cows and Dairy Farming,	-	-	-	-	\$2 60
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Science in Farming,	-	-	-	-	1 00
Artistic Horse Shoeing,	-	-	-	-	1 00
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Any of the above books sent postpaid on receipt of price.

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—ITS TRAIN SERVICE COMPRISING—

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BETWEEN **CHICAGO** AND

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## California and Pacific Coast Points,

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## Superb Day Coaches, Dining and Sleeping Cars,

IS CAREFULLY ARRANGED TO MEET THE REQUIREMENTS OF THROUGH AND LOCAL TRAVEL. THE **NORTHWESTERN** IS

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For the Commercial Traveler, the Tourist and the Seekers after New Homes in the Golden Northwest.

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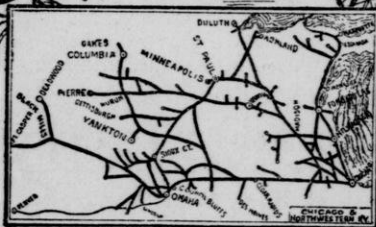
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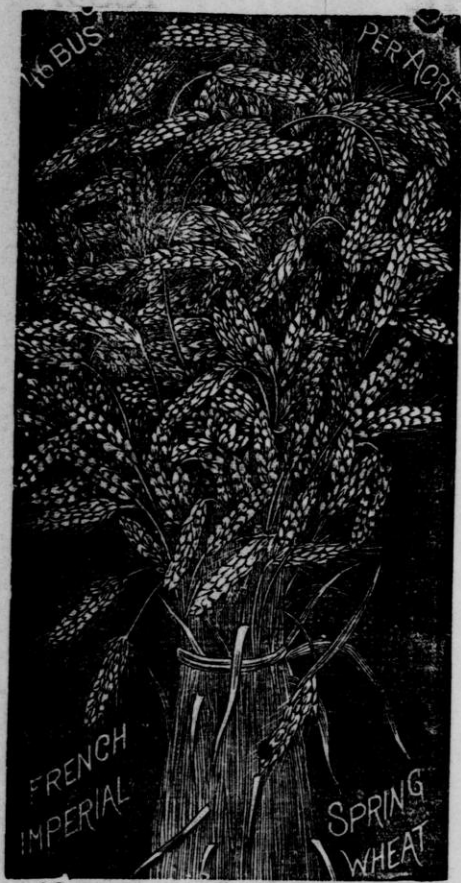
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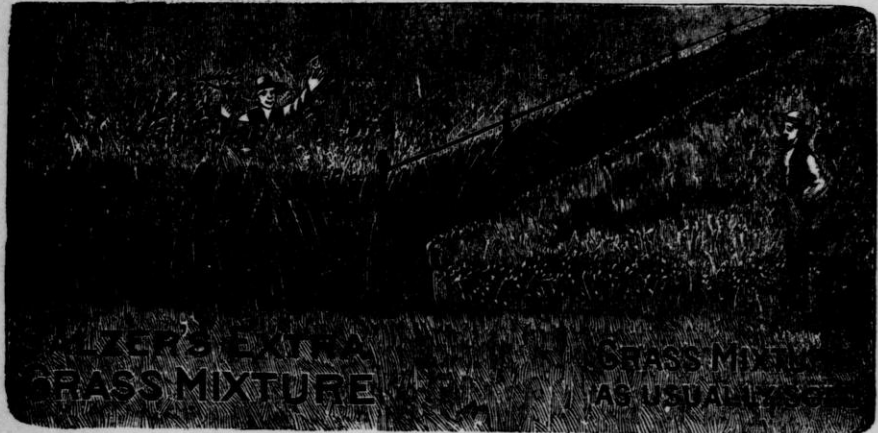
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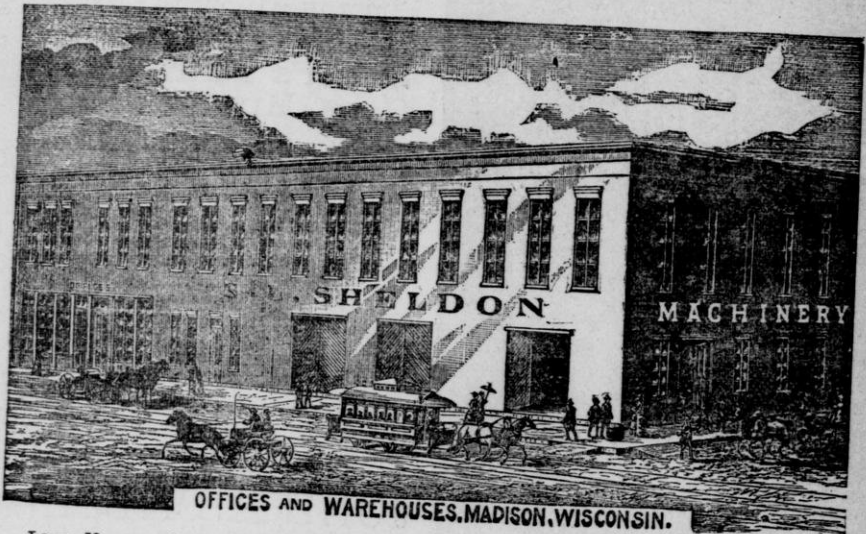
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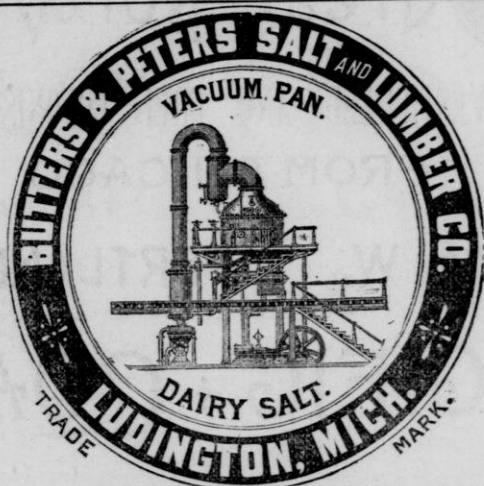


# Vacuum Pan Dairy Salt

## LEADS THEM ALL

In Flavor and Evenness of Grain.

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### READ ITS RECORD.

At the late State Fair in Milwaukee, Butter and Cheese were judged by three expert judges from Chicago, and butter salted with **VACUUM PAN SALT** was awarded **TWELVE PREMIUMS** out of **SIXTEEN**. No butter or cheese exhibited scored higher than that salted with Vacuum Pan Salt. Vacuum Pan Dairy Salt has been awarded the **FIRST PREMIUM** (diploma) wherever exhibited.

This salt is **absolutely free** from **pan scale** and all **other gritty substances**, is not **ground**, does not **cake**, and contains no insoluble matter which is so annoying to the consumer and detrimental to the sale of butter.

There is no **butter, grease, chemicals**, or any other **foreign substances** used in its manufacture either to **purify, bleach** or **granulate** it, and we guarantee it to make a brine

#### CLEAR AS CRYSTAL

quicker than any other salt, without any milky appearance, or dirty suds, thus showing its freedom from **lime and dirt**, and it will not **cake up hard**, thus showing its freedom from Gypsum.

Dairy salt is put up in 280 lb. barrels, the staves of which are selected and planed on both sides, and in 28, 56, 112 and 224 lb. sacks. Table salt in 3, 5, 10 and 14 lb. pockets packed in barrels. **second quality** and **agricultural** salt in car load lots.

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A. R. Hoard, Fort Atkinson, Wis.; Marr & Kachel Bros., Whitewater, Wis.; C. B. McCunna, Burlington, Harris & West, Spring Prairie, Wis.; J. C. Flack, Elkhorn, Wis. Hon. Hiram Smith, Sheboygan Falls; H. K. Loomis, Asst. Dairy Commissioner.

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My motto is, quality is better than quantity, and I have now on hand and for sale, as choice a lot of young Stallions and Mares as can be found in the Northwest, breeding, sire, style, and size and quality of bone considered, that I am prepared to sell on as easy terms and as cheap as any like establishment in America,



As I do my own selecting and buying in person, and have no expensive agents' bills to pay.

Visitors always welcome, and intending buyers are requested to come and examine the stock before purchasing.

Also a choice lot of grade Mares and some grade Stallions for sale.

Send for catalogue.

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Breeding Farm  $\frac{2}{3}$  miles west.

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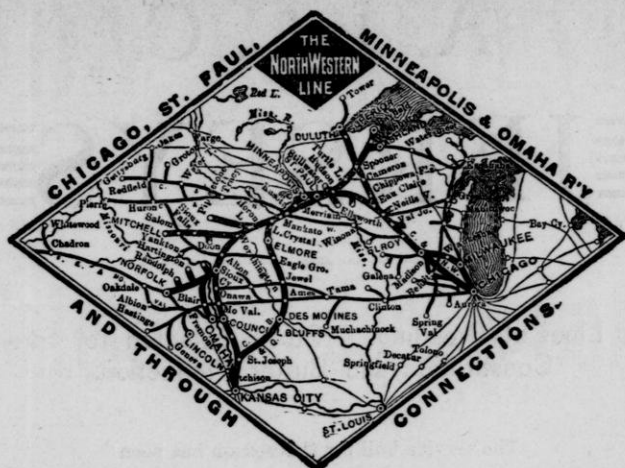


First-class Pigs shipped and satisfaction guaranteed. Visit my herd and make your own selection. All stock recorded. Correspondence solicited.

**GUSTAV SCHROETER,**  
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## FAITH'S PRINCE FOGIS,

A Grandson of Mary Anne of St. Lambert, and Sweepstake Bull at the  
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Calves of Both Sexes for Sale.

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I have in my herd some of the best butter families in the world.  
Satisfaction guaranteed. A choice lot of

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AT REASONABLE FIGURES.

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Correspondence solicited.

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**Four Immense Floors** filled to their utmost capacity, and connected by two safety elevators and broad stairways.

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**51,000 Square Feet** of floor service, one mile of counter room.

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**We Show Goods to Visitors** with the same degree of courtesy as to purchasers.

