Wisconsin Farmers' Institutes : a hand-book of agriculture. A report of the twenty-third annual closing Farmers' Institute, held at Mondovi, Wisconsin, March 16, 17, 18, 1909. Bulletin No. 23 1909

Wisconsin Farmers' Institutes
Madison, Wisconsin: Democrat Ptg. Co., State Printer, 1909

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ENGLISH YEOMAN'S TOAST.

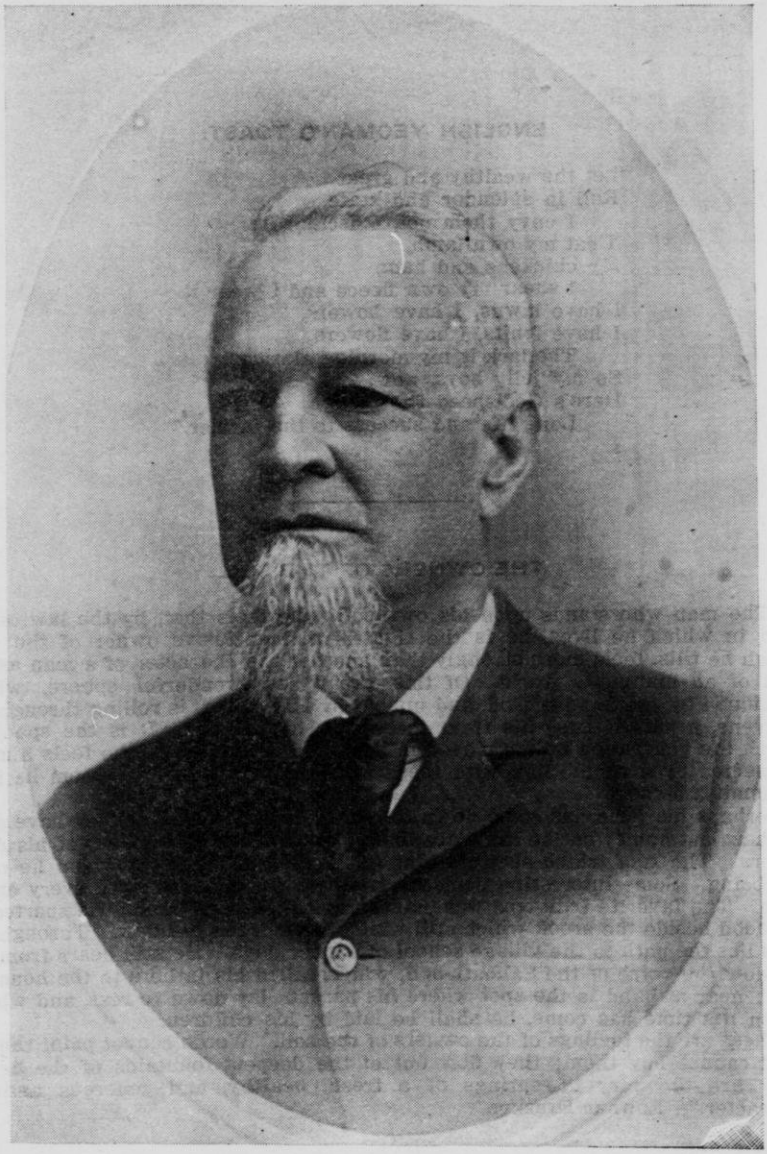
"Let the wealthy and great
Roll in splendor and state,
I envy them not, I declare it;
I eat my own lamb,
My chickens and ham,
I shear my own fleece and I wear it.
I have lawns, I have bowers,
I have fruits, I have flowers,
The lark is my morning alarmer;
So my jolly boys, now,
Here's God-speed the plough,
Long life and success to the farmer."

THE OWNERS OF THE SOIL.

"The man who stands upon his own soil, who feels that, by the law of the land in which he lives, he is the rightful and exclusive owner of the land which he tills, feels more strongly than another the character of a man as the lord of an inanimate world. Of this great and wonderful sphere, which, fashioned by the hand of God, and upheld by His power, is rolling through the heavens, a part is HIS—his from the center to the sky! It is the space on which the generation before moved in its round of duties, and he feels himself connected by a visible link with those who follow him, and to whom he is to transmit a home.

Perhaps his farm has come down to him from his fathers. They have gone to their last home; but he can trace their footsteps over the scenes of his daily labors. The roof which shelters him was reared by those to whom he owes his being. Some interesting domestic tradition is connected with every enclosure. The favorite fruit-tree was planted by his father's hand. He sported in boyhood beside the brook which still winds through the meadow. Through the field lies the path to the village school of earlier days. He still hears from the window the voice of the Sabbath-bell, which called his fathers to the house of God; near at hand is the spot where his parents lay down to rest, and where, when HIS time has come, he shall be laid by his children.

These are the feelings of the owners of the soil. Words cannot paint them—gold cannot buy them; they flow out of the deepest fountains of the heart; they are the very life-springs of a fresh, healthy, and generous national character."—EDWARD EVERETT.



Hon. T. L. Newton, Beaver Dam, Wis.

Secretary State Agricultural Society, 1887–1890; President of Wisconsin State Board of Agriculture, 1899.

WISCONSIN

Farmers' Institutes

A HAND-BOOK OF AGRICULTURE.

BULLETIN No. 23.
1909.

A Report of the Twenty-Third Annual Closing Farmers' Institute, Held at Mondovi, Wisconsin, March 16, 17, 18, 1909.

"I believe in a spade and an acre of good ground. Who so cuts a straight path to his own living by the help of God, in the sun and rain and sprouting grain, seems to me a universal working man. He solves the problem of life, not for one, but for all men of sound body." —*Ralph Waldo Emerson.*

EDITED BY

GEO. McKERROW

SUPERINTENDENT

FIFTY THOUSAND COPIES ISSUED.

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STENOGRAPHIC REPORT BY MRS. A. L. KELLY, Chicago, Ill.

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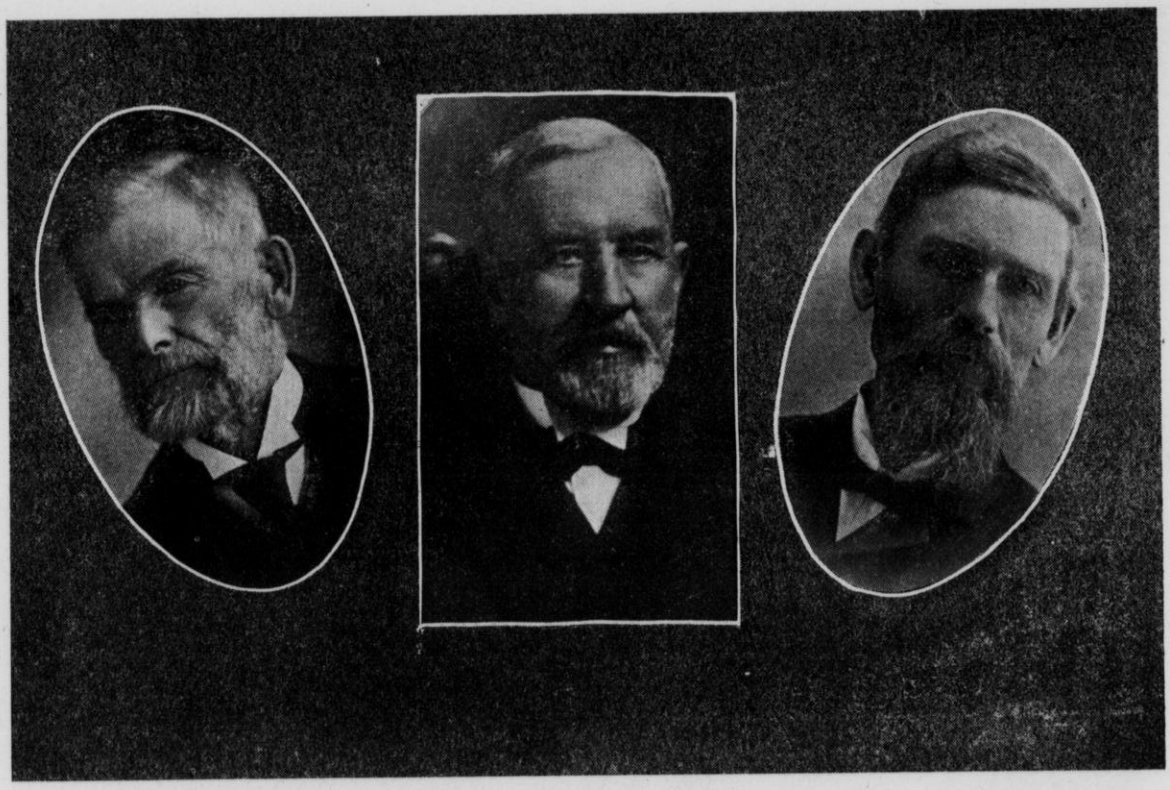

C. P. Goodrich. Henry Wallace. A. L. Hatch.

Three farmers who were honored with special recognition by the University of Wisconsin during the Farmers' Course, February, 1909, in appreciation of their eminent services in the development of agricultural thought and practice.

LETTER OF TRANSMITTAL

HON. W. D. HOARD,

President of the Board of Regents, University of Wisconsin:

SIR:—I have the honor of herewith presenting to you Bulletin No. 23 of Wisconsin Farmers' Institutes.

Most respectfully yours,

GEORGE McKERROW,

Superintendent.

Madison, Wis., Nov. 22, 1909.

American Society of Equity, Chippewa Falls, November 2, 3 and 4, 1909.

THE UNIVERSITY OF WISCONSIN

Board of Regents.

Charles R. Van Hise, President of the University, *ex-officio.*
Charles P. Cary, State Supt. of Public Instruction, *ex-officio.*

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State at Large, W. D. Hoard, Pres.
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7th District, Edward Evans.
8th District, Mrs. Florence G. Buckstaff.
9th District, Gustave Keller.
10th District Granville D. Jones.
11th District, A. P. Nelson.

M. E. McCaffrey, Secretary.

Organization.

The University embraces—
- The College of Letters and Science.
- The College of Engineering.
- The Law School.
- The College of Agriculture.
- The Medical School.
- The Graduate School.
- The Extension Division.

The College of Letters and Science embraces—
- General Courses in Liberal Arts.
- Special Courses which include:
  - Course for Normal School Graduates.
  - Chemistry.
  - Commerce.
  - Pharmacy.
  - Music.
  - Training of Teachers.

The College of Engineering embraces—
- The Civil Engineering Course.
- The Mechanical Engineering Course.
- The Electrical Engineering Course.
- The Applied Electrochemistry Course.
- The Chemical Engineering Course.
- The Mining Engineering Course.

The College of Agriculture embraces—
- The Experiment Station.
- The Long Agricultural Course.
- The Middle Agricultural Course.
- The Short Agricultural Course.
- The Dairy Course.
- The Farmers' Institutes.
- Home Economics.

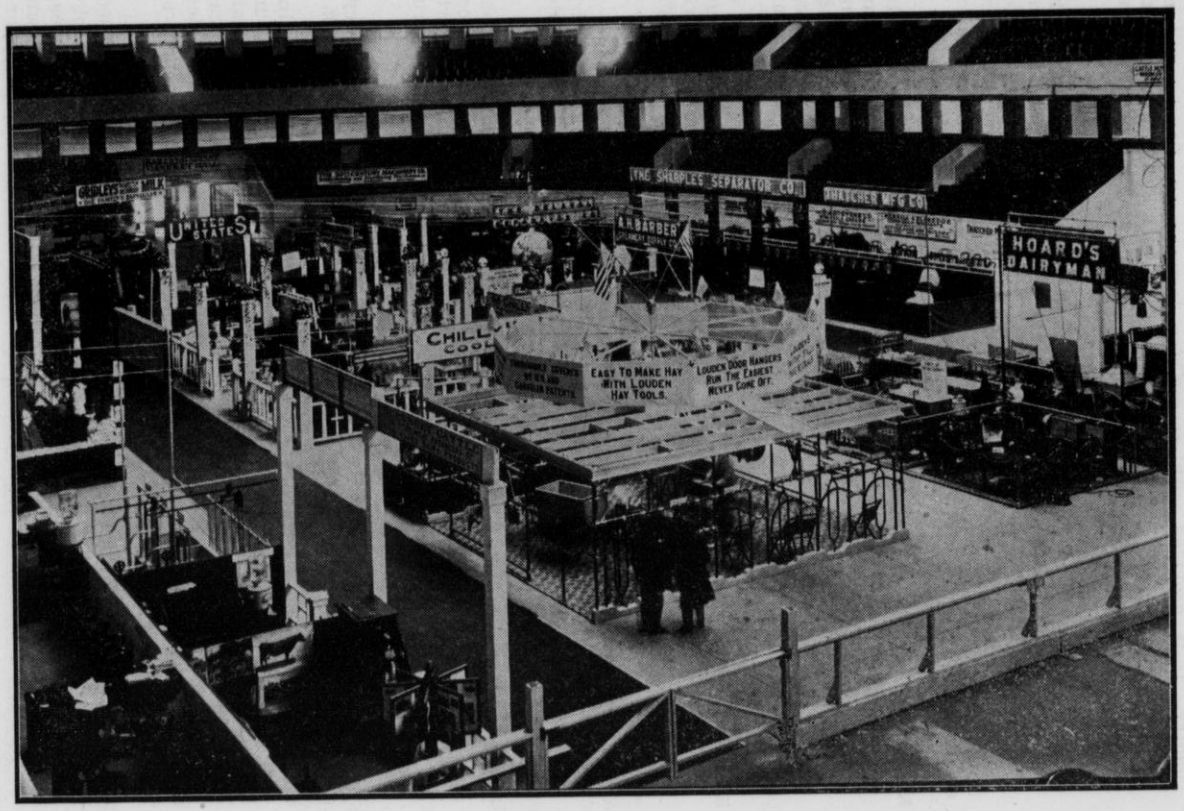
The Law School embraces—
- A Three Years' Course.

The Medical School embraces—
- The First Two Years of a Medical Course.

The Extension Division embraces—
- The Department of Instruction by Lectures.
- The Department of Correspondence-Study.
- The Department of General Information and Welfare.
- The Department of Debating and Public Discussion.

Branches of Study.

The University presents a wide range of study embracing more than three hundred subjects. Something of the extent and variety of these may be indicated by the following synopsis: Twelve languages are taught, viz.: Greek Latin, Sanscrit, Hebrew, German, Russian, Norse, French, Italian, Spanish, Anglo-Saxon and English. In Mathematics there are thirty-one special courses. Under the Sciences there are a large number of courses in each of the following: Astronomy, Physics, Chemistry, Geology, Mineralogy, Zoology, Botany, Anatomy, Bacteriology, Pharmacy. In History there are forty-six courses; in Political Economy, sixty-six; in Political Science, thirty-nine; in Mental Sciences there are forty-nine, embracing Philosophy, Psychology, Ethics, Aesthetics, Logic and Education. There are fifteen courses in Music, and two courses each in Military Drill, and Gymnastics.



Creamery and Dairy Supply Exhibit at National Dairy Show, Milwaukee, October 14–24, 1909.

Physical Culture:—The Armory and Gymnasium is one of the largest buildings for its purposes connected with any institution of learning in the country. It is provided with rooms for lectures on Physiology and Hygiene, and for class and individual exercise in all the forms of gymnastic practice. There are also the most abundant and approved facilities for shower, sponge and swimming baths.

Adequate accommodations are provided for the women's gymnastics by the construction of Lathrop Hall, which has been fully equipped and will be ready for occupancy in the fall of 1909. This furnishes ample facilities for systematic courses for young women, and is under the immediate direction of a trained instructor. This provides a new gymnasium for the exclusive use of women.

In Mechanics and Engineering:—Elementary Mechanics, Mechanics of Material, Dynamics, Mechanics of Machinery, Theory of Construction, Thermodynamics, Elementary Surveying, Railroad and Topographic Surveying, Geodesy, Sanitary, Hydraulic, Railroad, Electrical, Steam Engineering, Hydraulic Motors, Hoisting Machinery, Theory and Construction of Locomotives, Railway Locomotives, Railway Location, Railway Equipment, Construction and Maintenance of Way, Railroad Field Work.

In Electricity:—Electrical Testing, Electrical Plants, Electrical Construction, Electrochemistry, and various forms of drawing are given; also shop work in wood, iron, brass, both hand work and machine work, machine designing, construction and testing machines.

In Agriculture:—Various courses are given in agriculture. Animal Husbandry, Farm Management, Dairying, Agricultural Chemistry, Soils, Veterinary Science, Agricultural Physics, Agronomy, Horticulture and Economic Entomology, Bacteriology, etc.

In Law:—Courses in Equity, Jurisprudence, Real Property, Constitutional Law, Wills, Contracts, Torts, Practice and Pleading, Law of Evidence, Corporations, Domestic Relations, Admiralty, Insurance Estoppel, Partnership, Taxation, Criminal Laws, Common Carriers, Medical Jurisprudence, Probate Law, Code Practice, Agency, etc.

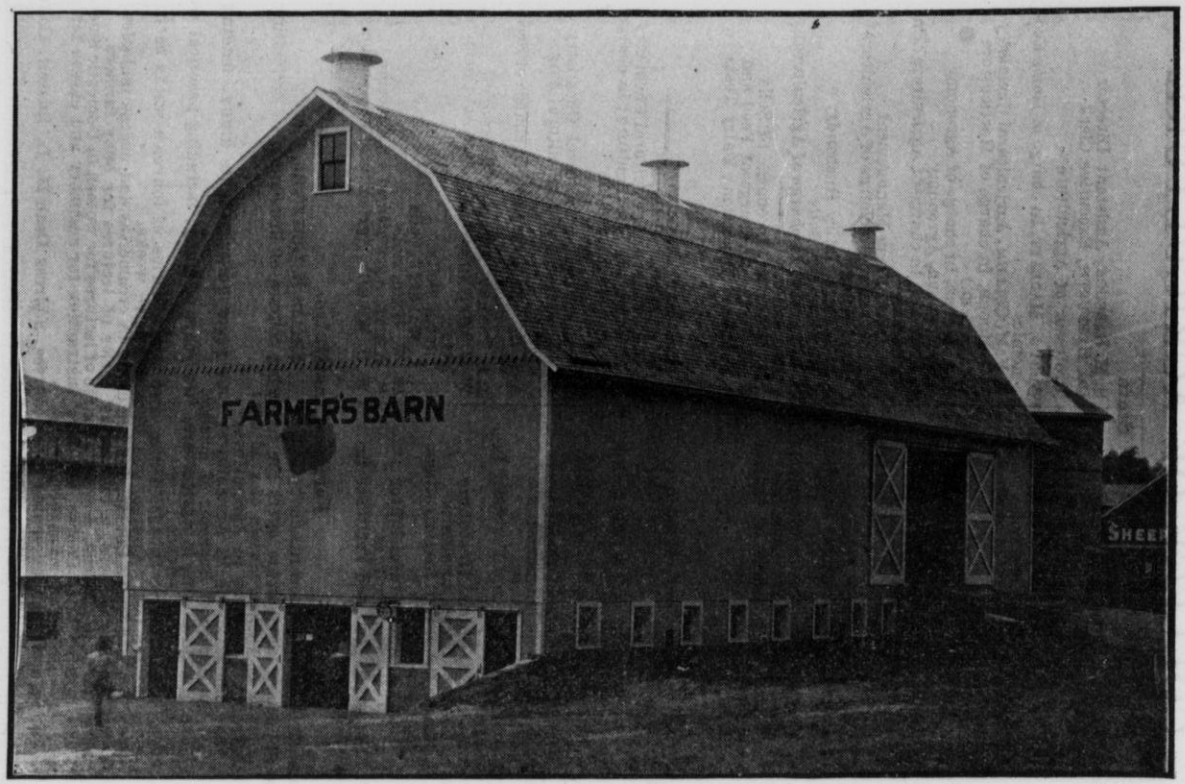
In Pharmacy:—Courses in Practical Pharmacy, Pharmaceutical Chemistry, Materia Medica, Pharmaceutical Botany and Practical Laboratory Work.

General Facilities:—The Faculty embraces three hundred and fifty-six instructors. The laboratories are new, extensive and well equipped; embracing the Chemical, Physical, Metallurgical, Mineralogical, Geological, Zoological, Botanical, Bacteriological, Civil, Electrical and Mechanical Engineering, Agricultural and Pharmaceutical Laboratories. Seminaries are held for advanced study in History, Language, Literature, Mathematics, and other branches.

The libraries accessible to students embrace that of the University, 147,000 volumes; of the State Historical Society, 311,000 volumes, including pamphlets; of the State Law Department, 47,000 volumes; of the city, 19,000 volumes, besides special professional and technical libraries, making in all more than 522,000 volumes, including pamphlets, thus affording very exceptional opportunities for reading and special research.

Any person who desires information in regard to any of the colleges or schools, should apply to

W. D. HIESTAND,
Registrar.



Farmers' Model Barn on Wisconsin State Fair Grounds, 1909.

The University of Wisconsin

COLLEGE OF AGRICULTURE.

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S. M. BABCOCK, Assistant Director
IDA HERFURTH, Executive Clerk

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E. G. HASTINGS, Agricultural Bacteriology
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E. TRUOG, Soils
H. L. WALSTER, Soils
W. W. WEIR, Soils
F. WHITE, Agricultural Engineering
W. H. WRIGHT, Agricultural Bacteriology

Farmers' Institutes.

GEORGE MCKERROW, Superintendent

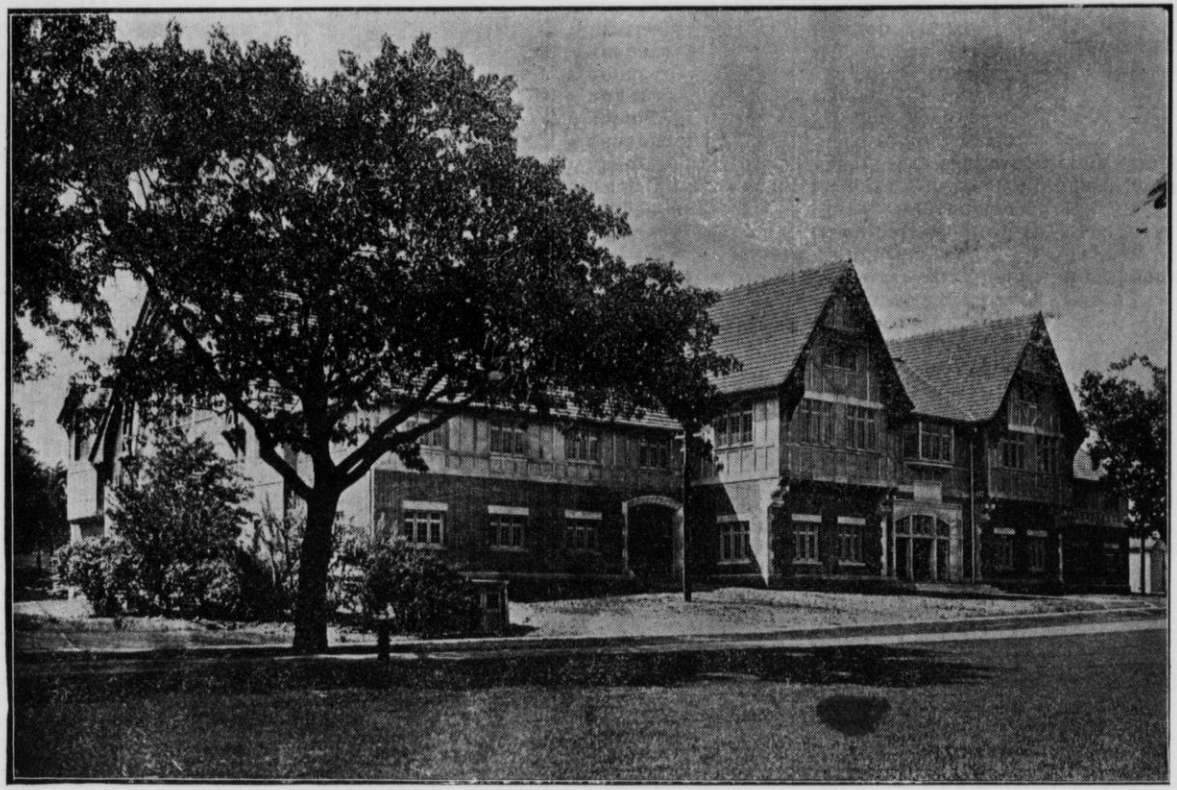
NELLIE E. GRIFFITHS, Clerk

The College of Agriculture offers the following courses of instruction in agriculture to meet the needs of various classes of students:

Graduate Courses in Agriculture.
The Long Course in Agriculture, four years undergraduate study, leading to the degree of Bachelor of Science.
The Middle Course in Agriculture, two years of study, including practical work and applied science.
The Short Course in Agriculture, two winter terms of fourteen weeks each.
The Winter Dairy Course, one term of twelve weeks.
The Summer Dairy Course, for beginners in creameries and cheese factories.
The Farmers' Course, a two weeks' series of lectures for busy farmers.
The Womens' Course, a week's course of lectures for women in Domestic Science.
The Special Dairy Course, ten days' instruction for creamery and cheese factory operators and managers.
For information concerning these courses, address Dean H. L. Russell, College of Agriculture, Madison, Wisconsin.

The Agricultural Experiment Station, devoted to research in agricultural problems, is supported jointly by the Federal and State governments. Bulletins are issued frequently and distributed free to farmers of the state. Any farmer may receive these on request to Director, Agricultural Experiment Station, Madison, Wis.

The Farmers' Institutes Department conducts over 140 meetings in various sections of the state where practical lectures and conferences on subjects pertaining to farm life and operations are presented. Over 40 Cooking Schools are conducted for the women. The Farmers' Institute bulletin is issued annually in an edition of 50,000 copies, and distributed at Institutes and by mail. Any community can secure an Institute upon proper application to the Superintendent. For further information address Superintendent George McKerrow, Madison, Wis.



Live Stock Pavilion at College of Agriculture.
The building fills a space 207 by 114 feet, erected at a cost of $75,000.

WISCONSIN FARMERS' INSTITUTES FOR 1909-1910.

ARRANGED BY COUNTIES.

County.	
Adams	Grand Marsh.
Barron	Cumberland, Rice Lake.
Brown	New Franken.
Buffalo	Cochrane, Cream, Fountain City, Nelson.
Calumet	Chilton, Potter, Sherwood.
Chippewa	Chippewa Falls, Holcombe, New Auburn, Stanley.
Clark	Colby, Loyal, Withee.
Columbia	Poynette, Wyocena.
Crawford	Ferryville, Prairie du Chien, Steuben.
Dane	Albion, Daleyville, Stoughton, Waunakee.
Dodge	Juneau, Knowles, Woodland.
Door	Bailey's Harbor, Forestville.
Douglas	Bennett.
Dunn	Colfax.
Eau Claire	Augusta, Fairchild.
Fond du Lac	Calumetville, Campbellsport, Dotyville.
Forest	Crandon.
Grant	Bloomington, Louisburg, Montfort, Platteville.
Green	Attica, New Glarus.
Green Lake	Green Lake, Kingston.
Iowa	Dodgeville.
Jackson	Hixton, Merrillan.
Jefferson	Hubbleton.
Juneau	Camp Douglas, Lyndon Station.
Kenosha	Somers.
Kewaunee	Casco, Norman.
La Crosse	Bangor.
La Fayette	Shullsburg.
Langlade	Antigo.
Manitowoc	Two Rivers (Closing Institute), Valders.
Marathon	Marathon, Stratford.
Marinette	Town Hall, Pound.
Marquette	Briggsville.
Monroe	Cashton, Leon, Norwalk.
Oconto	Gillett, Lena, Morgan, Oconto.
Outagamie	Black Creek, Stephensville.
Ozaukee	Cedarburg, Port Washington.
Pepin	Arkansaw, Pepin.
Pierce	Ono, Spring Valley.
Polk	Clam Falls, Clear Lake, East Farmington, Luck, St. Croix Falls.
Portage	Almond, Amherst.
Price	Prentice.
Racine	Union Grove, Waterford.
Richland	Bear Valley, Bloom City, Tavera.
Rock	Orfordville, Shopiere.
Rusk	Hawkins.
St. Croix	Baldwin, New Richmond.
Sauk	Ableman, Black Hawk.
Sawyer	Hayward.
Shawano	Shawano, Tigerton.
Sheboygan	Cedar Grove, Glenbeulah, Sheboygan Falls.
Taylor	Hannibal, Medford.
Trempealeau	Eleva, Independence.
Vernon	La Farge, Retreat, Stoddard, Westby.
Walworth	East Troy, Elkhorn, Genoa Junction.
Washburn	Birchwood, Sarona.
Washington	Fillmore, Wayne.
Waukesha	Eagle, Pewaukee.
Waupaca	Fremont, Royalton.
Waushara	Mt. Morris, Poysippi.
Winnebago	Neenah, Omro.
Wood	Marshfield, Sherry, Vesper.

INSTITUTES, WITH DATES AND CONDUCTORS.

Date.	W. C. Bradley, Conductor.	L. E. Scott, Conductor.	F. H. Scribner, Conductor.	David Imrie, Conductor.	E. Nordman, Conductor.	W. F. Stiles, Conductor.
1909.						
December.						
7- 8	Birchwood	East Farmington	Cumberland	St. Croix Falls* ..	Bennett	Colby.
9-10	Rice Lake*	Clam Falls	Hawkins	Luck	Hayward	Prentice.
14-15	Holcombe	Colfax	Spring Valley* ..	Sarona	Baldwin	Arkansaw.
16-17	Hannibal	New Richmond*..	Ono	New Auburn	Clear Lake	Nelson.
28-29	Tigerton	Pound	New Franken....	Forestville	Shawano*	Lena†.
30-31	Gillett	Morgan	Norman	Bailey's Harbor .	Oconto*	Casco.†
1910.						
January.						
4- 5	Chippewa Falls*	Marshfield†	Stanley	Loyal	Sherry	Antigo.
6- 7	Withee*	Marathon†	Medford	Vesper	Stratford	Crandon.
11-12	Mt. Morris	Stephensville ...	Green Lake†	Neenah	Black Creek* ...	Kingston.
13-14	Poysippi	Royalton	Almond†	Fremont	Amherst*	Omro.
18-19	Hixton	Ableman	Black Hawk	Augusta*	Briggsville	Eleva.†
20-21	Independence ...	Norwalk	Bear Valley	Merrillan*	Grand Marsh	Fairchild.†
25-26	Pepin†	Stoddard*	Ferryville	La Farge	Tavera	Cochrane.
27-28	Fountain City† ..	Prairie du Chien*	Retreat	Bloom City	Steuben	Cream.
February.						
15-16	Lyndon Station .	Leon	Wyocena*	Hubbleton	Bangor†	Albion.
17-18	Poynette	Cashton	Camp Douglas* ..	Juneau	Westby†	Shopiere.
22-23	Bloomington	Waunakee	Dodgeville	Orfordville†	New Glarus	Shullsburg.* *
24-25	Montfort	Attica	Louisburg	Platteville†	Daleyville	Stoughton.*
March.						
1- 2	Sheboygan Falls*	Glenbeulah†	Sherwood	Calumetville	Potter	Campbellsport.
3- 4	Port Washington*	Chilton†	Valders	Dotyville	Fillmore	Wayne.
8- 9	Woodland	Somers	East Troy	Cedarburg	Union Grove* ...	Elkhorn.†
10-11	Knowles	Waterford	Pewaukee	Cedar Grove	Eagle*	Genoa Jct.†

Twenty-fourth Annual Closing Institute and Cooking School, Two Rivers, Manitowoc Co., March 15, 16, 17, 1910.
All inquiries relative to Institutes will be answered promptly.
Cooking Schools conducted by Miss Edith L. Clift.*
Cooking Schools conducted by Miss Nellie Maxwell.†

GEO. McKERROW, Supt.,
Madison, Wis.

PROCEEDINGS

OF THE

TWENTY-THIRD ANNUAL

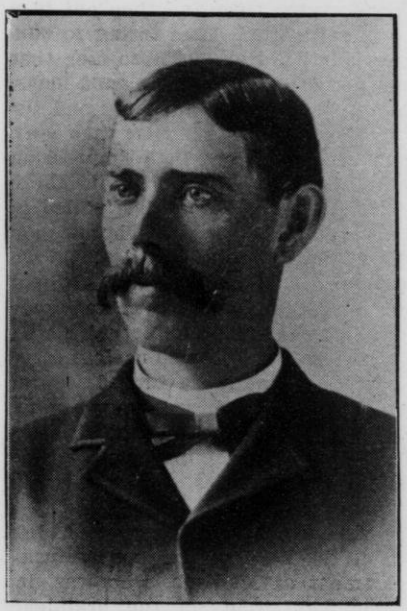
CLOSING FARMERS' INSTITUTE

HELD AT

MONDOVI, WIS., MARCH 16, 17, 18,

1909

The opening session was called to order by Superintendent Geo. McKerrow. Prayer was offered by Rev. Father O'Connor.



Mayor Gilman.

ADDRESS OF WELCOME.

Mayor S. G. Gilman, Mondovi, Wis.

Mr. Chairman, Ladies and Gentlemen:

The city of Mondovi is situated in the midst of a rich agricultural district. This section of the state has been settled for about fifty years. During that time I have been engaged in farming, actively part of the time, and the rest of the time by proxy, so that I have had an opportunity to know something of the primitive methods of farming and of the changes that have taken place and the present conditions.

A noted judge once said to me that there are three stages in the history of a judge, first, when he knows it all; second, when he doesn't know anything, and third, when he don't care a continental.

The farmer has similar periods in his history; unfortunately, some go through the last period first, and I am sorry that a few continue in the "don't care" stage until the time of

Farmers' Institute Workers at Twenty-third Annual Round-up Institute, Mondovi, Wis., 1909.

death, and of such an one it may truly be said that the world is no better for his having lived.

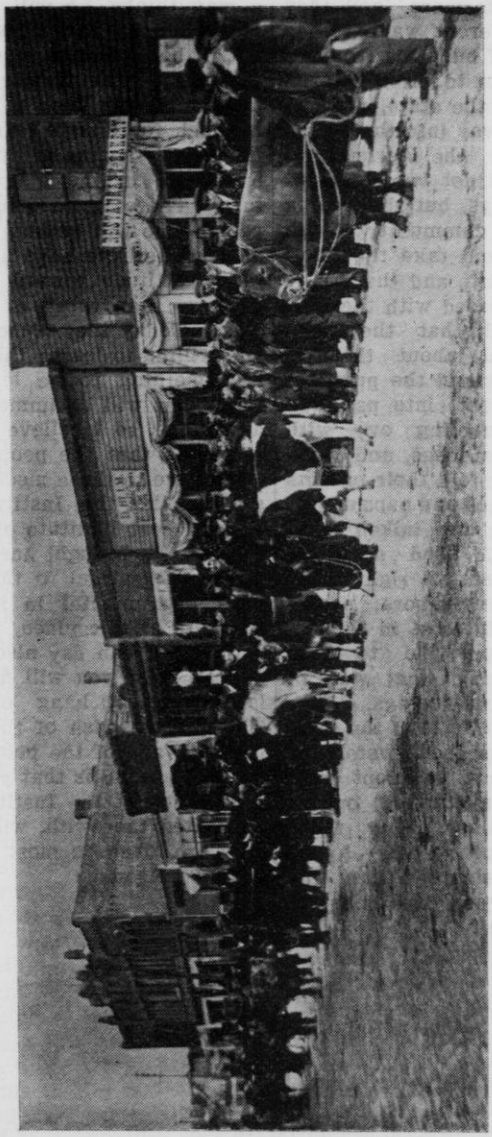
The history of agriculture in this part of the state may well be divided into three epochs: the first period, grain farming; then a period of diversified farming, and then a period of evolution. The grain farmer must not be criticised too severely, because he was such as a matter of necessity; dropped in the wilderness he had to do that from which he could get the quickest results; he could sow in April, harvest in August, thresh in September, and in October or November he could pay the year's store bill. In the course of time people began to settle upon the broad prairies of Minnesota and Dakota, where wheat was grown so easily and cheaply that the market was flooded and prices went down, and it was about this time that the chinch bug came and in a few hours it would change No. 1 wheat to No. 3 and it even established another grade, No. 4. This creature could not be caught nor trapped nor killed in any way, he was the farmer's enemy, and he had come to stay.

I remember on one occasion where the preacher made the statement that God creates nothing in vain, always for some useful purpose, and one of his audience asked him how about the chinch bug. He stopped and looked and hesitated, but he didn't answer, he couldn't answer, not at that time, but if he had lived until this time the answer would have been easy, and the answer is that the chinch bug drove the farmer from the wheat field into the field of diversified farming as a matter of necessity. He got a few more cows, he began to raise some corn and oats and barley and quite a bit of hay. He discovered that there was no season so poor but what he could raise a good crop of something; if it was so hot that the grain shriveled up, he raised a good corn crop; the harvests were never so much of a failure but that he got something to sell.

Of course we didn't know much about Farmers' Institutes in those days, but we continued this plan; we raised corn and oats and ground them into feed and fed them to our cows, fed them to our steers to make beef, and the cows produced milk; fed them to our hogs to make pork, and the women fed the same feed to the hens to make them lay.

I have forgotten how long ago it was, but it must be twenty years or so ago, that the first Institute came to Mondovi, and those early Institutes were well attended; we had some fine Institutes, we had such men as Governor W. D. Hoard, Mr. Austin and Theodore Louis and all the others, but it seemed as if a good many of the farmers were contented with their lot, they didn't seem to want to get rich, they wanted to have a comfortable time and they put in a good deal of their time trying to educate their children. Those men that came to us had some very good ideas, but the farmers would come and listen, more out of curiosity than anything else, and very little impression was made upon them, so that there were but two or three silos filled in this part of the state. Those men told us that in order to fill a silo we must raise corn and the stalks would grow as large as your arm and fourteen, sixteen, eighteen feet high, so some of the silos became useless after a few years and were turned down, most of them, and it was a good many years before there was another silo built in this part of the country. But the state authorities were not discouraged.

At that time, fortunately, we had a man at the head of the agricultural department at Madison, who was, in my judgment, one of the brainiest men the state has ever had and there seems to be no limit to his energy



Judging dairy cattle at Round-up Farmers' Institute, Mondovi, Wis., March 17, 1909.

and determination. Those people down there knew that they had to get in touch with the farmers and they reached out in different ways; they sent any number of bulletins from the Agricultural Station to all the farmers in this part of the state, most of which found their way into the stove; then they founded the Agricultural College, which was not very well attended in those days, but they got a few boys in each community to go down to Madison and take the Short Course in Agriculture, and those boys were very much pleased with their experience, they felt that they had learned a good deal about the new methods of farming and the practical ways of putting them into use, and they came home bubbling over with enthusiasm and new ideas, and when they got home they told their parents what they had learned and papa sat up and listened, and they talked over those new ideas and tried some of them and found them all right; they talked among the neighbors; people began to have an interest in the Agricultural department and to think there was something that was of some value in their teachings.

The result of the efforts of the state in this direction has been twofold; it has induced farmers to adopt new methods of farming, starting out on new and different lines. But there has been one result which to me seems far more valuable than the adoption of these new methods of farming, and that is that they have got these farmers to thinking. When a man thinks, he will ask questions, and when he asks questions there is apt to be a change of views in some respects. The farmer has learned that he doesn't know it all, that there is much for him to learn, and when the farmer begins to think a new era is started in the history of agriculture. There is no question that the people who will be here in attendance at this Institute have an entirely different attitude toward the Institute workers than those of twenty years ago. Today they come here anxious and willing to learn; they know there is something to be learned, something that will be immensely to their advantage, so I believe I am justified in saying that the people who will come here to these meetings feel very grateful that this Institute, the greatest and best Institute of the state for this year, is brought here to Mondovi; they feel grateful to those who have been instrumental in securing this Institute at this place.

I think I can say also that whilst you are here you will find that our latchstrings all hang on the outside. The dearest wish of the citizens of this city and of the people in all this country around is that you who are in attendance at the Institute, all those connected therewith, will realize that they are given a most cordial and hearty welcome.

RESPONSE TO ADDRESS OF WELCOME.

F. H. Scribner, Rosendale, Wis.

It gives me great pleasure this morning to respond to this courteous and kind welcome which you have extended to us on this occasion, and I assure you we appreciate what you have said and what you have given at our disposal, and we feel that we are welcome among you because the purpose for which we are gathered is certainly a good one.

I am glad I am a Wisconsin boy, and I am going to be a boy just as long as I can; I am glad that I am a Wisconsin born boy and that I live in this great, progressive state that is fast taking the lead in many respects of any state in the union. Wisconsin is raising more clover than any other state according to the reports, Wisconsin has more silos than any other state, Wisconsin has more pure bred and high-grade dairy cattle than any other state, and Wisconsin' Farmers' Institutes are considered the best, so I feel I have reason to be proud that I was born and live in this great state of Wisconsin.

And yet, while we are patting ourselves on the back, let us not forget that the proposition that faces the Wisconsin farmer today is a far different proposition than faced the farmer forty years ago and it requires intelligence to handle a farm successfully today. Farming has become a science and the man who is not farming on scientific, or good common sense principles is a failure as a money-maker, or as one who is keeping his farm up to a high state of fertility. Farms in the last fifty years have suffered very materially in the depletion of their fertility and it is only the studious, hard thinking, hard working farmer who is getting his farm where it should be.

This Farmers' Institute, like many associations of its kind in the country, is an educational institution, and when it comes into a place it leaves its impress and the influence that goes out from such meetings as these is broadening and deepening all over the state, as well as other states, and helping to bring prosperity and happiness to all those who labor patiently and well.

Now we are assembled in the Twenty-third Annual Round-up of the Farmers' Institute and I want to thank the people for the attendance we have this morning, and we want you to understand right here that the success of this meeting depends very largely upon you. A large part of our Bulletin is made up from the questions and answers, the discussions that are given in these meetings, and we want you all to help.

Supt. McKerrow—We will now have to get down to the business of this Twenty-third Annual Round-up and, as the mayor has stated, the chief purpose of such meetings as this is to set us to thinking. It is not what we can tell you here in this meeting that will be of benefit to you particularly, but it is the thoughts that grow from the seeds that may be dropped.

I will call to the chair one of our Institute conductors, Mr. W. F. Stiles, of Lake Mills, to preside over the deliberations of this morning's session.

Chairman Stiles—This is the third Institute I have attended at Mondovi and I am very much pleased to be chairman of this first session of this Closing Institute. We have five topics on the program this morning and after the reading of the papers will come the discussion, in which I hope you will all take an active interest.

CROP ROTATION.

Supt. George McKerrow, Madison, Wis.

You who have been in attendance at the Wisconsin Institutes for the last twenty-three years, when you have picked up the programs and looked them through, have almost invariably noted as one of the first topics this one that is to be first this morning, Crop Rotation; that and its counterpart, Soil Fertility and Manures, have been foremost as subjects discussed in Wisconsin Farmers' Institutes.

Some fifteen years ago, when I was asked to take charge of the Wisconsin Institute work, one of the first thoughts that came to me was, how can I vary or change this work so as to keep it just as good as it is and yet give it a new appearance, and I thought I must change the topics for the first session, Fertility, Manures Crop Rotation. This thought was in my mind all through that summer and fall, until I attended the Live Stock Show at Madison Square Garden in New York in the autumn. As I met the farmers from the east who were in attendance at that show and talked with them about the agricultural conditions in New England and in those other eastern states represented there, I found that the same story came from all of them, that farming as followed there was unprofitable; that they had to pay out what should be their profits for commercial fertilizers in order to harvest a decent crop and the profits were already gone in the commercial fertilizers before the crop was harvested, and it was a heartrending story they all told about their agricultural conditions.

That started a new thought in my mind, How are we to avoid such conditions in Wisconsin? How can we keep from paying out these great bills running into millions of dollars for this state for commercial fertilizers, and my mind went back to the old subjects, Fertility, Barnyard Manure, and Crop Rotation, and so I came back to Wisconsin to make programs with the same old subjects for a beginning.

Mr. Scribner has here stated that Wisconsin is growing more clover in proportion to her acreage than any other state in the union; that Wisconsin farms have upon them more silos than can be found upon the farms of any other state in the union; that we have more grade and high bred dairy cattle in Wisconsin than can be found in any other state of the union, and he has claimed part of this for the Farmers' Institutes of this state, and I believe this claim is correct.

What has brought this about? The discussion of the several subjects that we are discussing here today; the thinking of the Wisconsin farmer along these very lines.

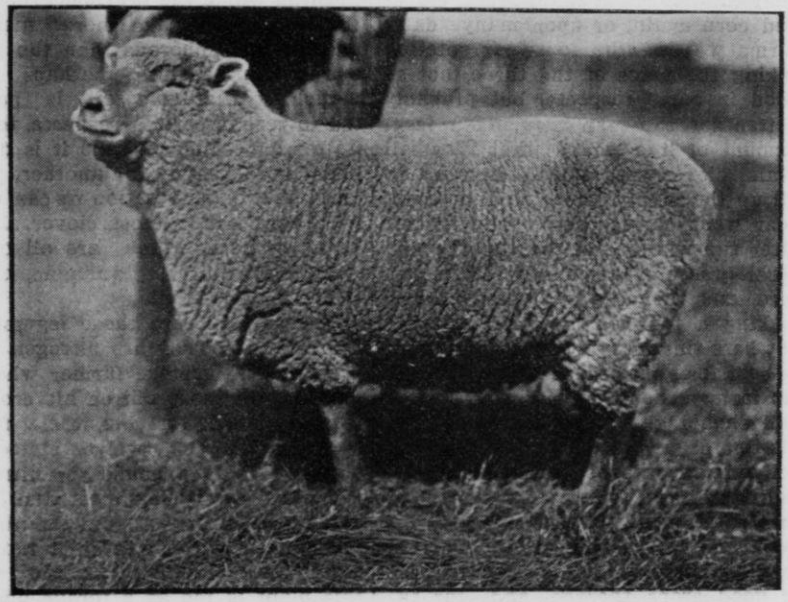
The mayor showed you how the chinch bug was a Godsend to the state of Wisconsin. The chinch bug probably more than any other one thing drove Wisconsin farmers to giving some thought to crop rotation, the question that we are about to discuss here this morning.

Conservation of Soil Fertility of Utmost Importance.

Less than a year ago that thinking, working man who has just stepped down from the highest office in the gift of the American people to that of a private citizen called together the governors of the different states in this union to discuss the question of the conservation of our national re-

sources. In that convention the principal subject was the conservation of our forests, our coal and iron mines; the conservation of our water powers and things of that class; they occupied the attention of that meeting, but let me say that the conservation of soil fertility is quite as important as these other subjects are—yes, the conservation of soil fertility is more important than all the others put together, and I am proud when I think that for twenty-three years before President Roosevelt took up the subject of conservation, the farmers of Wisconsin were discussing and thinking about the conservation of the most important of all of our natural resources namely, the fertility of the soil.

Now, why is this so important? Because upon that foundation, the conservation of the fertility of our soil, depends the feeding of all our people. We farmers have a great responsibility resting upon our shoulders, because future generations will have to be fed from this same soil that we are now feeding the people from, and therefore, it is right that we get down to discuss this primary principle of the conservation of fertility, and crop rotation helps to conserve that fertility.



Southdown ewe that helps conserve fertility and wins prizes at leading fairs.

This subject of crop rotation brings to our mind two lines of thought; one, the maintaining of the fertility, the development of humus in the soil, which conserves the moisture, particularly in the dry parts of our seasons so that the pumping process, capillary action and the breaking down of the elements in the soil may go on and so that there shall be moisture there to carry the necessary elements into the little rootlets of the plant.

Now, in Wisconsin, as we produce more clover than any other state in the union, therefore we can claim the best system of crop rotation, because the production of clover always means some system of crop rotation.

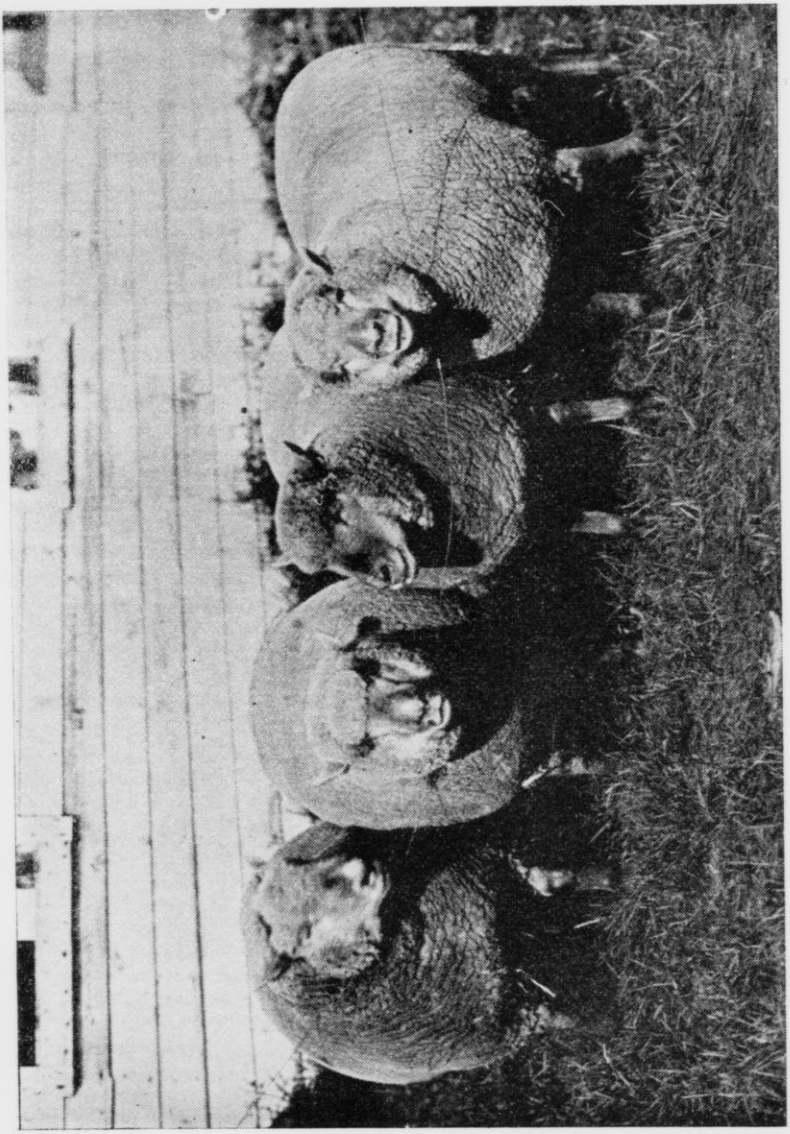
We may have a three-year or a four-year rotation, small grain, clover, corn and cultivated crops in the three-year rotation, then small grain, clover and corn again, or upon many dairy farms we find the four-year rotation taking the place of the three, not so good in some respects, but probably better for the man carrying a large amount of live stock; that is, small grain, clover with a little timothy, to fill up the blank spaces, and the next year what clover there may be left after the winter and the timothy and other grasses that come in for a pasture, and then the cultivated crops, making a four-year rotation. We are not here this morning to decide which is best for you, because each Wisconsin farmer should have brains enough and should give sufficient thought to his line of work to determine for himself what is the best system of rotation for him to follow, after he knows that rotation is the best thing for his farm and for the preservation of the fertility therein, and for the growing of good crops thereon, and for the best system of rotation, then it remains for him to adopt that system for himself and carry it out.

How Crop Rotation Helps to Conserve Fertility.

Why does crop rotation of the kinds that I have mentioned help in the question of fertility? That is a question that suggests itself—because all crops depend upon the soil for the same class of elements; nitrogen, potash and phosphorous are the three main elements in plant growth, therefore, why change? Of course we have the example of nature set before us, the wise Creator seems to have planned things on the rotation principle. You cut off one crop of timber of one kind and another crop of timber comes up, but it is not the same crop or kind you have cut off, you will find the principle of rotation right there. Now why? Because these other crops draw off these elements in different proportions from those in which the previous crop drew them, one will take more nitrogen and less phosphorous than the previous crop, and perhaps less potash, so that the soil is permitted to rest in certain respects, to rest up for one element while it is drawn upon more heavily for another. We learn that in our rotation we can bring in a series of legumes, clover, alfalfa, beans or peas, which are all of the same class, but very valuable, any of them, in the rotation.

What benefit are these legumes in the rotation? They are nitrogen gatherers. The eastern farmer who has paid out all the profit on his crop before he gets it for commercial fertilizers, has to pay twelve, sixteen or eighteen cents a pound for nitrogen. We plant these legumes and they gather this nitrogen from the air and through their roots feed it into the plant, store it up there, and when this plant is fed as a forage plant it goes back and forms manure, then it is turned over by the plowshare and puts these nitrates where other roots can find them ready for their use. We have turned under just so much value from the atmosphere which the soil has breathed in and it has been taken up by the bacteria of these legume plants, transformed and held for future use.

A plant like the clover plant or the alfalfa plant, a deep-rooted plant, goes deeper for its sustenance than does your shallow-rooted plant, your wheat, your barley and your oat plant, or your corn. It goes down, down where these elements have been washed down into the soil for ages and brings



Grand Champion Southdown Flock, all breeds competing. Minnesota State Fair, 1909; Owned by Geo. McKerrow & Sons, Pewaukee, Wis.

up phosphorous and potash, storing them in the ground ready to feed other roots with all these elements, brings them to the crown and the root, and when that is turned under these elements are released for the use of the shallow-rooted plants, so they are drawn from the mine below that had not been tapped until your clover root or your deep-rooted alfalfa gets down there and taps it.

All this time these plants, your large, deep-rooted plants like your clover and alfalfa, are feeding humus into that soil, and that question of humus is a very important one; that is where the man who buys commercial fertilizer and pays his good money for it fails. He puts it upon the soil, but it adds no humus and humus is very necessary to hold moisture. Humus is necessary so that the rotting or breaking-down process may go on in the soil; the commercial fertilizer furnishes none; your clover plant, your alfalfa plant furnishes a great deal, and therefore it is adding a valuable asset to this soil, putting it in that sponge-like condition which holds moisture and helps along the breaking-down or rotting processes.

It is not necessary for me to talk long this morning to set farmers thinking along this line, because Wisconsin farmers are already thinking this way. I propose to cut this talk short, so that some of the good thoughts that are lying dormant in this audience will come out in the discussion that will lead all of us to more thought and better thought. There are many farmers in this audience whose thoughts will be of value to all of us, and we are gathered together to compare thoughts and get these thoughts from our neighbors, if possible. Now, ask your questions, grind them out lively, with all the water power and brain power that there is in Buffalo county, so we may get a good grist for the next annual bulletin.

DISCUSSION.

Mr. Hill—Mr. McKerrow used the term "barnyard manure" as one of the necessary things in this crop rotation.

Supt. McKerrow—I meant stable manure, and lots of it, and the barnyard manure also—the more the better.

Mr. Hill—Is there any danger of too much clover, any danger of overworking the soil with clover?

Supt. McKerrow—Not in either of these three or four-year rotations. I might have said that we can scarcely get too much clover.

Mr. Jacobs—Can we keep growing crops without taking fertility from our farms?

Supt. McKerrow—The state of Wisconsin has some special crops grown in different localities; for instance, tobacco. It is one of the greatest problems that the farmer has to cope with to keep up these special crops without growing them at a loss to the general fertility of his farm. I find that tobacco farmers in the best districts are now saying that tobacco has not been a Godsend to them, from the very fact that the fertility on the farm has all to be placed on the tobacco field and cropped out. One man said that the dairy has helped the tobacco but has not helped the rest of the farm, because he had formerly put all the fertility from his dairy herd on the tobacco field and sold it off, so his farm was no better off than if he had kept no dairy. We find the same thing true in the potato districts, in the cabbage districts, and it will be true of all these special crops. The farmers in these particular districts and the farmers in other parts of the state who are thinking of going into these special crops should stop and weigh the matter very carefully.

A Member—Is ha a special crop?

Supt. McKerrow—Yes, timothy hay

is a special crop that does not recompense the soil in any way, and if you sell it off there is so much fertility of the soil gone, the same as with the tobacco or the potato crop.

Mr. Michels—Won't we have to recognize this principle, that when crops are sold from the farm, to keep the farm from lowering its fertility an equal amount of fertility must be brought back to the farm?

Supt. McKerrow—Yes, it is like any other bank, if you are going to keep your bank account good, you must keep on depositing as well as drawing out, and so it is with fertilizers. If you buy back and put commercial fertilizers on the farm, you cannot buy humus, so I would say the better plan is to buy food stuff, which means more humus for the soil.

A Member—In your rotation would you follow grain after clover?

Supt. McKerrow—As a rule I prefer corn, potatoes, or crops of that kind. We are just starting in now to follow some of our clover with peas. That is getting onto the special crop side but if there is any special crop grown in Wisconsin that I would like to have on the farm it is this legume kind.

A Member—Why wouldn't sweet corn come in all right, better than ordinary crops, hay or potatoes?

Supt. McKerrow—Because in sweet corn you have a lot of stalks left; you only sell off the corn. They told us a little while ago that if we grew sugar beets we wouldn't sell anything off the farm, because the sugar beet was made up of sunlight and water, but that isn't exactly true in practice.

The Member—After raising corn, we have the stalk which goes back to the soil, but when we have got a grain crop we have the straw left, and I don't see the difference.

Supt. McKerrow—There isn't much difference, only, as I said, I would prefer to grow that, rather than to grow these special crops we were just talking about. You would have a larger per cent left in the stalk than in the small grain.

A Member—Couldn't you grow potatoes and use a five-year rotation?

Supt. McKerrow—Yes; do you use that? If so, give us your outline.

The Member—First, we put on small grain, then the next year we have clover hay, then pasture, then put manure on the pasture; the year before we get a second crop of hay when it is pasture, and then raise potatoes and then corn the next year.

Supt. McKerrow—That is a very good rotation. You get two cultivated crops.

Mr. Scott—Did you ever follow corn with potatoes rather than potatoes with corn?

The Member—We never have.

OUR OLD FRIEND, CLOVER.

L. E. Scott, Stanley, Wis.

"There are no friends like the old friends when you and I were young" is a sweet song, sung down through all the ages. Why, then, should we turn our backs upon an old friend who has served us long and faithfully; one who has grown our calves, our lambs and our colts, one who has done a large part in the production of our dairy products; one who has given our work horses strength; one who has renovated and to some extent fertilized our lands, simply because a younger and sprucer and more smartly dressed rival, with true western gusto, has crossed our threshold? The latter may be able to do more for us, but you will find him more particular and exacting. His ideas are peculiarly western, which do not in all particulars conform to Wisconsin conditions. He belongs to a union and will not work with Timothy and others, whom he regards as "scabs." If a foreigner is the least aggressive, he calls upon you to remove him, while the former would simply plant his heel a little more firmly into the soil and say, "I am here for the season, I can defend myself." Last, but not least, if your food is not prepared to suit his refined taste and your menu is not to his liking, he is at once grouchy and says, "We may as well part company."

In all seriousness, I have nothing to say of alfalfa except in its praise, where it can be successfully grown, and in those localities where the conditions are adapted to its growth I believe that farmers are acting wisely in growing it or experimenting with it where they have a reasonable hope of success, but there are large areas in the state where, owing to a close and compact subsoil, heavy rains which do not readily percolate through it, and to the persistence of weeds and native grasses, I do not believe that alfalfa will ever be successfully grown upon them. To these conditions I wish to especially address myself.

Clover grows as naturally and successfully upon these soils as does alfalfa in Nebraska and Kansas. Then why not grow the crop to which our soil and conditions are best adapted? No one would think of planting bananas in Alaska. Clover is a Wisconsin crop and let us make more of it.

Value as a Feed.

I copy the following percentage composition from "Feeds and Feeding" of the principal elements of nutrition in the four most common hays.

	Protein.	Nitrogen free extract or sugars and starches.	Ether extract o fat.
Red clover	12.4	33.8	4.5
Alsike	12.8	40.7	2.9
Alfalfa	14.3	42.7	2.2
Timothy	4.5	41.9	3.0

It will be seen that the red clover is not quite so rich as the alfalfa in protien or sugars or starches, but is richer in fat. We have also found from digestion experiments that the protein in alfalfa is somewhat more digestible than that in the clover, while the carbohydrates in the clover are more easily digested than those in the alfalfa, but as the protein is the most valuable element the advantage is with the alfalfa.

Compared with timothy, it has long been conceded that clover is far superior for the growing animal, the milch cow, the sheep, and, if well cured and discreetly fed, it is equally superior for the workhorse.

Timothy has been thought by some to be better for the fattening animal, but in a recent experiment made at the Purdue university in Indiana it was found that by feeding one batch of steers on timothy and another upon clover, the same grain being fed in each instance, that by figuring the grain at cost price the timothy hay was worth $12.56 per ton, while the clover was worth $18.36, or nearly fifty per cent more.

A Northern Wisconsin Hay Crop. Crop of mixed hay (mostly medium red clover) upon Fairmount Farm, Stanley, in 1909. Estimated yield three and one-half tons per acre.

Value as a Fertilizer.

As a soil renovator and possible fertilizer the clover is superior to the alfalfa even. The stubble and roots are richer in the elements of fertility and being grown in shorter rotation and more frequently turned under are more valuable for this purpose.

I wish to correct a false impression. Timothy is often called a "robber plant." It is only fair to "give the devil his due" and I will say that it is no more a robber than corn or oats, and no more a robber of phosphorous and potash and the elements of fertility, other than nitrogen, than is the clover and alfalfa. True, it feeds upon the nitrogen supplied by the latter crops, but the clover is not a complete fertilizer. When the soil is deficient in nitrogen it draws its supply from the air in the soil through the bacteria in the nodules upon its roots, not from the atmosphere above through its leaves as many suppose,

but when the soil is sufficiently rich in nitrogen it chooses to take that which is nearest at hand.

True, we always grow large crops after clover, but it is due largely to a better mechanical condition, the roots penetrating deeply into the subsoil aerate the same and give it a larger capacity for the storage of moisture, but clover cannot add phosphorous or potash to the soil unless we supply those elements from some other source, the soil cannot be kept up for all time by the use of clover, valuable as it is.

A professor from a neighboring state recently said that phosphorous cannot be supplied in sufficient quantities by farm manure and that under our present system of farming Wisconsin soils will in thirty years become too poor in phosphoric acid to grow clover. It is evident that the learned professor does not quite understand Wisconsin methods. There can be no question but where mill stuffs are purchased and fed in the quantities they are upon our best dairy and stock farms, and where the manure from same, together with that from the roughage, is carefully returned to the soil, that the supply of phosphoric acid and all other elements of plant food is being kept up and increased and will continue to be so just as long as this system is practiced.

A view of the same field forty-nine days later. Estimated yield of second crop one and one-half tons per acre.

Essentials in Securing a Stand of Clover.

Buy the best seed, clean and strong in germination. Sow early in spring, upon soil that is fertile and in fine tilth. You never see a poor crop of clover in a strawberry bed, unless it

is hoed out. What are the conditions? The patch intended for the strawberry bed has been heavily fertilized and brought up to a good state of tilth by the previous cultivated crop.

There is in every seed all the elements of plant food to nourish the young plant till it can draw its nourishment from the soil, when it is weaned. The potato can supply this food till the sprout is several feet in length, a kernel of corn till the shoot is several inches, a grain of wheat till the young plant is a couple of inches in length, but the little clover seed can only support a delicate little sprout a fraction of an inch from the germ from which it issued and it must then draw its sustenance from the soil or wither and die.

It will be seen then that the larger the seed the less necessary it is to have the ground finely prepared. The potato and even the corn, may be planted upon coarse and soddy ground; the wheat and other small grains need a better preparation and the clover and grass seeds still more finely prepared soil.

Then again, what makes it more difficult, the finer the seed, the nearer the surface it must be planted, so it is necessary to have the moisture come clear to the surface to insure a growth. A more ideal condition cannot be found than a clean potato or cornfield unplowed and the surface worked fine and the sowing done early.

We have always had a good stand upon rye and winter wheat sowed early in spring. Our experience in this has been upon heavy soil. I am told that upon sand it is necessary to harrow with a spike tooth smoothing harrow, or, what some claim is better, to put in lightly with a shoe drill. The latter is for sand only, as it would not do upon heavy soil.

Don't cut too closely to the ground when harvesting the grain and unless there is an exceptionally heavy growth don't clip it or pasture it in the fall and you will avoid winter killing.

Making Hay.

Cut in full bloom to make the best hay, or as soon after it as your help and the weather will permit.

We like to commence cutting late in the afternoon and finish what we want to handle the next day as soon as the heft of the dew is off in the morning. We rake about eleven o'clock and right after dinner we put it in fair sized cocks, putting one forkful on top of another, and leave it for two days and if the weather permits we then open it and a couple of hours of airing is usually sufficient to dry the most of the moisture, which by the sweating process is on the article, and the hay is much better than when cured in the sun.

The herdsman at the Helendale Farms, who was doing the feeding when Yeksa Sunbeam and other noted cows were in the test, told me that fully as good results were obtained from native clovers cured in this way as from alfalfa hay shipped in. The latter was probably sun-dried. Here is a hint for the fellow who is buying alfalfa meal ground up from sun-dried and often over-ripe alfalfa and paying from twenty to twenty-five dollars per ton for it, when he could get as good results from well cured clover of his own growing that probably would not cost him over eight dollars.

Let us grow more clover in short rotation and take more pains in curing it and I believe we will find it profitable.

DISCUSSION.

A Member—Do you get two crops of clover?

Mr. Scott—Yes, we cut two crops the same season.

Question—Do you approve of growing clover seed?

Mr. Scott—I am not against growing clover seed where it can be grown profitably. It has been found that after a crop of clover seed has been taken off there is more weight and more plant food, as well, in the stubble and roots than where the second crop was cut earlier for hay, and even more than where the field was pastured after the first crop was taken off. I do not mean to say that fertility can be kept up indefinitely if you continue to grow clover seed unless you put something back. The small amount of fertility removed in the seed can be replaced in a cheaper form.

Question—How dry is your hay when you cock it?

Mr. Scott—We cock our hay when it is pretty green. It is wilted but very little and raked up before dinner and cocked in the afternoon, and in that stage, if it is well put up, one forkful piled on another, it will stand well without a cap. However, hay caps are good.

Mr. Michels—Don't you think you had better commence cutting your hay a little before it is in full bloom, don't you think it will be in a better condition for cutting?

Mr. Scott—Yes, I would rather begin a little before full bloom than to have it overripe, but clover cut in the full bloom is at the best stage.

Mr. Scribner—Don't you prefer a little timothy in with the clover?

Mr. Scott—Yes, we do, it makes it a little easier curing. Then again, when the clover fails in spots, on account of grain lodging, the timothy comes up and we would rather have timothy than weeds. We like a proportion of four parts of red clover, one part alsike and two of timothy.

A Member—Do you use a hay tedder?

Mr. Scott—No, we do not; we have used them. There are times, if you happen to have a heavy rain, when the hay tedder is desirable but I think damage is often done by over tedding.

Mr. Imrie—We can't cut it at all in the morning after the dew is off without the tedder. We just get it cut and go over it with the tedder and shake it up and dry the dew off. It keeps the mower going pretty lively, and if we had to wait until it was all dry we would have to wait a long time.

Mr. Linse—Isn't it necessary when you have a heavy crop that you have to use it?

Mr. Scott—No, sir I don't think so.

Mr. Imrie—I want to use the hay tedder myself.

Mr. Hill—I wouldn't want to make clover hay without tedder.

Mr. Scott—Let us consider for a moment how clover is cured. It dries through the leaf, does it not? Now, if you ted up the clover and dry it in the sun until the leaf is dry then no farther drying is possible, at any rate it is very difficult to dry the stem. The moisture that is in the stem goes out through the leaf, the leaves are really the lungs and throw out moisture. You take any green plant, say the corn plant, and when the blades are killed by the frost there is no farther drying of the stalk. The stalk will stand till it freezes up, just as full of sap as it ever was. You have seen the army worms work in a grain field, they will drop off the blades and the green straw will stand there for weeks like rushes. Now, if you cock up the clover before the leaves have ceased to perform their function, you will find upon opening the pile forty-eight hours after that the moisture is right on the outside. Just a little air at that time will dry off the moisture and your hay will be in the very pink of condition. I do not dispute the fact that if there are large crops and shortage of help it is difficult to do it in this way, but the best quality of hay is made by this method.

Mr. Imrie—We commence cutting in

the morning, we cut it before noon. If we have a very heavy crop of hay, it becomes packed down and it won't be dry at noon even, without we simply run over that and loosen it up. It isn't dry, it is just wilted a little, and we put it in the cock. If we didn't do that, we couldn't commence cutting until nearly noon and then we would have to wait until the next day to get it in in our latitude.

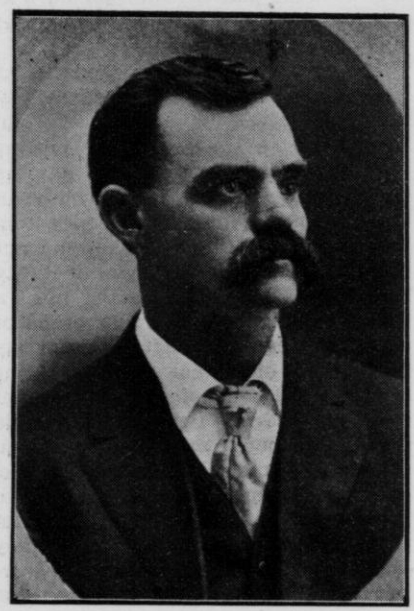
Mr. Scott—I think I make hay in about your latitude. When you rake it about eleven o'clock, don't you turn it over bottm upward?

Mr. Imrie—It does part way.

Mr. Scott—I have used tedders and hay loaders and there are times when the former may be used to advantage. It is the abuse of it that I object to and I fully believe that if tedders and loaders were used less in the curing of our clover that the amount of our dairy products would be increased.

CLOVER SILAGE.

W. P. Bussey, Omro, Wis.



Mr. Bussey.

The subject of silos and silage has been presented to us for years by our best practical dairymen at our Farmers' Institutes, Experimental Associations and Farmers' Short Course and through the agricultural and farm papers and farmers who have attended any of these meetings or have read many of the articles written on this subject have been forced to admit that the advocates of the silo have the best of the argument.

It has been my privilege to attend the Experimental Association meetings and part of the Farmers' Short Course for the past three years and while attending the meeting of 1908 I spent part of one forenoon with Professor Ocock finding out all I could regarding silo construction. Soon after returning home I contracted for two small stave silos, which were placed inside our barn, using part of the space that had formerly been used for a hay mow.

That part of our farm which is used for a pasture is rather low and in ordinary seasons gives us good feed, but such seasons as we have had for the past three or four years it has been too wet during the earlier part of the season. This had a good deal to do with our trying the experiment of clover silage for summer feed. The

past season gave us an enormous growth of clover, which stood up fairly well. As this was all new to us and not being able to find out from anybody that had ever tried to handle clover in this way, we waited until we thought it had reached the right condition to begin cutting for hay, that is when the first blossoms began to change to brown. We began cutting June 22nd in the morning while the dew was on, beginning at once to load onto the wagons, three or four men pitching it on with large barley forks. It was not necessary for a person to be on the load, for it unloaded much better when not tramped. This was drawn to the silage cutter and cut one inch long. It was well spread and tramped in the silo. During the forenoon we put eleven loads into the silo. This was about one-half the amount that had been mowed. At noon we had a very heavy rain which lasted about one hour. As soon as the rain was over, we commenced drawing the wet clover. Of course a considerable part of the water dripped out during the pitching onto the load and from the load to the cutter, but for all that the clover that was put in the silo in the afternoon was wetter than that which was put in in the forenoon. I am satisfied that this extra amount of water in the clover was one of the reasons that helped to make this trial so satisfactory.

The last load run through the cutter was one-fourth of an inch long. This being wet and by being thoroughly tramped left the surface quite hard and firm.

The following day I scattered some barley over the surface and for several days sprinkled it with water. In a few days we had a growth that seemed to exclude the air.

Some Results of the Experiment.

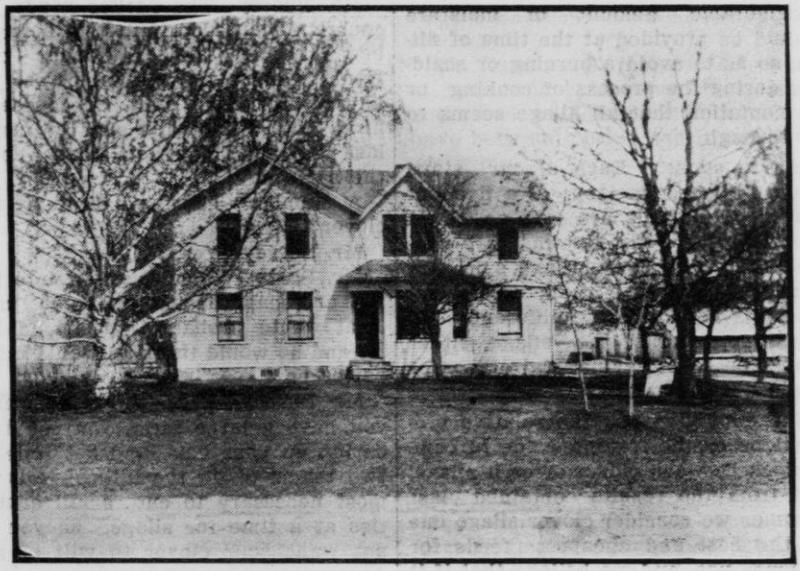
On the 27th of July we took about a load off the top. This took all the green barley, the root growth and a thin layer underneath which seemed to me to smell pretty strong. At this time our pastures were getting dry and the feed short. We had been feeding new clover hay for two or three weeks at milking time. We were so busy haying, harvesting and cultivating corn that it did not seem as if we could stop to uncover it, and right here I want to say, that, from the appearance of the top and the smell that came from it, and hearing the comments of people who had heard about the trial, I was not quite as anxious to open it as you might suppose. There seemed to be a feeling of pity, as well as curiosity concerning the results. Several different ones "kindly" offered to help pitch it out and draw it out on the land, for they thought that if it did not burn itself and set fire to the barn it might make pretty good fertilizer.

The first two or three feeds that were given the cows seemed to justify my friends' opinions. We put some bran on the feed after putting it in the mangers. The cows ate the bran readily, but ate the clover sparingly. This seemed to be a new item on their bill of fare and they did not seem to know what to make of it. My hired man said, "They acted like a fellow getting used to a new brand of chewing tobacco." After five or six feedings all of the cows were eating it. We fed a heaping bushel basket full to each cow twice a day. Some would eat more and it was given them. No bran was fed after the second day. Our cows soon began to increase their flow of milk and lost that dissatisfied look that they seemed to have had when they were brought up at milking time. As the pastures became poorer and the flies more numerous, the young heifers and some of the cows that were soon to freshen got into the habit of going into the stable at milking time and they were given feed regularly.