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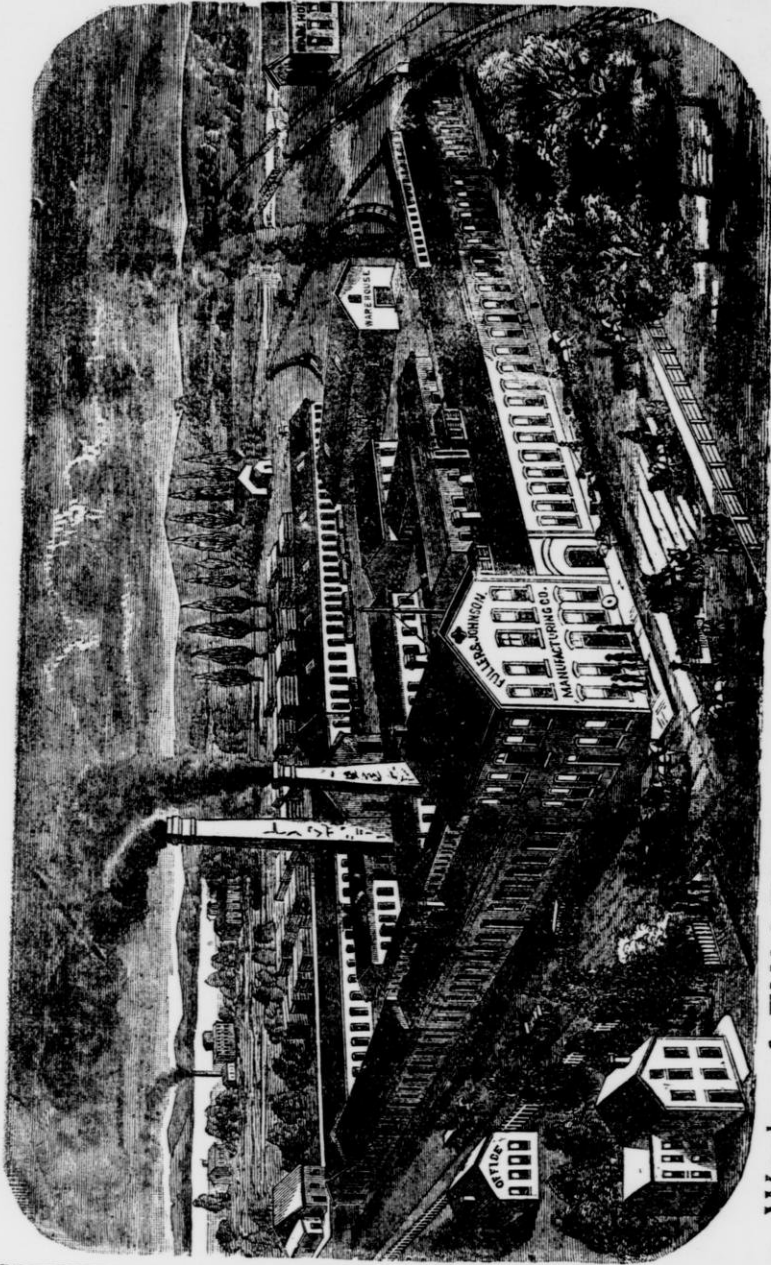
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Honest goods at honest prices, honestly represented, has made the White House the popular trading resort of Wisconsin.

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**Works of FULLER & JOHNSON MFG. CO., Madison, Wis.**

Manufacturers of Farm Implements, "Red, White and Blue" Mowers, Bonanza, Star, and Johnson Self-Dump Hay Rakes, Bonanza Force Drop Corn Planter and Check Rows, Plows, Cultivators, Harrows, etc. Write them for Illustrated Catalogue, which will be sent postage paid upon application. **THEY HAVE A PERFECT MACHINE FOR PLANTING ENSILAGE CORN.**

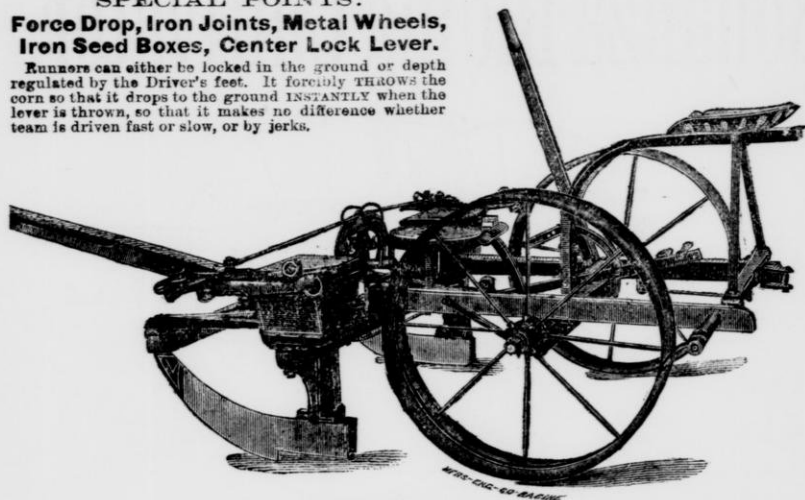
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# Bonanza Force Drop Corn Planter and Check Rower.

## SPECIAL POINTS:

**Force Drop, Iron Joints, Metal Wheels, Iron Seed Boxes, Center Lock Lever.**

Runners can either be locked in the ground or depth regulated by the Driver's feet. It forcibly THROWS the corn so that it drops to the ground INSTANTLY when the lever is thrown, so that it makes no difference whether team is driven fast or slow, or by jerks.



The above cut shows our Bonanza Force Drop Corn Planter with our Improved Check Rower.

Will plant corn in straight rows both ways, whether team goes fast or slow. This alone will save the price of Planter for every 100 acres planted, by not having corn destroyed by cultivating.

The operating slides rest on anti-friction rollers, so that the slide bar is much more easily operated,—a great saving of wear on the Check Rower,—which will therefore last much longer.

When raised out of the ground it is self-locking; thus avoiding the use of latches.

It has glass at the heel of the drop so that the driver can at all times see the corn dropping.

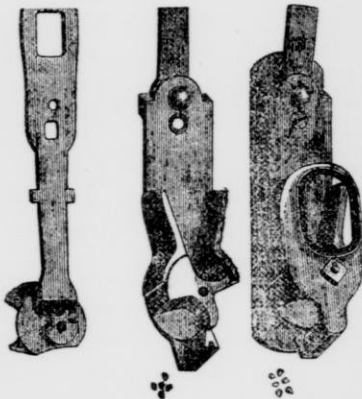
The lock being in the center, the runners go a uniform depth. Planters that lock at the side run deeper on one side than the other, when the Planter is locked in the ground.

## CHECK ROWER.

Made entirely of Iron and Steel. No wood frame across Planter. Great strength, easy movement. Only three working parts in center of Check Rower. Made adjustable for either our 3 ft. 6 or 3 ft. 8 Planter. Driver can throw off the wire at end of field without leaving his seat, by pulling the string attached to latch and hand lever. [See cut above.]

This Check Rower is of the very latest improvement, is adapted especially to our Force Drop Planter, and the two together make the very best outfit for planting corn to be found in the market. We defy any one to produce its equal.

The accompanying cuts show the working parts of the Force Drop. The one at the left shows the manner in which the lever causes the seed cup to revolve and throw the corn to place. The center cut shows the seed cup in position with corn in cup, and also hill of corn that has just been dropped. The cut at the right shows the whole seed cup and lever, and also hill of corn just dropped.



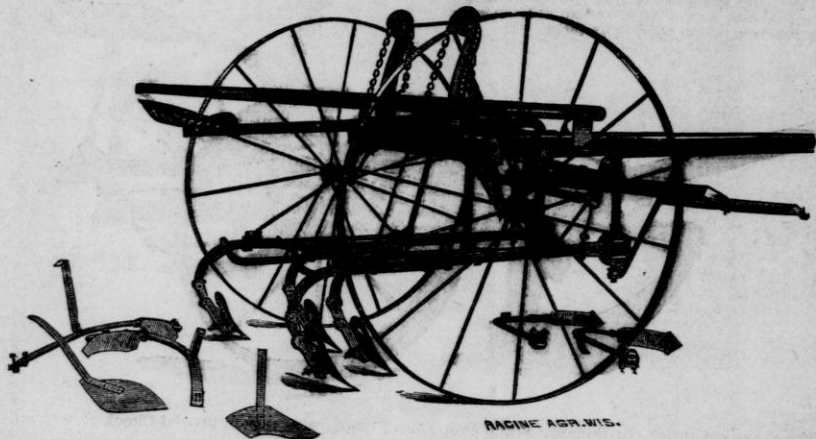
**DRILL ATTACHMENT.**—An attachment is used for planting the corn in drills, and when it is to be planted for *Ensilage*, making it a perfect drill for this kind of work. Manufactured by

FULLER & JOHNSON MFG CO., Madison, Wis.

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—IMPROVED—

# Bonanza Riding Cultivator.



Steel or Wood Beams, High Arch, Steel Axle,  
Long Drag Bars.  
Can be Used with Four, Six or Eight Shovels.

## ADVANTAGES.

The axle is made adjustable for cultivating in wide or narrow rows.

Axle is *very high* so that it will not break down the corn. The draft is direct from axle, and is so attached that it can be raised up or down and whiffletrees fixed at any point that may be desired.

Drag bars are attached to standards so as to swing with the least possible friction. Beams and shovels are provided both with friction slip and break pin, to prevent any possible danger of breaking shovels. Shovels are extra hardened and will scour equal to anything that can be had. Shovels are attached so as to be adjustable in every way; can be given more curve or set straight; set to throw dirt to or from corn.

We furnish either foot lifts or springs. The hand levers are very convenient to the driver, and drag bars can be raised very easily. The seat is adjustable high or low, also forward and back, so as to balance the pole perfectly. Wheels are high, and are made with iron hubs and run on steel axles. The tires on wheels are bolted to felloes.

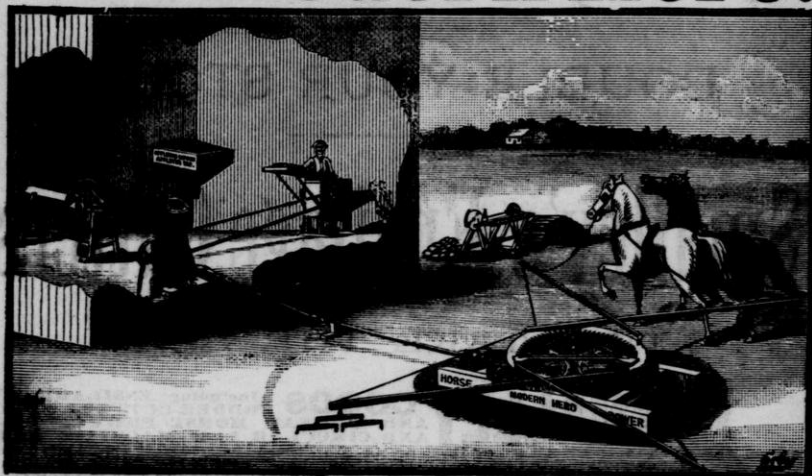
## SURFACE CULTIVATING.

These Cultivators are provided with shovels *plated and sharpened on upper end* so that when corn is well grown and there is danger of destroying roots by using pointed end of shovel and working deep in ground, the shovel may be reversed and the broad end of same worked in ground, which will destroy all weeds and grass, but will not go deep enough to destroy roots of corn. Few farmers fully realize the damage done to corn by deep cultivating after it is well grown and roots are much spread. Deep cultivating should be done while corn is small and before roots have spread. Manufactured by

FULLER & JOHNSON MFG. CO.,  
MADISON, WIS.

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# The Modern Hero.



Grind Your Grain, Cut Your Fodder,  
Saw Your Wood,

WITH THE CELEBRATED

Modern Hero Horse Power & Grinding Mill,  
Hero Fodder Cutter, and Common  
Sense Wood Saw,

—AND—

## SAVE TIME AND MONEY.

You will find them economical, profitable and satisfactory Machines.

**We Make the Best Goods and always sell them  
on their Merits.**

**We are the Largest Manufacturers of Our Line in the World**

Send for our handsome Illustrated Catalogue giving full description of our twenty-six sizes American Mills, Hero Fodder Cutters, Badger Seeders, Horse Powers, Corn Shellers, Peck's Husking and Shelling Attachment for Fodder Cutters. All goods fully warranted and sent on trial.

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# Money on the Farm.

## DOUBLE YOUR STOCK.

# Smalley's Ensilage Cutters

### STILL TAKE THE LEAD.



**SMALLEY GOODS** Including ENSILAGE AND FODDER CUTTERS, SWEEP AND THREAD HORSE POWERS, DRAG AND CIRCULAR SAW MACHINES, FARM ENGINES AND FLOWS, are positively ahead of all others in the country, and so warranted. Shipped to any responsible farmer in the U. S. or Canada, subject to 30 Days' trial, and return at our expense if not proving just as warranted. The **SMALLEY BUCKET CARRIER** (1888 Patent) is the only one that can be run at any angle from 40 to 85 degrees, and is the only perfect Silo Carrier in the market. Our "Why It Pays," or *Practical Views from* *Practical Men,* should be read by every farmer interested in Stock raising or Dairying. Also, contains full descriptive price list of Smalley Goods.

**SMALLEY MFG. CO.,**  
MANITOWOC, WIS.

Ask for  
Special introduction  
prices and terms.

THE SMALLEY CUTTER, WITH IMPROVED BUCKET CARRIER.      SMALLEY TREAD POWER WITH GOVERNOR.

—SEND FOR OUR 1888 BOOK—

# WHY IT PAYS.

## Ensilage and Fodder Cutting.

Practical views by such men as Hiram Smith, A. A. Arnold, F. C. Curtis, and D. F. Sayre & Sons.

—See Next Page.—

# The Smalley Manufacturing Co.,

MANITOWOC, WIS.

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# Smalley Ensilage Cutters

## STILL AHEAD.

### Never Feeds any Uncut Fodder.

SHEBOYGAN FALLS, SHEBOYGAN Co., Wis., March 13, 1888.

SMALLEY MANUFACTURING CO.

*Gentlemen:*—I built a Silo in the summer of 1886, size forty by twenty-eight, and sixteen feet high, divided into three pits, capacity 270 tons, cost about \$400; stands on stone foundation, the walls made of matched flooring and tar board paper. The building is used for grain barn, and threshing is done just before the corn is sufficiently matured for Ensilage, say large enough to make roasting ears, cost of cutting corn in field and cutting into Silo about fifty cents per ton. My success has been entirely satisfactory, and I shall build an addition this year with capacity of 125 tons more; it is the cheapest cow feed I ever raised. I feed one feed a day of dry corn fodder and barley straw mixed, run the dry fodder through the cutter, and on eight pounds of dry feed put four pounds of wheat middlings. Never feed uncut fodder. I have for the past two years used a No. 14 Cutter and twenty-four foot Carrier, manufactured by the Smalley Manufacturing Company, of Manitowoc, Wis., and like it very well.

Yours truly,

HIRAM SMITH.

### Ex-President Arnold tells his Experience with Ensilage and Cutters.

GALESVILLE, TREMPPEALEAU Co., Wis., March 12, 1888.

SMALLEY MANUFACTURING CO.

*Gentlemen:*—I built a Silo in 1887 in my barn; it is twelve by twenty-four, and twenty-eight feet deep, eight feet in the basement, and cost \$130; holds 125 tons, and cost about \$1 per ton for cutting and filling. Corn partly cured the best, corn well matured the best. When heated to 120 degrees, Ensilage is sweet and better than when filled too fast and not allowed to heat up. I consider a ration of from twenty to twenty-three pounds, twice a day, with dry fodder, the best ration in cold weather for the health of the cattle and the quality of the milk and butter. Fully matured corn from the field makes a good ration for fattening steers. I do not cut dry fodder at all. I use a Smalley No. 12 Cutter, and cut one ton in from fifteen to twenty minutes, one-half inch long, with an elevator. The elevator is like most of the machines, but I think it should be improved by use of rubber belts instead of chain.

ALEX. A. ARNOLD,

Ex-President Wisconsin State Agricultural Society.

### Never Done Better at Butter-Making.

ROCKY RUN, COLUMBIA Co., Wis., March 10, 1888.

SMALLEY MANUFACTURING CO.

*Gentlemen:*—Having a large stone barn used a part of it for a Silo, and to give cost of same would be no criterion, having used it two seasons. I was the butt of ridicule the first season, but it proved so valuable that four of these ridiculing neighbors built Silos the last season, and all are pleased with the result. Six men and six horses, with two wagon trucks, a Smalley Four-horse power and Smalley No. 12 Cutter, put in about twenty tons a day. We used their Carriers, too, all of which worked complete. I have fed forty-five head of cattle on Ensilage once a day, and good straw twice a day, with about eight quarts of wheat mixed with bran, oats and corn meal, each with warmed water. The stock so fed looks better than it has for two years, and the cows never done better at butter-making. Shall increase my Silo capacity the coming season.

F. C. CURTIS.

The Smalley Manufacturing Company, Manitowoc, Wis.

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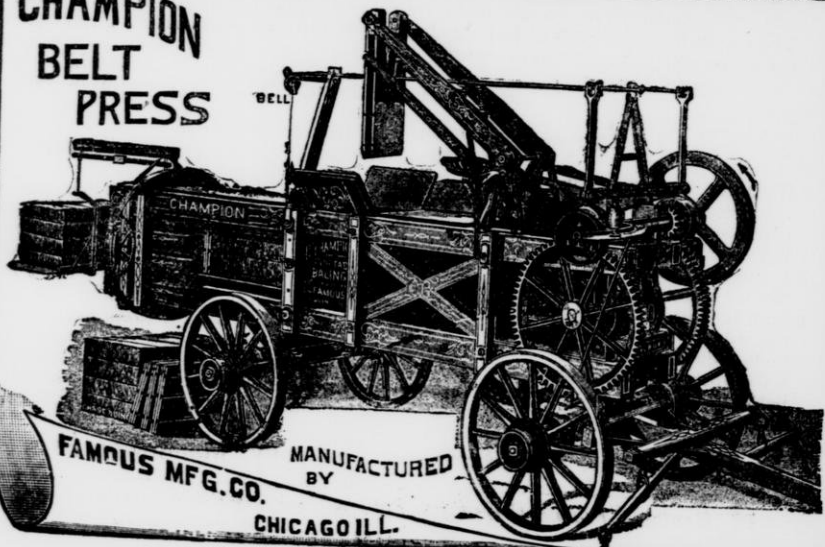


**CHAMPION**

**REVERSIBLE LEVER PRESS**



**CHAMPION  
BELT  
PRESS**



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# GENESEE SALT COMPANY.

MERCANTILE

EXCHANGE,

NEW YORK.



PRODUCE

EXCHANGE,

CHICAGO.

WORKS AT PIFFARD, N. Y.

Manufacturers of the Justly Celebrated

## Genesee Factory Filled Dairy Salt,

IN SPECIAL GRAINS FOR

## BUTTER, CHEESE AND TABLE USE,

The only Dairy Salt that does not lump, harden or gather moisture.

**THE BEST**, because it is  
**THE PUREST,**  
**THE DRYEST,**  
**THE WHITEST,**  
**THE STRONGEST,**  
**And Most Uniform Salt in the World.**

**FREE FROM PAN SCALES.**

For season of 1898 and 1899, butter and cheese salted with Genesee Factory Filled Salt were awarded First Premiums at the

**WISCONSIN, IOWA, MINNESOTA AND NEBRASKA STATE FAIRS.**

Eight First and Four Second Premiums at the

**AMERICAN FAT STOCK AND DAIRY SHOW.**

First Premium at the Iowa State Dairymen's Association. Second Premium at the Wisconsin. Grand Sweepstakes at the Illinois. First Premium at the Michigan.

An Unprecedented Record by any salt in the history of Dairying.

This salt is made from a natural flow of clear, fully saturated Brine; is in its natural crystal, and is not ground. It is now used by the

**Largest Creameries and Cheese Factories in the Country.**

**Samples, Price Lists and Testimonials Furnished on Application.**

**Mention "Farmers' Institute Bulletin," when Writing to Advertisers.**



We advise farmers to send a postal card with address in full, and get circulars in reply, representing

## The Boss Harrows and Boss Pulverizers

Write your address plain and full, and direct the postal card to

The Boss Harrow Mfg. Co., Madison, Wis.

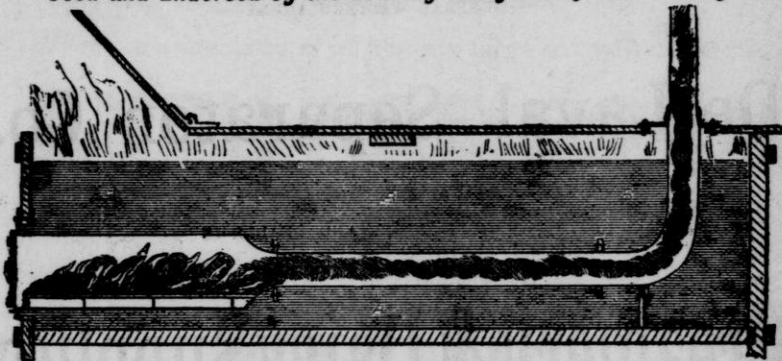
WE ADVISE THIS BECAUSE WE KNOW YOU NEED THIS CLASS OF GOODS



\*STOWELL'S\*

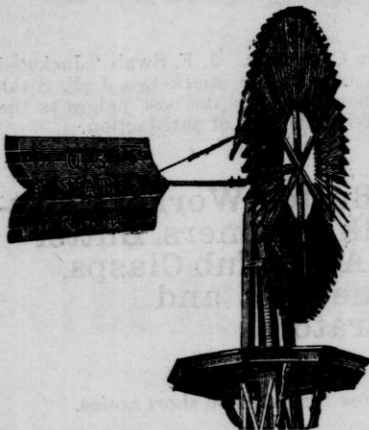
# Removable Stock Tank Water Heater.