Now as to results. The flow of milk was soon increased considerably, the cows were contented and very soon their appearance had changed so that several asked me how much and what kind of grain are you feeding your cows, and when told that all they were getting was the clover silage seemed hardly to believe me.

feeding corn silage better results have been obtained on account of the cows being in such good condition.

I am satisfied that we made two mistakes. One was in not putting in more clover and the other in not beginning to feed sooner, for if we had began feeding silage two or three weeks sooner instead of dry clover hay we



Farm home of W. P. Bussey, Omro, Wis.

The twenty-one loads of clover put into the silo were taken from three acres. We fed twelve of the cows all of the time and eighteen head part of the time for eight weeks. At the time of filling silos with corn (September 18) all of the clover had not been fed out. There must be two or three tons in the bottom now (March 16).

During the time of feeding the clover silage, some of our cows freshened. They were in fine condition and commenced milking in good shape and I think that since we have been

could have increased the amount of milk instead of the decrease which was noticeable at that time.

Some of my neighbors thought that the clover silage fed to cows while they were running in the pasture would physic them and be injurious, but such was not the case as not one of the cows was so affected.

Our bull was kept in the barn all of the time and received two feeds of silage a day with what dry hay he would eat at noon. He kept in fine condition and at no time did he show a too laxative condition.

There are one or two conditions present in clover that are not so noticeable in corn for silage purposes.

First: The stalk or stem of clover being hollow, more tramping seems necessary to exclude the air.

Second: The average temperature at the time of putting in clover silage being about thirty degrees higher that at the time of putting in corn, a considerable amount of moisture should be provided at the time of filling so as to avoid a burning or scalding during the process of cooking or fermentation that all silage seems to go through.

As to silos: Each of our stave silos is placed on top of a five-foot wall. The walls are laid up in cement mortar, the bottoms are concrete and both bottoms and sides are plastered with two coats of cement. There is no noticeable difference in the appearance of the silage, either clover or corn, against the staves or against the cement.

I cannot give you the relative proportions or the feeding value in comparison between clover or corn silage, but from the results obtained last summer we consider clover silage one of the best and cheapest feeds for summer use, and we believe that if it can be arranged so that we can have some of the clover silage during the winter, we will have a feed that the cows will relish and a pretty well balanced ration at a moderate cost.

I do not suppose that the conditions that were present when we put in our clover silage last summer may ever happen again, so we will try and arrange to have a tank or barrel elevated high enough so that a small stream of water can be run into the blower and the necessary moisture provided, for we believe that more moisture than is contained in the clover itself is needed to insure it against loss by molding or over-heating.

DISCUSSION.

Mr. Imrie—How deep was that silage in your silo?

Mr. Bussey—About sixteen feet after it had done settling. We had about twenty feet to start with.

Mr. Imrie—You stated you put that in when some of the heads commenced to turn brown.

Mr. Bussey—The earlier heads. Of course, I wanted to put it in before I began haying and I thought that would stand a day or two before the hay would come in. Of course I hired both the engine and the cutter last year and I got them when I could the same day.

A Member—This was medium red clover?

Mr. Bussey—Yes.

Mr. Scott—Why not put it into the silo and make hay at the same time? That would probably suit friend Imrie and he would think he would make better hay.

Mr. Bussey—That might do where you have a large farm, you could be curing up your hay and get one or two teams to do the filling—it is almost necessary to cut small quantities at a time for silage, as you do not want your clover to wilt or get dry.

A Member—Don't you find that clover is stronger smelling than corn ensilage, as a rule?

Mr. Bussey—My neighbors thought so.

The Member—I have noticed that all protein silage carries a little stronger odor than corn silage.

Mr. Bussey—There was a little stronger odor, though it was not disagreeable.

Mr. Scott—I have had three years' experience with second crop clover mixed with corn, one load of clover and one load of corn and then a load of clover. We have been feeding it this winter and I notice that the cows

pick out the clover in preference to the corn.

Mr. Martiny—Do you add any extra moisture?

Mr. Scott—No, but the corn stalks are juicy.

Mr. Michels—Do you find that the cows prefer this to bright hay?

Mr. Bussey—They were running in the pasture and what they got was pretty near devoid of any other moisture.

Mr. Michels—Do you feed mornings or evenings, or both?

Mr. Bussey—Both, at milking time.

Mr. Imrie—At feeding time you didn't try mixing corn silage with this?

Mr. Bussey—When we cut our corn silage we had this covered up, it was in the bottom of our pit. In the course of two or three weeks we will have this out again.

A Member—Will you have any corn silage left at that time to feed with it?

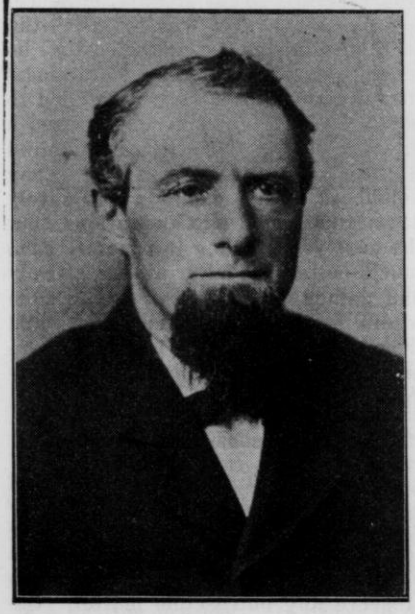
Mr. Bussey—We can't very well unless we try to cover it some way.

Mr. Martiny—Did you notice that the clover silage flavored the milk in any way?

Mr. Bussey—We did not. Of course at that time everything was open, doors and windows, and it would not have been noticeable had it been ever so strong.

TWENTY-EIGHT YEARS SILO EXPERIENCE.

Hon. Chas. Linse, La Crosse, Wis.



Hon. Chas. Linse.

Twenty-eight years ago the silo was a thing almost entirely unknown to the average farmer. The first trace I found of the silo and of ensilage was thirty-four or thirty-five years ago. In one of my farm papers, or a farm edition of some paper, the statement was made that a Frenchman had found a new way of preserving green crops by putting them into an air-tight receptable where they would keep unchanged.

This was very interesting news to me, more so than the discovery of a new gold field in Africa or Australia would have been. It set me to thinking what it would mean to a dairyman to be able to feed his cows summer rations in the winter. Well, I kept a sharp lookout for anything relative to the matter and soon learned more about it and got familiar with the words silo and ensilage. I also learned that they had built a silo at our Experiment Station at Madison and were experimenting with the new

feed, so I started for Madison to learn what they knew about the silo.

I found the silo all right but what they knew about it was very little. At least the contents of the silo were not very inviting, not enough so to induce a fellow to build a silo at once. The silage had an offensive smell and all kinds of colors, ranging from a dark blue to a greenish purple.

Professor Henry then informed me that a Chicago doctor settled on a farm near Oconomowoc had built a silo and was feeding silage, so I went to call on the doctor. He was a splendid old gentleman and very glad to meet me and give me all the information he had on ensilage, as we called it in those days. He was full of enthusiasm about the new feed, more so than I.

The silage looked a good deal better than that at Madison, but it was as full of acid and smelled as sour as the best vinegar pickle. Notwithstanding the unfavorable impression I had gotten from the silage I had seen so far I made up my mind to build a silo any way, or really four silos in one.

The silos I built were square, as we had not gotten the idea of the round silo in those days. They were built of solid rock and cement. At the first filling I followed the instructions and rules laid down by my Frenchman, namely, to cut the corn in as green and succulent a condition as possible and do the filling as quickly as possible, so in order to observe these two fundamental rules I cut the corn when fairly in tassel and setting ears, and hired a whole threshing crew to do the filling.

We filled two of the silos in about two days and a half. This ended the filling, as the corn intended for the silo was gone. This was the first object lesson to me, to learn the capacity of a silo. To complete the job, we covered the silage with a double layer of boards and planks and finally put about one and one-half cord of rock on top of each silo for weight, all according to the instructions given by my Frenchman.

Results of This Experiment.

And now for the results. When I opened one of my silos, about the first of December, I found to my surprise the silage as green as grass, even the very top below the cover, not a blade discolored, but otherwise it was in the same condition as that of my friend, the Doctor, that is, it was as sour as a vinegar pickle. When I started feeding it, the cows refused to eat it, but when I told my good Bossies, "You must, I don't want you to make me the laughing stock of the whole neighborhood," they began to think more favorable of the matter and ate the stuff pretty well, and they did very well on it. But this change in the attitude of my cows toward the new feed was certainly not due to the quality of the silage. At that time I was careful not to let out the secret to anybody, but I will to you—the fact is, I mixed the silage with so much corn meal, bran and oil meal that the good cows were compelled to eat it. Well, if I had not invested a lot of money in those silos and feared lest I should be laughed at by my neighbors, these results would surely have ended my silo operations, but the next year's filling fortunately gave much better results, as we already had gained a gleam of knowledge where we had made mistakes and from year to year we learned more and more how to improve on the silage.

The Principle of Silage Making.

To accomplish good results in doing a thing, we must understand the nature of the thing. Silage has often been compared with canned fruit. This is hardly a correct comparison. To preserve any putrescible matter, the oxygen, the promoter of all fermen-

tation and decomposition, has to be driven out. In preserving fruit, the oxygen is driven out of the can by artificial heat, by settirg the can in boiling water. If it is then sealed airtight, so as to exclude the oxygen, its contents will remain unchanged. They will stay sweet, as we term it. Not so with the silage. Sweet silage is a misleading term, as there is no sweet silage in this sense of the word.

Now the method preserving fruit cannot be followed in making silage. Another element must help us drive out the oxygen and this is carbonic acid, a gas much heavier than the oxygen and therefore capable of forcing out the lighter gas. So in order to have so-called sweet silage, we must promote the formation of carbonic acid. Carbonic acid in silage can be formed only through heat; it is a heating process. In order to develop the proper heat, the corn must be in the proper condition, namely, not too dry, nor too wet. We know that a pile of straw, for example, when thoroughly saturated with water, will not heat at all. Immature corn, containing an excess of moisture, will not heat sufficiently. It is not the immature corn itself that produces the sour silage. The excessive moisture in the corn slows up the heating process, thus retarding the formation of carbonic acid gas and the result is sour silage. Let a part of the moisture in the corn escape and your immature corn will make just as sweet silage as the more mature corn.

In Bulletin of Farm Institute you wi'l find that a gentleman recommends not to build too deep a silo, as he found that the silage in the lower part of the silo was always more acid (sour.) This is certainly not due to

Farm home of Hon. Chas. Linse, La Crosse, Wis.

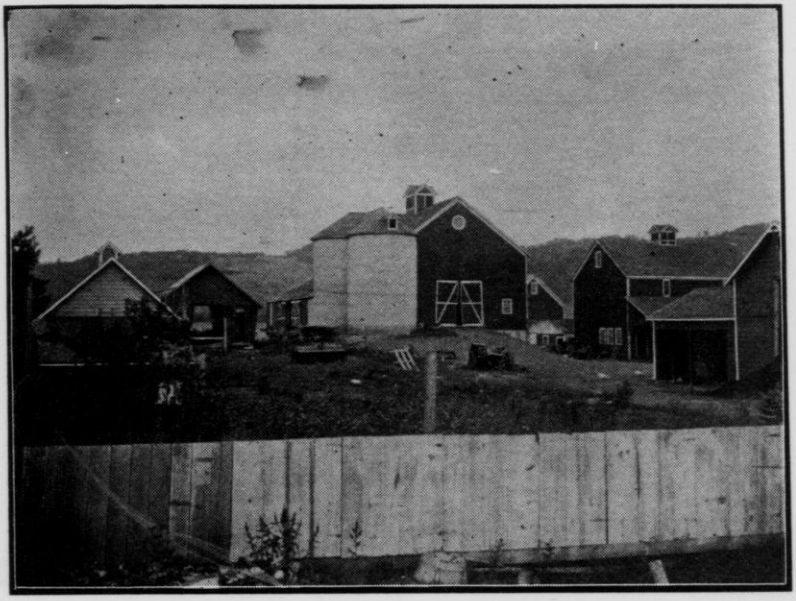
the depth of the silo, but to the condition of the corn at the time of filling. When we start filling, the corn, in most cases, is still rather green and if we fill rapidly, the silage has no chance to heat up sufficiently and the result is sour silage. My silos are forty feet in depth, but the ten feet of silage at the bottom are just as sweet as the ten feet on top.

The depth of a silo bears no relation to the quality of the silage. It is merely a matter of economy to have a deep silo, and it is advisable for various other reasons. However the argument that a deep silo is desirable because of the great pressure necessary to preserve the silage, does not appeal to me. It is hard to understand why the upper twenty feet of silage in a forty-foot silo should have more pressure than the upper twenty feet in a twenty-five-foot silo. And we certainly must preserve it all, the upper twenty feet as well as the lower.

Proper Filling of Silo of Greatest Importance.

The proper filling of the silo is of the greatest importance. It is altogether wrong, as has been recommended, to have a big outfit go from farm to farm and to fill a silo in a day or two. Fillin by such a method will not give the silage sufficient time to heat, and, therefore, will not develop carbonic acid enough to overcome the oxygen, and the result will be, at least in the lower part of the silo, sour silage.

The fast filling will also cause an uneven settling, which will result in more or less loss by mold and rot next to the walls of the silo. Another



Dairy barn, silos and outbuildings on the farm of Chas. Linse, La Crosse, Wis.

disadvantage of such fast filling is the loss of nearly one-third of the capacity of the silo, because it will only be two-thirds full after its thorough settling. I would therefore recommend that every owner of a silo have his own outfit for filling.

To fill a silo thirty-five to forty feet in depth and sixteen feet in diameter should occupy at least from ten to twelve days' time. It is therefore not necessary to have a large outfit. A four-horse power gasoline engine and a sixteen-inch cutter will answer the purpose. A gasoline engine of about that size ought to be on every farm. In our days, it is almost as necessary as a reaper and a mower.

Planting the Corn for the Silo.

The dimensions I have given, depth thirty-five to forty feet, diameter sixteen feet, make, in my opinion, the most convenient silo for the average farmer keeping from thirty to thirty-five head of stock. It has been recommended to plant twice as much seed in planting corn for the silo as when planting for ordinary field corn. This should not by any means be an absolute rule, but must be subject to great modification. If the land is composed of a heavy clay loam well manured, and if there is plenty of moisture during the season, then this heavy planting may prove profitable, but where, on the other hand, the soil is of a light sandy nature, and especially if the season should lack moisture, then this kind of planting would prove most detrimental. I have very seldom in my experience found a very heavy planting profitable, even for the silo. You will find in most cases that a hill of corn containing four stalks will outweigh a hill with six stalks in it, not taking into consideration the fact that, pound for pound, the percentage of nutrition is higher in the thinner planting.

We must, of course, aim to raise a big crop of stalks, as well as of corn, and should, therefore, plant the largest kind of corn which will with any certainty mature in the respective locality. I have often, with good results, planted an acre or two of a large, later variety for topping off the silo. For a final cover on the silage I have found nothing better than a load of green second growth clover run through the feed cutter and moistened down with a number of barrels of water.

We have the silo now filled and I hope that in the near future not a farmer in our state of Wisconsin will be without a silo. Corn is king and the silo is king, for there is no better way to preserve this great plant; no other method of treatment that will preserve to our stock the full food value of the corn, as does the silo.

DISCUSSION.

A Member—How many acres of good corn will it take to fill such a silo as you have described, thirty-five by sixteen feet?

Mr. Linse—Good corn and good corn is quite different, it is almost like asking a tailor how many yards it will take for a suit of clothes for a man. I have always had lots of manure and grown big corn. I filled two silos last year sixteen feet in diameter and forty feet deep. I put in about forty acres of corn, good, heavy corn, in the two.

Mr. Imrie—Didn't it take more acres last year than ever before?

Mr. Linse—Oh, yes it did. I suppose about thirty-five acres of the size corn I had the year before would fill them.

Mr. Michels—How many head of cattle can you maintain with a silo of ensilage such as you have described, together with such other feed as you feed with it?

Mr. Linse—That is a pretty hard question for me to answer. I have these two silos and I have about eighty head of cattle, of which sixty

are milk cows, and milk cows consume lots of feed, as you know. We feed three meals a day, of which one meal consists of hay, and also enough concentrated feed stuffs are fed to keep up as big a milk flow as possible, but nevertheless, the silage gives out altogether too soon.

A Member—Will it hurt a cow to give her all she wants?

Mr. Linse—No, not at all.

Supt. McKerrow—How many months in the year do you feed?

Mr. Linse—I start feeding when I start cutting the corn for the silage and it generally lasts from the first to the middle of June, making it in all pretty near ten months in the year.

Mr. Scribner—Do you find that ensilage will keep as well in a stone as in a wooden silo?

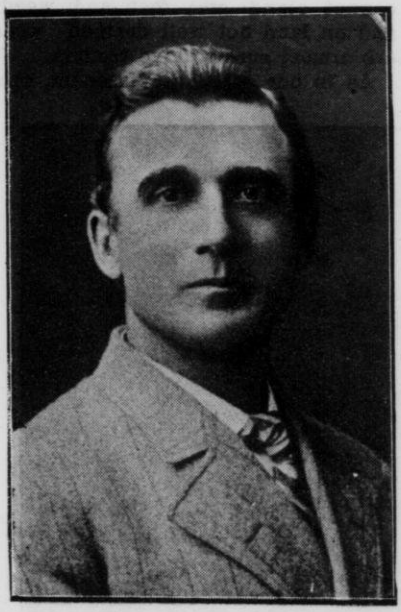
Mr. Linse—I only had the stone silo from the beginning. One time years ago, a very prominent dairyman, Hiram Smith, said at a Farmers' Institute that a partition in the silo is as much necessary as a partition in a meat barrel, and certainly a partition in a meat barrel is not necessary. On the other hand, he thought that ensilage would keep better against wood than against stone. I was always a great fellow to experiment; I had talked to a professor at the Experiment Station, so I went to work on his recommendation and tore out the partition wall and made the two silos into one. I put studdings against the walls and double boards with tar paper between were nailed to the studdings, so I had practically a wooden silo inside the stone silo. I filled it two years without noticing any difference in the quality of the silage, but the third year I had quite a lot of spoiled silage in places, as the lining had already become defective, and the next spring it was thrown out and the original old silo with the partition wall was restored. This was quite an expensive experiment for me, but fortunately lumber was cheap in those days. To gain the same knowledge today would cost about four times as much. Those are my first silos that I built twenty-eight years ago on the old farm. About ten years ago I started a new plant and built five modern round silos, forty feet in depth, out of solid rock and cement.

Mr. Scribner—You wouldn't have built another rock silo unless you thought they were a success, would you?

Mr. Linse—Certainly not.

ALFALFA.

Fred Stubley, Black Earth, Wis.



Mr. Stubley.

The rapid increase in the cost of our concentrated feeds, and especially is this true of feeds rich in protein, with these facts before us, it is no wonder that farmers of Wisconsin are turning their attention to studying the conditions and growing of alfalfa to meet their wants as a protein feed, as it shows the same analysis as wheat bran.

The original home of the alfalfa appears to be in the southwestern part of central Asia and from there has been carried to practically every part of the world. It is now one of the staple forage crops of every continent of the old world and easily takes front rank as the most important leguminous forage crop.

The name of alfalfa is of Arabic origin and means the "best fodder." In the southern part of Europe it is known as lucern. It was formerly applied to the plant of the United States, but this name has given way to alfalfa. It was introduced into California in 1864 and has been gradually extended eastward and the chances of its success increase as the special requirements for its production are understood and provided for.

Description of Alfalfa.

It may be briefly described as being a deep-rooted, long-lived forage plant, belonging to the botanical family of leguminous or pod bearing plants. Its flowers are violet, clover shaped and borne in compact, oblong clusters. One of the most important characteristics of alfalfa is its long tap root, often extending fifteen or twenty feet into the soil, this making it a most valuable forage plant to withstand drought, which would be fatal to a shallow forage plant.

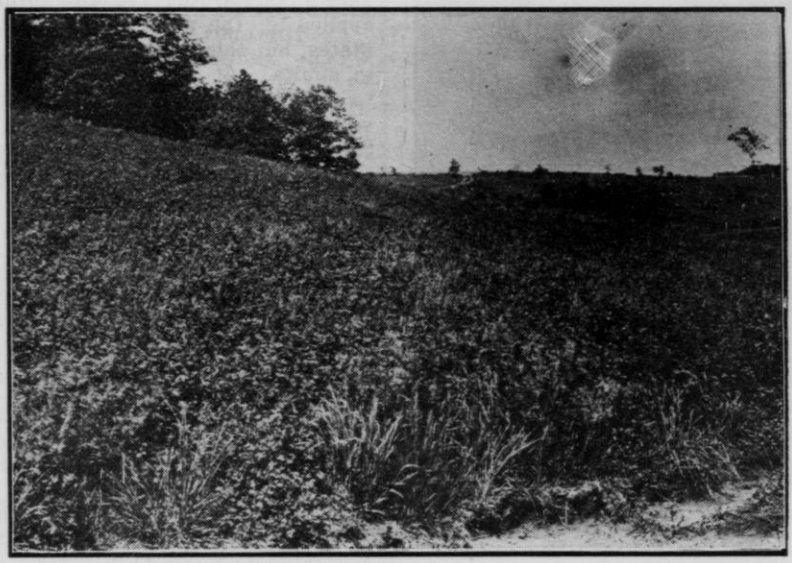
Adaptability of Alfalfa.

The wide distribution of alfalfa indicates a remarkable adaptability to various climates and conditions. As far as climate is concerned, alfalfa can be grown in every state of the union. It is, however, very exacting as to soil treatment. Although the adaptability of alfalfa is great, yet in areas not perfectly suited to its production, care is necessary to provide the very favorable conditions required by young plants in order to overcome the natural drawbacks.

A deep, fertile, well drained soil, rich in lime, and reasonably free from weeds, is necessary. The lack of any one of these essentials is very apt to be the cause of a failure.

Where Alfalfa is Best Produced.

A deep soil should be chosen if possible, as alfalfa is naturally a deep feeding plant that sends its roots down many feet to obtain plant food materials and moisture, although in some limestone sections it is successfully grown where the soil is but eighteen inches deep and underlaid with limestone.



Alfalfa field of 11 acres on farm of Fred Stubley, Black Earth, Wis., before cutting June 14th.

Fertile Soil for Alfalfa.

Alfalfa, through the nodules forming bacteria within its roots, adds nitrates to the soil and in this way increases its fertility to that extent, but the large yields we obtain draw heavily on the other elements of the soil, so it is necessary that the richest and best drained soil our farms contain should be selected.

There is risk in selecting bottom land, as there are two things alfalfa cannot stand—wet feet and weeds; and on land not well drained weeds are almost sure to give trouble.

As to our soils in Wisconsin, alfalfa can be grown on any kind of soil that will produce corn, and in many places where corn will not grow. The ideal place to seed alfalfa would be after a cultivated crop of some kind, as it not only puts the land in the very best condition, but it also destroys a large number of weeds.

Well Limed Soil Essential to Alfalfa.

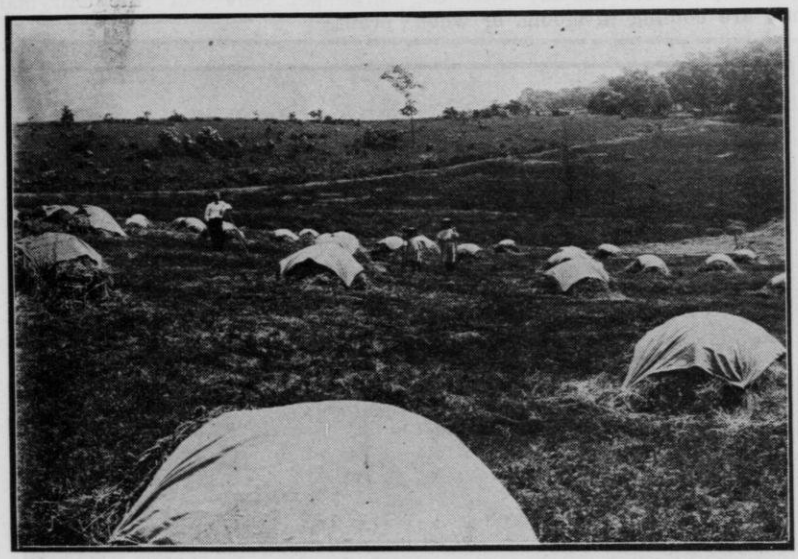
No other forage crop requires so much lime in the soil as does alfalfa. It is apparently necessary that the soil acidity be neutralized by the lime.

An analysis was made of the mineral contents of certain crops and it was found that the percentage of lime in the alfalfa ash was forty per cent, red clover twenty-one per cent, and timothy five per cent. Throughout Wisconsin alfalfa can be easily produced on our limestone soils.

a thin seeding of grain, such as oats or barley, would be good for protection and clipped when the alfalfa has a good start.

Method Best for Seeding.

Plow the ground intended for alfalfa seeding early in the spring, giving



First cutting, June 16th.

Preparing the Seed Bed.

The tender nature of the young alfalfa plants requires that the soil be in excellent tilth at planting time. The seed bed should be fine on top but thoroughly settled. As a rule, about six weeks are required for plowed land to settle enough for alfalfa seeding. It is important that the preparation be uniformly good, as the poorly prepared soils are apt to fail. It may be difficult to establish alfalfa on soils that are so sandy they drift. When bare the young plants are apt to be cut off by drifting unless protected; on this kind of a soil thorough cultivation until the last half of May or first of June, destroying all weed growth and giving a fine seed bed, then sowing fifteen to twenty pounds to the acre, without a nurse crop. Without a nurse crop will give the best results, as using a nurse crop we are apt to injure the growth of our alfalfa crop.

Inoculation of Soil.

Throughout the limestone districts and sections in Wisconsin, where sweet clover is found, it does not seem necessary to inoculate the soil, as there is present the bacteria for the

formation of the root tubercles. Where inoculation is necessary, it can be done by soil transfer from an old alfalfa field or sweet clover patch.

Treatment of Crops.

Ordinarily no treatment is necessary, except to cut the hay when the plants are coming in bloom, or when the new crowns have started. Remove the hay from the field as soon as possible, in order to allow the new growth to commence uniformly over the field. Cutting just as the field shows bloom usually gives satisfactory results; if left until the basal shoots get too long we injure the following growth by clipping off the young plants.

In conclusion I would urge every farmer in Wisconsin to sow a few acres of alfalfa and study the requirements and conditions of the plant, as I predict that in twenty years Wisconsin will be one of the leading states in the production of alfalfa, as well as she leads now in dairying and the production of common June clover. She is bound to forge to the front in supplying feed stuffs to take the place of our concentrated commercial feed, which is advancing rapidly in price and takes a large per cent of the dairyman's profit.

Second Cutting, July 24th.

DISCUSSION.

Mr. Scott—Does the gentleman mean to say that alfalfa can be successfully grown upon any Wisconsin soil that will successfully grow corn?

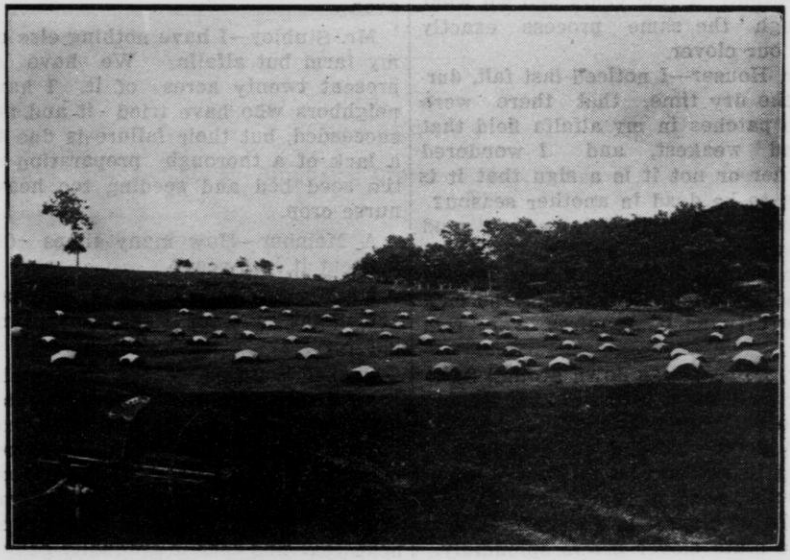
Mr. Stubley—I think it is safe to predict that, after we get our soil thoroughly inoculated—it will take some cultivation first.

Chairman Stiles—There are some soils that are comparatively well calculated to grow alfalfa; some others are too low.

Mr. Stubley—Yes, I said it could not be grown on wet land.

Mr. Scott—It remains to be seen what will be done in the future, but I believe there are a good many acres in Wisconsin that are now growing good crops of corn that will never grow alfalfa successfully.

Mr. Linse—These uplands near us that we thought would grow good corn won't grow alfalfa. Some of it. I have raised about three acres, or tried to, and last year was the first year that I got it, but then it was very successful. I don't know how it will stand our winters It stood the first winter best where I sowed it without any nurse crop. I clipped it about eight or ten inches high and let it stand through the winter, and last



Third cutting, September 13th.

the farmers there have tried very hard to grow it, but they can't make it grow, because about three feet underneath there is a sort of heavy clay and the moisture will settle there and kill out the roots.

Mr. Stubley—We are raising it on clay land and our clay is about eighteen feet deep. It grows very successfully on that soil.

Chairman Stiles—How many farmers here have tried to grow alfalfa?

Mr. Houser—I have noticed none, except my own. I have known of several attempts being made here which have proven failures, but I think there has always been some cause for year it came on nicely. It was a beautiful crop and makes fine hay.

Mr. Hill—What time of the year did you sow it?

Mr. Houser—About the first of June. I suppose I violated all rules in the preparation of this soil and the sowing of this crop. I sowed it on the sod. That is, I broke it up the previous fall, a clover or mixed grass sod, old established sod. I had pastured it for years and years and it was very rich, and I manured it in addition to that. But in the spring I worked it thoroughly, time after time, time after time, until it was perfectly pulverized and was in good condition by the

first of June. I sowed my seed, there was plenty of rain after that and the seed came out nice and strong and it made a good catch.

Chairman Stiles—How much seed would you sow to the acre?

Mr. Stubley—Fifteen to twenty pounds. I don't think our failures are due to anything else but lack of bacteria. We have got to have that at present. A few years ago we went through the same process exactly with our clover.

Mr. Houser—I noticed last fall, during the dry time, that there were some patches in my alfalfa field that looked weakest, and I wondered whether or not it is a sign that it is going to be dead in another season?

Chairman Stiles—It is not a good sign where it turns yellow.

Mr. Stubley—No, it is not; it may be lack of bacteria, or it may be lack of fertility, as it requires very rich soil.

Mr. Hill—It was down around Syracuse, New York, they had that trouble in the very dry season.

Mr. Scott—I think the speaker is wrong in saying that all that Wisconsin soils need is bacteria for the growth of clover. In the greater part of the state clover grows splendidly.

Mr. Stubley—I did not say it lacked it now, but that it has lacked.

Mr. Scott—We have a million acres of new land in the north that never has had clover on it, and you are almost sure of a crop of clover on it.

Mr. Linse—I think it is a fact though that we are not as sure of a crop of clover as we were when we first settled this country.

Mr. Scott—No, I don't think so, upon my farms where a proper system of rotation has been adopted and the clover has been returned to the soil and good tillage is given to the land, I think we can grow as good crops as ever.

Mr. Stubley—I have nothing else on my farm but alfalfa. We have at present twenty acres of it. I have neighbors who have tried it and not succeeded, but their failure is due to a lack of a thorough preparation of the seed bed and seeding too heavy nurse crop.

A Member—How many times did you cut it last year?

Mr. Stubley—We cut it three times and might have cut it the fourth time but for fear of winter killing.

Chairman Stiles—Those of you who have grown alfalfa and clover know that it needs a different kind of bacteria to grow alfalfa than to grow clover, but it seems as though those who sow alfalfa on a piece of land and then plow it up and sow it the next year find that it gradually comes into the land. Some people carry out the practice of sowing alfalfa seed with their clover seed so as to get it started.

Recess to 1:30 p. m.

AFTERNOON SESSION.

The convention met at 1:30 in the afternoon.

The following committee on resolutions was named by Superintendent McKerrow: Chas. L. Hill, Rosendale; A. W. Hopkins, Madison; James Dillon, Mondovi.

David Imrie called to the chair.

In the absence of Mr. C. L. Richardson, of Chippewa Falls, the subject of "Strawberries" was taken up by Mr. D. E. Bingham, of Sturgeon Bay.

STRAWBERRIES.

D. E. Bingham, Sturgeon Bay, Wis.

Mr. Bingham.

What few words I shall say will perhaps bring out the important points in the discussion.

The growing of the strawberry is important on the farm because it is one of the earliest fruits and it is one of the best fruits that can be grown, coming in at a time of the year when it will supply the place that nothing else will supply on the table, and we, as farmers, ought to have the best we can grow upon the farm, and a liberal supply of strawberries every year, a good, liberal planting every year, will do much toward making farm life more pleasant, more congenial, and give us something that is valuable on the table for three or four weeks.

Preparation of the Soil.

Now, it is necessary in order to make a success of growing strawberries to have the soil well drained. The strawberry can be grown on almost any soil in Wisconsin, any farm that will grow wheat, oats, corn and potatoes, or any of the farm crops, will grow strawberries. I say it is necessary to get the land well drained, that is, with reference to air drainage, as well as surface drainage, in order to be sure of being freer from spring frosts and escape failures in the crop. It is necessary to get the soil in a good condition before planting. The strawberry is a plant that can be made to produce anything from one

hundred to one thousand dollars' worth of fruit per acre, according to the kind of work you put on it. If you choose a good, rich soil, say plowing under a crop of clover, then heavily fertilizing with well composted manure and giving it careful cultivation through the entire season, you will have your ground in a condition to produce almost any amount of fruit.

Selecting the Plants.

In order to get the best results, it is necessary to understand something about the growth of the strawberry. Planting early in the spring, the selection of good, strong plants is very material, plants that were well grown, not merely plants from the edge of the row, but well grown plants with a good root system, and you must get these plants on the farm in good condition, so that you get a good stand. From that first planting every plant should live. If they are shipped from a distant nursery, they should come packed in a box in layers rather than tied in bundles. We find a good deal of failure is due to the nursery taking the plants, putting them in bunches, tying twine around them and wrapping those bunches together, and in a few hours they will dry and nearly all will be injured. If they are packed in a box with a good deal of damp moss, they will be in good condition when you get them.

You want your soil ready when the plants arrive. You don't want them to lie around before planting. The ground should be in good, thorough preparation and the fertilizing should be looked to before the plants are planted.

Setting Out the Plants.

The best method of planting the strawberry is to make a good opening so that the roots will get down into the soil straight, and then the dry weather will not affect the plant nearly as much as where they are spread along near the surface of the ground.

Cultivation.

The cultivation should begin immediately after planting and be kept up often. The cultivator should be run close to the row, and then as the runners begin to form, about the first of July, the cultivator should be kept close to the plant, so as to keep the runners close to the row rather than spreading out.

In growing the strawberry, it is well to do all the work possible with horse power if we are looking for the best results.

If any great amount of time elapses between cultivations, the plant will set six or eight inches on the outside and it is necessary in order to get a matted row, the right distance apart, to keep up the cultivation, or else you will find there will be space left where the plants are not thick next to the parent plant. By cultivating close and gradually narrowing up the cultivator, you get the best results.

After you have got the row sixteen or eighteen inches wide, it is a good plan to run a rolling coulter, cutting off the runners. This last season the rows were not as wide as we wanted, but if we get an early grown plant, those are the ones we want, and we want to get a good, strong plant for the next year's fruiting, giving us the largest kind of root system and the strongest kind for the fruit the following year. This cultivation should be kept up as long as the plants are growing.

Winter Protection.

Late in the fall, after the growth has ceased, we like to cover the ground as soon as the ground begins to freeze nights, and I might say that freezing and thawing at that time of year is just as injurious to the plants

as it is in the spring. That mulch for your ground is full of humus and good results can be obtained by raking that mulch between the rows in the spring; it helps keep out the weeds from the matted row, and the ground around the plants should be worked enough to make the dust mulch along the rows.

It is just as important to keep the berries clean as it is to cultivate them, because if you are growing them for market a sandy strawberry is not nearly so valuable as a good, clean article, and so it is important to keep that ground covered and when we put the mulch on in the spring we want to cover the ground between the rows and in the center of the row there should be enough mulch to keep plenty of moisture, and it is quite important to retain all the moisture. If all these things are as they should be, your conditions are ideal for a good crop of strawberries, and the only thing that will cut off the crop is a very severe drought or lack of pollenization from too much rain at blossoming time, or something of that nature.

We do not find much difficulty in growing the strawberry on most any soil. There has been considerable trouble lately with what we call the root disease of the strawberry; no one knows exactly what it is; it has not been determined whether it is a fungous disease when it is attacking a plant, or whether it is partly due to root killing. That is a subject that is being studied and in the near future we hope to get something more definite than we have.

Varieties for Wisconsin Farmers.