*Used and Endorsed by the Leading Dairymen of the Country.*



A well-known Dairyman warmed the water for 25 cows. No variation was made in the kind or amount of food, yet the flow of milk increased twenty quarts per day, and the higher yield continued. Thus, **SIMPLY WARMING THE WATER** was equivalent to enough food to produce twenty quarts of milk a day, which at the rate milk was sold—5 cents per quart—was equal to \$7 per week for 25 cows, or about \$300 per year, while the results with fattening and stock cattle are even more satisfactory than with dairy cows.

This Heater will take 50 per cent. less fuel to warm the water than any other Heater in the market. The furnace being longer, fire can be built farther back from the door, consequently less danger of fire. It can also be removed during summer, when not in use. Testimonials of thousands of farmers throughout the northwest pronounce it the best Heater made. All Heaters warranted to do as represented. They are built of cast iron, proper shape and thickness, and warranted not to crack or break, as other cast iron Heaters do.



## The "U. S. STAR,"

**Storm-Defying Wind Mills.**

The Best Mill in the Market. Has been in constant use for 16 years, with a record equaled by none.

Best regulated solid wheel, as well as best made mill ever offered to the public.

—MANUFACTURE—

SILO, STOCK AND RESERVOIR TANKS,

COOLEY

Combination Creamery Tanks.

Tanks of all sizes made to order, with Heaters adjusted, shipped knock down, in good shape for putting together.

Good Reliable Agents Wanted in All Unassigned Territory.

ADDRESS ALL ORDERS TO

**O. G. STOWELL,**  
DELAYAN, WIS.

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# J. F. SWAB,

—GENERAL WESTERN AGENT—

## De Laval Separator Co.,

—MANUFACTURER AND DEALER IN

# Creamery & Dairy Supplies,

**ENGINES AND BOILERS, CREAM AND  
MILK VATS, WEIGH CANS.**

Teet's Chicago and New York Steel and Iron Clad Cans. J. F. Swab "Jacketed Refrigerator Cans," the best and cheapest can in the market. J. F. Swab "Ventilated Milk and Cream Cooler," acknowledged by the best judges as the leading invention. Thousands in use and giving the best of satisfaction.

**Revolving Box Churns, Butter Workers, Butter-Milk, Cream and Milk Strainers, Butter Cloth Circles, Tin and Acme Tub Clasps, De Laval Turbine Belt and Hand Separators.**

Complete outfits a specialty. Estimates furnished on short notice.

Factories, 8 & 10 North 1st St.,  
Cedar Rapids, Ia.

Office, 3 Chicago St.,  
Elgin, Ill.

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# GRASS SEEDS

TIMOTHY, CLOVERS, FLAX, HUNGARIAN, MILLETS,  
RED TOP, BLUE GRASS, LAWN GRASS, ORCHARD  
GRASS, BIRD SEEDS, ETC.

## POP CORN

We make a specialty of all kinds in large or small quantities.

## ENSILAGE CORN

ALL STANDARD VARIETIES, in car load lots or less.

PLEASE CORRESPOND BEFORE BUYING.

## FLAX SEED.

REFERENCES: First National Bank, Mercantile Agencies and Merchants generally

## PASTURE GRASSES

Permanent or Alternate Husbandry

## FOR ALL SOILS

PRICES ON APPLICATION.

## THE ALBERT DICKINSON Co.,


SEED MERCHANTS,


WAREHOUSES:

115, 117 & 119 Kinzie St.  
104, 106, 108 & 110 Michigan St.  
1800 to 1614 Clark St.

OFFICES, 115 KINZIE ST.,

CHICAGO, ILL.

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Creamery, Cheese Factory  
AND DAIRY  
MACHINERY  SUPPLIES

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D. H. ROE & CO.,  
CHICAGO, ILL.,

CARRY A FULL LINE OF

ALL KINDS OF SUPPLIES,

—SUCH AS—


Butter Cloth, Cheese Cloth, Cloth Circles,  
Rennets, Rennet Extract, Rennet Tab-  
lets, Cheese Color, Butter Color,  
Cheese Grease, Salt, Butter  
Tubs, Cheese Boxes,  
Cheese Box Stock,  
Etc., Etc.

ALSO, A FULL LINE OF

CREAM VATS, MILK VATS, SELF-HEATING VATS,  
CHURNS, STEAM BOILERS, STEAM ENGINES, SEPARA-  
TORS, CHEESE PRESSES, BUTTER PRINTERS, ETC.

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Send for Price List, and Mention the Bulletin.

 Mention "Farmers' Institute Bulletin," when Writing to Advertisers.

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# FARMERS!

SAVE MONEY BY BUYING FROM

**H. R. EAGLE & CO.,**  
68 Wabash Ave., Chicago.

<b>Everything</b>  <b>you Eat,</b>  <b>Wear or Use,</b>  —AT—  <b>Wholesale</b>  <b>Prices.</b>	John Clarke, Jr.'s, cotton thread, perspool \$ 03	<b>ALL GOODS</b>  <b>ARE</b>  <b>Guaranteed</b>  <b>TO BE</b>  <b>First Class</b>	<b>ONE</b>  <b>TRIAL</b>  <b>will</b>  <b>Satisfy</b>  <b>You.</b>
	Kingsford's Silver Gloss Starch, per lb .. 05		
	Price's Baking Powder, per lb ..... 32		
	Church's "Arm and Hammer" soda, pr. lb 08		
	25 lbs. Prunes for ..... 1 00		
4 lbs. very fine Uncolored Japan Tea .... 1 00	<b>SO BE</b>		
4 lbs. good Plug Tobacco for..... 1 00			
30 lbs. Rice for ..... 1 00			
All grades of Teas 25 to 40 per cent. lower than the cheapest retail dealers.		<b>First Class</b>	

Send for price list at once to

**H. R. EAGLE & CO.,**  
68 Wabash Ave., Chicago.

# SAVE MONEY!

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# H. Heyn's

Department Store,

103-109 Wisconsin St., Milwaukee

—THE MOST COMPLETE STOCK OF—

## D·R·Y G·O·O·D·S.

Dress and Cloak Trimmings, Laces, White Goods, Embroideries,  
Notions, Hosiery, Underwear, Gloves, Corsets, Jewelry, Fans,  
Leather Goods, Black and Colored Dress Goods, Black  
Silks, Hand-Knit Goods of our own Manufacture, Yarns.

**The Largest Millinery Department  
in the State!**

*The Finest Art Embroidery Department in the Northwest,*

*A Beautiful New Department for Cloaks, Shawls and Suits,*

*An Immense New Department for Toys and Fancy Goods.*

**Especial Attention Paid to Mail Orders.**

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# A Chance to Make \$25.00 in Five Minutes!

—A GRAND OFFER TO OUR READERS BY—

## Dr. Valerius & Co.,

—IMPORTERS AND BREEDERS OF—

### Clydesdale, English Shire and Percheron Norman Horses.

Please write in the blank below the names of any stallion men that you know of, and especially anybody that you think wants to buy, cut the blank so filled up out of the Bulletin and mail it to us, after writing your name and address at the bottom in the space provided for that purpose. We will then write to the parties whose names you send, and try to sell them a horse. If we sell one horse to any one of them we will pay you twenty-five dollars for your trouble as soon as the sale is made. And for additional horses sold to the same party, or others on the blank you send, we will pay you twenty-five dollars more for each horse sold.

Your name will not be mentioned unless you request it. If you are not satisfied that we will do as we say, you can write to the Wisconsin National Bank, of Watertown, Wis., for information. If it should so happen that the same name be received from more than one person, and a sale is made, then the prize will go to the one whose blank is received first. It is therefore best to fill up your blank and mail it promptly.

Our correspondents sometimes wonder how we can make this liberal offer and yet sell better horses and cheaper than our competitors. Our answer is that we simply spend the money this way instead of paying tens of thousands of dollars every year for newspaper advertising.

Address:

**DR. VALERIUS & CO., Watertown, Wis.**

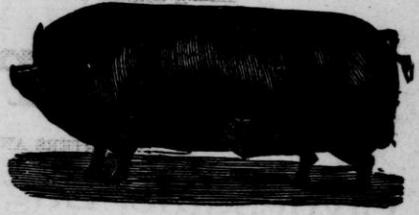
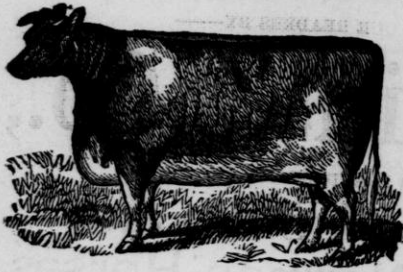
NAME.	POST OFFICE.	COUNTY.	STATE.
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ALEX. A. ARNOLD,  
Eastville Farm, Galesville Wis.,



←BREEDER OF→

SHORT-HORN CATTLE

—AND—

✦ BERKSHIRE HOGS. ✧

RECORDED CATTLE ≡

—AND—

≡ REGISTERED HOGS

OF ALL AGES AND SEX, CONSTANTLY ON HAND.

Stock Kept Constantly Thriving,  
BUT NEVER PAMPERED.

MILKING QUALITIES MADE A SPECIALTY  
IN BREEDING SHORT-HORNS.

The Short-horn is standard for beauty and utility and the most valuable breed for the average farmer.

The Berkshire is also the standard hog, and weighs when mature, about 500 pounds, it furnishing, when ready for market, the best pork of all breeds, for the reason that the skin is thin, the bones firm and comparatively small, with more muscle or lean meat than any other breed. They mature early, are good mothers, prolific breeders, and when crossed on the large breeds produce best results.

COME AND SEE THE STOCK.

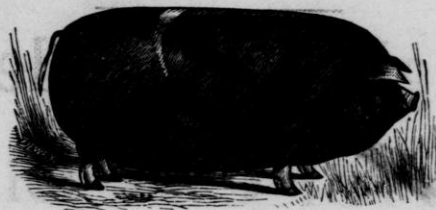
Correspondence Solicited.

A. A. ARNOLD,  
GALESVILLE, WIS.

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# GEORGE WYLIE,

\*BREEDER OF RECORDED\*



## POLAND CHINA SWINE.

—SPECIALLY BRED FOR—

MUSCLE, BONE, CONSTITUTION AND  
EXEMPTION FROM DISEASE.

—ALSO—

## SHORT HORN CATTLE.

STOCK AS GOOD AS THE BEST, AND  
PRICES ALWAYS REASONABLE.

COME AND SEE THE STOCK.

GEO. WYLIE,

Columbia County.

LEEDS, WIS.

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**ASHLAND**  
**MLS&W.RY.**  
**ROUTE**

**MILWAUKEE,**  
**LAKE SHORE**  
**& WESTERN.**

**Through Palace Sleeping**

—AND—

**Parlor Car Line,**

—BETWEEN—

**CHICAGO AND MILWAUKEE,**

—AND—

**APPLETON, WAUSAU AND ASHLAND.**

The Gogebic, Penokee and Montreal Iron and Mineral Ranges, Hurley, Ironwood, Bessemer and Wakefield, Superior and Duluth, and the manufacturing centers and lumbering districts of Central and Northern Wisconsin.

**Sheboygan, Manitowoc, Kaukauna,**  
**Appleton and Wausau.**

Special Inducements and Facilities offered for the location of Manufacturing Establishments. Close connections at New London Jc. with the G. B., W. & St. P. R'y for Winona, La Crosse, St. Paul and Minneapolis and the Northwest. At Ashland and Duluth for Northern Pacific and Pacific Coast Points.

**TO SPORTSMEN.**

The most celebrated Fishing Resorts for Bass and Muskallonge in the Northwest are all reached by this Line—

**GOGEBIC LAKE, THE EAGLE WATERS, PELICAN LAKE, THE ONTONGONAGON, BRULE AND OTHER TROUT STREAMS.**

Guide Books, Maps, Time Cards, and full information furnished on application to the Gen'l Passenger and Ticket Agent.

CHAS. L. RYDER, Gen'l Agt.

A. W. RUSSELL, City P. & T. Agt.

197 Clark Street, Chicago.

**Milwaukee City Office, 95 Wisconsin St.**

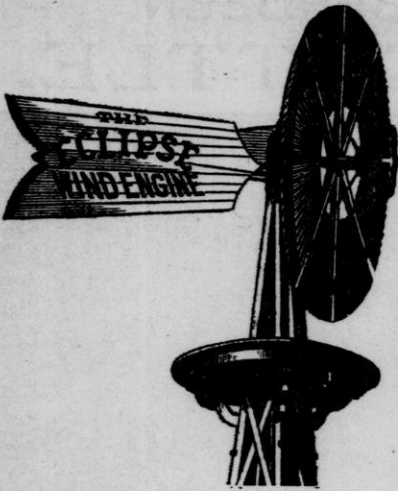
H. F. WITCOMB,  
Gen'l Manager,

ERNEST VLIET,  
Act'g Gen'l Pass. Agt.

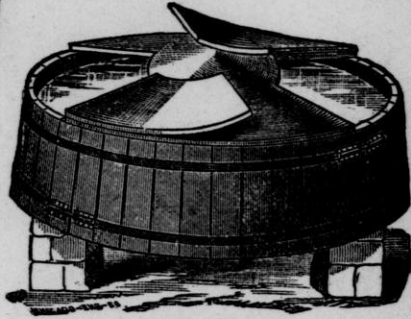
**MILWAUKEE, WIS.**

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No Dairy or General  
Farm is complete  
without the

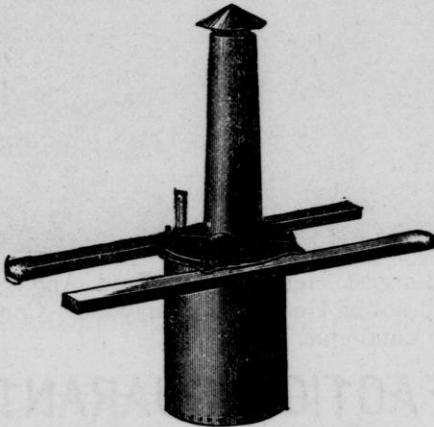


ECLIPSE WIND MILL,



STOCK TANK,

\* ————— AND ————— \*



DECATUR TANK HEATER.

FOR PARTICULARS, ADDRESS

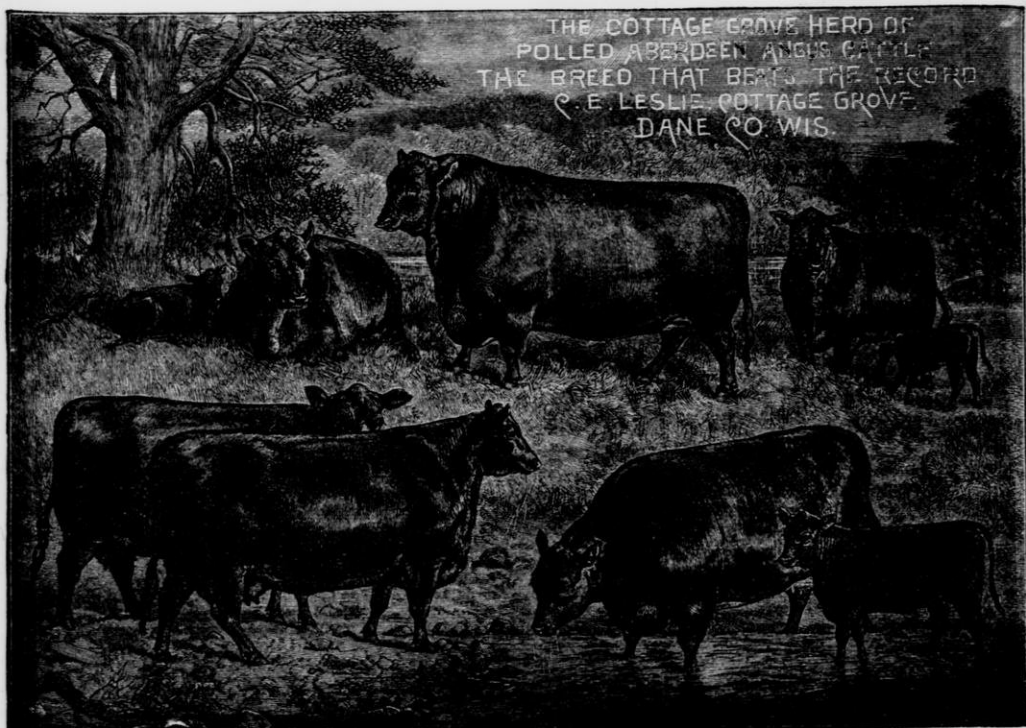
**FAIRBANKS, MORSE & CO.,**  
Corner of Lake and LaSalle Sts., Chicago.

— DEALERS IN —

Fairbank's Scales and Agricultural Specialties.

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# POLLED ABERDEEN ANGUS CATTLE.



We have the Largest Herd of Pure-Bred Angus Cattle in this County. We will not be Undersold by anyone. Come and see our Stock, or write for Catalogue.

## SATISFACTION GUARANTEED.


We also have a large herd of  $\frac{3}{4}$  and  $\frac{7}{8}$  grades. All Black. No Horns. Beautiful in Form.

## WILL SELL VERY CHEAP.

—WRITE TO—

## LESLIE & BURWELL,

Cottage Grove, Dane Co., Wis.

 Mention "Farmers' Institute Bulletin" when writing to Advertisers.

# The Profit is in the Dairy.

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Let us suppose that the general purpose cow when it is time to sell her to the butcher weighs 200 lbs. more than the Jersey, and suppose the Jersey during her life has yielded 500 lbs. more butter than the other, which is a conservative estimate, 200 lbs. old cow beef at 2 cts, \$4; 500 lbs. butter at 20 cts., \$100. Quite a margin in the Jersey's favor, eh? You have been supporting this extra in carcass all these years.

Texas men say now that they can put beef on Chicago market with a profit, at 2 1-2 cts. per pound. This must govern prices. You see our "general purpose cow" man works against great odds, while the Jersey man who relies on his cream that comes every day is reaping a steady harvest.

Ask a farmer the price for which he will keep a steer for you a year, and he will probably figure very carefully, and tell you that, take it the year around he will have to charge you about a dollar a week, or say, \$50 per year, and he will claim that he cannot make anything at that.

**The beef business is discouraging.**

---

"The Maples" farm, the home of "The Maples Herd of Jersey Cattle," is situated at the eastern city limits of Madison, Wisconsin. It is easily accessible from the city, as any street car going east will take you within a few moments' walk. We would be glad to have you come out, whether you wish to purchase or not; you will feel repaid if you enjoy looking at fine Jersey cattle. The choicest strains of Jersey blood are represented in this herd, and the cattle have individual merit.

We trust your visit will be something pleasant to remember; it may result in your thinking of our herd should you ever want anything in Jerseys.

Very truly yours,

**C. B. MILLER & CO.**

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— THE —

# Green Bay, Winona & St. Paul R. R.

— IS THE —

## SHORTEST ROUTE

— FROM —

# GREEN BAY

And all points in **EASTERN WISCONSIN** to

NEW LONDON,	MERRILL,	STILLWATER,
STEVENS POINT,	WINONA,	HUDSON,
GRAND RAPIDS,	LA CROSSE,	EAU CLAIRE,
WAUSAU,	CHIPPEWA FALLS,	

St. Paul, Minneapolis, Sioux City, Omaha  
AND COUNCIL BLUFFS,

And all points in Minnesota, Dakota, and all points on the NORTHERN  
PACIFIC RAILROAD and ST. PAUL, MINNEAPOLIS &  
MANITOBA RAILROAD; is the

## SHORT LINE

From WINONA, LA CROSSE, and all points on the CHICAGO, BURLINGTON  
& NORTHERN RAILROAD, WINONA & ST. PETER RAILROAD  
and SOUTHERN MINNESOTA RAILROAD, to

MERRILLAN,	STEVENS POINT,	FOND DU LAC,
NELLSVILLE,	APPLETON,	SHEBOYGAN,
GRAND RAPIDS,	OSHKOSH,	GREEN BAY,

—AND ALL POINTS IN—

Eastern Wisconsin, Northern Michigan and Lake Superior Regions.

Passengers from all points—West, Northwest and Southwest—will find the

# G. B., W. & St. P. R. R.

The **DIRECT LINE** to all the above points.

THE PASSENGER EQUIPMENT of this Road embraces all the modern improvements and conveniences that tend to make traveling by rail safe and comfortable.

☞ Be sure your tickets read via the

**GREEN BAY, WINONA & ST. PAUL RAILROAD.**

S. W. CHAMPION, Superintendent.

J. B. LAST, Asst. Gen. Pass. Agt.

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# KOSHKONONG HERD

—OF—

# GUERNSEY CATTLE.

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## Special Offer of Guernseys.

I offer to those who will personally inspect them, about 60 REGISTERED GUERNSEYS, comprising:

A few of my own breeding.

Choice selections from the DUNCANNON HERD.

Representatives from the herd of Mr. EZRA MICHENER.

Fine animals bred by J. M. CODMAN.

The cream of the increase of the FERNWOOD and PAULSDALE herds.

And the herd owned and bred by the late CHAS. B. WOOD, one of the oldest and most careful of breeders.

Here are service bulls of the finest quality and fit to head any herd, young cows, and heifers soon to be fresh, and heifers unserved. All of these animals have been selected for pedigree and individual merit. There are no culls. To purchasers of unserved heifers I will allow, during the next three months, the use of my own service bulls free of charge.