I will mention something about varieties for Wisconsin farmers. I think it is well to grow only the varieties that are self-fertilizing. The Warfield is considered a very good variety, but due to the fact that it is a pistillate variety, it needs something more to grow with it. The Warfield and Dunlap make a very good combination and they are two good commercial varieties, and you can add to them the Gandy and the Beiderwood. The Haviland, Beiderwood and Gandy would make a very good variety for the farmer's garden. Of course you keep each variety separate.

The quality of berry that the market demands is a dark red, plump berry and you will find that the Warfield and Dunlap will be as good as any for the market; that is, for shipping.

DISCUSSION.

Mr. Scott—Will it pay to spray strawberries?

Mr. Bingham—I think so, provided you begin at the beginning of the season and keep it going all through the season, that is, while they are growing, beginning first soon after they are set. The rust on strawberries is controlled by the Bordeaux mixture.

Mr. Scott—What should we do in case the strawberry plants come to us dry?

Mr. Bingham—The proper method of handling strawberry plants if you get them shipped in by express and you think they are a little dry is to line them out and then you can tell what ones are alive. If they are heated to any extent, there will probably be some lost. Line them out in a thin furrow, put the plants in with the crown just above the ground, then put in a lot of moist dirt and in a few days those that are alive will start and you can sort them out, but you want to be very careful when you take them up from this place not to expose them to the air, keep them in the shade, so that these little rootlets will not dry out. Plant only the live plants.

A Member—You spoke of using the perfect flowering plant for the farmer's garden; you think that would be the easier way?

Mr. Bingham—Yes, if you don't want to bother to keep your varieties separate. I think one variety will do for the farmer's use, the Dunlap will be a very good variety.

Mr. Scott—I think that is one reason a great many farmers fail in raising strawberries. We start to buy plants from the nursery, they show us the various varieties and we try to experiment with those that seem to us to be all right and the first thing we know we haven't any strawberries. I think it would be wise for us to get the names of a few varieties of perfect flowering plants that will give us good strawberries on the farm.

Mr. Bingham—The Dunlap is one, the Beiderwood is another, the Excelsior, the Glen Mary, the Williambelt. That gives you a list of early and late and they are all staminate varieties.

Mr. Scott—The argument is general that some of those varieties will not produce as well as others that could be named.

Mr. Bingham—Yes, I have heard those arguments brought up, and it is true that the Williambelt will not produce as much as the Beiderwood or the Warfield, but it will produce enough.

Mr. Scott—Don't you think the Excelsior is rather a poor variety?

Mr. Bingham—Perhaps not the best in quality and not as good a yielder as some others. Of course I wouldn't recommend them very largely; that is, there are others that are better.

Mr. Scott—I have a higher regard for the intelligent farmer than many have, I believe in the Wisconsin farmer and that he knows enough to put the Warfield in one row and the Senator Dunlap in another and keep tab on them, where and when he wants to set another row, he knows enough to go to the right row for his plant, I am sure, and he would have better results than he would from any of the perfect varieties, as we call them.

Mr. Bussey—Wouldn't it be safer when the plants were snipped in to heel them in immediately?

Mr. Bingham—Yes, if they are tied in bunches they ought to be heeled in. The root system must be carefully handled.

Mr. Bussey—Is not the root system of the Warfield a smaller root system than some other varieties in a dry season?

Mr. Bingham—That depends a good deal upon the culture and the soil that that plant is grown on. If your soil is deep, a deep, loamy soil, with plenty of humus, you will get a good root system on the Warfield that will stand a good deal of travel. We all admit that the farmer knows enough to plant a row of Warfield and a row of something else, and he will cultivate it the first season all right, but nine out of ten won't know which is the Warfield next season. I have known men who have bought as high as ten thousand plants and bought all Warfield and later they have to go to work and dig out a lot of those and put in something else. The farmer knows this as a fact, but he doesn't make a record, and then he naturally gets mixed, doesn't remember, and it makes a lot of trouble.

Mr. Scott—What Mr. Bingham says may be true in his locality.

A Member—I think you will find it is true in this locality to a great extent.

Mrs. Perkins—In planting do you advise pouring water in the opening before setting the plant?

Mr. Bingham—No, I would not water in setting out, but I would wet that plant in a pail of water before I set it out; then, if the soil is not absolutely dust dry, that soil will stick to the roots and if the soil is pressed firmly around the roots, there will be enough moisture to feed those plants. I have planted where there was practically no moisture down in the soil, and still, when the rain did come, it was carried to the strawberry roots

and they were all right. You want to clip off the ends of those roots two or three inches, then when you throw them into the opening made by the spade, spread them out and do not get them all in a bunch. I have had fellows work for me who would throw the plant into the opening and give it half a turn around that would twist those roots together, and of course they didn't do so well. Our object is to get a good row from one end of the field to the other.

A Member—In cultivating your plants, do you take any particular pains in going the same way?

Mr. Bingham—After they make runners we do. Usually we start one side of the field and go once in the row, oftener, just as well as twice in the row and not so often.

Mr. Lees—In starting a new garden, can you not take out plants yourself and have good success?

Mr. Bingham—Yes, you can do that if you plant strawberry plants every year. You have got to plant every year, if you are going to have a supply of plants.

Mr. Lees—Can you get any fruit by the first year's planting?

Mr. Bingham—No, in the spring of the year, after they are planted, the blossoms should be cut from those plants. Be very careful to cut those blossoms off in order to get all of the strength into the plant that would go into the fruit. Even if you leave on a few strong stems, you will find that the plant will be weakened, there will be no runners until very late, whereas if you cut them off the runners will come early, and that is what you are after.

Mr. Lees—My method is this—I plant in long rows and give the land as much work as possible. I have read a great deal about strawberries and they always recommend cutting off the blossoms. I set my rows one hundred yards long and I went along and picked out certain plants with my spade. I picked out sometimes as much as half a dozen and I lifted it up—all I could handle on that spade. I dug a hole as big as I could with the spade once, then I took hold of that mat and set it right in, everything that there was, old berries and young berries, and every kind. The result was, after I had cultivated those little patches, taken out all the weeds, put a mulch all around them and cultivated between the rows, I got as heavy a crop off those plants, if not heavier, than I did on the place where they were matted. That was one year old. I have only had three years' experience in this method, that is all I have got to put against what other people have to say about that, but from what I know now, I expect to plant berries in that way as long as I plant berries, and I think I can do it as cheaply as any one can anywhere. Make your rows long, pick out your berries and put the berries, every one, the right distance apart, and that is all there is to it. There you are with your spring-planted berry that will yield you just as good fruit as you can raise on any matted row by any other method that I have seen, and you or anybody can't tell by looking at them, but what they are off the matted row.

Mr. Bingham—What would you do if you didn't have any plants on the farm; then you couldn't pick up this wad of plants in dirt.

Mr. Lees—I am only telling you the way I do it, and I call it the lazy man's method.

Mr. Bingham—Of course I can see how it works out with you, but it would be impossible for the general farmer to do that kind of thing unless he had those same conditions, had his first planting started. After that, if you wish to adopt your method, it is a very good one, but I would advise cutting the blossoms. I have transferred lots of mats to fill in, taking the sod and strawberry plants to fill

in a vacant space, and in that case there is no necessity of taking off the blossoms, because the plant has not been injured by the transfer, but where the plant has been shaken out of the dirt, it is absolutely necessary to give that plant all the vitality that is in it, and all of the root system in it, give it every chance to produce a good root system.

Mr. Hill—How far do you set the rows apart, and how wide are the rows?

Mr. Bingham—The distance that we use in fruit culture would be about three and a half feet between the rows, even four is not objectionable, and then eighteen inches in the row, somewhat depending upon the vigor of the plant. If you have good, strong plants, eighteen inches will give you a good matted row. If your plants are inclined to be a little small, I would advise putting them in a little bit closer. If I were buying plants and shipping them in, I would plant perhaps fourteen inches and would be more apt to get a good start on a solid matted row.

Mr. Hill—There is a farmer here, a neighbor of mine, who has had experience in growing strawberries. He keeps Jersey cows and he likes Jersey cream. He found he had very good success in growing the fruit, but it took too much cream, so after thinking it over he concluded to plant milk weed occasionally between the rows so as to save cream.

The Chairman—We all know who that was, but I think we better close this topic.

SPRAYING ORCHRADS.

D. E. Bingham, Sturgeon Bay, Wis.

"There is nothing new under the sun." This is true of spraying. While orchardists of the present day are inclined to consider themselves the leaders, if not the pioneers, in spraying and combating all manner of insects and fungi, a glance backward will show that the practice is not by any means new.

In the year 1629, John Parkinson, writing on "The Ordering of the Orchard," says: "The canker is a shrewd disease when it happeneth to a tree; for it will eate the barke around, and so kill the heart in a very little space. It must be looked into in time before it hath runne too farre; most men doe wholly cut away as much as is fretted with the canker, and then dresse it, or wet it with vinegar."

To those familiar with the blight canker of the apple and the present method of treatment, the above will appear good advice, even if it comes over a distance of two hundred and eighty years. It is true we now use corrosive sublimate or copper sulfate as an antiseptic instead of vinegar, but the suggestion that "it must be looked into in time before it hath runne too farre," is most excellent.

Discovery of Bordeaux Mixture For Spraying.

In Europe the French vineyardists were the first to look for remedies for the control of the vine mildew. Various drugs were recommended and used, but the problem was finally solved quite by accident and as follows. Vineyardists in the vicinity of Bordeaux (France) had suffered considerable losses by the theft of fruit

from vines growing along the highways. It had been the practice for many years previous to 1882 to sprinkle the fruit with verdigirs so that it might have the appearance of being poisoned. In 1882, for reasons of economy, certain growers substituted a mixture of lime water and copper sulfate and were astonished to note that the vines so treated were free from the downy mildew. Out of this accident grew the Bordeaux mixture, the most valuable remedy known for the treatment of fungous diseases of plants. While we have borrowed most of the remedies which we now use from France or Germany, much of the early development of spraying can be found in this country.

It is with considerable pride that Wisconsin horticulturists refer to the record of the late Professor E. S. Goff in the pioneer work of spraying.

The first systematic trial of Paris Green as a remedy for coddling moth was conducted by Goff at Geneva, N. Y., in 1885, as was also the first experiment for the control of apple scab. In the latter case hyposulfite of soda was used.

While it is true that we in the United States have not added materially to the list of remedies for the control of insects and diseases of plants, and while it is true that the Bordeaux mixture for fungi and kerosene for insects comprise about our entire list, much has been done in the development of special formulas. Our Experiment Station scientists have also laid bare the life histories of the plant pests, the first and most important step in their intelligent control.

My personal introduction to spraying was in 1891 at the end of a short pump handle, one of the first spray pumps, the old Nixon tripod, in a large orchard in the southern part of Wisconsin, and the blisters on my hands were more numerous than the barrels of spray we put on the trees daily. But for all this I was kept steadily at my task of working the pump handle and I concluded that spraying must be very important or I would get a rest, so I watched closely for results, for I had a dream of an orchard and some one else getting the blisters. And sure enough, when harvest time came, the results were very evident, the apples were freer from worm and scab than where they were not sprayed. And so I saw in the future some one else working the pump handle while I held the spray rod.

It was at this time that Professor Goff was carrying on the experiments in spraying with Bordeaux mixture to determine its efficiency as a fungicide. It was used very much stronger than we use it now and it was found to be no better.

A Commonly Used Spraying Outfit.

The most commonly used outfit of today is the hand pump fitted to the end or side of a barrel, according to the style or make of a pump, and mounted on a stone boat, cart or wagon, to suit the user. If good judgment is exercised in the selection, very satisfactory results can be obtained.

Care should be taken to select a pump made of brass with a good agitating device and one that has sufficient power to produce a fine spray with the least amount of labor.

styles and are much superior to hand-

The power sprayers are of several power, barrel or tank pumps. When orchardist's interest warrants, a power pump should be used by all means.

All pumps, no matter what style, should be fitted with the best hose of proper length and for tree fruits an extension rod of six or eight feet long is very convenient.

The nozzle is perhaps the most important part of the spraying outfit. The Vermorel type is the best and should be used.

Making the Solutions.

For making the solutions, procure a barrel, cut it in halves, using one-half for blue vitrol and the other for lime water. If much Bordeaux is to be used, it is well to have more barrels in which to keep a stock solution of vitrol and lime to save time in getting the mixture ready. Always use wood or earthern vessels for blue vitrol.

For large orchards, an elevated platform fitted with plenty of tanks of the proper size is necessary in order to do the work economically, having a good supply of water which can be gotten into the tanks without the necessity of hand pumping.

Bordeaux mixture is perhaps the most valuable remedy known for the treatment of fungous diseases of plants. That there will be others in the near future I have little doubt.

The lime-sulphur wash bids fair to become a valuable fungicide, as well as valuable for some of the insects that live on the sap of the tree, such as San Jose scale, which it will completely control if properly and persistently used.

Arsenate of lead is the best insecticide in use today for all biting insects, and should be used in spraying instead of Paris green. It is safer, being less danger of injuring the foliage where it is used. Our desire in using any poison is to kill something and arsenate of lead is sure to bring results. It adheres to the foliage better and can be used in much greater strength, exercising care in putting on only sufficient spray to cover the plat or tree and avoiding any great amount of drip, thus reducing the possibility of poisoning the land, if there is anything in the recent statements that such is the case where spraying is overdone, which it seldom is.

The formula of Bordeaux is as follows:

4 lbs. of Blue Vitrol
6 lbs. of Fresh Stone Lime
3 lbs. of Arsenate of Lead
50 gals. of Water.

Put twenty-five gallons of water into each of the half barrels previously provided and dissolve the blue vitrol in one and strain the slacked lime in the other. Add the arsenate of lead to the lime water and pour both solutions into the spray tank at the same time. Now you have the complete Bordeaux arsenate mixture, which is the most widely used of all spray mixtures and controls the fungous diseases as well as insects that attack the foliage and fruit.

Should you wish to spray plums, it is a good plan to dilute the mixture somewhat and add about three pounds more lime, making what is called peach Bordeaux.

3 lbs. of Vitrol
9 lbs. of Lime
50 gals. of Water.

When and How to Spray.

The first application is made at the time buds are bursting and should be done thoroughly. The second application should be made as the blossoms fall and the third in ten days to two weeks later, the fourth about August first to fifteenth. Should it be very rainy, it may be necessary to spray oftener, or in case of bitter rot on apple, and we should keep spraying till late, or till danger of disease is past.

Apple scab is perhaps the most troublesome of the fungous diseases in Wisconsin and four applications will be almost certain to control it if the work is well done. Sometimes two applications will be sufficient.

To control coddling moth, three or four applications will be necessary for the best results and the late spray does very much towards keeping in check the second and third broods.

For oyster shell bark louse, use some of the soluble oils when trees are dormant.

After careful estimate of spraying, I find that for trees averaging eight years planted, the cost is about eight cents per tree for material and labor, three or four applications with hand pump; some less with power machines.

Very few commercial orchards in the state are receiving the thorough spraying they should in order to produce apples as perfect as it is possible to produce in Wisconsin, and still many are returning their owners good profit. But there is still chance for improvement. More application and applied with higher power and applied in a more thorough manner are the things we ought to be considering, closer observation of the time to apply the spray to be sure to protect rather than try to remedy or cure.

If you have no spray pump at your command, you can get a cheap one that will do to spray a few trees, any pump that will give force enough to produce a fine spray. You cannot produce results by forcing the solution into the tree in streams. It must coat over all fruit and foliage, leaving no space unprotected for the best results, and results are usually in proportion to the thoroughness of the work.

Some Benefits Derived From Spraying.

The profits directly due to spraying can be easily figured by observing the orchards that are sprayed and making a comparison with those not sprayed. The profits are very marked in the case of the cherry. It is extremely doubtful if cherries can be grown in Wisconsin to any extent without thorough spraying. And while apples can be grown in many seasons without spraying it is a fact that they cannot be produced at a profit through a period of years without the aid of Bordeaux. It has been done in a few instances, however.

The profits cannot be figured entirely in the fruit produced, but much good is done the tree by keeping healthy foliage, enabling the tree to produce strong, vigorous fruit spurs and buds and also to be in condition to stand more severe cold.

Of course spraying will not do all, but when combined with cultivation and fertilization we are getting nearer the right way to grow good fruit.

DISCUSSION.

A Member—Your estimate of cost of eight cents per tree, is that per season or per application?

Mr. Bingham—Per season.

Mr. Purse—Don't you have to have a certain kind of lining in your pump for Bordeaux?

Mr. Bingham—Bordeaux mixture will corrode iron very quickly, and it is better to have a pump with a brass cylinder. There will be some trouble when you first start up with iron rust, but if you wash out your pump immediately after using it, even the iron pumps will last for a number of years.

A Member—Will your arsenate of lead be all right for potato bugs?

Mr. Bingham—Yes, I think it is better than Paris green, because it will adhere to the foliage and even a heavy rain won't wash it all off like it will Paris green.

A Member—How much would you use?

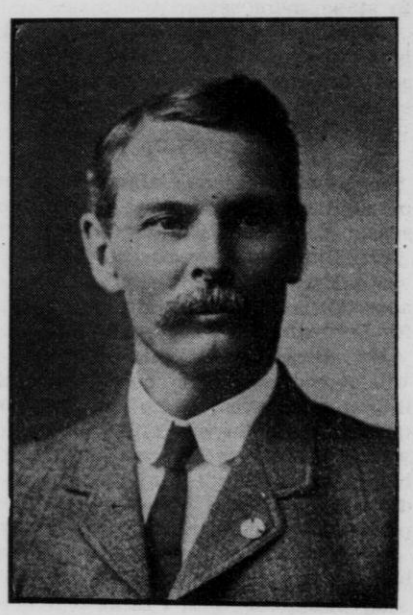
Mr. Bingham—You can safely use it on any foliage, at least six or eight pounds to the one hundred gallons. You can use six to fifty gallons on the potato itself.

A Member—Where can we purchase this arsenate of lead?

Mr. Bingham—Most any of the better manufacturers are selling arsenate of lead, the Williams Company. The cost ranges anywhere from ten to fifteen cents. If you use it by the barrel it will cost a little more than Paris green, but the results, I think, will make it fully as cheap in the long run.

CASH CROPS.

R. E. Roberts, Corliss, Wis.



Mr. Roberts.

In presenting this subject, I believe there are two very essential factors to be considered. First, it is essential that annually the results should show a fair profit for the capital invested, and a reasonable compensation for the time and labor expended in operating the work of the farm. In the second place, it is no less essential that to farm successfully, the fertility of the soil must be maintained, as soil fertility is the absolute support of successful farming and should not be reduced, as in the case of exclusive grain or cash crop growing and these sold off from the farm. All our soils are exhaustible and in general are steadily decreasing in fertility. In facing this situation, to build up and maintain the fertility of our soils is the most important problem that confronts the farmer, hence it is the most important of our economic problems and should be given our most serious attention.

A permanent system of farming should be established and practiced on every farm, such as a proper crop rotation, joined with live stock husbandry of some class of live stock, as plant food cannot be indefinitely maintained without proper crop rotation and the liberal application of stable manure.

If the products grown upon the farm are all fed to stock upon the farm and the animals are provided with absorbent bedding, as straw and refuse cut corn fodder, so that all liquid excrement is also saved, seventy-five per cent of the manurial value contained in the feed may be returned to the land in the form of manure.

Yet, I regret to say, from my observation, as highly as this valuable fertilizer is regarded by all good farmers, there is probably no product of equal value so neglected and poorly cared for, such as not saving the liquid part, which is richer in both nitrogen and potash than the solids, and more available to the crops. When we see on many farms, manure thrown out against the side of the stable, where the water from the roof leaches through it, and washes out much of its fertility, and the heating and fermentation, another cause of great loss, we must conclude that the farmer is either wholly indifferent or unconscious of an extravagant waste of fertility.

In order to reduce the loss of fertility to a minimum, the liquid part of

the manure should be all saved as well as the solids, and to economize in handling, unless the farm is very hilly, it should be hauled directly from the stable to the field and spread, or; in any event, as soon as practicable. I believe the practice of this method will result in less loss of fertility than any other that could be pursued.

We should grow such crops as are best for feeding all classes of live stock, known as legumes, such valuable crops as the clovers and alfalfa, which have the power to take nitrogen from the air and store the same in the nodules upon the roots, and when decayed in the ground, becomes available for the succeeding crop of corn or other grains. This method, I term, is getting near pursuing a prosperous and permanent system of farming.

On the other hand, the growing of the class of crops known as "cash crops," such as tobacco, cabbage, sugar beets and potatoes, to the extent of making one of these crops the principal one to the neglect of others grown, and the chief source of income, and as each one removes a wealth of fertility from the soil where grown, and selling the same off from the farm makes no equivalent return of fertility removed is not practicing a permanent system of farming.

Those who are engaged in growing these crops to a large extent, must necessarily have a fertile or rich soil for them, made so by the liberal application of stable manures, to the extent of robbing the corn land and other crops. Consequently the corn and other crops yield less and the result is less stock has to be fed upon the farm, which necessarily makes the farm less productive each succeeding year; and then, in the event the cash crop should be a failure or the price very low, the farmer has practically no source of income to meet the season's expense. Thus he is compelled to borrow the necessary funds, or his merchant must carry his credit on his books.

While in a measure I believe in diversified farming, I do not advocate the growing of these cash crops unless the farm is under a fertile state of cultivation, and then only to a small extent, so as not to rob, interefere or conflict with the regular system of crop rotation, simply as a side issue, then, in the event the cash crop yields good and the price is also good, the farmer has that much more to his credit for the year's work. In the event the cash crop is a failure, or the price should be exceedingly low for the crop, as it is some years, the farmer does not feel the loss, as his regular system of farming is being carried right on and his regular income is being realized.

Under these conditions, a small acreage of cash crops may be grown and not reduce the fertility of the farm, and it gradually becoming impoverished and the farmer financially poorer, as the result would be in extensive cash crop growing, as by the continual and extensive growing of some of these exhaustive cash crops some of the eastern and southern states have for years sadly realized the effects of an exhausted soil and impoverished farms.

Therefore, the principal basis of good farming is live stock husbandry, with a good class of live stock, to convert the farm products into a condensed form for market, thereby maintaining and increasing the fertility of the soil, thus making the farm more productive and more valuable, and the farmer more prosperous. This, I believe, is the only successful and permanent system of farming to pursue.

DISCUSSION.

Mr. Scribner—What has been your cash crop?

Mr. Roberts—I have grown a little cabbage for the past four years.

Mr. Scribner—Any profit in a little cabbage?

Mr. Roberts—Yes, sir, when the crop is good and the price also.

Mr. Michels—If I understand the trend of your paper, the less cash crops we grow the better off we are as farmers.

Mr. Roberts—Yes, sir, to a large extent, one year with another, for a number of years.

Mr. Scribner—What results can you get out of an acre of cabbage?

Mr. Roberts—That depends on the season, the crop and the price. One cannot tell what a crop of cabbage will bring him until it is sold; the yield per acre and price vary each year, as the crop grown in New York governs the price of Wisconsin cabbage to a large extent.

Supt. McKerrow—How does it average in your district?

Mr. Roberts—All the way from four to twenty dollars a ton.

Supt. McKerrow—But what is the average price, ten or twelve dollars?

Mr. Roberts—About six dollars on an average.

Supt. McKerrow—And the average crop?

Mr. Roberts—About fifteen tons to the acre is a good average.

Supt. McKerrow—Ninety dollars an acre. Now, how much of that is profit?

Mr. Roberts—It takes about the same labor that it does to raise an acre of corn, or fifteen dollars per acre.

Mr. Stiles—Growing such crops as sugar beets or tobacco, if a man has an eighty-acre farm, how many acres do you think would be advisable for him to put into beets and tobacco, providing he has live stock and dairy cows, for instance?

Mr. Roberts—A man with eighty acres of land under a high state of cultivation could safely grow three or four acres of cash crops and not over that. If he grows more than that, he is going to impoverish his farm.

Mr. Scribner—And you would work that in rotation?

Mr. Roberts—Yes, sir.

Supt. McKerrow—You would put it in as part of your rotation, the same as your corn and potatoes?

Mr. Roberts—Yes, sir, you would have to rotate with those crops.

Mr. Martiny—Wouldn't it depend upon what your cash crop was as to how many acres you would grow? For instance, in northern Wisconsin we grow quite a large acreage of canning peas and quite a small acreage of tobacco.

Mr. Roberts—You cannot grow as many acres of tobacco as you could of cabbage or peas. If you have a flock of sheep or some young cattle they can run upon this cabbage land and consume the stumps and the leaves, or the pea vine can be fed profitably.

Mr. Scribner—I do not want my cows to eat the tobacco stems.

Mr. Roberts—They are good for lambs.

Mr. Jacobs—With a cash crop we have to realize that when that crop is sold all the fertility in that crop is gone, our farm is deprived to that extent, whether it is three or forty acres; we have sold that much off the farm. Now, it seems to me that the principle is the same, it is only a question of degree; it seems to me the true principle is that from crops that we sell off from the farm in this way we must bring something on to the farm to take the place of the fertility sold off in that crop.

Mr. Scribner—I don't think that is quite all either; I think that quite often the crop is taken care of to the detriment of the other crops. The farmer is going to take care of that special crop at the proper time, even if the others are not taken care of, and I believe that cuts some figure.

A Member—When it comes to a crop of grain, we could raise a good

deal more than three acres on a farm profitably I think.

Mr. Roberts—Yes, sir, in selling grain off the farm you still have the straw and refuse to work up into manure.

Mr. Scott—And if you sell potatoes, you still have the bugs.

Mr. Roberts—Grain growing is a little different to what are termed strictly cash crops.

Mr. Stiles—Don't you think that where a man is favorably located to grow sugar beets, near a market or near a station, or in a tobacco section, or in a canning section, he can grow a pretty good acreage and make money?

Mr. Roberts—It would be profitable for him to grow a small acreage if his farm is under such high cultivation that he can keep up his rotation. The farmer must take into consideration his distance from the loading station. If he is too far from the loading station, he will spend too much time on the road going and coming.

Mr. Stiles—How many miles is too far?

Mr. Roberts—I think four miles is the limit for cabbage or sugar beets.

Mr. Hopkins—What about onions?

Mr. Roberts—I know nothing about onions, have never raised any and never made any inquiries with regard to them. A large number of people on the lake shore are growing onions very successfully.

Mr. Stiles—Of course those people are close to Chicago and can buy stock yards manure very easily.

Mr. Roberts—There are a great many farmers buying manure, along the lake shore many of them do not keep any stock whatever, only one or two cows. They keep horses to do their farm work and buy all their fertilizers at the Chicago Stock Yards.

Mr. Stiles—Then it would be safe for those men when it would not be safe for other farmers?

Mr. Roberts—That is true in a measure, but when one takes into consideration the quality of the manure they get, which is not the best, as it is largely horse manure composed of shavings and sawdust, that makes a difference. They have to pay twenty-four dollars per car for that.

Mr. Hill—There is one crop I would like to know something about, it doesn't take very much land to grow it, and that is ginseng. Perhaps a quarter of an acre might support a family and they wouldn't need to cultivate the rest of the farm. There is one other cash crop that would probably be more practical; there is a farm in Winnebago county, the owner is known by a good many of us. He told me that there were six hundred dollars' worth of hens sold from that farm and I presume they didn't take much from his farm, they probably traveled over onto his neighbor's, but that is a cash crop that does not require any outlay for fertilizers.

Mr. Roberts—I only referred to four crops, those which are the most extensively grown, tobacco, cabbage, sugar beets and potatoes.

BARNS.

Thomas Convey, Ridgeway, Wis.

Where a permanent structure is to be erected, it is very necessary that it have a good foundation. Lumber and mechanical labor are now too high-priced to put either into a building not durably built. The foundation should be either stone or cement, preferably concrete. A much lighter wall of the latter can be built, hence it may be cheaper. Where it is difficult or impossible to secure mechanics when you want them, any intelligent man can build successfully.

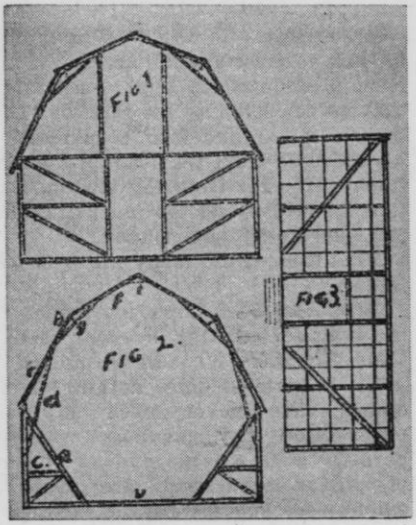
A cement mortar and low grade stone may be used where gravel or broken stone cannot be obtained. By building short pieces of 2x4 through the wall at short distances, at or near the bottom, uprights can be bolted to them to hold forms in place, and a notched clamp can be used to hold uprights in place at top.

Two parallel walls make a good foundation, the ends to be closed with lumber. Tiles should be built in the wall for ventilation. It should be built solid for three or four feet, then a series of pillars and windows. The latter should be in sections rather than singly.

When about to build, do not make the mistake so commonly made of beginning at the wrong end of the proposition. First determine size of stalls, gutters, mangers, etc., and then build outside of that.

Although I have both, I much prefer the high basement. The light is better and for eleven months of the year it is superior to the low basement. If it is more difficult to heat during cold weather, I am satisfied to put up with the inconvenience. We have a basement eleven feet high, also one eight feet high. I would build the former in every case, or at least ten feet.

I wouldn't think of building a house of heavy timbers, neither would I a barn. The old style of barn building was a humbug and the mechanic who follows that system should be ashamed of it. If a building is no stronger than its weakest part, the old style is not to be commended; large beams and small tenons, short braces and the tie beams in the way, should not be tolerated in modern

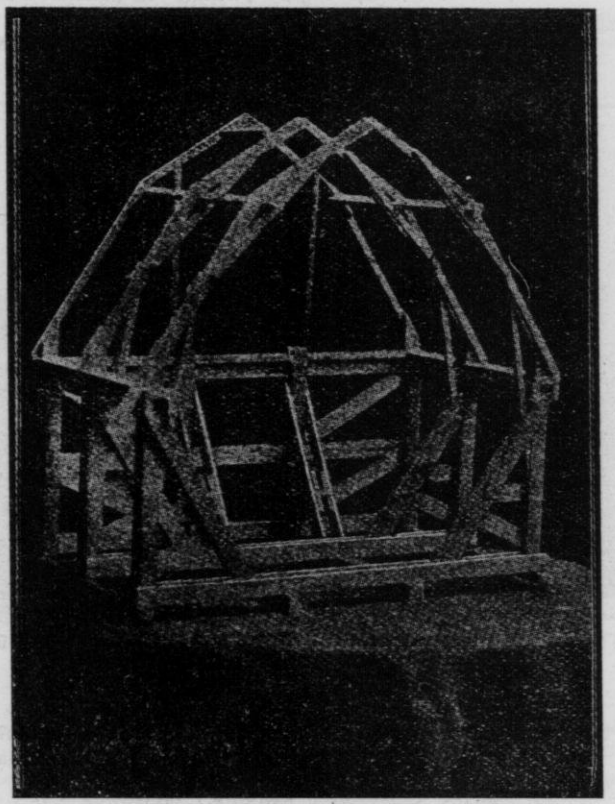


Plank frame barn.

construction. Surplus material may mean considerable more expense and it is not even as good as the lighter material, as with the latter the manner of construction is based on scientific principles; the lighter material is not so much subject to decay and the erection does not require so much skill or labor; there is one-third less material required. There is also a saving of the same amount of labor

where material of proper dimensions is obtained, no sawing or fitting is necessary. All lengths of material can be used where desired, as a short piece may be slipped in and a splice made. This is handy where piece stuff is sawed at home.

forage is not a serious objection. Our barn is fifty-six feet high from foundation and forty-four feet from the second floor. We can get in hay forty feet deep; the hay in lower part of mow is compressed like baled material. We stack the grain in one end of



Barn frame.

There are too many barns built with short posts. This is not consistent with either convenience or economy. The high barn does not cost much more than the low one, but it may have double the storage capacity, besides feed is likely to be nearer to place of consumption, it is a whole lot easier to throw down than to carry laterally. The elevation of grain or

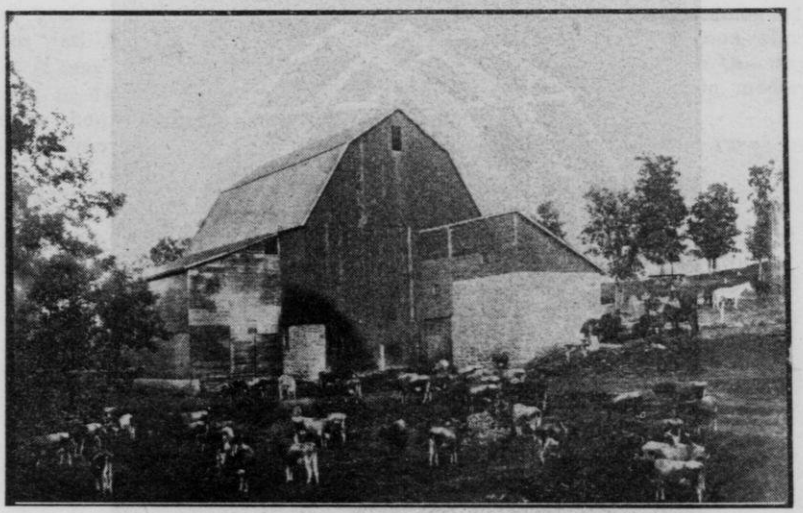
the barn, thresh there, and stack the straw in an addition. After years of experience both ways, I feel sure we lose at least one-third of food value where it is left outside, besides the inconvenience of feeding. We are bound to have years of plenty and others of scarcity and where we have ample storage capacity they can be equalized. As the country grows old-

er, food stuffs become more valuable, and it seems that is the condition here at present.

I would not build a large barn without a driveway through the basement to haul manure. We prefer to have cows face away from center, the two gutters then form part of the driveway. With both end doors open, it is a cool place to milk in summer.

tinuous. Where it is necessary to take in hay from outside building, a series of doors would be preferable. The diagram represents a barn forty-four by sixty feet and forty-four feet high.

It is unnecessary to outline manner of putting in girths to nail on lumber, as any carpenter can readily do it. Care should be taken to leave



Plank frame dairy barn and silo with herd of Jerseys in foreground on the Convey farm, Ridgeway, Wis.

A Plank Frame Barn.

The hollow or plank frame barn is nearly all made of 2x8-inch hemlock. A good quality should be used, however. Figure 1 is intended to represent the end bent. I do not claim anything original in this, except that the bent is held in place the same as the sides by four 2x8 pieces, two on each center post extending from near the top of posts in about twelve feet to sills running lengthwise of building beneath the floor. If desired, the tie beam in end bent need not be con-

place on top of post to bolt the first pair of rafters that they may be flush with outside of frame.

The principle of construction in Fig. 2 is to get each bent sufficiently strong that not only the bent but timbers between bent will be rigid. b is made of several 2x8 pieces. I use three pieces eighteen feet long on each side and three pieces twelve feet long in the center. This gives two feet of a splice at each joint. There is a two-inch space between, except where spliced.

The posts are twenty feet high, two

2x8 pieces being used on each side with two inch spaces between. The girths, a, to hold post in place, are twenty-two feet long. Leave a space of one foot on top of post on inside to bolt a 2x8 on inside and outside of post to carry plate. The lower end of girth, a, runs down between pieces

ed trough. I placed two posts between each bent. The rafter, c, is two 2x8's, twenty feet long, f is two 2x8's, sixteen feet long, and g is two 2x8's, sixteen feet long. They are spaced two inches apart by using pieces of plank between joints, also one outside of each joint. This makes a joint ten

Farm home of Thos. Convey, Ridgeway, Wis.

in tie beam, b, just twelve feet from outside of post.

It is better to put rafters up after sides are up and plates on. Spike a, being two 2x8's, and b, being three ply, together. Fasten a temporarily at top, so the building may be brought in line. When all are up, line it and bolt top and bottom of a and put in short braces. Leave about six inches of post above plate to slip rafters between. I made bents twelve feet apart and used 2x12's, twelve feet long, between bents for plate, spiking them to edges of 2x8's, like an invert-

inches thick at peak and hip; d is put on after rafters are on; it is 2x8 and twenty feet long.

I nailed rafters together with peak down and base of rafter on plate, using a mast forty-four feet high with cleats instead of a scaffold and hoisting rafters by power. The building is forty-four feet high from top floor, or fifty-five from basement. I used no scaffold except to shingle.

The rafters between the bents are 2x6, trussed with a sixteen-foot fence board. The space between truss and hip is eight inches on bent and ten on

intermediate rafters. A 2x10 twelve feet long, is used from one bent to another for purlin plate. It is cut down two inches at bent on upper side, that it may support the six-inch rafters. Those are put in after rafters are trussed and in place. The ends have to be beveled if they lap. Remember the frame of bent also takes the place of a rafter.