Visitors will be met at Ft. Atkinson or Koshkonong, Wis., on the Wisconsin Div. C. & N. W. Ry. after two days' notice by mail.

F. E. DRAKE,

Secretary.

G. E. GORDON,

Owner.

Koshkonong, Wisconsin.

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# Trotting Stallions

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Gobebic 8556 by	-	-	Red Wilkes.
Allencon 9342 by	-	-	Lord Russell.
Brighton by	-	-	Electioneer.
Wertheim 7462 by	-	-	Allandorf.
Manipulator 9341 by	-	-	Nutwood.
Increase 9405 by	-	Mambrino Patchen.	
King Piedmont by	-	-	Piedmont.
Electrification by	-	-	Electricity.

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## Uihlein Bros.' Stock Farm,

TRUESDELL, WIS.

Located on Main Line of the Chicago, Milwaukee & St. Paul Railway, 32 miles from Milwaukee, and 55 miles from Chicago. Send for Catalogue giving description and pedigree of over

## 100 Fine Bred Stallions,

**BROOD MARES AND COLTS.**

**ALSO, PURE-BRED NORMAN-PERCHERONS AND CLYDESDALES.**

Young Stock, by our own and other Stallions, out of great mares, for sale.

UIHLEIN BROS., Milwaukee, Wis.  
HENRY LAUGHLIN, Supt.,  
Truesdell, Wis.

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# GUERNSEYS!

I HAVE ON MY FARM,

“The Butternuts,”

—AT—

LAKE GENEVA, WIS.,

A FINE HERD OF WELL BRED

## Registered Guernseys

THE INCREASE OF THE HERD

For Sale at Moderate Prices.

Address,

N. K. FAIRBANK, Chicago, Ill.,

Or on the farm, W. H. LAWRENCE, Lake Geneva, Wis.

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## To Montana, Oregon and Washington.

---

If you are going west bear in mind the following facts: The Northern Pacific Railroad owns and operates 987 miles, or 57 per cent. of the entire railroad mileage of Montana; spans the Territory with its main line from east to west; is the short line to Helena; the only Pullman and dining car line to Butte, and is the only line that reaches Miles City, Billings, Bozeman, Missoula, the Yellowstone National Park and, in fact, nine-tenths of the cities and points of interest in the Territory.

The Northern Pacific owns and operates 621 miles, or 56 per cent. of the railroad mileage of Washington, its main line extending from the Idaho line via Spokane Falls, Cheney, Sprague, Yakima and Ellensburg, through the center of the Territory to Tacoma and Seattle, and from Tacoma to Portland. No other trans-continental through rail line reaches any portion of Washington Territory. Ten days' stop over privileges are given on Northern Pacific second class tickets at Spokane Falls and all points west, thus affording intending settlers an excellent opportunity to see the entire Territory without incurring the expense of paying local fares from point to point.

The Northern Pacific is the shortest route from St. Paul to Tacoma by 207 miles; to Seattle by 177 miles, and to Portland by 324 miles — time correspondingly shorter varying from one to two days, according to destination. No other line from St. Paul or Minneapolis runs through passenger cars of any kind into Idaho, Oregon or Washington.

In addition to being the only rail line to Spokane Falls, Tacoma and Seattle, the Northern Pacific reaches all the principal points in Northern Minnesota and Dakota, Montana, Idaho, Oregon and Washington. Bear in mind that the Northern Pacific and Shasta line is the famous scenic route to all points in California.

Send for illustrated pamphlets, maps and books giving you valuable information in reference to the country traversed by this great line from St. Paul, Minneapolis, Duluth and Ashland to Portland, Oregon, and Tacoma and Seattle, Washington Territory, and enclose stamps for the new 1889 Rand McNally County Map of Washington Territory, printed in colors.

Address your nearest ticket agent, or CHAS. S. FEE, General Passenger and Ticket Agent, St. Paul, Minn.

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*Mention "Farmers' Institute Bulletin" when writing to advertisers.*

**Superb Train Service,  
Good Connections,  
Fast Time and No Delays**

Can all be secured by taking the

# Northern Pacific R. R.

BETWEEN THE EAST AND

**Dakota, Manitoba, Montana,  
Idaho, Washington Territory,  
British Columbia,  
Oregon and California.**

THIS IS THE

## Yellowstone Park <sup>AND</sup> Dining Car Route.

The NORTHERN PACIFIC RAILROAD is the SHORT LINE to HELENA, TACOMA, SEATTLE, and PORTLAND, ORE.; is the ONLY LINE running PULLMAN SLEEPING CARS to FERGUS FALLS, GRAND FORKS, GRAFTON, WINNIPEG, FARGO, HELENA and BUTTE CITY, and is the ONLY LINE reaching JAMESTOWN, BISMARCK, MILES CITY, BILLINGS, BOZEMAN, MISSOULA, SPOKANE FALLS, TACOMA and SEATTLE.

### Pullman Sleepers, Dining Cars,

AND

### FREE COLONIST SLEEPERS

ON EXPRESS TRAINS DAILY.

### This Line Offers Special Attractions to California Tourists.

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**CHAS. S. FEE,**  
Gen. Pass. and Ticket Agt., N. P. R. R.,  
ST. PAUL, MINN.

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# FIRST PREMIUM HERD, WISCONSIN STATE FAIR, 1888.

—AT THE HEAD—

Imported Squire of Les Vauxbelets 4th, 771,

—AND—

✽ LADY EMILY FOLEY 2D, ✽

Dam of Squire of Les Vauxbelets 4th, 771.



First Prize, Bath and West of England Society, at Exeter, as heifer not exceeding 2 years old, 1879. First Prize, Bath and West of England Society, at Worcester, 1880, as heifer above 2 years old. Second Prize, Bath and West of England Society, at Tunbridge Wells, 1881, as cow exceeding 3 years old. First Prize, Royal Agricultural Society of England, at Derby, as cow in milk. First Prize, Bath and West of England Society, at Cardiff, 1882, as cow in milk. First Prize, Royal Agricultural Society of England, at Reading, 1882. First Prize, London Dairy Show, 1882. First Prize, 1884, Pennsylvania State Fair. Sold at Philadelphia, 1884, at auction, for \$1900. The largest price that any Guernsey has ever brought.

Sire of Squire of Les Vauxbelets No. 771, A. G. C. C.

Squire of Les Vauxbelets won the first prize, G. H. B. S., second prize at the R. A. S. E. Show, Kilburn, and first prize at the B. W. E. Show, Exeter, 1879; first prize at the R. A. S. E. Show, Carlisle, second prize at the B. W. E. Show, Worcester, and second prize, R. G. A. S., 1880; first prize at the B. W. E. Show, Tunbridge Wells, and second prize at the R. A. S. E. Show, Derby, 1881; second prize at the R. A. S. E. Show, Reading, 1882.

Squire of Les Vauxbelets 4th, No. 771, A. G. C. C., born June 17, 1883. First Special Prize Pennsylvania State Fair, 1884; first prize on bull 3 years old and over, Wisconsin State Fair, 1888; first prize on bull of any age, Wisconsin State Fair, 1888; first prize on herd, Wisconsin State Fair, 1888.

First on breeders' herd, 1888; first on two year old heifer, 1888; first on bull calf, 1888; first on heifer, 1888; first on heifer over six months, 1888; second on yearling bull, 1888; second on cow, 1888; second on yearling heifer, 1888; second on bull six months, 1888; second on over six months, 1888.

My herd is one of the largest in the country, containing quite a number of imported animals.

I. J. CLAPP, Kenosha, Wis.

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# FRED. PABST,

IMPORTER AND BREEDER OF

## Percheron Horses,

INVITES THE ATTENTION OF FARMERS AND OTHERS INTERESTED IN  
HEAVY DRAFT HORSES, TO HIS

### Model Percheron Horse Stock Farm,

Situated in the town of WAUWATOSA, three miles west of the city of Milwaukee, Wisconsin, where some of the most carefully selected famous

### Percheron Prize Stallions & Mares

Two to three years old and over, all of my own Importation,

ALSO A LARGE NUMBER OF

### Pure Native Bred Percheron Horses and Colts

are constantly kept on hand and for sale at very reasonable prices. Visitors always welcome. For further information call on, or address by letter,

FRED. PABST,

Office of Phillip Best Brewing Co.,

MILWAUKEE, WIS.

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CHOICE

✻·G·R·A·P·E·S·✻

FOR THE TABLE.

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PURE ✻ NATIVE ✻ WINES,

✻ALSO✻

SELECTED VARIETIES OF

GRAPE VINES

Best Adapted to Wisconsin.

CATALOGUE SENT ON APPLICATION.

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CHOICE JERSEYS,

—OF THE—

Alphea and St. Lambert Families,

For sale at reasonable prices. Correspondence solicited.

WILLIAM FOX, Baraboo, Wis.,

Proprietor Mt. Airy Vineyard.

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# Hickory Park Herd Short Horn Cattle

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❖PURE BRED.❖

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Individual Merit the Standard.

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Imported Giltspur (52937) American Herd Book 92520, with Prince  
Victoria of Hickory Park 94481, both

## PURE BRED CRUICKSHANKS,

At the head of our herd. We offer for sale at fair and reasonable prices, stock  
from the above, of both sexes.

## Pure Bred Short Horn Cows

Of other strains at a bargain. Correspondence solicited.

**C. M. SANGER & SON,**  
Waukesha, Wisconsin.

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R. B. OGILVIE,

BREEDER AND IMPORTER OF

**CLYDESDALES.**

The Largest Breeding Establishment in Wisconsin, and one of the most important on this side of the Atlantic.

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THE MATCHLESS

**“McQUEEN”**

—AND—

**Young Marmion,**

AT THE HEAD OF MY STUD.

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**YOUNG STOCK**

Representing the best types and most fashionable breeding, of both sexes, constantly on hand for sale. Correspondence solicited, and a personal inspection of my animals invited.

R. B. OGILVIE, Madison, Wis.

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# Big Berries!

→AND←

Lots of Them

CAN BE GROWN

By procuring plants at

## Ripon Small Fruit Farm,

C. H. HAMILTON, Prop., Ripon, Wis.,

Who cultivates and has for sale plants of the following varieties:

Britton and Snyder Blackberries.  
Lucretia Dew Berry.  
Gregg, Ohio, Souhegan, Tyler,  
Nemaha, Carman, Johnston's  
Sweet, Earhart, Everbearing,  
Black Raspberries.  
Marlboro, Hansell, Cuthbert,  
Golden Queen, Rancocas, Red  
Raspberries.  
Downing, Industry, Triumph,  
Houghton, Gooseberries.  
Fay's Prolific, Victoria, Cherry,  
White Grape, La Versellare,  
Red Dutch, and Lee's Prolific,  
Black Currants, 1 and 2 yrs. old.  
Grapes—All the leading varieties.



Large Stock of First-Class Plants, and at reasonable prices. Correspond with me if you wish to plant and get prices. Yours truly,

## C. H. HAMILTON, Ripon, Wis.

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# REID BROS.,



JANESVILLE, WISCONSIN,

IMPORTERS OF

English Shire,  
Clydesdale, and  
Cleveland Bay

—H O R S E S—

SIXTY HORSES ON HAND.

First-class Horses at Moderate Prices. Seven First Premiums at Wisconsin State Fair, 1888. A fine herd of

POLLED ANGUS CATTLE

—AND—

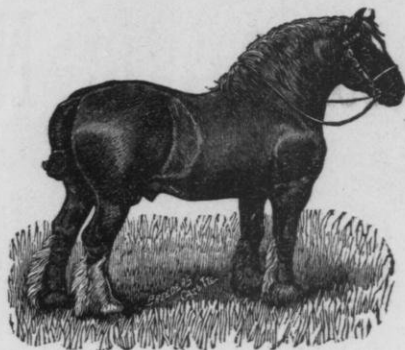
Shetland Ponies.

Come and see the stock. Correspondence solicited.

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POLLOCK & GRAHAM,  
JANESVILLE, WIS.,



Breeders and Importers

—OF—

**CLYDESDALE**

—AND—

English Shire Horses.

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↪ Choice Stock at Reasonable Prices. ↩  
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COME AND SEE US.

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# A. D. BARNES,

—PROPRIETOR OF—

## Waupaca Arctic Nursery

—AND—

### FRUIT FARM.

Thirty years' experience in Wisconsin orcharding, and member of State Horticultural Society.

Patronize Home Industry and Get Acclimated Stock.

MY MOTTO:

**LIVE AND LET LIVE,  
PLANT A TREE AND MAKE IT LIVE.**




A FINE STOCK OF

## WAUPACA COUNTY SEEDLINGS.

Give me your patronage, and I will instruct you How to Plant, Cultivate, Prune and Protect.

**All Mail Orders Will Receive Prompt Attention, and Satisfaction Guaranteed.**

WAUPACA, = = WISCONSIN.

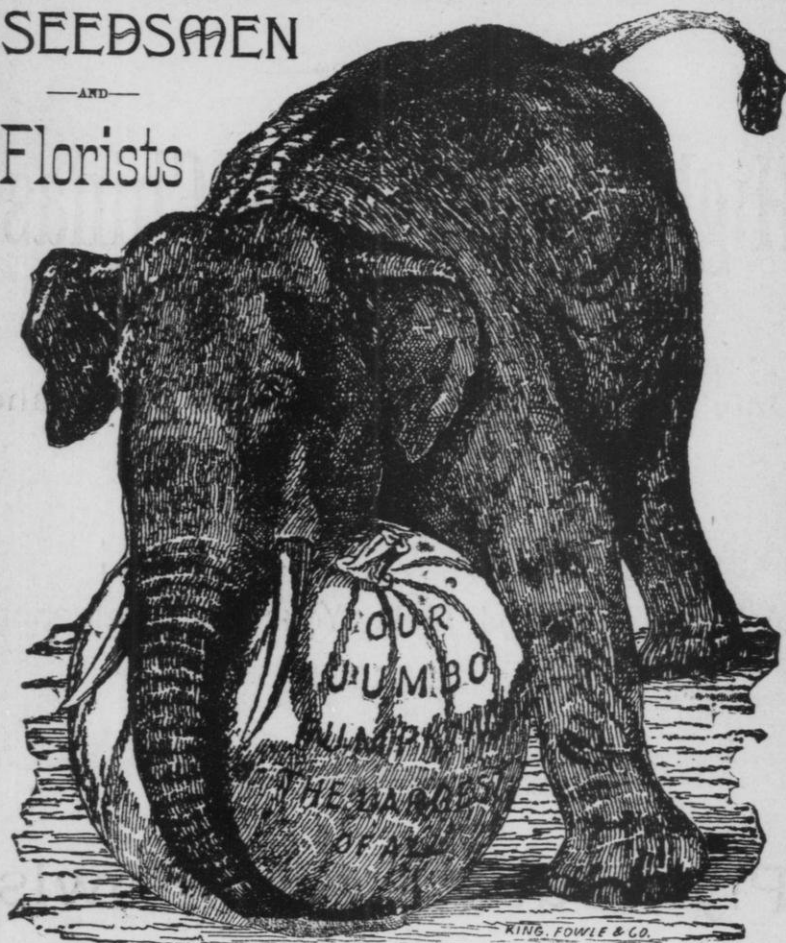
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# CURRIE & BROTHERS, SEEDSMEN

—AND—

## Florists



**Growers, Importers, Wholesale and Retail Dealers of  
Farm and Garden Seeds, Plants and Bulbs.**

Farm and Garden Implements. Cut Flowers and Floral Designs.

**CURRIE BROS.,**

Seed Store, 312 Broadway. | Greenhouses, cor. 10th St. & Grand  
Flower Store, 108 Wisconsin St. | Ave., and cor. State & 27th Sts.,

**MILWAUKEE, WIS.**

Illustrated Catalogue mailed free on application.

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# THOMAS CONVEY

—BREEDER OF—

## High Class Poland Chinas.

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Only First-Class Pigs Shipped on Order, and  
Satisfaction Guaranteed.

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Visit My Herd and Make Your Own Selection.

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Correspondence Solicited. Also

## Plymouth Rock Fowls.


COME AND SEE ME.

**THOMAS CONVEY,**

Iowa County.

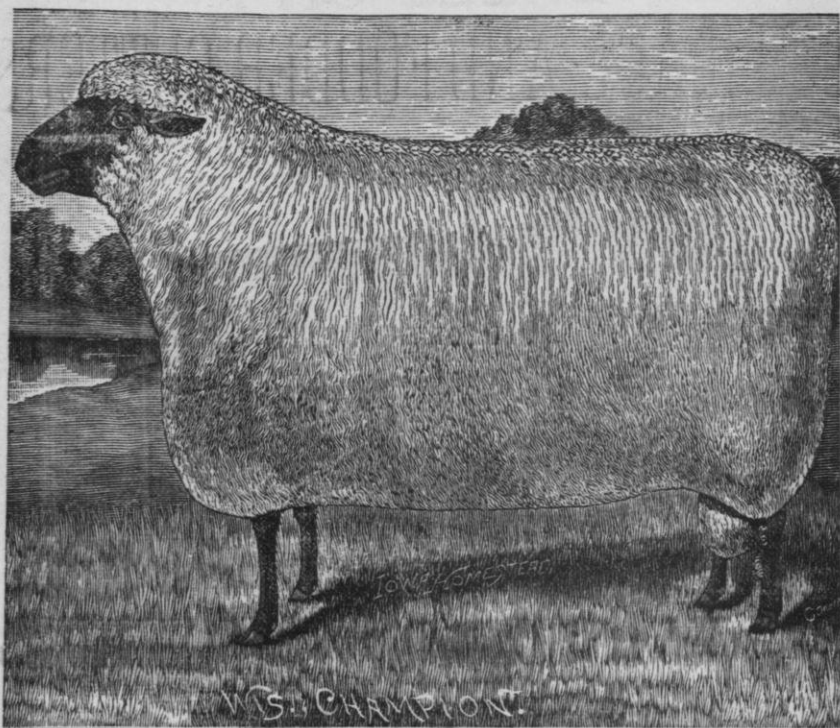
Ridgeway, Wisconsin.

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→Over 400 Prizes in Three Years.←



Oxford Down, Shropshire,

—\*AND\*—

SOUTHDOWN SHEEP.

Cheshire Hogs and Bronze Turkeys

BRED AND IMPORTED BY

GEO. MCKERROW, *Sussex, Waukesha Co., Wis.*

Our Motto: The Best are None Too Good.

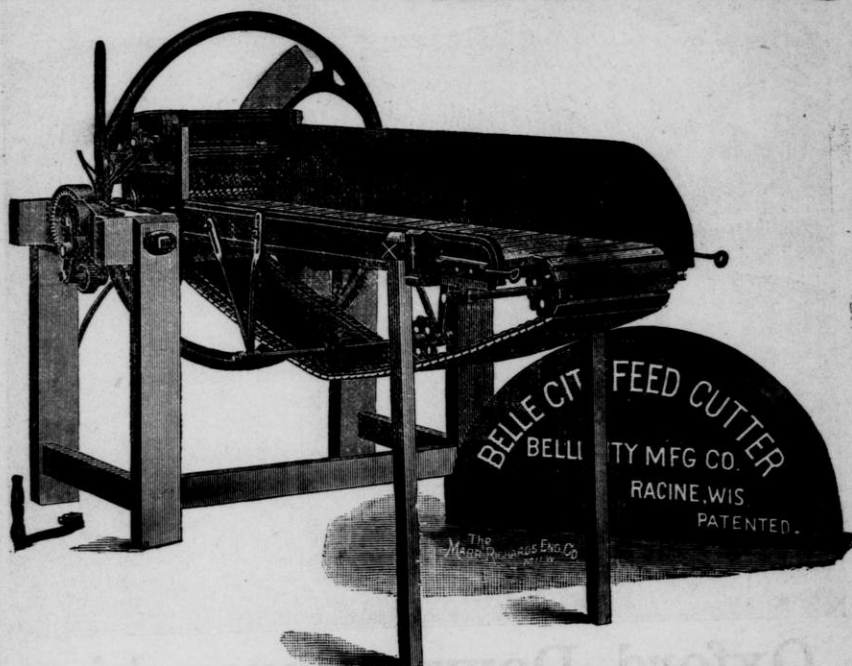
R. R. STATIONS—Templeton, on Wisconsin Central, and Pewaukee, on Chicago, Milwaukee & St. Paul.

COME AND SEE US, OR WRITE.

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# BELLE CITY ENSILAGE AND FODDER CUTTERS



## THE BELLE CITY MANUFACTURING COMPANY

Have sold over 15,000 of these Cutters the past season, which is the best recommendation that can be offered regarding them. They are now used at most of the State Farms, also at the Government Experimental Stations. The above cut shows the self feeding attachment which they are putting on most of the larger sizes, and which is becoming so popular among the stockmen and ensilage feeders. These are the lightest running machines on the market, and have the greatest capacity of any machine now known and are all guaranteed to run at great speed with perfect safety. The capacity of these cutters is almost unlimited, taking fodder of all kinds more rapidly than operators can get it to the machine. The Belle City Cutters are made in twelve different sizes for both power and hand use, and most of the power machines can be easily turned by hand. Carriers of any length can be attached to these machines and run at any angle. The knives of the very best cast-steel, which this company are now importing direct from Sheffield, England, is used for these cutters. **Send for Illustrated Catalogue and Price List.**

ADDRESS

## BELLE CITY MANUFACTURING CO.

Racine, Wis.