Figure 3 represents one side of frame, the double lines indicating edges of posts, other perpendicular lines intermediate posts, and two by fours horizontally. The latter are not necessary if the siding is put on horizontal. The diagonal lines indicate a series of short braces that are flush with outside girths. The spaces above the door are used for windows. A two-inch plank is used on the wall for a sill. This barn is built on two parallel walls eleven feet high, the ends closed with lumber, with driveway eleven feet wide lengthwise of basement. We can unload hay from basement or upper floor. A rope is placed between trip pulley and fork, the latter hanging as low as hay in the mow will permit. The hay can be swung to either side before dropping. The track can be bolted together on barn floor and hoisted in place. It is well to put a 1x6 board on a; it looks better, and stiffens it sideways. There is a saving of at least one-third in labor and material in such a frame as this, and it is stronger and better in every way than an old style frame. No very long timbers are necessary, which makes it less expensive. There are no mortises to hold moisture and no tenons to rot off. Every part of frame is equally serviceable and strong. The curb roof is the most desirable in a large barn for several reasons.

This building should be put on a good foundation; if the floor should sink it would draw in the sides and cause the roof to buckle and get the whole building out of shape. After ten years' use I am satisfied it is all right.

Owing to the height, we had some difficulty in getting the fork back. This was overcome by drawing the end of rope through the carrier instead of knotting close to the carrier, as is usually done. When you get sufficient rope through to return the fork, put on the knot, attach an extra pulley to the track near the trip block, run the rope through the latter and attach weight to loose end of rope, and you have a return carrier, and no infringement on patent. This would work on any carrier.

DISCUSSION.

A Member—Do you use stock boards and battens on the outside?

Mr. Convey—No, we use shiplap, but put it up and down. Of course we had to use strips on the framework to fasten it to.

A Member—There are a great many barns built in this country with drop siding.

Mr. Convey—I would prefer to have the lumber run up and down. Those seams catch water, the paint will peel off of the lumber and the lumber will rot. You can easily tell in ten years which way is preferable. That is the trouble with a metal roof on a barn, it will decay more on the inside than on the outside. I do not know whether that will apply to galvanized iron or not.

A Member—I built one last year, putting the sheeting on horizontally and covering it with tin.

Mr. Roberts—A great many farmers in our section of the country are boarding up their barns with good common fence flooring, that makes the building tight and it resists the wind—perpendicular, of course.

A Member—Mr. Convey, wouldn't you bolt your braces?

Mr. Convey—Not necessarily. I have noticed the spikes we have used and

they don't show any evidence of rust. I was inclined to bolt, but I am now convinced that the spikes will remain indefinitely. There is only the head exposed, of course, the spikes are imbedded in the timber.

A Member—I notice some of the eight-penny nails I used three years ago are rusted through between the board and the timber.

Mr. Convey—In my case, the spike is well in the timber. I haven't noticed that the heads of the spikes are rusted at all yet. I wouldn't object to the bolts at all.

A Member—No, I didn't notice the heads of those spikes rusting, but when I came to pull them off in doing some new work I found that state of affairs.

Mr. Stubley—In Mr. Convey's case, the spikes were not so exposed to the air.

Mr. Convey—I am not alarmed about it. If I should become alarmed, I would put in more.

Supt. McKerrow—How would you reach up to put them in?

Mr. Convey—There are a whole lot of things you don't know anything about.

Chairman Imrie—Mr. Jacobs, how did you fasten your frame, did you put 2x4's in the wall?

Mr. Jacobs—I put up studding and ceiling on each side of the studding, and then put wires across through the frames to hold the bolts, sufficient to hold them. When we wanted to take the frame off, we cut the wires off and left them in the walls.

Mr. Convey—Of course it is very little expense to build in the stuff and then you have something that is adjustable. I think that would answer the purposes of the building for a straight wall, or even a circular silo.

Chairman Imrie—Wouldn't the 2x4's rot?

Mr. Convey—If they did, it would be so long before that I wouldn't worry about that, and the decay would not affect the utility.

Chairman Imrie—What size spikes do you use?

Mr. Convey—I use all sizes.

Chairman Imrie—Would you recommend something larger than a twenty-penny?

Mr. Convey—Yes. Of course you have to use the small spikes to begin with, but in finishing up you want to have them go square through; it takes lots of nails of course. We brace the ends just the same as we do the sides; that is, there are two posts eleven or twelve feet apart in the gable ends, and those are braced just the same as those sides are. Quite frequently with such barns you find the ends bulging out. If you have a brace of that kind and the strain on it is lengthwise, you know you cannot break it, where the strain of the timber is lengthwise it won't pull apart and is not at all liable to break. So in the case of building up the ends, I would prefer to use stays and I would just as soon have an open end there, a door, so you wouldn't have to elevate the hay higher than the mow. It is more convenient, because you have a swing on the fork where there is a rope or chain between the fork and the trip pulley, that is a big advantage in saving labor.

A Member—What do you think of this plan of building the porches on the south side of the barn?

Mr. Convey—I wouldn't submit to it; it is convenient sometimes, but it makes a lot of mischief, it is too much shade entirely and shuts off the light.

Chairman Imrie—You spoke about having these windows in sections. What do you mean by that, two windows side by side?

Mr. Convey—Yes, or three. In building a stone wall where you have a single window in each place, you don't get much light. I would prefer to build the pillars and bridge over two or three windows in a section. We

have to have more light than we used to have and better ventilation than we used to have in barn building, and it is very necessary that we build good sized windows in the foundation.

A Member—Where is your outlet for the ventilation?

Mr. Convey—Our barn was built before I knew anything about the King system, and that of course would be the proper system of ventilation; the outlet should go through the highest part of the roof, and of course that is inconvenient where we have the driveway through the center of the building, but it can go up on one side and then be taken on a slant; the same as you would a chimney.

Mr. Jacobs—How low down to the floor would you take it?

Mr. Convey—One or two feet will answer.

Chairman Imrie—I think you will find that fully described in the Bulletins that are given away here, on page 144, King's system of ventilation.

Mr. Jacobs—How about the round barn?

Mr. Convey—Before building a barn the last time, I took that matter up, I tried to divide it up in such shape that it would be convenient, and I came to the conclusion that, owing to the inconvenient shape, in order to get my feeding alleys in there and to be able to drive around to gather up the manure, I could not use a round barn. It is quite difficult to get the alignment well in a round barn, unless it is very large.

Mr. Jacobs—Suppose there is a hundred tons allowed in this barn; doesn't it brace out or bear down on those braces so as to push on them sideways?

Mr. Convey—In our barn they are twelve feet apart and when we dump hay we don't dump on them but between—I don't suppose it would hurt if we did. It is eighteen inches to the foot rise, that makes it quite sloping and doesn't seem to bind on there, but of course in unloading hay we dump between and it makes it a great deal more convenient to get it out too. Mr. Stubley has a barn of this kind and I would like to know if he has any criticism to make.

Mr. Stubley—None at all, but don't you think a 2x6 would be sufficient where it is 2x8's and supposing they are using their siding horizontally?

Mr. Convey—We used intermediate posts. We used poles eight inches in diameter at the bottom and put them in every four feet, nailed them to the plate above and toe-nailed them at the bottom.

Mr. Stiles—Of what value is the cupola on a barn, except for ornament?

Mr. Convey—Well, the cupola is somewhat dangerous as far as lightning is concerned. During the haying season, when the hot air accumulates in there, I think it is an advantage to have some manner of letting it escape. On the other hand, I think it is somewhat dangerous as far as lightning is concerned.

A Member—What do you think is the best roofing at the present prices?

Mr. Convey—Good shingles are the most satisfactory things I know of as yet. I would be little bit afraid to put a metal roof on a barn, owing to the statements I have heard that it is inclined to rust from the bottom as well as at the top. I do not know whether that would apply to galvanized iron or not. We put shingles on a barn in 1873, and they are on there yet and the roof is good, but they were shaved shingles and they cost a dollar a bunch.

Mr. Linse—My experience is that shingles now days are the poorest things we can put on a building. The shingles in the sixties or seventies were a different proposition. I have some that are on yet. Again, I have put shingles on a building where they are totally gone in less than five years. Another thing, I would ad-

vise you if you put on shingles to do it with galvanized shingle nails. I have a good cedar shingle roof and at every storm a lot of them blow away because of the common shingle nails that were used in putting them on. You want to use galvanized nails. I have put on rubberoid, three ply. Of course I can't tell yet anything about how the roof is going to last, but before I put it on I examined roofs where this stuff had been on eight years and it was as good as when it was put on. An ash shingle roof cover is the poorest kind.

Mr. Convey—I made the same mistake of putting on shingles with common shingle nails and I expect to have trouble before very long on that account, so I would caution anybody against using anything but galvanized nails.

A Member—Wouldn't you consider old fashioned cut nails all right?

Mr. Convey—They are certainly durable, but the carpenters don't want to use them, and a lot of them don't know how to drive a cut nail.

Mr. Scott—I think if you will see that your shingles are thoroughly dry when they are put on you will have no trouble with the nails rusting. If they are not thoroughly dry, the nails will rust every time.

Mr. Linse—Our cedar shingles came to us too dry, they had been dried in a dry kiln and all the life was dried out of them. Another thing, I have found that the common steel nails will rust out.

Mr. Convey—I know that Mr. Linse has probably erected more buildings, and more expensive buildings, than any farmer I know of in the state, so I place a lot of confidence in what he says. I would like to ask him a question myself. Is it worth while putting any preparation on the shingles, roof tar, or anything?

Mr. Linse—No, sir, the worst thing about that is if you want to do anything to preserve your shingles, dip them before you nail them up. If you apply anything afterwards the moisture will run down and catch underneath, and it is a detriment to the shingles. They are using some kind of a solution in La Crosse, one of these creosote solutions.

Mr. Roberts—There are two kinds of those galvanized shingle nails, the lead galvanized nail is practically worthless. The good zinc galvanized is better, but I would rather have the old-fashioned cut iron nail.

Mr. Hill—And it must be the cut iron nail, not the cut steel nail, that is no better than the common iron nail.

A Member—This question of shrinking roofs, I think, will give another argument for shingles. I know it is the only roof we have now that will stand everything through a series of years without being treated with tar or something. I know of a large barn that was built ten miles from our place with the prepared roofing; that was on there two years and the man tore it off and put on shingles and I think he had a reason for it. I value Mr. Linse's experience and judgment in almost all things, but I believe of all the roofing materials we have at present that cedar shingles will be the cheapest in the long run.

Another Member—The cedar shingles seem to be the ones that rust off the nails; the pine shingles won't do that.

Mr. Moore—I followed building as a business for a few years and I found just that trouble, especially with these Washington cedar shingles; there is a sort of acid that cuts the shingle nails. I found that fourpenny galvanized nails were the best to use and will last a long time.

A Member—Does anybody ever put any tar on any roof that really does any good?

Mr. Convey—Yes, I put it on hot and it certainly did good. We burned the gas out of it, you have to do that

when you use gas tar. I have put it on some of the shingles and they never warped, never got out of shape, and they are lasting all right. The tar wants to be thoroughly heated. We had occasion to tear off some of them this past summer and they are in nice condition, after twelve years' use.

A Member—Do you sand the roof?

Mr. Convey—No.

ROAD LEGISLATION.

W. O. Hotchkiss, C. E., Chief of Highway Division, Wisconsin Geological and Natural History Survey, Madison, Wis.

Mr. Hotchkiss.

The subject of Road Legislation is one of considerable interest at the present time. The state is about to abandon its old policy of having nothing to do with internal improvements and start on an extensive program of road improvement with state funds. This will call for the expenditure of large sums of money and for this reason every tax payer and every public-spirited citizen should give careful attention to the matter and see that the law providing for the expenditure of state money is the best that can be drawn.

The subject of this talk is road legislation in general, however, so a little time must be taken to tell of the road bills of lesser importance. This time must be brief, as there are about fifty road bills introduced.

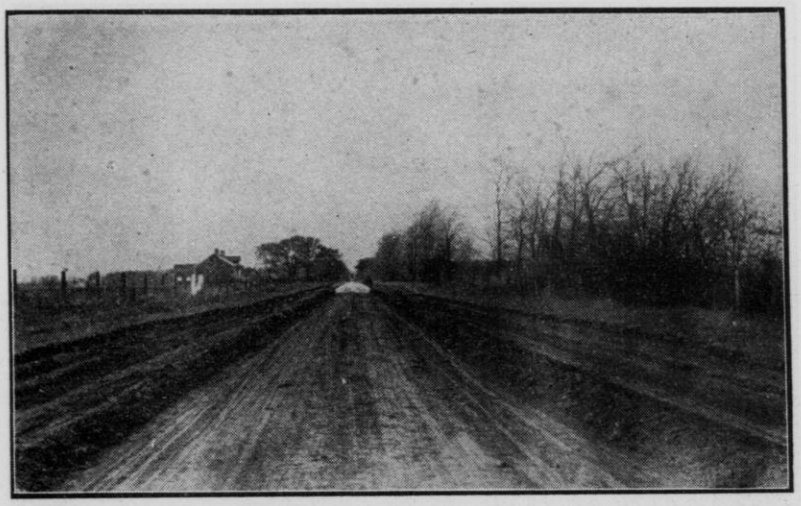
Wide Tires.

With regard to wide tires, there are three bills, the effect of which will be to repeal the law passed last session and revive the old law exempting wide tired wagons from tax. There is also a possibility that narrow tired wagons may be compelled to pay an extra road tax for the reason that they damage roads more than wide tired wagons and so ought to pay more.

County Aid For Bridges.

There are six bills relating to county aid for bridges. These will probably be combined into one bill by the committee in such a fashion as to do away with some of the abuses which have grown up on account of the present law. The law will probably provide that all bridges costing over a

certain definite amount—four hundred dollars is the sum being considered—shall be aided by the county. The county would not pay anything on a four hundred-dollar bridge, but would pay the extra cost above that until the whole cost of the bridge was eight hundred dollars and then the town and county would each pay half.



Trench thrown out with a road machine and sand ready to receive broken stone. This system of laying stone or gravel in a trench should be followed on all roads whether a steam roller is used or not.

For instance, a four hundred-dollar bridge would be entirely paid for by the town; one costing six hundred would cost the town four hundred and the county two hundred dollars; one costing eight hundred would cost the town and county each four hundred dollars, and one costing one thousand dollars would cost the town and county each five hundred dollars.

Relating to Road Supervisors, Town Boards, Etc.

There are bills under consideration enabling town boards to pay road supervisors more than one dollar and a half a day if they see fit. This law will simply legalize a practice already existing in many towns where the boards have been compelled to pay more to get anyone to do the work.

One bill being considered contemplates a change in the term of members of the town boards. It is proposed to elect one member each year to serve a three-year term, the chairman to be elected by the people when the previous chairman's term expires. While not strictly a road law, it is believed that the change would result in the betterment of road conditions and a more efficient county board. Under the present system, a town board can be thrown out of office as a result of some action which was for the good of the town, but the good effect of which is not seen for a year or two. With a more stable body safe from the yearly

danger of removal, it is probable that the towns would get better service.

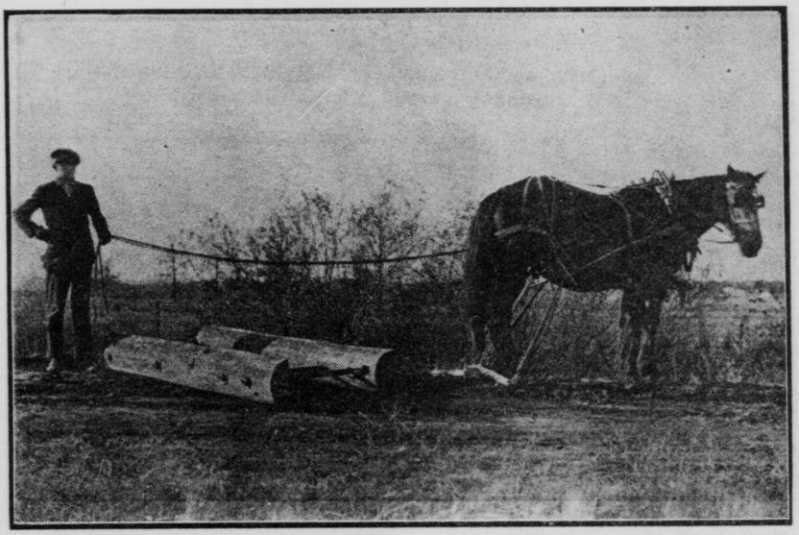
It is also proposed to allow farmers to work out their road tax in dragging adjacent roads with the split log or other drag at the rate of seventy-five cents per mile for each time they are requested to drag by the town board. This law should result in a great increase in the use of this drag and a consequent improvement of the dirt roads of the state.

Many of the bills relate to miscellaneous subjects, such as railway crossings, removal of encroaching fences, road engines, etc. These are of minor importance and time will not permit of their discussion.

State Aid For Roads.

There are two bills relating to state aid for roads and as this is by far the most interesting and important subject in road legislation it will be considered more in detail.

The most important features of a state aid law are two. The first is a careful safeguarding of the spending of the state's money to insure that it shall be spent in the most efficient manner possible. The greatest difficulty with our present system of road improvement, as every thinking person admits, is the waste in expenditure of labor and money. Most people admit that the results attained under the present system could be attained at a much less expense if the roads were maintained by some company as a business matter, as the railroads are maintained.

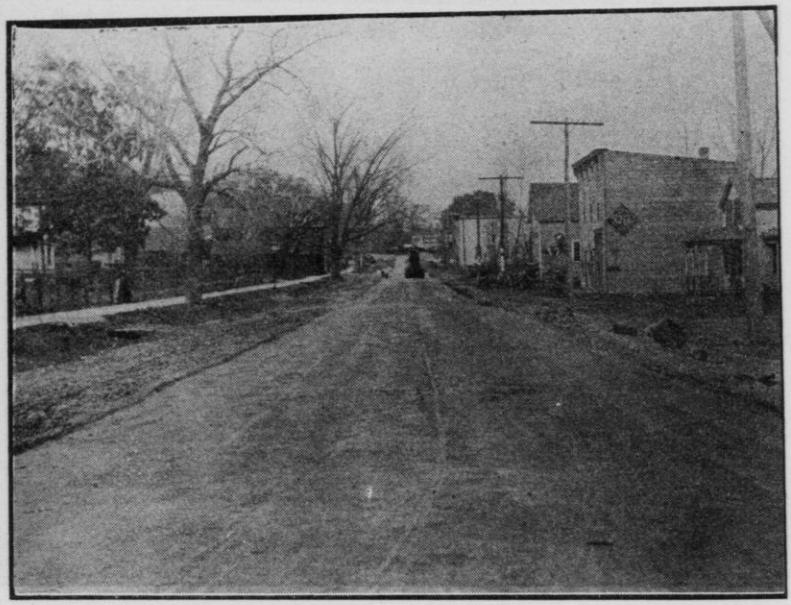


Road drag in use at Tomah, Monroe county. Drag is too heavy, but nevertheless does good work.

The first thing necessary for this efficient spending of state aid money is to keep it entirely out of politics. The commission should be one composed of men holding positions which qualify them to look after the matter of road improvement, such as the dean of the engineering college and the dean of the agricultural college. These

men should be ex-officio members of the commission. They should select a state engineer to be the active man in charge of the work. He should be the best man available and should be kept on the job so long as he gives efficient service. This method of administration would be essentially the same as has been found most effective and this public business should be put on the same efficient footing.

This is the system provided by the bill introduced by the senate committee on roads and bridges. The other bill introduced in the assembly by Mr. Jones provides for a commission of three appointed by the governor to control the work.



Street to depot, Hartland village, Waukesha county. Built with crushed gravel from local pits. Plans, supervision and machinery furnished by the Highway Division.

in all large private enterprises. The commission would compare to the board of directors, who would meet occasionally to decide upon matters of general policy, and the state engineer would correspond to the president or active manager who carries into effect and looks after the details of the things decided upon by the commission. This is the way in which all corporations from railroads down to co-operative creameries are managed.

I wish to point out some of the objections to this plan. In the first place, these three men are active paid commissioners—three bosses on the job. The commissioners in the senate bill are supposed to give but a small amount of time to the matter as a board of directors would, and are not paid, the state engineer being the active, paid manager—the single boss on the job.

But far more important than this

objection is the fact that men appointed by the governor would be subject to political influence. We have never had a commission in this state that has had the control of spending great sums, such as will unquestionably be spent on the roads under the state aid plan. We have a most excellent railroad commission appointed by the governor, but from the very nature of their business, they have comparatively little money to spend and there is but little temptation to appoint men for the purpose of influencing the spending of money that the commission handles.

With the road commission this will be different. This commission will probably have the spending of millions of dollars in the aggregate and it would be a great temptation to any governor to appoint such men as would use this money in such a manner as to help out his party and his own ambitions. It is evident to every thoughtful person at once that the state aid law should be framed in a manner to do away with this temptation and take the whole matter out of politics.

The importance of keeping state aid for roads free from politics is exemplified in many states. The greatest trouble with state aid in many states is that the whole matter is too much mixed with politics. A recent issue of a New York city daily commented on this difficulty in that state very forcibly. It stated that Governor Hughes had sent the names of three good men to the senate as his nominations for the state highway commission. The senate refused to approve one of the men, and the reason openly stated was that the two party machines (who are opposed to Governor Hughes) had agreed to divide the rich spoils of the highway commission and

Stone road nine feet wide, Almond, Wis. Built under the plans and supervision of the Highway Division.

refused to approve the appointment of a man whom they could not control.

We certainly do not want such a situation ever to be possible in Wisconsin and the best way to prevent it is to have the law provide for an ex-officio commission, composed of men entirely out of politics, whose positions will insure that the men holding them will be fit persons, such as the deans of the colleges of agriculture and engineering of the state university.

Same road, showing culvert in foreground.

The second important feature of a law giving state aid for roads is a just method of distributing the money. Two methods are proposed. The assembly bill provides that after the town and county have completed a road, the state commission shall examine it and if it is properly constructed shall reimburse about one-third the expense to the town and county. If the road is not properly built, they do not give any money. If more aid is called for than the money available will cover the aid is prorated in proportion to the money spent. This method works an injustice to poor towns and counties and gives the rich counties the advantage. Suppose a rich county builds roads calling for forty thousand of state aid and a poor county asks for one thousand dollars. If twice as much aid were called for as could be granted, the aid given each of these counties would be half that petitioned for, and while the poor county would only get five hundred dollars, the rich county would still get twenty thousand dollars.

The senate bill provides a system which is more equitable. It is not based on wealth alone, as the use of any one factor as a base results in injustice, as shown. The plan is briefly as follows:

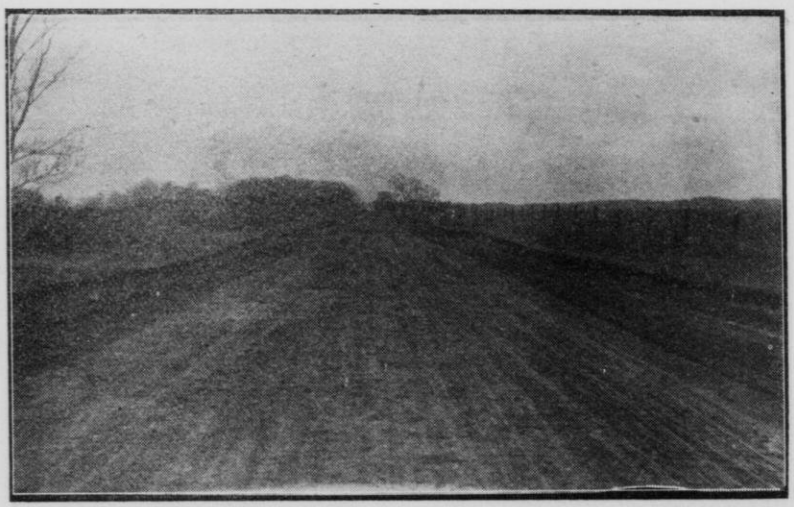
One-third of the total amount available for state aid is divided in equal

amounts, the same sum being allotted to each county. This division favors the small and the poor counties as compared to the larger and richer ones. Another third of the state aid fund is divided among the counties on the basis of area. This division gives the larger counties a greater proportionate share of the money than the small counties. The last third is divided on the basis of assessed value, and obviously favors the rich counties, as they would get a larger proportionate share of the money than the poor counties.

This threefold allotment of the funds is adopted so that each class of counties will be favored in one of the allotments—the poor counties, whether small or large; the large counties, whether rich or poor; and the wealthy counties, whether large or small.

All money not petitioned for by any county is reapportioned among those asking for more than their first allotment. This will enable the towns taking the matter up first to get roads built more rapidly than those that wait until more demands are made for aid.

Aside from the important features named, the two state aid bills differ in matters of minor importance only. Both bills repeal the present unsatisfactory and poorly thought-out county system laws that were passed last session. Both provide for a county highway officer—the assembly bill making it necessary to appoint one right away and the senate bill making his appointment optional until the county is ready to take up the permanent improvement of its roads.



A well graded earth road, Kenosha county.

How Towns Can Secure State Aid.

Perhaps of most interest to you here is the manner in which your towns can get state aid and the purposes for which it can be applied.

The first thing to be done is the selection of the main roads leading to market from the various townships. This is done by the county board. These roads will be improved first and later other roads will be added to the system as fast as they can be improved, so that eventually all the

roads will be improved. The most heavily traveled, however, should be improved first.

The next thing is for the town to vote a tax to improve a part of this county system. The town board then applies to the state highway department and to the county board for aid.

On the basis of these petitions, the state aid money is allotted to the various counties and the county board notified as to how much will be available in that county. The county board then grants such petitions as the state aid money will cover and appropriates the county's share.

Plans and specifications are then drawn up by the state engineer and contracts are let for the construction. This construction is inspected by the state to insure the proper spending of the state's money.

It is evident that at first there will be a smaller number of towns asking for state aid than there will be later, so those towns which apply first are almost sure to get what they ask for, while those waiting a few years will have to take their turn with the larger number that will then be asking for state aid. The best thing for any progressive town to do is to vote a tax this spring to be levied next January, providing the law makes state aid available next year, as it probably will.

The law will most probably be so framed as to cover all improvements that may be called permanent. The senate bill provides that the towns may get aid in putting on a stone or gravel surface, or in making a sand-clay or clay-sand road. They may get aid in cutting down a bad hill, even though they do not wish to improve the surface of the road with stone or gravel. They may also get state aid for a bridge on the county system of roads. These provisions are so drawn that any town, no matter how poor, can take advantage of the state aid law and get some state money to be used in improving its roads or bridges.

The proportions of the cost of these permanent improvements to be borne by the town, county and state are for cutting down bad hills or improving the road surface with stone gravel or other material approved by the state highway department, one-third each by town, county and state; for bridges on the county system of roads two-fifths each by town and county and one-fifth by state. The cost of drains, culverts and small bridges under six feet span are included in the cost of the road, and the state pays one-third of this cost also.

After these state aid roads and bridges are constructed, they are to be maintained at the expense of the county, and the town has nothing further to do with them or to pay on them, except to pay its share of the general county tax. This will let the towns apply the whole of their road taxes on the side roads and consequently these can be cared for in better manner.

In closing I wish to say that it is the desire of the committee of the legislature to get as many suggestions as possible from every interested person, and if you will write to me at Madison all the suggestions will be turned over to the proper committees. If you believe, as stated in the first of this paper, that the two important things in a state aid law are to keep the spending of the money out of politics, and to provide a just system of distribution of the funds, a letter to your assemblyman or senator will be of assistance to him in forming his opinion.

DISCUSSION.

A Member—What would seem to be the advantage of having the county keep up the roads, rather than the township?

Mr. Hirst—I read this paper at the request of Mr. Hotchkiss and I wish

he were here to answer the questions, but I will do the best I can. County work will make the roads more uniform. The county needs to have the machinery and can use it to better advantage. The towns are not large enough to keep the expensive machinery needed, nor to hire an expert road builder to take charge, while the county could easily do this.

The Member—I know a good many people who prefer that way.

Mr. Hirst—In the course of time these roads are supposed to be continuous roads leading from the towns out several miles, and the counties could maintain them, as a whole, cheaper and better than the towns.

Mr. Houser—Do you think it is possible to keep a thing of that sort entirely free from political influence?

Mr. Hirst—That is what should be done, and it is done in many states.

Supt. McKerrow—What do you think about it? You know more about politics than most of us.

Mr. Houser—I think you will have to go to the graveyard for your commissioners. It may be politics, but it will be a higher grade of politics. The trouble with this thing will be that the man who will undertake to go outside of the field and furnish competent men will meet his Waterloo.

Mr. Hirst.—The idea is to put this thing into the hands of a responsible body.

Mr. Houser—As I understand the theory of this movement, it is to get competent, scientific work done upon the road. The way our roads are constructed nowadays, you get mighty indefinite and inferior results—all sorts of roads by all sorts of plans. The state aid proposition is simply taking the money out of one pocket and putting it into another. It all comes out of the taxes finally, of course, but it makes for an intelligent expenditure of the money, and that is the object of the law and the benefit to be derived from it.

Mr. Hirst—I don't believe that it is going to result in the raising of the tax at this session of the legislature. It will probably be paid out of the general fund and the idea is that the rural communities will get a bigger share of the general fund than they have had in the past.

Mr. Houser—But you know the general fund is a fund that is derived from railroad taxes and from other corporation taxes, railroads and insurance companies, etc., and it goes to the payment of the expenses of the state. If you divert part of that fund into other uses, necessarily it must be replenished, and it must come from the same source that the original amount came from, and it is the people who pay the taxes of the state.

Mr. Hirst.—Of course that is true. We had a meeting down at Milwaukee, and one gentleman got up and gave a very eloquent description of where the money was coming from, and another gentleman answered him by asking, "Where do you suppose the money is coming from? Is it coming down from Heaven?" And yet the general fund is paying for our new capitol and when this drain is off the same amount could be used on roads without any greater tax than at present. We believe that this movement will result in a better expenditure of the state's money, because the state roads will serve as models for the rest to be built after. It is a fact that those roads and bridges are samples of what could be done by requiring the people to follow those plans.

Supt. McKerrow—I believe there is one very important thing in road legislation that I hardly think this legislature is going to get at, and that is the collection of all highway taxes in cash. One-half the farmers in Wisconsin possibly work hard enough to work out their taxes, but half of them work to great disadvantage and the money is improperly used, because

they do not fairly and honestly work out their tax. If we could allow this tax to be paid in cash and properly worked out under a correct system, we would not need to ask for more money from the state, there is enough money assessed if it is properly used, and I think that is one of the first things for the legislature to give its attention to.

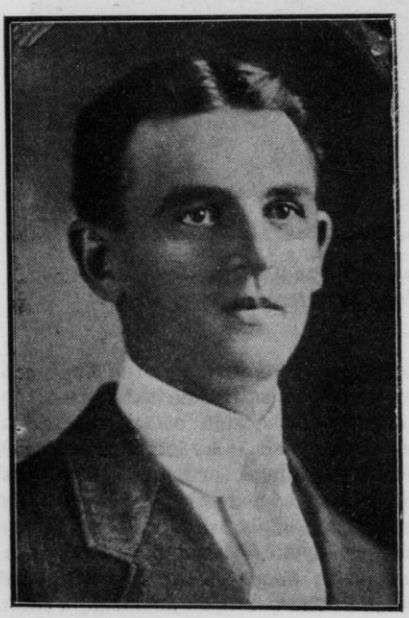
Mr. Hirst—There was one man who told us that he was going to put in a cash tax bill, but I guess he lost his nerve.

A Member—For the last few years the town where I lived has collected its tax in cash and they have the cash on hand; they couldn't get anybody to do the work for cash.

Mr. Hirst—This is because they went at it wrong. If they had hired two or four men to give their whole time to the work through the whole season, they could have got the work done, but they wanted it all done at once in the old way. The cash tax is no panacea for all road ills—you have got to have the proper system to handle it.

THE WORK OF THE HIGHWAY DIVISION OF THE WISCONSIN GEOLOGICAL AND NATURAL HISTORY SURVEY.

A. R. Hirst, Madison, Wis., Highway Engineer.



Mr. Hirst.

The Legislature of 1907 granted an appropriation to the Geological and Natural History Survey for the purpose (among other objects) of assisting towns, villages and cities in the construction and repair of their roads and bridges, and of promoting the improvement of the public wagon roads of the state in every way possible. To carry out the provisions of this act, the Highway Division was formed and it has since been engaged in doing all in its power to help the people of the state to get better roads and better bridges.

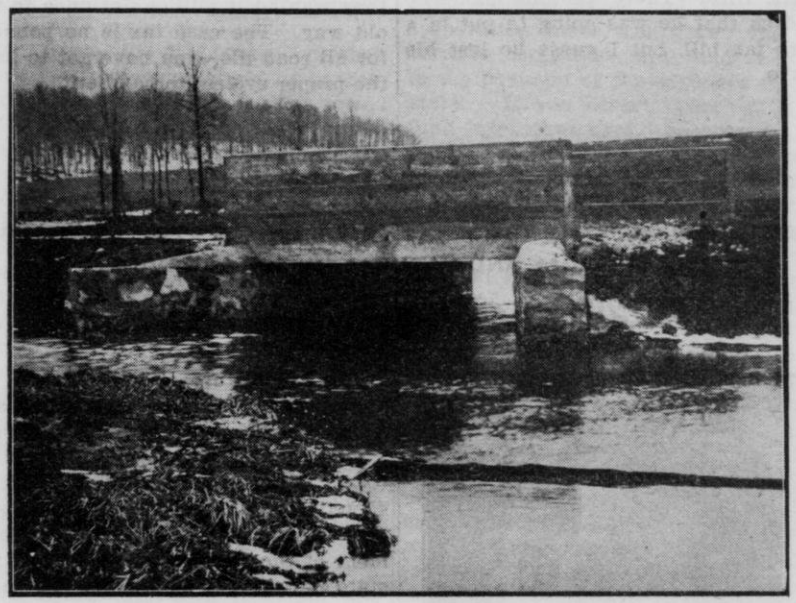
In the brief time allotted us this afternoon we shall only be able to present an outline of what work we have done and to give our ideas as to how best to attack this great problem of highway construction and maintenance.

Our work may be said to be divided into three main lines: Educational work, Road work and Bridge work. We will take these up separately and in the order named.

Educational Work.

Before there can be progress made along any line of improvement there must first exist a desire for progress. And before such a desire can exist, there must be a realization of the fact that present methods are faulty and that better results are possible by the application of different methods. Our educational work has therefore been directed toward the creating of this desire for progress and betterment. The means employed have been various.

Four pamphlets covering most of the common methods of road and bridge maintenance and construction have been published. These were written with the object of presenting some methods of improvement applicable to all localities and capable of being carried out by even the poorest town. In fact, our whole work has been along the line of economical and reasonable expenditure of the public road money. These pamphlets contain information of value to every town in the state and every citizen of the state will be furnished copies on application. Editions aggregating thirty-seven thousand copies of each have been distributed.



Concrete bridge, 12-foot span, on masonry abutments, town of New Holstein, Calumet county. Plans furnished by Highway Division.

A second branch of the work has been the road talks given at various public meetings, principally Farmers' Institutes. About two hundred talks have been given and in this way we have been able to get into direct contact with about twenty-five thousand people. The points emphasized in these talks have been the same points which we shall present today: better meth-

ods of maintaining dirt roads, better building of stone and gravel roads, and better and stronger culverts and bridges.

The newspapers of the state have been furnished numerous road items of interest and have published many of them. In this way many thousands have had an opportunity to read parts of the pamphlets previously mentioned, and other items of interest to road builders. Exhibits have been placed on the State Fair Grounds each fall, and many have there been enabled to get some idea of the modes of culvert and stone road construction employed at the present day.

The object of all of this work has been to arouse public interest in the subject of road improvement, and it is believed that in part this has been accomplished. There yet remains much to be done before the subject attains the position in public estimation that its importance warrants. If the state highway work is continued, it is expected that this public interest work will still be kept up and increased wherever possible. Talk and pamphlets (it may be objected) do not build roads, but they do sometimes create the spirit which results in their building, and without the arousing of this spirit of progress little can be accomplished.

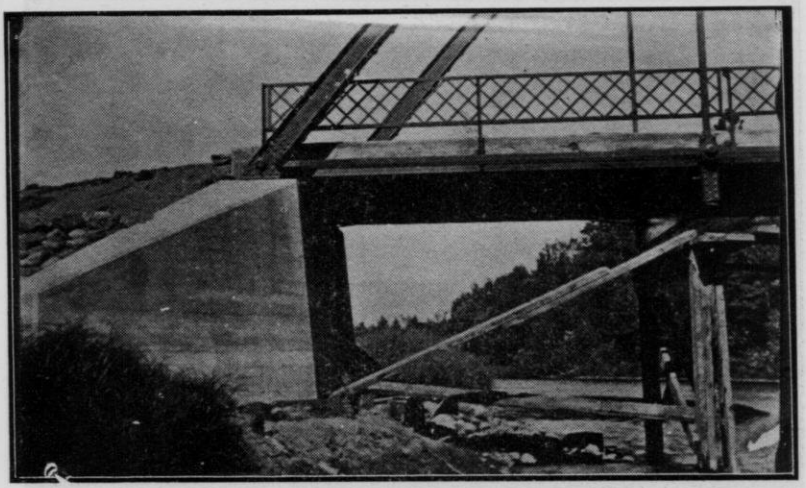
Reinforced concrete girder bridge, 36 feet clear space, town of Sand Creek, Dunn county. Contract price, $1,147, for bridge and abutments complete. Built under plans and specifications of the Highway Division.

Road Work.