See opposite page.

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# Belle City Manuf'g Co.,

## RACINE, WIS.

### Our Red Jacket Horse Hay Fork

It is Strong, Durable, Simple, and a perfect working fork; is made of SPRING STEEL, and therefore will not break. It is so constructed that there is nothing to prevent it from going over beams or through pitch holes; does not catch or tear itself to pieces.

It is very light (weighs only ten pounds), and therefore easily pulled back to the load. It is easily tripped or unloaded, takes up ALL KINDS OF HAY, and for Clover and Short Hay, it

**SURPASSES ANY FORK KNOWN,**

And having a Cutting Edge Point, it enters the hay easily, even when damp. A boy ten years old can operate it. All things considered, it is the very best Horse Hay Fork in use.

**AGENTS WANTED IN EVERY COUNTY.**

**PRICE \$4.00.**

MANUFACTURERS OF THE FAMOUS

Belle City Fodder Cutters,

Horse Powers (both tread and sweep), Horse Hay Forks, Root Cutters, Barrel Carts, Cultivators, Harrows, and other implements.

Send for Illustrated Catalogue. A free book on Ensilage will be sent to any one, upon their application for the same.

SEE OPPOSITE PAGE.



We show on this page a cut of our

## Power Feed Cutter,

With Chain Feed Attachment.

Also, with long length of Carrier driven by rope instead of belting. This is an advantage in a good many ways, as it is easily tightened and very seldom runs off the pulleys, which sometimes causes a great deal of trouble. The Carrier, as seen in this cut, represents one long length of 35 feet, and one short length under the Cutter. This Carrier can be swung at either angle.

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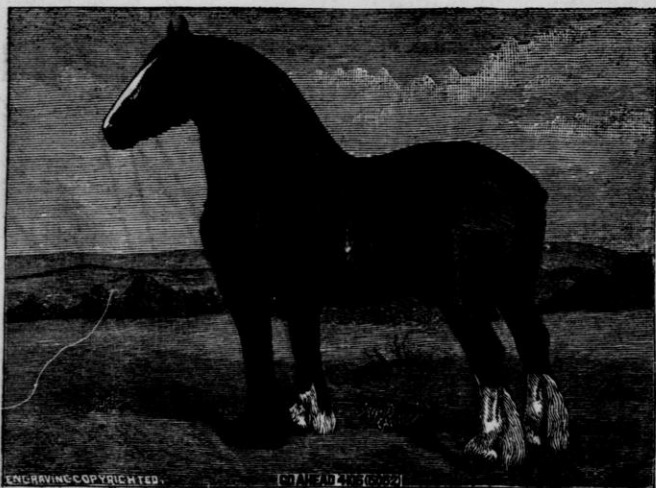
# Galbraith Bros.,

—THE—

# Largest Importers

—OF—

Royal Society Winners in  
Each Breed.



Prices and Terms to Suit  
Everybody.

## BRITISH HORSES IN THE WORLD.

Have imported during the present season over 250 Stallions, including

Clydesdale, English Shire, Suffolk  
Punch and Hackney Horses.

More Prize-Winning High-Class Stock imported by us than any other three firms in America. Superior horses, fashionable pedigrees, and all guaranteed good breeders. Visitors cordially invited. Send for catalogue.

More Premiums Won by Us at the American Stock Shows of 1887 and 1888 than by any other Exhibitor.

## Galbraith Bros.,

JANESVILLE, WIS.

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# BOWLES, HADDEN & CO.,

JANESVILLE, WIS.,

—IMPORTERS AND BREEDERS OF—

❖ HIGH CLASS ❖

## PERGHERON,



French Draft,



French Coach

—AND—

## English Shire Horses.

We offer as fine a lot of

## STALLIONS and MARES

In breeding, size, draft conformation and quality, as can be found in the stables of any importer in America. Our prices have been put at the lowest notch consistent with the quality of the stock offered, and terms will be made to suit purchasers. For further information address as above.

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# “The Burlington.”

THE VESTIBULED LINE TO

ALL POINTS NORTH, EAST, SOUTH AND WEST.

—THE—

**Chicago, Burlington & Northern Railroad,**

AND CONNECTING LINES OF THE

**“GREAT BURLINGTON ROUTE,”**

Offer to the traveling public the most expeditious and comfortable means of reaching  
*Chicago, St. Paul, Minneapolis, St. Louis, Peoria, Kansas City, St. Joseph, Omaha, Lincoln, Denver and Cheyenne,*

From all the Principal Places in Wisconsin and Minnesota.

Its road bed is unexcelled, the grades are light, enabling fast time to be made, and the equipment is of the very best.

Starting from Minneapolis and St. Paul, its line runs along the east bank of the Mississippi to Savanna, Ills., whence one branch diverges east to Chicago, the other south to Fulton, Ills., connecting with the Chicago, Burlington, & Quincy R. R. Pullman sleeping cars to Chicago and St. Louis without change. Peerless dining cars on Limited trains, furnishing an unapproachable cuisine at moderate prices. For tickets, information, etc., apply to any railroad ticket agent, or address,

**GEO. B. HARRIS,**  
*Vice President.*

*St. Paul, Minnesota.*

**W. J. C. KENYON,**  
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# Theodore Louis,

—BREEDER OF—

✦ HIGH CLASS ✦

## POLAND CHINAS

Only First-Class Pigs Shipped.

SATISFACTION GUARANTEED.

Visit My Herd, and Make Your  
Own Selection.

CORRESPONDENCE SOLICITED.

**THEODORE LOUIS,**

Dunn County,

Louisville, Wis.

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# T. A. Chapman & Co.

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## DRY GOODS.

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*Established in 1857, being in business over thirty-two years, have gained a reputation for keeping the best of goods; also of fair, honest dealing. Those wishing goods or samples can order by mail and be served just as well as if they were at the store in person. It will be their especial care to fill any orders which they may receive with all possible dispatch. Below they give directions for ordering:*

*1st—Write name and address distinctly. 2d—State quality and measurements clearly. 3d—Say how you want goods shipped. 4th—Put in samples when possible. 5th—Enclose Bank Draft, Express Order, P. O. Order, or send currency by Express or in a Registered Letter. 6th—Goods will be sent C. O. D. when desired, but by remitting with order Collection Charges will be saved.*

*Small parcels weighing **4 Pounds** or less can be sent by mail at the rate of 16 cents per pound—the purchaser taking the risk of loss.*

*In ordering from samples, please make a second choice, in case the first choice should in the meantime be sold.*

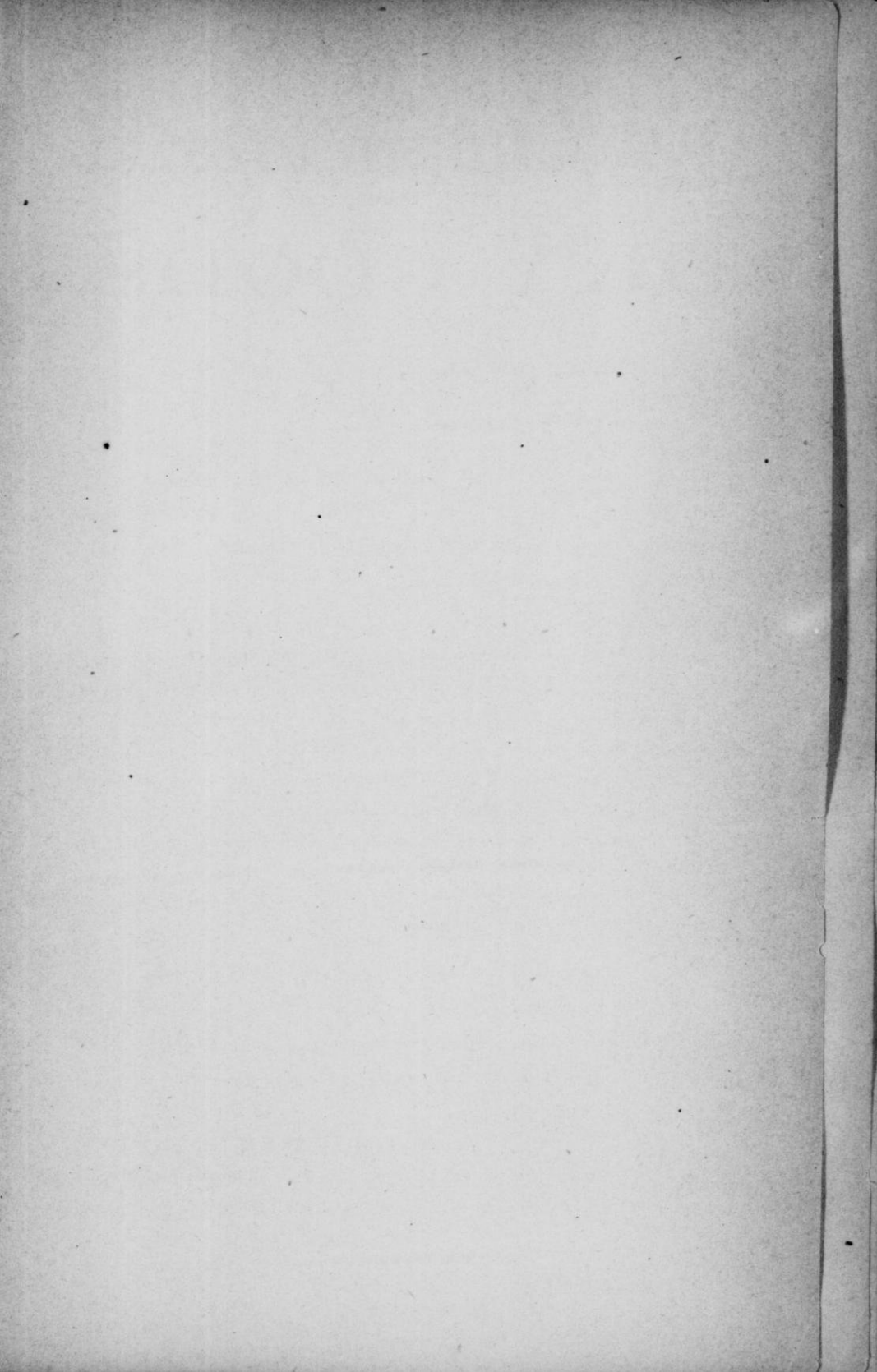
*When ordering samples of Silks, Dress Goods, etc., state prices and colors wanted, and also what kind of goods.*

*If you wish any goods in their line—send them your order, no matter whether large or small. They desire to make this department an accommodation to all parties living out of town, and a small order will receive as prompt and careful attention as a large one.*

**T. A. CHAPMAN & CO.,**  
Milwaukee, Wis.

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