The active road work may be classed under two heads—Dirt Road Construc-

tion and Stone and Gravel Road Construction, and the first is of more importance to this state than the second. In too many communities of the state, the dirt roads are considered as hopeless and fit to serve only as a base for a stone or gravel surface. It is true that dirt roads are difficult to maintain, but it is also true that no type of road will repay better the expenditure of a little money and a little common sense than these same dirt roads. They must be graded up with the road machine so that they can shed water to the ditches and the ditches and culverts must be so constructed as to allow the water to get away. If you add to these simple requirements a reasonable amount of work with the split log drag or plank drag after every rain, you will have a good road for travel most of the year and not impassable in the spring season.

We believe, and know, that no tool will give so much road improvement for as little expense as will the drag. Simple to make, easy to use and almost marvelous in its results, the drag should be in universal use instead of being employed in a desultory way here and there. Every mile of clay and loam road in this state should be dragged after every rain. It would benefit most of them and couldn't hurt any of them.



Abutment for bridge in Barron county. Built by town chairman from plans furnished by the Highway Division.

Pamphlet No. 2 gives our ideas as to how it should be built and used. If built as light as it should be, two horses will drag a mile of road in two hours at a cost of about fifty cents, and the result if repeated after every rain is that you get a road that dries out quickly and that does not rut badly, and is smooth and dry when other roads are a sea of mud. Practically every farmer in the state has read about its great work. He thinks, "Well, it's a fine thing for Missouri," or "It's done wonders for Illinois," or "It's done great work in Minnesota,"

but he must think that it is worthless for Wisconsin, for he throws the paper aside and thinks no more about it. If it is good in Illinois, Iowa, Missouri and Minnesota, it's good for Wisconsin, and this has been proved time and again last summer in this state. Hundreds of them are being used, but there is room for thousands more. We have yet to see the man who has used the drag with intelligence on a road fit to drag who doesn't say it's the best tool for dirt roads ever made.

We will make surveys for grading work and for draining difficult places, and for relocation of roads, upon request of town boards. The eye in some cases is not a reliable instrument to judge grades with, and in difficult places, where knowledge instead of guesswork is required to properly set grades or drain a road, we will take levels and furnish plans free of cost to the towns. We have made about forty such surveys in Wisconsin and furnished plans for twenty-five miles of work. Even the best engineers are often fooled as to the way drainage flows, and it doesn't pay to guess when in doubt. Good drainage is the first requisite for good roads, and we will be glad to help any town to solve any drainage or grading problem that may arise.

This office is willing to supervise the construction of stone, gravel, sand-clay or other surfaced roads upon request. The only way to build these hard roads is to build them right and with proper machinery. Road Pamphlet No. 3 gives our ideas as to stone and gravel road construction and a rough idea of their cost. Last summer we built stone or gravel roads at Sparta, Tomah, Glidden, Baraboo, Lake Mills, Hartland and Kenosha. These roads were all built with machinery loaned by the State and more or less under our direct supervision. We hope to continue work along the same lines this year.

We have yet to go into a community to build hard roads in accordance with modern methods where the old methods were not abandoned after a chance for comparison of results was offered. Countries that are building roads in any amount have long since given up the idea of throwing good stone or gravel down on a poorly constructed road bed for traffic to make into a road. The extra cost of properly preparing the road for the stone and putting down the stone properly is so small in comparison with the cost of the material used, and the added life of the road is so great, that they have found it didn't pay to build them by the old slipshod methods.

If these facts are true in England, France, Germany, New York and Massachusetts, they are true here in Wisconsin. If any community wishes to try modern methods and to build the best roads possible with the material at hand, we will be glad to do what we can to help them. Advice, surveys, plans and supervision will be furnished free of cost to the towns: In a limited number of cases, we will be able to furnish crushers and steam rollers to the towns also. Applications for surveys and machinery should be in early, as many applications are always filed early in the year.

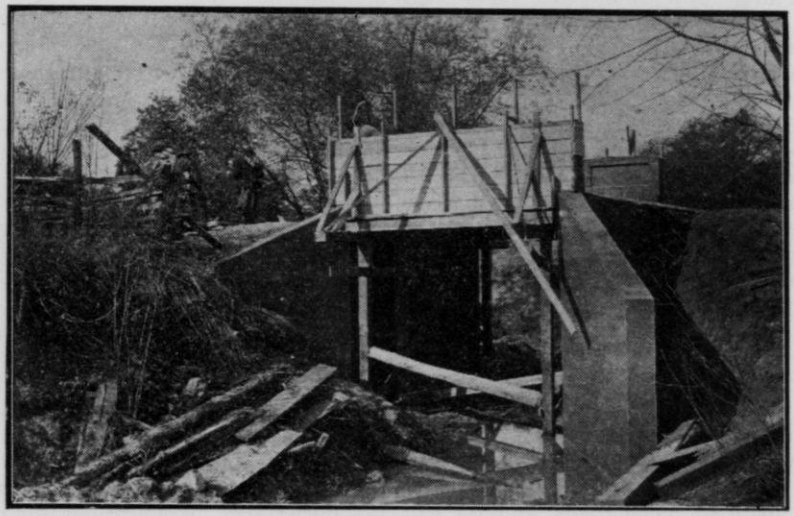
Bridge Work.

Probably the most popular branch of our work has been the bridge work. However well fitted town boards may be for coping with the road problems that arise, few, if any of them feel competent to design and erect their bridges. Lumber is rapidly passing into disuse as a material from which to build culverts and bridges, and steel and concrete are taking its place; and the field of bridge construction opened by their introduction is a great one. The people are beginning to realize

that bridges, whether of stone, concrete or steel, should be designed by those who have made a study of bridge engineering, and our bridge department was organized to meet this demand for skilled supervision in bridge work.

In throwing the old materials aside, we should be careful to select the materials which are best and most economical in the long run, and if we can get material which is not only cheapest in first cost but is also the longest lived, we are indeed lucky. Concrete is such a material. Available in most localities, it is inexpensive in small sizes of culverts and bridges, easy to build and practically everlasting. It neither rots, rusts or burns, and with all these virtues has few if any faults. If gravel or stone is available under two dollars per cubic yard, circular concrete culverts can be built cheaper than you can put in any kind of metal pipe and the culverts will be there when the pipe is a streak of rust. It doesn't pay to dig down in your pockets and send money out of the town for metal culverts. Spend the money at home and build concrete structures.

Reinforced concrete culverts and bridges can be built up to thirty or forty feet in span within reasonable cost, but are most economically used for spans of thirty feet or under. Steel eye beams with concrete floors make a good bridge for spans of from fifteen to thirty feet. Above thirty or forty feet, according to circumstances, steel truss bridges should be built, but they should be built strongly and on proper foundations. The fact often proudly stated that a town has its bridges built of steel means little or nothing. There are such variations in the design and strength that the term "steel bridge" means no more than the term "horse." One horse may be



Flat top concrete bridge. Completed with the exception of filling the approaches and removing the floor forms.

cheap at five hundred dollars, another dear at five hundred cents; one is fit to bear the strain of travel for long years, the other is liable to drop at the first indication of a heavy load. It's the same way with bridges. To be safe they must be designed properly; to be strong they must contain the proper amount of steel properly distributed; to last long they must be built of long-lived material. How many highway bridges are known to embody these requisites by those who pay for them? A light bridge with a plank floor that rattles when you go over it, seated on eye beams stuck in the mud, backed with steel or plank, certainly does not fulfill any of these conditions.

A steel bridge should always be seated on masonry foundations, except where extraordinarily poor soil is encountered at the bridge site, or where material for cement rubble or concrete masonry is only available at a prohibitive price. Possibly it is occasionally best to use steel cylinders for foundations, but we can't think of a condition where it would be best to use eye beams stuck in the mud with a backing of steel or plank. Farmers don't think of placing barns or houses on steel foundations, why should they then allow bridges to be built that way?

A reinforced concrete girder bridge, 36-foot span, Town of Sand Creek, Dunn county. Largest span, flat top, concrete bridge in the state. Contract price, $1,147. Built under plans of the Highway Division.

This whole problem of bridge work, it seems to us, comes down to the simple proposition that bridges, whether of stone, concrete or steel, should be designed by those who have

made a study of bridge design, just as farms should be run by men who have made a study of farming. A good bridge engineer would make a poor farmer in a good many cases, and a good farmer is just as apt to make a poor bridge engineer.

The answer is sometimes made that the town boards don't design the bridge; the bridge companies, who have good engineers, do that. This may be true, but the work of the bridge companies should at least be looked over to see that it is right and strong, and no man can check the design of a bridge unless he is master of the principles of bridge construction. If towns are willing to trust to the good faith and honesty of the bridge companies to give them a good strong bridge at a fair price—well and good—put the matter of what the seller shall give and the price he shall get for it entirely in the seller's hands. But we don't think that is the way to do public business. We believe that there is great need of some disinterested party between the man who sells and the town which buys, to see that the town gets a good strong bridge at a fair price, rather than a weak bridge at a strong price. This service the Highway Division offers to the people of Wisconsin free of cost. An engineer will visit the bridge site and in consultation with the town board and county bridge committee decide upon the kind of bridge to be built. We design the bridge in accordance with this decision and furnish plans, specifications and estimates of cost to the town board. At the letting the

Hewitt Bridge, Towns of Chetek and Dover, Barron County.

Concrete abutments, pier and floors built by the towns. Two 80-foot spaces. Cost for complete bridge about $4,000. Built under plans and specifications of the Highway Division. One of the best and cheapest bridges yet constructed in Wisconsin.

town then has a proper plan and a proper price placed upon it. The bridge companies all bid on a bridge of the same strength and the company which bids lowest is putting up the best bridge for the least money. After the bridge, if steel, is erected, the bridge will be inspected to see that the specifications were fulfilled. We believe that this plan offers towns a good chance to get a square deal in buying bridges, and since the assistance is offered without cost to the town, there is no reason why towns should not avail themselves of it.

In the manner just outlined we have furnished plans for about two hundred and fifty bridges since we commenced this work, and it is believed have given satisfaction to the towns in most cases. This summer we hope to make even a better record.

A steel bridge should be built with a concrete floor in practically all cases for spans under one hundred and twenty-five feet. The concrete floor will save its extra cost before the lifetime of the bridge is one-third past, even if lumber did not advance in price. The great question, however, is not what plank floors cost now, but, if lumber advances in price as it has in the past, what they will cost twenty-five, fifty or even seventy-five years from now, when a well built steel bridge will still be in existence. The time for using plank has passed except where absolutely necessary.

Do away with plank floors on good masonry abutments for short spans—put in concrete floors instead. Put concrete floors on wood covered eye beam bridges, putting in more eye beams to bear the extra load, if necessary. Do away with wood boxes as fast as possible, concrete is cheaper by far in the long run.

Pamphlet No. 4 gives prices of various kinds of culverts and bridges and data for building simple structures. In most cases, however, it is better to have our engineer visit the site and make special plans to suit conditions. If there isn't time to have us design the bridge, send the bridge companies' plans to us and we will see that they are all right and give the proper price to be paid for such a structure.

The public has a duty in this bridge work as well as the town board and the bridge committee and the bridge companies. That duty is to appropriate enough money at the town meeting for a good and strong structure. Small prices mean poor bridges, however honest and intelligent your representatives may be. The greater portion of poor bridges in the state are not due to graft but to small appropriations. Good economical bridges are not cheap in first cost, but are cheap in the long run. One forty-foot bridge with abutments may be cheap at a thousand dollars while another is dear at six hundred.

Give your town board enough money to build right; ask them to call us in to help them in the design of the structure and in most cases the town will get a good bridge at a fair price.

To Recapitulate.

The ideas we have tried to spread are the following:

Better grading and draining of earth roads.

The universal use of the earth road drag.

Proper construction of stone and gravel roads with good material and modern tools.

Replacing metal as a foundation for bridges with masonry.

Substituting stone and concrete for metal in culverts and small bridges.

The construction of concrete floors on all new steel bridges.

Through all the work we have tried to emphasize true economy in public expenditures. If we can only get away

from the idea that the cheapest thing is best much will be accomplished. More money should not be spent until better methods of expenditure are common. Let the motto of each community be not more work for less money, but good work for as much money as is necessary to get it. But above all each individual in the town must take an active, live interest in seeing that his tax is expended fairly and honestly along proper lines. Let us have a dollar's worth of road for every dollar of tax.

DISCUSSION.

A Member—I understood the gentleman to say that he advised not using any planks upon bridges, except in case of necessity. Please state what that means.

Mr. Hirst—The only case of necessity that I know of is old steel bridges that are not strong enough to stand concrete floors.

A Member—Would you advise building concrete bridges under any circumstances without regard to cost?

Mr. Hirst—No, sir; I would not; for there are many communities in this state that cannot build concrete or stone rubble bridges, but in general, for small span bridges, we believe in building them of masonry.

A Member—I know of some bridges that have been built where you could take the interest on the money invested and keep the bridge—every timber up perfectly strong.

Mr. Hirst—That must be a place that is pretty far away from concrete material. It is a wrong idea that concrete structures are very expensive. Small structures can be built, if gravel can be got under two dollars a cubic yard, cheaper than you can build with steel or iron. In larger structures, say, of eight or ten feet spans, they can be built a good deal cheaper if maintenance is considered. There is no question that it is past the time to use lumber. The choice is now between metal structures and concrete, and concrete is cheaper, even in first cost, in many cases.

Mr. Gilman—Is concrete cheaper than stone when stone can be bought at seven dollars a cord?

Mr. Hirst—No; not unless the gravel is right there. In Trempealeau county they can get the stone in place in arches at ten dollars a cord, and of course we can't beat that. They are a good type of structure; we have nothing to say against stone arches.

Mr. Gilman—What kind of foundation do you want for a stone arch bridge?

Mr. Hirst—Well, if you have good gravelly soil, you can build on the natural soil, or if you have a natural clay soil or hardpan; if you have a sand foundation, you would possibly have to pile it. The way we treat sand and other soils that need it is to drive piles, in some cases two or three feet apart on centers, cut them off below water level, cap them with a concrete base, and then build up the walls over it. It is a mighty expensive foundation.

Mr. Gilman—We have one of those stone arch bridges and it took four courses before we got up to the level. We laid it in cement.

A Member—Will sandstone do for the arch?

Mr. Hirst—Sandstone is all right.

Mr. Gilman—Do you consider it a good business proposition to put in a concrete bridge over one of our creeks from four to six feet wide where you sink four hundred dollars for foundation concrete and then a cement bridge on top of it? That has to be done very often in this part of the country.

Mr. Hirst—We examine all kinds of propositions when we look at a bridge

site and we try to do what is most economical in the long run. Usually we find it is best to use concrete or stone for such short spans.

A Member—Will cement arches crack?

Mr. Hirst—They do sometimes if not reinforced, but that is not a very serious fault.

A Member—Will wire help that?

Mr. Hirst—Yes.

Mr. Convey—Has the road drag any value in repairing stone roads?

Mr. Hirst—The road drag has a value in repairing stone roads where the stone or gravel has been kicked or pushed out to the edges, it serves to bring the material in and fill the ruts and horse tracks.

I am sometimes asked whether steel rods are useful in concrete; in other words whether reinforcing will add to the strength of the structure. To illustrate that proposition, I will take this plain concrete bar and try to break it. You see it breaks pretty easily, as plain concrete has little tendency to resist pulling apart, though it has plenty of compressive strength. The reason for using steel rods is to give concrete tensile strength. When we put the two together as in reinforced concrete, we get the tensile strength of the steel and the compressive strength of the concrete in the one material for construction. Now, in this bar, which is reinforced in this way, we see the effect, as it is practically impossible to break it when held with the steel in the bottom of the slab, where it is needed. When the bar is turned over with the steel on top, where it is not needed, you will note that the bar is easily broken. Now, in building concrete structures, the application of this principle is simple; you must put your steel rods in the position where the strength is needed, and that is in the bottom of bridge floors or slabs, and on the outside of silos.

A Member—In a round silo the pressure is pulling all the while.

Mr. Scribner—Will not that reinforcement rust out in course of time?

Mr. Hirst—They claim it will not. They have been building with it over in Germany and Austria thirty years or more. They have had to take down some of the structures which have been up twenty-five or thirty years and they found no rust. You see no air can reach the steel and consequently no rust.

Chairman Imrie—How many in this audience have used the King road drag? Evidently only a few.

A Member—We have used it on sandy roads and of course there is not much necessity for it there.

Mr. Hirst—No; it is not much good on sand, if any.

A Member—How would you remedy sand roads?

Mr. Hirst—The easiest thing is to put straw or hay on them, or shavings or sawdust.

A Member—Straw is best in the winter.

Mr. Hirst—The next step is to put clay on them, if you have it within reaching distance; it would hardly pay you to go over a mile or so. Within that distance, if you haul clay on it and mix the two together, you have got a pretty good piece of road. The best gravel roads and the best stone roads are built on sandy soil, because you get the best drainage.

Mr. Convey—Isn't it possible for sand to be so loose that it would be difficult to establish a stone road there?

Mr. Hirst—We never found any trouble. We spread about two inches of marsh hay and then the stone will readily compact and not mix too much with the sand. It is usually necessary in building stone roads to be rolled

with any kind of a roller on sand to put in a foundation of hay or straw. If you apply a couple of inches of clay, it will do the same thing; anything to keep the sand from working up in between the stones.

Mr. Convey—How thick a layer of clay would you have to have to make a good road on these sandy roads?

Mr. Hirst—All the way from four to eight inches in the center and tapering out to two to four inches on the side, slope it up nicely and roll it thoroughly. The only piece of sand clay road we have built in Wisconsin was up in Colfax, where we had a pretty poor quality of clay, but it was a pretty fair job. Put sand on clay roads or clay on sandy roads and it makes a big improvement to both of them. One good application will keep a road in pretty good condition for a number of years.

Adjourned to 7:30 P. M.

EVENING SESSION.

The session met at 7:30 P. M., March 16. Superintendent McKerrow in the chair. Music by the Farmers' Institute Quartette.

COMMUNITY AND HOME INFLUENCE ON EDUCATION.

Prof. H. H. Liebenberg, Buffalo County Training School, Alma, Wis.

The people of Mondovi and vicinity deserve to be congratulated upon having secured this Closing Institute for our county. It is indeed a great privilege for any one to be able to witness the climax meeting of our Farmers' Institutes for this season. In the midst of these broad-minded and experienced men who have done so much for our rural communities, I feel more than ever my inefficiency to deal with the great problem I am to discuss here tonight, namely, "The Community and Home Influences on Education." One of the great difficulties in discussing a problem of this kind is to see the true relations of the large variety of forces that enter into it, only too often a one-sided view is taken and treated as though it included the whole field. The situation reminds me very much of the story that John G. Saxe tells about the six blind men of Indostan who went to see the elephant. "One fell against his side, and at once began to bawl 'God bless me, but the elephant is very like a wall.' Another got him by the tusk and declared that he was very like a spear. Another who got him by the trunk averred that he was very like a snake. Another who got him by the leg swore that he was very like a tree. The fifth seized the elephant's ear and said he was like a fan. While the sixth, who laid hold of the elephant's tail, insisted that he was very like a rope."

"And so the men of Indostan
Disputed loud and long

Each in his own opinion
Exceeding firm and strong,
Though each was partly in the right,
And all were in the wrong."

How often that is true of the notions, discussions and criticisms of our public schools. Have you ever made note of the great variety of views expressed by different people in regard to public education? These people are almost always honest in their views and convictions; the trouble with them is that they have taken only a one-sided view of the elephant. This same situation confronts so many of our parents who think that when they have sent their children to school they have performed their main duty toward bringing them up. When, at our educational gatherings, we listen to the learned discussions which so ably portray our educational system as a complete and sufficient means to develop our boys and girls into good citizens, we have overwhelming evidence that our teachers too have a very one-sided view of the elephant. There is no getting around it, every child's early development is largely the result of home influences and it is here that the foundations for future development are laid. It is here that he develops his powers to see, to hear, to walk, to talk, to please, to displease, to judge right and wrong, to judge people, to inquire into his surroundings, to understand some of his relations to his environment. To attempt to enumerate all his different lines of development during the early years of his life would be folly, because it would be impossible. There comes a time, however, in the child's life when he needs opportunities for development that can probably best be arranged for in schools, but this does not mean that home influences then cease. The power to read, the opportunity to come in contact with the ennobling influences of biography, history and literature; the power to express ideas in oral and written form; the ability to perform numerical calculations, both concrete and abstract; the power to understand the relations of individuals and communities to industries and environments are some of the lines of development for which our schools ought to provide adequate facilities, because if our schools do not provide these they are never provided for many of our children. The legal status of our schools today assigns to our schools their places, their work and also their limitations. I believe the efficiency of our schools is extensively undermined by our over-zealous teachers, superintendents and educational writers in their efforts to accomplish everything.

I will invite you again to our educational gatherings and to our educational literature. In both you can freely find the wonderful purposes of our schools elaborately painted in panoramic pictures of glowing splendor, purposing to build magnificent character, to evolve the ideal social being, to develop the perfect citizen, to teach that all is love, to teach how to live completely (one of our girls by misreading a letter had it, to teach how to love completely). The variety of this panorama is as endless as are teachers and educational writers numerous. This array of idealistic purposes is enough to bewilder and discourage the efforts of almost any conscientious teacher. When we compare these idealistic purposes with the actual purposes of the plain, everyday, ordinary teacher as she stands before her class, we find a difference as great as is the difference between day and night. When we compare the final results of our schools with the teacher's purpose, we again find a great difference. The actual results of our schools quite fairly represent the aims and purposes of

our children,—aims and purposes so often ignored, so seldom cultivated, and yet they are the only aims and purposes that in reality count for anything in our educational processes. The child's interests, desires and purposes are vital factors in shaping the child's development.

Effect of the Community Influence.

Another force that we must reckon with in the educative processes is the community influence. By that I mean the child's relation to other homes, other people, community interests, the church, his playmates, his street life, etc.

In the development of every child there is probably a period when these community influences predominate over all others. His playmates teach him how to play fair, how to obey rules, how to judge and punish his fellows, and many other things. What the child of today learns about the mysteries of life he learns very largely from his playmates and chance acquaintances on the streets and on the playgrounds, and often in this connection he is brought in contact with low moral ideals which more or less influence him for better or worse throughout life. The wholesomeness or unwholesomeness of these community influences is usually quite independent of individual home or school influences.

The relative importance of these various educational forces was well shown by Dr. Washington Gladden in an investigation in 1880 concerning the school training of one hundred successful representative business men of Springfield, Massachusetts. These one hundred men, including "bank presidents, insurance company presidents, chief managers of railroads, heads of the most important manufacturing companies, leading merchants, leading lawyers and physicians, chief editors, and principals of schools," were asked where they spent the first fifteen years of their life. Of the eighty-nine who replied, seventy-two (over eighty per cent of them), stated that they spent their first fifteen years under rural conditions. Recent investigators inform us that among our successful men of today, two out of three grew up on the farm. These investigations show that our former farmer boys who enjoyed only short term ungraded schools, taught by untrained teachers in crude buildings, outstripped their city rivals who enjoyed better buildings, richer equipments, expert superintendents and trained corps of teachers. These investigations also show that it was not school influences, but community and home influences that brought about such results. The clearing of the land, tilling of the soil, raising the crops, taking care of the stock, and the many other farm activities, together with the simple home life and frugal management everywhere,—these were the factors that developed the qualities of those successful men. During their early years these men developed good digestive systems, abundant lung capacity, vigor, intelligence, skill, and habits of industry and perseverance which later in life became their ever available resources.

Conditions on our farms have materially changed. Some of our people still remember what perseverance and endurance it required years ago to hoe and hill the corn and potatoes. Today our farmer boys ride on the sulky cultivator in comparative comfort and ease. Some also remember what it meant years ago to sow, rake and pitch hay by hand. Our farmer boys today handle the hay by machinery and horses from beginning to end. Binding grain by hand used to test the quality of the farmer boy, now he rides on the self binder and does the hardest part of shocking the grain by

means of the bundle carrier. Cutting and husking corn by hand is fast giving way to the corn binder and shredder. In regard to the care of the stock, some of you remember what it meant years ago to dig the hay and cornstraw bundles out from under the snow and carry them into the log barn where the stock was tied to mangers along the walls. Compare that to the warm, well ventilated barn of today, with its convenient feed storage, its silo, its central feedway, with its trucks to carry the feed to the stock, its manure carriers that dump the manure directly onto the manure spreader to be hauled to the fields. The bucksaw for making firewood has given way to the steam circular saw. Think of what it meant years ago to cut, split and haul the rails and build a "worm" fence, and compare it to the building of a modern woven wire fence. There is almost no comparison, and the end is not yet. A bulletin just issued by the Department of Agriculture says that for a herd of from fifteen to twenty cows electric machine milking is more economical in every way than hand milking. The work of muscles is everywhere being superceded by brain work. It has been said that "Necessity is the mother of invention," well might it be said in many, many instances necessity has been the mother of growth and development. Our farms still offer abundant opportunities for work, but the necessity for our children taking part in it has been largely removed. As a result our rural children have no longer the physical endurance they formerly had, and their physical development is still on the decline.

City children never enjoyed adequate facilities for physical development. Cities and city schools are now providing, under desirable supervision, larger and better playgrounds, outdoor and indoor gymnasiums, swimming tanks, etc. These, although inadequate, are somewhat improving the situation.

Physical Activity Essential to Growth and Development.

Let us turn for a moment to one of the immediate conditions necessary for the growth and development of a child. We know that appropriate physical activity ever leads to growth and development, and inactivity to weakness. This law for physical development holds equally true for mental, moral, spiritual, aesthetic, all kinds of helpful and harmful developments. We may sum this up into the simple statement that each individual's growth and development is the direct result of his thinking and acting. What you and I are today is the direct result of the thinking and acting we have done in the past. What you and I are going to be in a year, in five years, in ten years, from now will depend on the thinking and acting we do before that time. This explains how a child can grow up in what we call a splendid home and attend what we consider a most excellent school and remain undeveloped if he fails to do the necessary thinking and acting, or develop into an undesirable citizen if his thoughts and actions are of the kind that lead to this. It also explains how a child can grow up in a hovel, attend a poor school, or attend school very little, and yet grow into greatness, power and usefulness if he does the right kind of thinking and acting, as, for instance, was the case with Abraham Lincoln. This also shows that all real growth is from within and is the direct result of spontaneous effort. The person who is no better than the law compels him to be is not going to grow into the best kind of a citizen, and the pupil who does no more in school or out of school than he has to do is not

undergoing any great growth or development. The desire to be and the desire to do seem to be essential requisites in the processes of true development.

Some of the Educational Problems to be Solved.

To what extent are the desires of our children to be and to do influenced by our untrained, poorly trained, and often immature teachers, and to what extent are they influenced by the home and community life in which they live? We all know the answer, and in that answer we can clearly behold one phase of the great community and home influences on education.

I believe our people do not generally understand the importance of this situation. Ask the parents why they send their children to school. Ask the children why they go to school. Both parties will tell you "to learn," "to get knowledge." Many teachers in our schools work with the idea that it is their business to impart the knowledge they find in the text books. So the process goes on from without inward, "pouring in" knowledge, while real growth is always from within outward. The knowledge poured in is frequently unsuited, improperly prepared, or too large in quantity, so that it can neither be properly digested nor assimilated, and as a result many of our children are mentally dyspeptic.

Another condition that frequently leads to the "pouring in" process is found in districts where the community and home influences are indifferent to higher ideals in intellectual, moral and spiritual life. A teacher entering such a district cannot suddenly create the proper ideals and desires and in order to make any kind of a showing will consciously or unconsciously resort to the "pouring in" process and very often with the already stated results.

Another element of this problem, widespread and deep-seated among our people, is the desire to live comfortably without the necessity of doing productive work. For years, yes for centuries, people have praised, extolled and eulogized those who have invented machines to relieve man of burdensome physical labors; those who have taught how, with the same effort, two blades of grass may be made to grow where formerly one grew; and those who have taught in so many vocations how to get larger and richer results from a minimum of effort, until there has sprung up this almost universal false notion that 'labor is a curse" and "leisure is a blessing.' Many of our children have absorbed this so thoroughly that they come to school to do the least they can do and get the pass mark and the diploma, apparently utterly ignorant of the fact that their growth is directly proportional to the thinking and acting they do. Where this kind of a spirit prevails, the best equipped school with the best kind of a teacher can produce only meager results. Tompkins in his "School Management" tells us that although other things may be helpful "A school can exist with a Mark Hopkins on one end of a log and a Garfield on the other." When the right spirit, the right attitude is there, success is within reach.

Another widespread and often pernicious idea among parents and children is that all school work should be made easy and interesting. All difficulties must be smoothed out and the children must be entertained. How strong this idea sometimes becomes is well illustrated by an incident that happened in one of our practice classes. When a boy was taken to task for not paying attention to the recitation, he promptly informed the teacher that "If she had made the recitation more interesting he would have paid attention." What tragic condi-

tions there are when such children leave school and embark in the struggles of real life! How quickly their little crafts become shipwrecked! Many scarcely survive the struggle and those who succeed must begin life over again and build along new lines. It is no wonder that G. Stanley Hall of Clark University deplores that "Our school children of today lack stamina." Nor is it strange that Hon. Duncan McGregor, ex-president of one of our Normal Schools and a lifelong teacher, when asked "What is the greatest need of our schools today?" said, "As I see it, what Wisconsin and our entire country needs more than anything else affecting education is school material properly prepared for the activities of school. If the child were sent to school trained to obedience and accustomed to industry suited to his years the returns for educational investment would be much more satisfactory. Indeed, it not infrequently is found that the child is spoiled as school material on account of the false motives he brings to school in regard to obedience and the pernicious idea that the chief duty of the teacher is to relieve him from all responsibility. * * * Resolutions by associations and even legislative enactments can bring no relief. This condition is beyond the power of school authorities to change. * * *" For rural people, another phase of this problem arises when their children have finished the common schools and are sent to the neighboring high school. This usually occurs at an age when the superficial glitter and glare of the city only too often makes them discontented with their former surroundings. At this time, too, they still need the care, advice and guidance of their parents. At this time they also need very much the chores and other work they do if they are on the farm with their parents. When mature enough there are many advantages in children leaving home and mingling with people of other communities, but this condition is quite undesirable until after high school years. Our legislature has wisely recognized this and has made provisions that any rural district or group of rural districts maintaining a high school shall have one-half of the expenses for maintaining such a high school paid by the state. It is unfortunate that so few of our rural communities have taken advantage of this splendid opportunity. At such a school arrangements could be made so that the children who live some distance from school could drive there and find facilities in the school for preparing a warm dinner and also shelter on the school grounds for their horses. The courses of study for these schools could be such that they would meet in the fullest possible measure the particular needs of the children in the community. Enough land could be provided to do actual gardening. At least one study each year throughout the course could be devoted to practical work in agriculture, manual training, domestic science, etc., including a study of the leading crops, stock problems and manufacturing interests of that neighborhood, with wood work, iron work, machine economy, etc., for the boys, and cooking, sewing, sanitary housekeeping, etc., for the girls. Such a school would also furnish facilities and a splendid nucleus for uplifting entertainments, social meetings and social gatherings for the neighborhood.

We live in an age of organizations, where clubs, meetings, conventions and associations abound in great numbers,—an age in which the general intelligence of our people is rapidly enlightened by general reading and study. All our intelligent farmers are reading and studying more or less extensively the needs of their cows and calves, horses, sheep, hogs, chickens,

bees, corn, clover, grains, tobacco, meadows, pastures, silos, soil, drainage, water supply, mulching, insect destruction, and what not. I see by this afternoon's program that there is a beginning to study egg nog, egg lemonade, egg junket with whipped cream, albumenized milk, gruel, soup, chicken galore, cook-boxes, roasts, toasts, steaks, tomatoes, sauces and dates. I think some of our young ladies may take very kindly to the instruction in regard to dates. Each one of these subjects is important and all are valuable and I am heartily glad they receive attention. May I ask you mothers here tonight what books you are reading systematically on the development of children? When and where do you hold your mothers' meetings and mothers' clubs for this purpose? What are we fathers reading along these lines? When and where are our conventions and associations for this purpose held? May I ask you in all candor when, where, by whom and to what extent are the needs of our children systematically studied? Do we as parents and communities who wield such a powerful influence over them give them a square deal? Can we leave them a greater legacy than their fullest, richest and noblest development? No matter how prosperous we are along other lines, the richest and most valuable output of our farms and our cities is well-developed children. Our educational situation urgently demands relief from sources our schools cannot reach directly. There are neither immediate nor remote prospects that our schools can directly bring relief to many of the problems that confront them.

Great hopes are now entertained for what Manual Training and Domestic Science will do for our children. There are excellent educational opportunities in these lines of work, but as long as our children come to this work with the same spirit in which they approach other school work not much, if any, relief is in sight. Those who are hoping that this work will usher in an educational paradise are in all probability doomed to a sad disappointment. The attempt to solve our educational difficulties by the introduction of manual training and domestic science looks about as hopeful as to try to tame a wild elephant by attempting to teach him certain movements of his tail. No doubt something can be accomplished, but to secure the desired result the approach in either case is probably from the wrong direction. As long as parents and communities are invested legally and morally with the powers and privileges which they now have in regard to their children, they have certain duties which no other agency can perform for them. One great need of our day is to help parents and communities to see more clearly their relations and duties towards their children and to assist them as far as possible in the performance of these duties. It would seem that if some of the money and effort now spent in educational work were effectively spent in enlightening parents and communities ultimately better educational results would be secured.

The sooner we recognize the various educational forces and bring them into that harmonious co-operation where each does its part, the sooner will we reap larger returns from our outlay of money and effort. If the efforts of the present day furor of public school criticism, often about things beyond the direct control of schools, could be directed and utilized to develop better educational sentiment generally, a valuable resource for a desirable movement would be secured.

THE HIGHER IDEALS OF FARM LIFE.

A. J. Buxton, Wittenberg, Wis.

I think I am the youngest of the Farmers' Institute family, and I feel very proud that I have had the opportunity of being invited, for a time at least, into the family.

I was very much interested this afternoon while hearing the discussion of the subjects that were presented, these discussions coming from men of different nationalities, from all parts of the United States and different parts of the state, men who have come to our land and to our state to become farmers and help us in solving our problems as farmers here. What nation can boast a citizenship such as ours? The peculiarities of speech indicate that the Irishman and Englishman, the Scotchman, the Welshman and the German are here. To all these we have opened our doors and after a generation or so we see their boys and girls with a common expression upon their faces, with the American flag in their hands, come tripping down the steps of our public schools singing, "My Country, 'tis of thee, sweet land of liberty."

Upon the program of this Round-up Institute we have had discussions that have interested us in the various domestic animals that are found upon the farm; the cow and the sheep, the hog and the horse, have all been discussed, and the discussions have been entered into with great interest, for we are farmers who are interested in the development of these domestic animals. It is given to me tonight to draw out another thought, to present the animal that is found upon the farm which is not a four-footed beast, although he sometimes seems to have cloven hoofs. I am to speak tonight of the two-legged animal, the man, the farmer himself. It is my purpose to confine myself to the farmer as a man, and his place among men. If in the past the farmer has allowed himself to be called a "hayseed" and to be spoken of as an "old Granger," it is nobody's fault but his own. The farmer has not held up his head with the dignity of his profession, or his vocation. The farmer has not demonstrated himself in the past as he is demonstrating himself today, as a man of the community, a man of affairs in the state and in the nation.

Today he has come to be a scientist. His vocation has become one of the sciences of the hour. The farmer has a place among the men of his time, and he is demonstrating the fact, just as every other class of men is demonstrating the fact, that the ideals of a community are never higher than the personal character of the citizens. I shall speak tonight of those higher ideals which I think ought to characterize the farmer's life, the farmer's attitude to other men, and the farmer's attitude to his task.

A Mistaken Idea.

The people of the professions have a tendency to look down upon the farmer and the farmer's job and to think that when a man steps aside from one of the professions and takes his place upon the farm that he is lowering himself, or that he is limiting his opportunity and has cut himself off from much that ought to be true of his life.

This is a mistaken idea. As an illustration of this in my own life—I am a minister, at the present time a pastor of a church. Because of ill health I

have been forced to go out into the country and am now out on leave of absence on my farm. A personal friend, a real estate man, came to me not long ago and calling me by name said, "I am very sorry indeed to see you out there on that farm on the edge of the woods; to me it is a sad mistake to take charge of the estate. He was going into the mule raising industry on that farm in the south, and I was to take charge of it with ten or twelve negroes to assist me, and there under southern conditions and in that southern atmosphere I was to look upon my widening horizon. He was very ear-

Dwelling on Cedar Spring Farm, east and south view, home of A. J. Buxton, Wittenberg, Wis.

that such should come to be true of you. I have got an opportunity for you, I want to give you a wider horizon; I want to give you an opportunity to see the world and get out from the narrow limits of this little stuffy timber farm." The opportunity which he offered me was upon a large tract of land in the state of Mississippi of which he had become the owner. He intended to go to the city of St. Louis and buy three or four hundred brood mares and take them down to this tract of land in Mississippi and send me down there nest and he meant what he said, and to him the fact that I had been obliged to step out from my study and my pastoral work and take my place upon the farm appeared to be a very great loss.

Now, this view of the matter ought not to prevail, this idea that if a man goes or is forced out upon a farm that his life has been restricted and narrowed and his opportunities cut off, because it is not true; the truth is the farmer has the greatest opportunity of all men; he has the widest horizon, the most diversified outlook; he has an

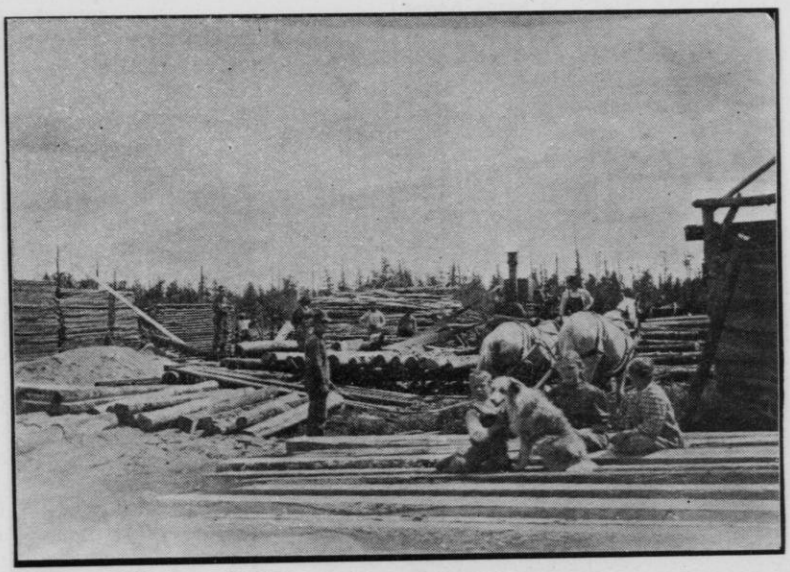
opportunity to get closer to the God of Nature and the natural things with which he comes in contact. He is in a natural environment.

The Farmer's Attitude to His Task.

One reason why people have this false idea and think the farmer's horizon so narrow and limited is that the farmer himself has not been seeing his environment, he has not been feeling his environment, he has not been coming in touch with God through Nature and the things of Nature! He has not been coming in contact in any real sense with the pulsing life that is all about him. His life has not given evidence of the opportunity his vocation has afforded him.

The farmer, because of his surroundings, ought to be not only the proudest man, but the best man; he ought to realize that he comes in contact with the widest sphere and the best opportunity, the most blessed sphere of any man who toils. We have closed our eyes as farmers to much that we might see, and have closed our ears as farmers to much that we might hear, and we are not in touch, in the larger sense, with the things with which we are surrounded.

John Burroughs, the great Nature student and graphic writer, has said in his little book "Sharp Eyes," that a naturalist came into his community to find a certain little brown frog which he had come there to study. Mr. Burroughs told him he had never seen it, though he had lived there many years, but the naturalist insisted that it was there; they went out together and they had not gone ten feet into the marshes before several of these little creatures leaped out of the grass. Burroughs concluded what he said with the remark, "I went out that morning with my eyes ripe to see the thing I had gone out to see and I saw it."

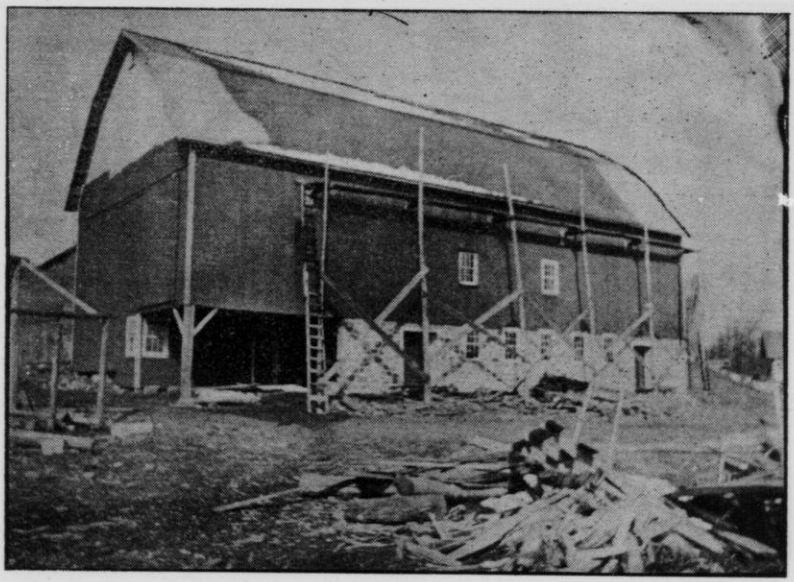


Sawing lumber on the farm for the new barn.

Let the farmer catch the thought and go out into his fields every day with eyes that are ripe for the beauties which it is his constant privilege to behold.

The State universities are turning their attention particularly to the education of our farmer boys and the farmer ought to be and will be a better farmer if he knows something of the geology of the furrow that he turns, if he knows something of the plant life with which he is surrounded, if he knows something of the biology and zoology of the animals by which he is surrounded, and it ought not to make him any less practical, less efficient as a farmer, because he has become scientifically acquainted with things. He ought to be a better farmer because he has learned the relations existing between plant and soil, between animal and plant. His father may have scouted the idea of scientific farming, but he has come to see the value of technical knowledge and is a more practical man as a result.

In every avenue of life, we want the man who is up to his opportunity; who is equal to his task. The end of all education, as the professor has said here tonight, is to fit the individual for life, make him able to measure up to his opportunity, and the farmer who receives this higher education ought to be more fit to grapple with and successfully handle the task that has been entrusted to him. How big the opportunity, how high the task assigned the farmer to study the relations of soils, plants and animals to each other, and through this study to be able to answer many important questions.



The barn nearly completed.

We have allowed the idea of utility to enter into our educational methods too largely; we have thought too much of the practical value of education and too little of the idealistic value of education. We have thought of fitting our boys and girls for a particular task

and have thought too little of fitting them for right living.

Let us cease to train our boys simply for trades, let us cease to prepare our boys simply for a particular profession and think more of preparing them for life's great task, that they may measure up as men to the opportunity before them.

The farmer is first a man, and second a farmer.

I felt very proud this morning when I entered the train at your little station out here a few miles and found that I was surrounded for the first time by a trainload of Farmers' Institute men and women. They were a jolly set; and they were a happy set; they were full of fun and life, full of their subject and full of everything that made for merriment, and I was glad to be one of them.

I say first the farmer must be a man, second he is a farmer. The first thing of which he should think is his relation to life and life's opportunity; the second consideration is his relation to his vocation, to his task. In the idea of education that has prevailed, we have sometimes lost sight of that which really entered into the development of character, making for the highest and best citizenship. I have sometimes wondered if the farmer has as great an interest in the training of the boy upon his farm for life's work as he has for the development of the Poland Chinas that are in his pens. I know there are many communities where the farmer pays much more attention to the man who is to take care of his stock than to the man or woman who is to enter the public school to teach his boys and girls, and there are many farmers who would be more willing to pay the price without question that a competent man asks to care for their dairy cows and feed their steers than they are willing to pay as the wage of the girl, splendid in character, beautiful in spirit and competent in ability who applies for the position as teacher in their school district.

The question is squarely before us,—Which is the more important thing—that our boys and girls shall be trained for usefulness and nobility, or that our cattle and sheep shall be skillfully cared for? Are we to develop the broad acres of a farm and be successful in our vocation, or are we to use that farm with its broad acres and its fertility for the opportunity that it affords to give to our boys and girls a larger sphere and to ourselves a better home and a wider outlook?

The first claim that we shall make for the farmer is that he shall be a man; strong, beautiful, noble, a splendid citizen, and, second, a farmer, competent, skillful, scientific, intelligent, able to measure up to the great task before him.

It is such a man, who, through his careful study of the problems of animal husbandry, of horticulture and of agriculture, will fit himself for larger success in his vocation, and also to solve the great problems for our nation's well being. Because of his devotion to the interests of his community and of his state, he will become the nation's hope in times of peace, the nation's defense in times of war. He it is, who, because of his training of his boys and girls for usefulness, is sending out from the farm homes of our land into the various professions, trades and avocations, a large percentage of the men who are doing the world's work.

He it is, who, because of his loyalty to the flag he loves and his support of the Constitution and the institutions of our land is to become the expression of the very highest type of our American life.

Adjourned to the next day, Wednesday, March 17, 1909, at 9:30 A. M.

SECOND DAY.

The convention met pursuant to adjournment. Prayer by Rev. Mr. Anderson. Mr. Convey in the chair

Mr. Houser—I want to suggest some topics for this morning, or some time during this Institute, that are of very pressing importance to us here.

First, what are we going to do with the quack grass? It is like sin, it is everywhere. It is like the poor, it bids fair to be with us always, and it seems to me that these authorities, the most learned in the land on subjects pertaining to farming, ought to be able to give us some highly valuable advice as to how to rid our farms of this pest. It is the most insidious noxious weed that we have.

Another thing, we would like to learn here how we can raise oats. We used to be satisfied with nothing less than fifty or sixty bushels to the acre and now the very best we can do is thirty-five bushels, and mighty poor stuff at that. Now, if your program has some vacant places where these important things can be put in, I know that our people would be more than glad to hear something on these topics.

Chairman Convey—They are both hard questions that you have thrown at us.

Mr. Houser—This question of quack grass is coming to affect the value of our farms and most of us must make a living off our farms, and one thing is sure, if the quack grass is going to make its living off the farms, the farmers cannot.

Supt. McKerrow—It may be like the chinch bug—a Godsend to compel a man to work.

Mr. Houser—I wouldn't charge the Creator with that job.

Supt. McKerrow—He made the quack grass just the same as he made the clover. Later in the day we hope to have time to touch upon this and we will try to have Mr. Houser present so he can lead off the discussion. I have no doubt he can give us some pointers as to how to get rid of it.

POTATOES.

L. E. Scott, Stanley, Wis.

It costs from twenty-five to forty dollars per acre to grow potatoes, and we get in gross receipts from this acre all the way from nothing to one hundred dollars.

There has been good money made in growing potatoes in Wisconsin where conditions were favorable. There have been many good buildings erected upon farms from potato money; there have been many children educated and a good many bank accounts kept up on potatoes, but the growing of potatoes has also rendered some farms very poor in fertility where they have been grown for a series of years.

I would advise a man who is growing potatoes to grow them only in connection with the dairy or live stock industry, and that only upon a portion of his farm. I believe that upon a farm of eighty acres, six or eight acres of potatoes are sufficient, putting in the balance of the farm to crops for stock, so that the fertility of the farm cannot be depleted through this one cash crop.

Northern Wisconsin potatoes, grown by L. E. Scott, and shown at the Wisconsin State Fair, 1909, winning five first premiums and a second, out of seven varieties entered.

No. 1—Rural No. 2, 1st prem.; No. 2—Beauty of Hebron, 1st Prem.; No. 3—Carman No. 3, 1st Prem.; No. 4—Sir Walter Raleigh, 1st Prem.; No. 5—Early Ohio, 1st Prem.; No. 6—California Russet, 2nd Prem.; No. 7—Delaware, entered as "any other variety."

Another important thing to consider is nearness to market. It is not advisable to grow potatoes and haul them ten or twelve miles to a railroad station or a market; they are a heavy commodity and the cost of hauling is considerable. Where you are near to market and your sales are favorable, there is no question but what there is good money in growing a few acres of potatoes in connection with this other industry.

In order to do so, we want well drained soils, preferably a sandy soil, because we can grow potatoes more cheaply upon soils that are light, loose and porous. We can grow potatoes that will market better than those from heavy soils, but for home use I sometimes think that we get a little better potato upon loamy soils than upon clear sand.

The Variety.

The next thing to consider is the variety. I was talking the other day with a buyer of potatoes and I asked him what varieties he found upon the market, and he answered me, "We have but two varieties, the round white and the long white." It seems that the market today demands a white skinned potato, smooth, and for hotel and restaurant trade they prefer a potato that will not cook to pieces, so it can be sliced and warmed up for the next meal. As a result we have potatoes of rather poor quality in the market; potatoes that are dug before they are ripe, late planted and not well ripened, and we find in traveling about the state that it is a rare thing indeed to get a really good, light, floury potato on a hotel table.

If I were growing potatoes for the market, I would grow those varieties that the market demands; if I were growing for home use I would grow those varieties that my wife liked best, even if I didn't get so large a yield. These white, smooth, greasy skinned varieties do not, as a rule, give us much satisfaction. I like potatoes with a little russety skin. The old Beauty of Hebron was one of the best potatoes that we ever had; the old Snowflake has never been excelled in quality. The real Snowflake has rather a rusty skin.

Selection and Care.

Now, the next thing to consider is the care and selection, or selection and care. I believe in planting from medium to large sized potatoes. True, when potatoes are very high at planting time, to a person planting a good many acres that means quite an additional expense, and for such it may be advisable to plant second size potatoes. Side by side with selected seed, ofttimes there has been but little difference in the yield, but it is always safe to plant a few rows from selected stock from which to save the seed again, because you know in that way the potatoes will not run out as quickly as they will if you plant smaller potatoes year after year, continuously. I believe potatoes will run out in time, the best we can do, even if we select the seed, for the potato itself is not the true seed, it is only a developed root or tuber, and when you plant that potato you simply continue the life of the potato that grew last year; there is no renewal of life, no reproduction, really the seed of the potato is in the little ball that grows on top of the vine. Once in about twenty-five or thirty years we have got to go back to that source, and it will take several years to get a full development, but then we get a renewal of life. There are men engaged in that work and when they do reach results, then it is for us to profit by their experience.

Now, as to the care of the seed. I would prefer that potatoes be dug

rather late in the fall than too early. I would like to have the weather and ground cool when we dig and handle this crop. We used to pile them in the field, cover the piles with corn stalks or something of that kind, but we have found of late years that we get just as good results by putting the potatoes in a bin, not too deep, in the cellar, and keep the cellar cool, keep it open until the cold weather comes and keep the temperature as low as we can without freezing.

I try to keep potatoes from sprouting in the spring, and so we open the door and dry it out, and that helps.

It is better, I think, to take the potatoes intended for seed upon the floor of some outbuilding when spring comes. Don't put them in a pile, because they will sprout even worse than in the cellar, but spread them out, and the best way is on racks. They will send out a little leafy sprout that will not be broken off in the process of planting and the potato will come up better than if it was taken directly from the cellar and planted.

Preparing the Land.

I like a clover sod upon which to plant potatoes, and whether we shall plow in the fall or the spring is still an open question. The difficuty in plowing in the spring is that we have to plow more deeply for the potato than for the corn crop and I do not like to turn down the green matter and the manure to too great a depth. It might be better to plow in the fall and then again more deeply in the spring, but at any rate we want the soil loose and friable.

Yesterday something was said about following potatoes with corn. We have been advised against two hoed crops in succession in our rotation, but I realize that where potatoes are grown on a large scale in a commercial way that it may be sometimes advisable to do this, and I believe I would prefer to follow corn with potatoes rather than potatoes with corn. In that case we manure the clover for corn and then sow rye on this corn ground after the corn is taken off, and this can be readily done where we put the corn in the silo. Then plow this under in the spring before it gets too large and woody, and this green matter fermenting in the soil will cause an acidity that will kill the germ of the scab and you will be sure to grow a smooth and good crop of potatoes. I have sometimes plowed under young clover just seeded the year before. The new seeding of clover always starts earlier in the spring than where a crop has been cut, and sometimes we get quite a growth of the young succulent clover, and we have always had good results from that.

The Preparation of the Seed.

Now, the next thing is the preparation of the seed, the cutting. There used to be an old theory that the potato must be cut lengthwise, or through what is call the seed, blow or terminal end; the end farthest from the stem. I believe that is wrong, it makes a long, slim piece, too large a proportion of cut surface, and in case of a wet season it will rot much more quickly than if that potato had been cut in a chunky form. On the other hand, if it is a dry season, it will dry out more quickly. I do not think it will give the plant as good a start as if it were cut the other way. Take a medium sized potato, cut it in four pieces and in a chunky form, and crossways. You see there is but little cut surface as compared with a piece cut the other way and it will not dry out nor rot as quickly.

You ask how many eyes should be left. That is immaterial; it depends

more on the size of the piece. We have grown good crops of potatoes when they were cut down to one eye in a piece, but of course that was when the conditions were favorable.

Planting and Cultivation.

If you are planting in a small way, just for home use, you can get along very nicely by opening furrows about three feet two inches apart, and you can do this with a sulky cultivator. We use a Planet Junior No. 70, which has a good many attachments. We drop the potatoes in the furrows about sixteen or eighteen inches apart, then put on the hillers to cover them. If we were growing potatoes on a commercial scale, we would use the planter. I would prefer a planter that handles the seed carefully without puncturing, scraping or mutilating it, even if it requires an extra hand to regulate the dropping.

Always adjust coverers to leave a ridge over the row and in about a week after planting the weeds have started, but the sprouts of the potatoes have not reached near enough to the surface to be broken off by the process, you can go on with a common smoothing harrow crosswise of the rows. The ground is then free from weeds and the potatoes will come up, after which all they need is cultivating. I like a fine tooth cultivator and to keep it going just as long as we can get the horse through between the rows without material injury to the vines.

The question is often asked if it will injure the potatoes to cultivate them when they are in bloom. No, if that cultivation has been continuous, but if you have neglected the crop for three or four weeks and the ground has become hardened, if you go in with a shovel plow and break up the surface, you will prune the roots and you will no doubt damage the crop, but if you can keep up your shallow cultivation continuously it will do no harm; in fact, it will increase the yield.

Spraying.

We use Paris green for bugs. I have no doubt from what I have read about arsenate of lead that it is a good thing, but I don't know so much about it. We use Paris green in the water and we so regulate our sprinkler that a fourteen-quart sprinkler of water will go over a row of potatoes about forty rods in length, by stopping up the holes with wooden plugs. We keep the mixture stirred and walk right along. We put in a heaping tablespoonful of green to a fourteen-quart sprinkler of water. It is better, if you are going to use Bordeaux mixture, to have some other tool. You can't put on Bordeaux mixture successfully with a common sprinkler, you need a spray pump and nozzle.

The spraying of crop with Bordeaux has shown an increase of about thirty bushels to the acre in Wisconsin experiments. I think covering a period of seven years, the average increase in New York has been about forty bushels to the acre where the crop has been sprayed five times. After your spraying machinery is purchased, you can spray at an expenditure of about a dollar an acre for each application; that means five dollars an acre for the season, and as an offset there will be the extra forty bushels per acre, but if you are growing on a small scale, it is doubtful whether it will pay to spray.

Spraying, of course, is a preventive of the blight and the potatoes will remain greener, and if there are any spores of blight the spraying will, of course, keep the plant green longer. So, if you are going to spray, I would advise planting the potatoes earlier in the season, so the spores will all be dead before the potatoes are at-

tacked. The early blight will not cause rot, but late blight means rot every time. It has been said recently by some of our scientific men that we have not the late blight in Wisconsin, but I am certain they are mistaken, for I have seen the late blight in Wisconsin a number of times, possibly once in six or eight years. It is a fungous disease; you will notice that the leaves of the potato drop down and turn black and you will find a fuzz or mildew on the under side of the leaf and along the stem. When the rain comes, these spores are washed down into the earth and the potatoes lying next to the surface will rot. Now, do not dig at this time. Should you do this, the spores being alive, you will distribute them through the whole mass. Instead you might just as well smile and let them rot. If well covered, leave them in the ground and after two or three weeks possibly, the rotting ceases and you will find the potatoes that lie deepest in the ground are sound yet. Pick them over carefully and if there are any affected ones throw them out and put the sound potatoes in the cellar, and they will keep all right through the winter.

I have made a kind of rambling talk and possibly at this point we had better submit it for discussion.

DISCUSSION.

Mr. Imrie—Would there be any advantage in planting these potatoes more deeply on account of this late blight that you speak of?

Mr. Scott—The more deeply potatoes can be planted the better they will come out, you will raise a larger crop of potatoes and they will be smoother, more uniform in size, but it is unsafe to plant very deeply in heavy wet soil.

Mr. Bingham—How long will potato scab live in the soil?

Mr. Scott—It has proven that it will live six years.

Mr. Bingham—When does the first blight come along?

Mr. Scott—Along in August; there will be a little difference in the dates between the early and late blight. In the early blight you will notice little brown spots appearing on the leaf.

Mr. Bingham—When do you make the first application of the Bordeaux mixture?

Mr. Scott—When the plants are six or eight inches high.

Chairman Convey—That means July in the southern part of the state.

Mr. Scott—Yes, I would begin to spray the last of June, anyway as soon as the young bugs begin to appear, because you can mix in a little poison with the Bordeaux mixture and kill bugs and disease spores with the same application.

A Member—Did I understand you to say that the shape the seed is cut has something to do with the rotting of the seed?

Mr. Scott—Yes, the chunky piece will rot less quickly than the long slim piece, because there is proportionately less cut surface.

The Member—What does that rot do?

Mr. Scott—It is simply rot. I suppose it is a fungus.

The Member—You mean it simply rots that piece of seed?

Mr. Scott—Oh, yes, the seed I mean, not the crop. We only experience that once in a while when the season is wet and the soil heavy.

A Member—I would hardly think that was due so much to the shape of the seed as to the condition of the soil.

Mr. Scott—Of course both those pieces, either shape, will rot if the conditions are not favorable, but one piece will rot quicker than the other; that is,

the long slim one will rot quicker than the chunky piece.

A Member—I can't yet see the benefit of having that kind of a piece.

Mr. Scott—Before the chunky piece is entirely rotten the plant may be six inches high and well established, while if the other piece rots more quickly you may fail to get any growth.

A Member—My experience has been that there wasn't much growth where the seed rotted early in the season. Of course where the plant comes up and becomes established it is all right, but if it doesn't produce a plant the shape of the seed isn't going to have anything to do with its rotting.

Mr. Scott—I don't think you quite understand me. A piece cut slim may rot before the plant is established, while, in the other case, although it may rot, it will rot more slowly, and the plant may be established before the seed is entirely rotten.

Supt. McKerrow—Mr. Scott's theory is that where you use a solid piece there will more of it be taken up in the plant and it will get a better start in life than if it were a thin, slim piece.

Mr. Bingham—There would be a little more cut surface and a little more opportunity of rot attacking that other piece.

Mr. Scott—And that little difference may mean the difference between a plant and no plant.

A Member—Do you like level cultivation better than hilling?

Mr. Scott—If your soil is dry enough to admit of deep planting, it is better.

The Member—I had a big crop last year by level cultivation, and my neighbors hilled and they had none.

Mr. Hoff—The most alarming thing I have listened to in the statement of Mr. Scott about raising potatoes is the cost per acre to the farmer who proposes to go into the business. As I understand that cost is from twenty-five to forty dollars an acre. I do not like to take issue with Mr. Scott on that subject, but I raise them cheaper.

Mr. Scott—Maybe you value your time cheaper than I do. My estimate, of course, includes interest on investment and taxes.

Mr. Purse—I do not think the average farmer is careful in cutting his potatoes lengthwise and is apt to cut the crowns right in two and the scientist will tell you that is not a good thing to do.

Mr. Scott—There is one thing I want to say in closing. A young man starting upon a farm likes to grow cash crops, such as the potato crop, and that is advisable for a few years, but as soon as you can get established in stock growing or in dairying, then you will be wise if you make this potato growing only a side issue, if you grow them at all. You will notice that there are some of us here, like Mr. Griswold and myself, who have carried on this business a good many years and it has caused a good many gray hairs to come into my head and more of them to come out.

THE FARM WATER SUPPLY.

W. G. Kirchoffer, Madison, Wis.

The importance of a pure supply of water for domestic purposes has long been recognized as essential to the health of cities and villages; it is likewise essential for the farm as well.

In the short time that I shall talk to you, I have decided to speak of a few of the fundamental principles of water supplies rather than dwell at length upon dangers one may look for from a polluted supply of water, or what blessing he may fall heir to from a pure one.

The Sources of Our Water Supply.

A correct understanding of how and where our water comes from may be of as much an incentive to secure and keep a pure water supply as it will to know the difference between a good and bad one.

Inasmuch as the source of all water is the rain that falls upon our land, we must look to it to fill our lakes, rivers, wells, etc. The rainfall is disposed of by several means: a part of it runs off the surface into the rivers and lakes, another part of it soaks into the ground to reappear again as springs, or flow under ground into the rivers or ocean. A small part of it soaks down into the deep strata which furnishes our artesian wells. Another small portion of it is made use of by plants and animals.

Those of us who have the good fortune to live near, or have a river or brook running through our land, do not need a great deal of advice or recommendations from a water supply expert, except as to its protection from contamination.

The class of water supplies in which I am greatly interested, and those about which there is the least known, are those from underground sources. For convenience of description, and to the end that the subject may be better understood, it is advisable to divide underground waters into two classes. First, those which are found in sand and gravel beds, and in some cases where it lies near the surface of the ground, and second, those which are found in deep-seated rock formations, from which we secure our artesian and deep well waters.

The first class in nearly all localities are flowing under ground as a vast river, although at a very low velocity, possibly only a few inches per day. These waters are usually flowing towards some lake or river. These sand beds occur in the glacial deposits which cover a large portion of this state and in the alluvial deposits in river valleys. While scattered widely over the state, they are, however, more generally used as sources of water supply in the north central portion. The amount of water flowing in these beds depends upon the porosity and size of the sand grains, and upon the slope of the formation.

The wells which draw water from this source are our common shallow wells. These wells may be divided into three classes: the open or dug well, the drilled well and the driven well. Commonly a well is simply an opening for the ground water to rise into from its horizon to that of the surface of the earth by either natural or artificial means. In the case of a dug well, or a developed spring, it is a reservoir excavated in the ground water horizon. This reservoir usually

consists of a wooden tub two or three feet in diameter by as many feet deep. A well of this kind sunk upon relatively low ground and in a coarse water-bearing sand or gravel, will be satisfactory from the standpoint of capacity, but is the most liable to become contaminated of any of the classes of wells.

Two of the principal difficulties with this form of well are that it does not penetrate far enough below the natural surface of the water and that the water-bearing material is altogether too fine to allow the necessary quantity of water to pass through the small area at the bottom of the tub without drawing fine sand along with it. The tub is not deep enough for the reason that as soon as we begin to pump a well, the surface of the water within the well begins to lower, and, if pumping is continued long enough, it will reach the bottom of the tub, unless the sand is coarse. This may not be plain to some of you, but, if you will go back to the principle that water will always seek its level and that a river flows down its valley because there is a difference in level, you will have the principle which governs the flow of water into a well. If there is no difference in level between the water in the well and that outside in the sand beds there can be no flow. The tub, therefore, should be sunk deep enough so that the water surface in the well can lower several feet and still leave a little water in the bottom to cover the suction of the pump.

The other difficulty mentioned can be overcome by driving well points in the bottom of the tub, or a steel cylinder, or a pipe can be sunk several feet below the bottom of the tub, then fill it with coarse sand or fine gravel and withdraw the metal. This will furnish a much larger surface through which the water can percolate into the bottom of the well.

To show the great effect of the size of the sand grains upon the amount of water that can be obtained from a sand bed, a sand that will pass a sieve with forty meshes to the inch will allow twenty-five times as much water to flow through it in a given time as a sand that will pass a hundred mesh sieve. The porosity of the sand or gravel also has a great effect on the amount of water that can be obtained from a given sand bed. A sand having forty per cent porosity will pass two and one-half times as much water as one having thirty per cent porosity. By porosity is meant vacant space between the sand grains.

These statements may seem to you a little theoretical and out of place at a meeting of this kind, but I am stating them to impress you with the necessity of sinking your wells into a proper kind of material, and, if this is impossible, then to get the proper material artificially.

The Location of the Well.

All wells, and especially is this true for those sunk in sand or gravel formation, should be located on relatively low ground. Don't put your wells on a hill. It is the first place to dry up on the surface and it is the place where the ground water lowers the quickest and fastest in time of drought. In the valley, where the ground water is flowing in from every side, is the place for the well.

The objections stated regarding a dug well will apply equally as well to a drilled well where the same does not reach rock. Here the hole through which the water can come into the well is so small that, if the well is pumped for any considerable length of time at a rapid rate, the velocity through this small hole is so great that the fine sand is pulled right up into the casing, thereby decreasing the supply

of water. The best way to fix a drilled well of this kind, where it is not too deep, is to sink the casing down until a porous stratum of sand or gravel is reached, and then insert into the same a large well screen several feet long with its top so arranged that when the main casing is pulled up it will form a tight joint with the upper surface of the shoe on this casing. If this cannot be done, then fill casing with fine gravel, etc. Wells of this type are used in the sand beds in central Wisconsin, and besides being very satisfactory as to the quantity of water obtained from them, they are very well protected from a sanitary point of view. In cases where the pipe cannot be pulled back, as I have suggested, a smaller casing can be inserted so as to remove the material to a depth of six or eight feet, then insert the point or gravel and remove the smaller casing. This, of course, would involve considerable additional expense, but would make a much more satisfactory well.

The Driven Well.

The other type of well in sand and gravel formations, which often causes a good deal of trouble, is the driven well, and the principal reasons for this are that no knowledge is had whatever of the character or size of the material through which the well is being driven. The gauze on the point is often stripped off, and in other cases, where it is not, it passes through such fine material as to clog up the screen and thus prevent the flow of any water into it. A much more satisfactory way would be to first sink an open end casing and determine the character of the material, then, when a good porous stratum was found containing water, the well could be driven to this depth and thus insure a good supply. Besides insuring a greater abundance of water, it is a matter of economy that the water should flow into a well freely, because, if it is necessary to lower the water many feet to supply the pump, or produce a high vacuum on a well point to get enough water, it takes power to lift the water the additional height or produce the high vacuum. This extra work is an important item when the wind won't blow, or gasoline is twenty-five cents per gallon when an engine is used.

It often happens that a farmer is blessed with having a spring upon his farm, but it may not furnish a sufficient quantity of water, or is located so that he cannot get at it to use the water. However, this spring with a very little work can be made to be of great value. The flow can be greatly increased by excavating at the vicinity of the spring and removing the vegetable matter, which in many cases overlies the formation which supplies the water. In cases where the flow is very meager, a tub or small reservoir could be sunk down to the sand beds, or at least down through several feet of the overlying muck, and well points driven into the bottom of the same until the sand beds were reached. In cases where the flow comes from rock, it will often be increased by removing several of the surface layers of rock, or excavating a pit down into the rock in the vicinity of where the water appears. This will give some storage and additional surface for the water to percolate through.

Deep and Artesian Wells.

The other main class of wells which are important to the farmer are the deep and artesian wells. The name artesian is commonly applied to wells that flow at the surface of the ground, but it is equally applicable to deep wells that derive their flow from a stratum in which the water is under pressure, that is, the conditions are such that, when the water-bearing

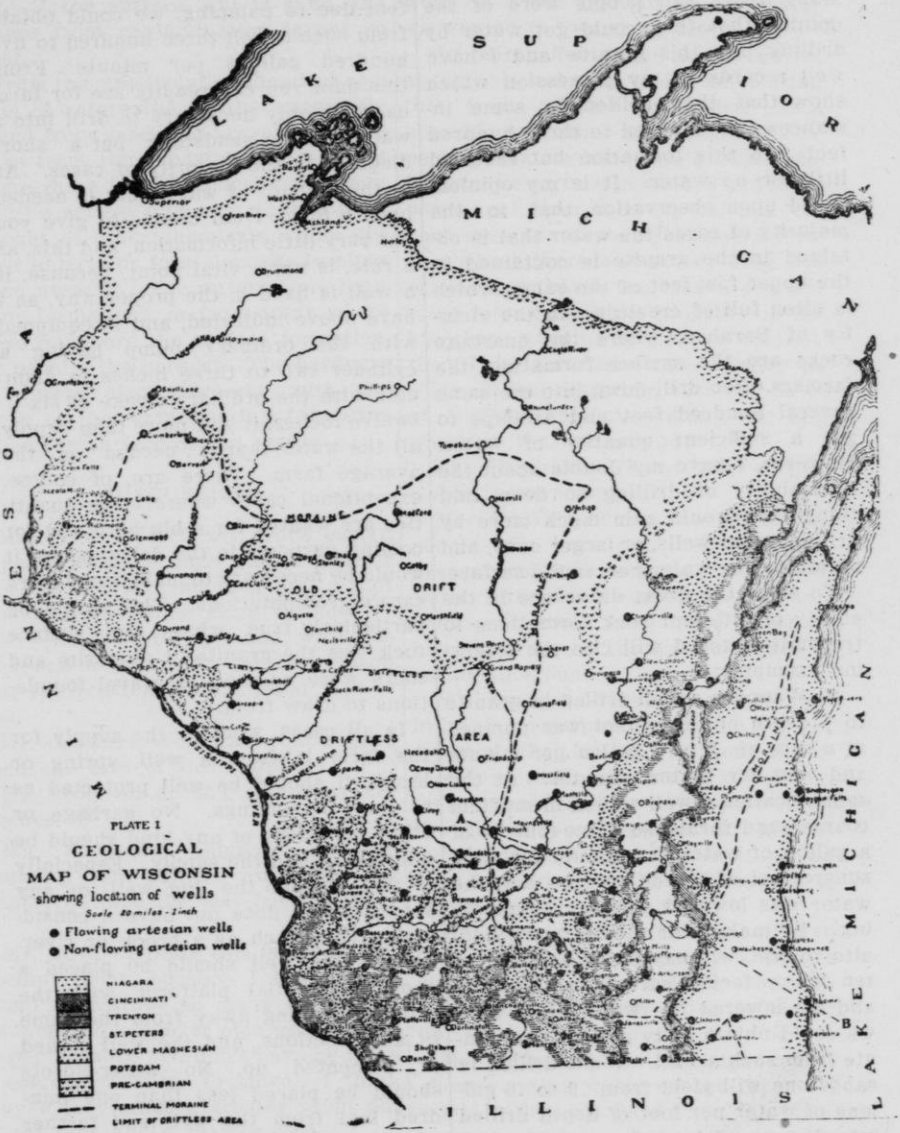
stratum is pierced by a drill hole, the water will rise above the upper surface of the water-bearing material. The only difference between a non-flowing deep well and a flowing well is a difference in the relative elevation of the surface of the ground at the well.

The name "artesian" was derived from the province of Artois in France, where, in the year 1800, wells of this class were first put down. The first artesian wells put down in Wisconsin of which we have record were made at Fond du Lac in 1840.

The essential condition for the existence of artesian wells is a relatively porous stratum to receive and transmit the water lying between two strata that are relatively less porous but not necessarily impervious. An inclined stratum of sandstone with an upturned edge lying between the two layers of limestone or shale furnish this condition. The stratum must be inclined, or its edge turned up as an outcrop to furnish an area for the collection of the rain water and the outcrop must be at a greater elevation than the water-bearing stratum at the well, in order to supply the necessary pressure for a flow to take place through the stratum. There must be sufficient rainfall to soak into the stratum and to keep all of the pores well filled with water. Many other qualifying conditions affect the quantity of the flow or the pressure, but they will not be discussed here.

In Wisconsin the main sources of artesian wells are the Potsdam and St. Peters sandstones which lie buried in the central and southern portion of the state, and the Niagara limestones in the eastern portion along Lake Michigan. The exact dividing line between the areas in which artesian water may be secured, and that in which it cannot, is difficult to define. A flow at the surface can be secured in most of the river valleys in the southern half of the state, and especially is this true of the Mississippi, Wisconsin, Rock, Fox, Kickapoo and Baraboo river valleys, and along the shore of Lake Michigan. An occasional flow is secured from the sand and gravel beds. To illustrate what has been said a little more clearly, I have prepared this map, which shows you by the full black dots the location of the flowing artesian wells, and by the half circular black dots the non-flowing or deep wells. A close inspection of this map will reveal to you that the flowing wells are located along Lake Michigan and in the principal river valleys. On the higher ground we notice that the wells are of the non-flowing type. The depth to the porous stratum varies a great deal in this state, from perhaps one hundred to two hundred feet up to seven hundred or eight hundred feet, the depth gradually increasing from north to south and to a slight extent east and west from the center of the state.

From the foregoing statements I trust that it will be plain to you that there is no particular mystery about a flowing well, that its waters do not come from Lake Superior, as some persons have supposed, and that you cannot get an artesian well anywhere by simply drilling deep enough. If the formations which are essential to the production of these wells are wanting, no amount of drilling will bring the water to the surface of the ground. There is, of course, usually some water in most all rock formations, especially if they lie below the zone of permanent saturation due to the artesian head of water below, and in a great many cases regardless of the character of the rock, a supply of water can be obtained that would be sufficient for a small farm, but would not be sufficient for a factory, creamery, village or city supply. I have in mind particularly the granite formations in the


LAKE SUPERIOR
MICHIGAN
DRIFT
DRIFTLESS AREA
ILLINOIS
LAKE MICHIGAN
PLATE I
GEOLOGICAL MAP OF WISCONSIN
showing location of wells
Scale 20 miles - 1 inch
Flowing artesian wells
Non-flowing artesian wells
NIAGARA
CINCINNATI
TRENTON
ST. PETERS
LOWER MAGNESIAN
POTSDAM
PRE-CAMBRIAN
TERMINAL MORAINE
LIMIT OF DRIFTLESS AREA

north central portion of the state. Many years ago people were of the opinion that they could get water by drilling into this granite and I have well records in my possession which show that they drilled in some instances two hundred to three hundred feet into this formation but received little or no water. It is my opinion, based upon observation, that in the majority of cases the water that is obtained in the granite is contained in the upper few feet of the same, which is often full of crevices. In the vicinity of Baraboo, where the quartzite rocks are the surface formation, the farmers often drill down into the same several hundred feet and attempt to get a sufficient quantity of water. However, I have my doubts about the advisability of drilling so deep, and think they would gain much more by drilling more wells, or larger ones, and obtaining the water nearer the surface.

To show the great difference in the ability of different rock formations to transmit water, I will cite the following examples:

At Waupaca a well drilled in granite to a depth of thirty feet was pumped at a rate of .3 of a gallon per minute and was dry in ten minutes. At the same location a well screen in medium coarse sand furnished three-fourths of a gallon of water per minute for each square foot of screen surface, and the water was lowered one foot by pumping. To make that a little more definite to you, will say if the screen had ten square feet of surface on the same and we lowered the water eight feet, we could obtain sixty gallons per minute from such a well. Wells drilled in sandstone will yield from .3 to .5 gallons of water per foot of depth drilled into the standstone from every foot that the water is lowered in the well by pumping, that is to say, if there was one hundred feet of sandstone in the well and the water was lowered ten feet due to pumping, we could obtain from such a well three hundred to five hundred gallons per minute. From this data you can readily see for farm use it is only necessary to drill into a water-bearing sandstone but a short distance in the majority of cases. As to the amount of water that is needed upon a farm, I am unable to give you but very little information, and this, as a rule, is not a vital point, because, if a well is fixed in the proper way, as I have above indicated, and is equipped with the ordinary pump having a cylinder two to three inches in diam eter with the ordinary stroke of six t twelve inches, it will more than supply all the water that is needed on the average farm. There are, of course, exceptional cases where large quantities are wanted for a big herd and for cooling purposes in the dairy, where it would be necessary to make some more careful computations. This would be particularly true where the surface rock was the granite or quartzite and there were no sand or gravel foundations to draw from.

In all cases, whether the supply for the farm is from a well, spring or brook, it should be well protected as to its surroundings. No garbage or other pollutions of any kind should be allowed around the supply. Especially is this true of the dug well, or any supply which does not have a considerable flow, such as a brook or river. Around the well should be placed a good, substantial platform, with the ground draining away from the same in all directions, and the well stoned or cemented up. No water-closets should be placed less than one hundred feet from the well and farther away would be much better. Where the surface formations are clay or crevised rock, the worse conditions exist for the contamination of the sup-

ply. If the surface soil is sand, the danger from contamination is not so great.

From the standpoint of chemical contents of waters will say the waters obtained from sand and gravel beds and those from the sandstones in an area where there is little limestone present are the softest and contain the least amount of other chemicals which discolor objects or form deposits in pipes or on utensils. The waters from limestone formations, or from areas where these rocks are the surface formation, are usually the hardest. The hardness of waters also increases with the depth of the water-bearing formation below the surface of the earth.

DISCUSSION.

Mr. Scott—Which will work easier, a pump with an inch and a quarter pipe, or one with an inch and a half pipe with the same sized cylinder?

Mr. Kirchoffer—The one with the inch and a half pipe, for the reason that the friction in that sized pipe is less.

Mr. Martiny—Would not that depend upon the size of the cylinder?

Mr. Scott—It doesn't make any difference.

Mr. Kirchoffer—Suppose we are pumping ten gallons an hour, the larger the pipe the less friction there is.

Mr. Scott—I think this is a very important point, because I have heard pump men argue so many times that an inch and a quarter pipe would pump easier because you don't have as large a column of water to move. I think maybe they make a greater profit out of the inch and a quarter pipe.

Mr. Stiles—You stated you could get a well quicker down in low ground than on a hill. In our case we went on low ground and drove forty-two feet and couldn't get any water. Then we went on a hill and got all the water we wanted in twenty-six feet.

Mr. Kirchoffer—That is, of course, an exceptional case and I am stating this from general principles. As a general rule, the ground water, especially that in sand and gravel beds, is near the surface in valleys and more permanent than it is on the hill. In your case you probably struck a location where there was a very deep bed of clay and that is the reason you had to go forty feet, while probably on the hill there wasn't any clay, or very little. This is surface water I refer to.

Mr. Stiles—Isn't it a fact out there at Madison that they didn't get any water on the low ground?

Mr. Kirchoffer—They are getting water there now.

Mr. Bradley—There are a lot of people who have put their wells on low ground and have to carry their water fifteen or twenty rods, when I believe it would have been better to have gone up on the hill and made it easier all around.

Mr. Scribner—I live on a very high hill and we supposed we could not get water on that hill and we went eighty feet down and carried the water many, many years. Finally we dug a well on the hill and we found water just as quick and just as much of it as we ever had down in the hollow, and it saved a whole lot of work.

Mr. Roberts—I think it is better to locate our wells just exactly where we want them, and I believe you are surer of good water if it is higher up.

Mr. Scribner—The gentleman spoke about running water on the farm. I would rather not have it on the farm, because where you do have it you have a lot of waste land around it and if you are unfortunate enough to be near a creamery, it will be all overflowed a good deal of the time.

A Member—I wish you would ex-

plain to us farmers where the closets should be placed with reference to these wells, whether above or below.

Mr. Kirchoffer—From the principles that I have tried to outline in my paper, the ground water is flowing underground in a downward direction, either towards any lake or valley, it can be plainly seen that if the closet was located on high ground and leached down to the surface of this water which has a sloping plane, that these leachings would have a tendency to go toward the well, because as you pump water out of the well that increases the slope of the water, so that any contaminating substance of any kind should be placed, if possible, where it will not drain toward the well. When I spoke of placing a well on low ground, I did not exactly mean you should go into the lowest hollow you might be able to find and of course that would not necessarily apply to these wells, because if these formations exist in the valley, by moving half a mile, as a rule, will not take you out of the area from which water can be obtained from the same source.

Mr. Bradley—Where a well is dug, we will say fifty or a hundred feet, in sand and perhaps fifty or a hundred feet or more through rock, would the location of the closet have anything to do with the contamination of the water under those circumstances?

Mr. Kirchoffer—As you dig down through this sand, if there is water that would leach down into your drilled hole in the rock, it might; but if that was cased off or cemented off so that the water could not get in, it would make very little difference.

Mr. Martiny—In the location where I live we have a great many of these so-called "driven" wells with sand points, and universally they give a lot of trouble. We have to use a two-inch pipe with a sand point on that, and drive that down in the bottom of the open well, and then insert in this an inch and a quarter pipe, which would go into this two-inch pipe and would sort of cut off the suction on this sand point. What would you suggest about that?

Mr. Kirchoffer—You must remember if you take water from a well, you must necessarily lower the water in the well in order to create a flow into the bottom of the same. If the well pump pulls hard, it takes power to drive water into the point and what you do with the two-inch casing, you pump that quantity of water out of that two-inch pipe and suck the water into the bottom of it, simply because that pipe can't take the water in fast enough. There is one thing that might be done in a good many cases where there is a dug well or an open well, if it fails to give a sufficient quantity, you could drive several points and hitch them together, that would give you more screened surface so that the suction would be better.

Mr. Martiny—Would that be better than using a longer sand point?

Mr. Kirchoffer—Oh, that is all right, but if your sand bed was only two or three feet thick and you ran into clay, then more points would be advisable.

Mr. Gilman—We have an artesian well here and the flow of the well has been decreasing for two or three years. We would like to know the reason.

Mr. Kirchoffer—I don't think that necessarily means that there is any less water flowing through the ground. It is very likely that you are allowing water to escape. The artesian well principle is practically the same principle as a water main. If you have a standpipe a hundred feet high and would make a small opening somewhere, the water in this standpipe gradually goes out and as the water goes down the pressure becomes less, and therefore the flow is less. That is what happens to your well, you are

allowing the water to escape and therefore the pressure is less. If you will seal that well up for a number of years I will guarantee the flow will come back again.

Mr. Gilman—We don't allow much water to escape. We have a small pipe and shut down the water. Other wells have been started in this neighborhood and I was wondering if that would affect the flow of our well.

Mr. Kirchoffer—That most certainly would. Wells not more than fifty feet apart will often have from twenty-five to thirty per cent interference upon each other. What I mean is that the quantity of water that each well will supply or flow will be cut down about twenty-five or thirty per cent.

Mr. Gilman—There is considerable iron in the water. Do you think that would gather any material in the pipe that would cut down the flow of the well?

Mr. Kirchoffer—I hardly think so. Of course it coats up the pipe and increases the friction a little bit, but that wouldn't amount to a great deal.

A Member—My farm is watered with a mountain spring and it always flows fast enough for all the use we have for it, but in a very dry time it flows nearly double as fast as it does at other times, and I would like to know why.

Mr. Kirchoffer—I guess you have got me guessing.

Mr. Scribner—This is a dry town.

Mr. Kirchoffer—It might be, for instance, in the spring of the year, when we have a good deal of rain and we haven't had so very much rain during the winter and the snow has been running off the surface, it may be that the supply of your spring has decreased. Now, when it comes in spring time the water hasn't had time enough to flow down through these beds, as the outcrop which feeds your spring may be several miles away and it takes a good while for the water to reach you. I can't say that this is the explanation, but it might be something of that kind.

Mr. Houser—I am sorry I did not hear all this discussion, but I caught one point as to sinking a well in the lower places in the valleys in preference to driving them on a hill. My farm is equipped with a water supply with a windmill, and the well is placed on an elevation twenty-five or thirty feet above our buildings, where I have a tank or reservoir which supplies the pipes which carry the water to my barns and my house, so that what I want to inquire about is really not for my own information, because I am pretty well fixed, but for the information of other gentlemen here I want to ask you if it would not have been better for me to have sunk the well down where the buildings were and run the water up the hill to the reservoir? Mine is a driven well.

Mr. Kirchoffer—If you had gone far enough below the surface of the ground water level, so that in case of a dry time you can stand several feet of depression, I would say that it would not make a great deal of difference. The argument I have been trying to bring out in my paper regarding the placing of your wells on the lower ground was that on the hill the ground water slopes down somewhat similar to the surface of the ground and you know that the area on top of a hill, for percolation of water is much smaller than in a valley, because in the valley we have not only the area that is there, but the side hills also. If we dig a well on top of the hill and a dry time comes, we are liable to lose our water, but if we dig a well down there and only get two or three feet of water in the well, it is more apt to stay with us in dry time. If you are getting down deep below the ground water level, it doesn't make any difference

whether you are on a hill or in a valley.

Mr. Scott—Isn't it more practicable to lift water than it is to force it? That is, as in Mr. Houser's case, whether it is better to put the pump down in the low valley and force the water up on the hill, or to put the pump above and lift up the water.

Mr. Kirchoffer—Yes, if you can get sufficient force to lift it, it is better to raise it up, because it means less power.

Mr. Houser—In other words, it is better to lift it forty feet than to force it forty feet.

Mr. Scott—I think it is better to lift it forty feet than to try to lift it by suction twenty feet, and force it the other twenty feet.

Mr. Kirchoffer—Certainly, get your cylinder down close to the water and make your suction lift as little as possible.

Mr. Imrie—There is always a leakage any way you can fix it, you have to considered that in placing your well, also we must remember that we get more wind up on the hill for the wind-mill than down in the hollows.

Chairman Convey—Is the air pressure system to elevate water a practical system?

Mr. Kirchoffer—Yes; it is a practical system. Of course, from the standpoint of first cost, and possibly somewhat as to operation, it is not quite as economical as the elevated tank would be, but it certainly is a very nice system to have in the house where you can have your tank in the cellar under pressure and either allow the water to flow into the tank and pump up with air, or have it pump the water to the highest point. In that way the tank is inside where it does not freeze and does not form any unsightly object outside.

Mr. Jacobs—As to location of wells, can't we safely say that if we live on a hill, we better put the well on the hill and if we live in a valley, we better put it there, just wherever we need it?

Mr. Kirchoffer—I would say that is a good argument.

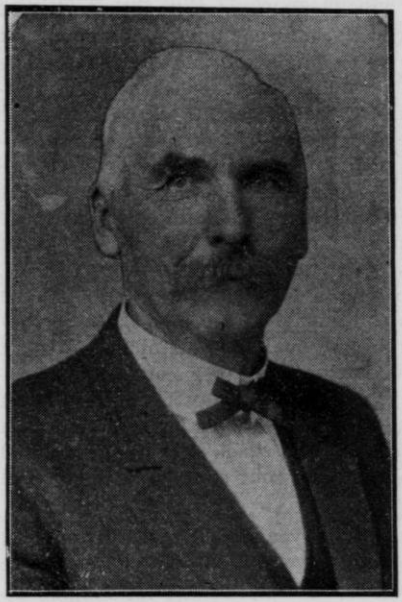
Mr. Houser—I don't agree with that proposition under all circumstances. You want storage on the farm, at least one hundred and fifty to two hundred barrels of water, if you are carrying a lot of stock, and in order to have that on tap all the time, you must have an elevation. If you can get an elevation of forty or fifty feet above your buildings, it is very desirable.

Mr. Michels—Suppose you were on a level?

Mr. Houser—You have no business to put your farm on a dead level.

SEED GRAINS.

W. C. Bradley, Hudson, Wis.



Mr. Bradley.

I am a little bit sorry that this water works talk was cut off so soon. My paper isn't very long, and so I am going to take about five minutes' time to talk about a little different water supply than our speaker has been talking about.

What I want to urge on the farmers of Wisconsin is to get water, plenty of it, and put it in the house where it is handy. Don't let your wives go out and carry water thirty and forty rods for all the washing they have to do. Five, six or ten dollars will put a pipe into the house, almost any house in Wisconsin, from the well, and yet I have known women to pack water for thirty years to save ten dollars' worth of piping.

Another thing, why not have this water under pressure the same as Mr. Houser has? We can't all live on nice level farms: for instance, where I live it is up and down a good deal, but I put my well just where I wanted it and then we put a tank up in the house, and we can draw water any time we want it and any quantity, and the women don't have to run ten or fifteen or twenty rods for water, and it costs so little to build an overhead tank, and when we have a windmill that does all the pumping to get it up in the tank, there is certainly no excuse for not having it, and even if we haven't the windmill, it only necessitates a few minutes' work with a hand pump.

A pressure pump in the cellar of the right kind will put water anywhere in your barn or your house, and it is on tap all the time, and if it is only for the matter of saving our insurance, we ought to do it. Put your pump just where you want it, where it will be handy. I do hope that in the near future there will be hundreds of these overhead tanks put in farmers' houses, or the underhead kind.

Seed Grains.

"Whatsoever a man soweth that shall he also reap."

The seed is the life of the crop. Good seed usually brings the sower satisfaction at harvest time. Poor seed brings curses from the thresher, the buyer and sorry looks from the stock that feed on its product. Good seed, full of vitality, will thrive under adverse conditions that would ruin the

crop if seed lacked vitality. So it is important that seed grains be well cared for to preserve their vitality, as well as to be carefully selected for trueness to type, weight, color, etc.

Very often good seed is spoiled by careless handling. Oats or barley stacked when bundles are too wet or too green, will stack burn; if threshed and put into close granaries while damp, will heat and damage for seed. Seed corn is often spoiled after drying, by allowing to hang where it will absorb moisture, then freezing will injure the vitality, so it should be kept in a dry room where it will not absorb moisture. Timothy and clover seeds are often injured by throwing on top of a bin of heating grain. From tests that have been made, the germinating qualities of the common grains are not injured by two or three years' age if kept dry, but the vitality would perhaps be weakened by age. Grain for seed should be plump, heavy, clean, dry and a velvety, glossy color, but the color may be injured by dews before or after cutting that would not materially injure the vitality.

There is no excuse for the Wisconsin farmer sowing old, badly mixed varieties of grain, for seed centers have been established all over the state that grow and sell at very reasonable prices, usually ten or fifteen cents above the market prices for ordinary grains, the pure improved varieties that have been developed by years of careful selection from a single head that under same conditions has outyielded other kinds. Wisconsin in the past ten years has become noted for its pure seed grains. Our Experiment Station has been doing a great work in growing and distributing through its Short Course graduates splendid varieties of oats, barley and corn, and hundreds of bushels of this pure seed are being shipped to neighboring states, while a large percentage of our farmers will continue to sow inferior seed, saving twenty or thirty cents an acre at seeding time and losing one or two dollars at harvest.

The formaline treatment of seed to prevent smut has done much good, but is being neglected and will have to be renewed as smut appears. The sowing of light weight, shrunken, dirty seed causes a loss of two or three million dollars a year, as we grow of the three leading grains, oats twenty-eight million, barley ten million, wheat three million, rye three million, or about forty-five million dollars' worth in all, so that a loss of one or two pounds to the bushel in the aggregate is very great and ought to be stopped. I think that seventy-five per cent of the barley marketed in northern Wisconsin the past year was so badly mixed with oats and foul seeds that it sold as feed for three or four cents less than clean seed.

About a year ago I saw a man bring a load of wheat to a mill that contained eighteen pounds of foul seed, mostly cockle, to the bushel. This the miller gets for nothing, grinds it and sells it back to the farmer at ten or fifteen dollars a ton, and we hear so many farmers say the grain buyer is getting rich while they are getting poorer. Whose fault is it?

Then the sowing of unclean seed is filling our land with all kinds of harmful things that reduce production, sap the fertility and reduce land values. There is a bill before the legislature of Minnesota to spend fifty thousand dollars in experimenting on ways to kill quack, so bad has it become in that state, and Wisconsin is nearly as bad. Wild oats, mustard, evening cockle, thistles and many other pests have become thick in many places by carelessness in seeding.

Cleaning the Seed.

Take time in cleaning the seed; don't be in a hurry; don't put it off until you want to sow and then run it through the mill once, or perhaps not at all, do it now, in the winter when you have time. Get a good mill, there have been great improvements made in fanning mills in the past ten years, and with a good mill you can separate the good from the poor and the foul seeds almost perfectly, but with clover and grass seeds it is a harder matter. Seedsmen complain that the removal of noxious weeds from seeds is very difficult and that very much of the grass seed direct from the farm contains noxious weeds. But with a variety of sieves from eighteen to twenty-two meshes to the inch, a man can clean three to five bushels per day, taking out the dodder, plantain, sorrel, thistle and evening cockle. A great deal of the timothy seed comes from land full of quack. Of course most of the quack can easily be taken out, but be on the lookout for it.

Adulteration of Seeds.

Some seeds are being fearfully adulterated. The Department of Agriculture found that one-eighth of the clover seed imported into the country in 1906 was low grade, only germinating forty-three per cent. This was sown on 125,000 acres. The buyers no doubt thought they had bad luck if the crop failed. Test all grain and grass seeds before sowing and if they contain any foul seed that you cannot remove and do not know the name and nature of growth, send a small sample down to Madison, they will examine it free of cost and tell you just what it contains and the percentage of foul seed.

Clean seed will do wonders; keep the land clean, keep the man clean, keep the buyer from saying unclean things, cleans up the mortgage and gives your speaker a clean chance to drop the subject.

DISCUSSION.

Mr. Scott—What is the difference between Canadian blue grass and Kentucky blue grass?

Mr. Bradley—I don't know; but they claim there is a good deal of difference and that they are shipping in lots of Canada seed and mixing it with the Kentucky blue grass, and that the farmers are being fooled. You can't tell the difference in the seed. It is a good deal like clover seed, a man might perhaps want June clover seed and not want Mammoth at all, and yet you and I couldn't tell the difference.

Supt. McKerrow—The Canadian blue grass, as it grows, looks just like Wisconsin blue grass.

Mr. Scott—How large is quack grass seed?

Mr. Bradley—It is pretty big seed, half as big as rye. Unless you are careful in handling that a few seeds may get into the timothy seed, and one is too many. It is easy enough to separate out, but the trouble is that where so much of our timothy seed is produced on land that is full of quack, it sticks to the sacks, or in some way will get into the timothy seed, and we have to be very careful.

A Member—It is easily mistaken for chess, isn't it?

Mr. Bradley—It might be.

Mr. Michels—You stated that a large amount of barley in this state is mixed with oats. Do you think that is any disadvantage?

Mr. Bradley—It will sell for about four cents less. If I was going to raise barley, I would want it clean, I wouldn't want any of it that looks as

bad as the average barley in northern Wisconsin.

A Member—Do you think that the poor crops of oats we have been growing this last two years come from poor seed?

Mr. Bradley—No, sir; it has come from climatic conditions at ripening time. Right now in Wisconsin we are simply up against it. We have got in northern Wisconsin thousands of bushels of light oats that only weigh twenty pounds to the bushel, and too many of our farmers are going to plant those oats. Perhaps they will produce a fair crop, but they haven't got the vitality to produce good seed.

The question has come up over here whether it will pay the farmers to buy imported seed. Up at New Richmond yesterday we found there were farmers who had got in a car of Canadian irrigated oats that would weigh forty pounds to the bushel, splendid oats, but the question is, will it do to bring in those Canadian oats and sow them here? We don't know yet. I think perhaps it will be better to risk those good heavy oats than to risk poor oats, and yet the moving of oats so great a distance and not being acclimated, of course we cannot be sure that it will work well. If any of your neighbors have good heavy oats and you can buy them, I think you will be wise to sow them in place of planting light oats.

Chairman Convey—Might not the poor crop of last year be attributed to poor seed from the year before?

Mr. Bradley—No, I think not; I think it was on account of the weather.

Mr. Scott—In our country it was attributed to the green bug.

Mr. Bradley—I don't think that has much to do with it.

Mr. Scott—You would find it did if you had examined them just at the proper time.

Mr. Stiles—We find that quite a few farmers in the last few years like to thresh rye out of the shock and put the grain in the bin. Is that good practice?

Mr. Bradley—No; I think the man who is saving seed grain had better stack his grain and let it go through the sweat in the stack; he will have brighter, firmer grain.

Mr. Buxton—In separating the seed for seeding into three grades, what would you reject? I have done this, I have separated it and then saved No. 1 and 2 and rejected 3, which is the small grain. Would it be better to reject No. 1 and No. 3 and save No. 2, the medium sized grain?

Mr. Bradley—No, sir; I would save the big grain; I would save the No. 1; I would take out the very best there was. If I had a hundred bushels and I wanted to get twenty-five, I would take out twenty-five of the biggest, best, strongest, firmest kernels. Some of you perhaps will say that by this system you will be breeding toward a larger kernel that perhaps will not give you any more bushels but I don't think so. All of our small grains, like wheat, barley, rye and oats, are self-pollenizing to a great extent and we can breed true to type and still separate out the small or inferior kernels. That probably would not hold good in the corn plant, because that pollenization is different from what it is in the small grains.

Mr. Buxton—I have examined the meat inside the oats and found that in most cases the meat from the larger oats was smaller than that from the medium sized oats.

Mr. Bradley—I think you will find that true this year more than ordinary years.

Mr. Imrie—He measured the size. not the weight.

Mr. Bradley—There is another thing that perhaps some of us go wrong on. We have seen perhaps in years past

a year that our late oats sprouted badly and went wrong and therefore the temptation has been perhaps to sow an earlier grain. In my neighborhood there were one or two farmers who had very early oats that ripened up quite heavy, but I think sometimes we will make a mistake in trying to breed or grow a thing that comes a little earlier than it is natural for it to mature. Take our early garden peas that ripen in five or six weeks but will not give us as much per acre as some kinds that take longer time to ripen, and I think the same may be true of grain. We don't want a grain that is too early, we want that which takes a long time to develop and we are likely to get a heavier crop in long growing grain than in that which grows rapidly.

Mr. Nordman—Don't you want an oat that will ripen before the blight and other diseases come along?

Mr. Bradley—Yes, but not a very early one.

Chairman Convey—At the Iowa Station they have tested about sixty varieties of oats in the last five years and the early oats in every case gave the best results, both as to quality of grain and as to yield. I refer to the Iowa Seed Bulletin.

GROWING THE CORN CROP.

Geo. C. Hill, Rosendale, Wis.

I think if we are going to grow the greatest crop in America in fifteen minutes, we shall need to plant a quick growing variety, and get up a hot discussion.

As the subject of corn growing has been on the program of nearly every Institute and farmers' meeting for the past twenty years, it would seem that Wisconsin farmers should know how to grow profitable crops of corn. I believe that those who have been called on to discuss the subject were all successful corn growers, producing fifty to one hundred bushels per acre, teaching by example as well as by precept. Why not then a better average production for the state? Doubtless because there are too many poor farmers, and I am afraid there will always be, who plant poor seed on poor land and give poor cultivation, but, thanks to the teaching and example, there is an awakened interest among the majority of farmers to produce better crops and better corn. Especially is this true of the younger farmers, so that we find the average production slowly rising, being reported at about thirty-four bushels for 1908, which I think is an increase of nearly two bushels per acre for the million and a half acres of the Wisconsin corn fields, worth at fifty cents per bushel a million and a half dollars, enough to pay part of the expenses of Farmers' Institutes and corn experiments at the Station.

The Proper Corn Soil.

The corn plant is a rank grower, and a big feeder. It eats and grows day and night in the effort to grow big and get ripe. It needs a warm, fertile, well drained soil, well supplied with humus. These conditions should be found in every field of a cultivated farm, resulting from a rotation of

crops, including clover and grass, and a plentiful supply of stable manure, well cared for and properly applied to the clover and grass sod, where the corn crop is to be grown.

Clover roots furnish humus. Old grass sod furnishes more, but is likely to be infested with worm pests. Decaying vegetable matter warms the soil, retains moisture and helps in making fertility available. Webster, defining humus, adds "It is a valuable constituent of soils."

Corn will grow on any Wisconsin soil, but seems most at home on prairie loam, probably because it is a warm soil. Sandy soils are well adapted to corn growing, for the same reason. Of the samples of fine corn I have seen in many parts of the state, the finest was in Adams county.

The Preparation of the Soil.

In the preparation of the soil there is little danger of overdoing the matter, if the soil is in proper condition to be worked. The more thorough the work is done before planting, the easier will be the work following. Clay soils need special care in preparation to avoid a lumpy and too compact seed bed. Planting had better be delayed than to prepare the land when too wet, and with right handling it may scarce ever be too dry.

Spring plowed land is best prepared as fast as plowed and can be planted immediately, or kept in condition until the whole is ready for planting, by harrowing after every rain. Two or three weeks of such treatment prior to planting rids the land of a crop of young weeds, and greatly assists clean culture.

Only Good Seed Should be Planted.

It would seem there has been enough said about the importance of planting good seed, but the fact cannot be too strongly emphasized. Wisconsin farmers are greatly indebted to our Experiment Station and to Prof. Moore in particular in demonstrating the value of good seed and improved varieties. It is such a simple, easy matter to be sure of good seed, and so much depends on it that no chance should be taken in providing it. It is the height of folly to plant poor corn seed. The labor is wasted, the land cheated of its right to grow a good crop, and compelled to raise a crop of weeds. The neighbors point the finger of scorn at —the cornfield. The harvest is poor, the crib empty, the swine poorly fatted, the cows lowing for some good silage.

We admire the big ears and deep kernels of the corn grown farther south, but should beware of advertisements of billion dollar grass, or two hundred bushel corn, when the corn hails from Indiana or Ohio.

Not every farmer should be a corn breeder any more than he should be a breeder of pure bred live stock, but every farmer should improve his corn as he should improve his herd. Too many have been growing a mongrel type of corn, not worth improving; they doggedly believe corn is corn, as "pigs is pigs," and what they grow is the best on earth.

Over in the next county, where there is a farmers' club, may be found a variety already much improved above the average. It would be a short cut in the way of improvement for the grower of the scrub corn to get seed from over the line. Such corn can often be found at neighboring county fairs. We have also improved varieties adapted to different sections of the state, very well bred, having quite a resemblance to the southern type. Doubtless there are sections of the state where flint corn grows better than dent. I have found by trial that as much grain can be grown per acre from flint corn as from dent, and with

a larger proportion of foliage and small stalks. On this account the corn fodder and silage from flint corn is preferable for sheep feeding. It costs some more to grow and harvest the flint varieties.

Planting.

I like to grow corn in checks, three by three and one-half feet, with two or three good stalks for producing ear corn, and three to four for silage. I think with this close planting that two stalks to the hill will produce as much ear corn as three. A noted corn grower of Indiana plants in checks three and one-half by three and one-half feet, two stalks in a hill. He says that if each stalk produces one ear the yield is one hundred bushels per acre, and it is if each ear weighs one pound. They probably do, for it is reported he sold ten ears for one thousand dollars. They must be heavy. Two ears averaging three-fourths of a pound, if produced from hills three by three and one-half feet, the yield is eighty bushels.

The Cultivation of the Crop.

Cultivation should follow planting, by first rolling, if the soil is loose or dry, and then by repeated harrowings before the corn appears above the ground. This surface work with the harrow before and after planting, keeping a fine mellow surface, is an important part of the cultivation. It aids the soil to get rid of excessive moisture, retaining it when needed, making it warmer to hasten germination, and destroying vast numbers of little weeds. On our farm, this work has mostly taken the place of harrowing the corn after it is up.

Whenever I hear the subject of harrowing corn discussed, I am reminded of a story; not one of the ordinary Institute kind, but one with a moral.

At one of the sessions of the first Farmers' Institute held in our village about twenty years ago, one of our good farmers said he had a message to deliver. On his six-mile ride to the meeting that morning, accompanied by his family, he was accosted by a man, an old acquaintance, who said to him, "You tell the folks at the meeting that Farmers' Institutes never hoed a row of corn for any man."

The Institute received the message and proceeded in the discussion on the growing of corn, and other topics. At that time the subject of harrowing corn was a live topic at all farmers' meetings, resulting in improved methods of corn culture, almost eliminating the slow and laborious use of the hand hoe, and yet with cleaner fields, thus practically the Farmers' Institute has hoed, not only one row, but thousands of acres of corn for the Wisconsin farmer.

Cultivation should be frequent during the growing period. Cultivators with the leveler attachment do the best work, smoothing the cultivator marks and exposing the weeds to the sun. A single cultivator with many small teeth can be used after the plants are too high for the double machine, continuing until the tassels appear. The best tool I have seen for this purpose, and for garden work, is the Little Giant, which has fourteen teeth which are reversible, and can be set at any angle. It is durable and costs only three dollars.

In this temperate climate the elements are often unfavorable for the growing of the semi-tropical corn plant. While weather conditions cannot be changed, the corn grower should aim, by planting on well drilled land, careful preparation of the soil, selecting adapted varieties and giving good cultivation, to overcome adverse conditions. No crop that we grow responds quicker to generous treatment, and I

believe there is none more sure. In the fifty-four corn crops grown in my experience in central Wisconsin, there has not been a failure. Two or three crops failed to ripen well, but enough so that seed was saved. If the silo had been in use in those years, the loss would not have been large. A lusty cornfield is a thing of beauty; it promises to be profitable; the owner is justly proud of it; passers by take notice; it is an example of well doing.

DISCUSSION.

Mr. Nordman—I would like to inquire of the gentleman who raised this corn that has been brought in here, how close together that seed was planted.

A Member—Three feet eight, about three kernels to the hill. It was grown about ten miles northeast of here.

A Member—Would you prefer to plow, in order to raise a good crop of corn, in the fall or in the spring, your clover sod?

Mr. Hill—I don't think it would make any difference about the time, but if I were to apply the manures made during the winter on the sod, we would have to postpone the plowing and preparation until spring.

A Member—You would not get as good corn to plow it in the spring in this country as you would to plow it in the fall, because then you would get rid of the wild buckwheat.

A Member—Isn't it more apt to wash when it is plowed in the spring?

Mr. Hill—I couldn't speak from experience; our lands are quite level.

Chairman Convey—It would wash more and blow more, in a dry open winter on plowed land.

A Member—Do you always plant on the sod?

Mr. Hill—We do of late years. We used to have a different rotation.

A Member—Would you plow this ground early in the spring, or would you wait until nearly planting time?

Mr. Hill—We usually delay it until planting time, for the reason that we want to get as much manure on it as possible.

A Member—Wouldn't it be better to plow in the fall and top dress with a spreader right on the plowed ground during the spring?

Mr. Hill—If the manure was not too coarse, too strawy, that would be a good plan.

A Member—I have tried it for two years and I have a relative from Iowa and he says we raise better corn here than they do there, and I use the manure spreader in the spring.

Mr. Imrie—I think you will find that most of the people here who have clay soil prefer the fall plowing. We manure it the year before and then plow it that fall.

Mr. Hill—I spread manure on clover that is to be plowed.

A Member—We aim to have our corn land plowed in the fall and we put the manure on this land during the winter as it is made. This system of plowing the sod in the spring and having the manure put on there I have not been able to work, because I couldn't get a coulter or any kind of a plow that would do a good job after the manure was spread in that way. Of course we have no manure spreader and perhaps we put it on too thick.

Mr. Scribner—Drag it.

A Member—You better spend the money for a manure spreader.

Mr. Imrie—Perhaps Mr. Hill's conditions are a little different from ours. We haul out all during the winter and spread it where it is going to be pasture the next summer. Where a man has had steers, the yard has to be cleaned out, but if you have a manure spreader none of these things cause any trouble. If it is applied through the winter, in the spring, before the

grass is up, you will find no trouble and can make hay later. You will gather up a little straw, but it will be dry, it won't hurt the hay.

Chairman Convey—I think the longer you keep a growing crop on the land, the better condition it is in. We use the same plan Mr. Hill does. The manure plowed under on the clover sod, you get whatever weeds and rubbish are likely to be in the manure down to such a depth that you get the corn land ready and the corn started before the weeds come up, there is no difficulty in keeping land of that kind clean and it is certainly much superior to fall plowing on hilly land. The snow will blow off that class of ground, it will freeze deep and the spring rains will run off that land, so there isn't so much moisture as where clover is growing. So, all things considered, I would very much rather advise spring plowing, although years ago I recommended fall plowing. The manure spreader is almost a necessity on a farm.

Mr. Buxton—A man will work in coarser manure in the spring than he will in the fall. I plow my land in the fall and then start manuring. I am particular about doing a good job and often plow it again. I want the land very carefully prepared.

Mr. Hill—Referring to the fine sample of corn brought in, I think the Superintendent of Farmers' Institutes better come to Mondovi to get a corn talker for the next Round-up if this is the kind of corn they raise up here.

Adjourned to 1:30 P. M.

AFTERNOON SESSION.

The convention met at 1:30 P. M. March 17, 1909. Superintendent McKerrow in the chair.

Supt. McKerrow—Mondovi this year obtained the Closing Institute over several competitors, among whom were Neenah and Menasha over in the eastern part of the state. The reason Mondovi secured this Institute was that for twelve years Mondovi has been asking for the Round-up Institute and I have got tired of saying no. Then again, Mondovi has a very good record for attendance at Farmers' Institutes and is located in the western part of the state. This year Neenah and Menasha are in the field again, along with Fond du Lac, Two Rivers, Waupaca, and a half dozen other places, but Neenah and Menasha are very much in earnest and so they have sent a delegate over here whose name I presume is familiar to you all, the Hon. S. A. Cook, who comes to give us an invitation and comes representing the Business Men's Association and the farmers of that district.

Hon. S. A. Cook—I want to thank you for permitting me to come before you and to assure you that it will not only be appreciated by myself, but by those whom I came here to represent, if you shall see fit to come our way next year.

Never before in the history of our

state or nation have farmers and products of the farm received the thought and attention that they have for sometime past and are at this time. A high standard has been reached by many farmers through rigid care in selecting the proper branch of the industry, and then by mastering the profession they engage in. I admire the man who from books alone can, on the platform, or through the papers and magazines, tell us how to conduct our business, our farms and factories, and tell the working man what constitutes a day's work, all from theory; but I honor the man who can do these things himself, do something practical, whether it be on the farm or in the bank; it is results that count either for or against us.

As stated, a high position has been reached by many of you, but you are now, or soon will be, confronted with the problem, how to hold that position; you cannot do it by being content to rest where you are, if so you will fail. You are advancing or receding. To hold your position you must go higher and to do so you must take with you those who are content to be let alone. I refer to the careless farmers, and they are in quite large numbers.

The careless farmer is to blame for bringing his milk to the creamery or cheese factory in cans and condition that would be a crime to allow his own family to use the contents for food. The butter or cheese maker becomes much more of a criminal in receiving the milk, he is not only deceiving the public as to the cleanliness and wholesomeness of his butter or cheese, but he is wronging every one of the farmers who are bringing to his factory first-class milk in first-class condition.

The farmers need not fear for many years to come of a low price for high-grade butter or cheese alone by an over stock of the high grade article, it is the vast amount of poor grades placed on sale as first-class goods, when, as a matter of fact, all they have to entitle them to a place in any market as an article of food is the name "butter or cheese." It is the article with simply the name to recommend it, that is and will cause you more trouble and loss than all else in the industry, and similar conditions and results will apply to all other farm products.

History says of us that no nation has approached our own in rapid growth and unusual intelligence. The spirit of progress is the greatest asset an individual or community can have, it is a desire to know what constitutes success and the willingness to take every wholesome opportunity that leads to it, and pause only when victory is won.

The great factor for that success for which your institution contends is the education and co-operation of your fellow farmers for better work in the art of producing, caring for and the marketing of your product. The weeding out of the incompetent that is a dead weight, also to demand the enactment and rigid enforcement of such laws as will protect the producer of honest farm products against unjust discrimination and competition from dangerous filth and deceitful imitations.

Chaldea and Egypt, Greece and Rome, grew rotten and ripe for destruction, not in the fields or farm home, but in the crowded streets and places of vice, shams and fraud; no nation was ever overthrown by its farmers, and just the same the great agricultural industry of this nation will never be injured or overthrown by its high grade products.

There are two chief reasons for lack of co-operation necessary for lasting success; one is that men do not agree on what is best to be done, the other is a selfish motive that deceives men to

believe they can get more by going alone. The narrow-minded man fishes with a hook and thinks he will have all the catch; the broad-minded, progressive man joins with others in using a large net and his portion of the catch far exceeds what he might get with a hook.

If a man desires to obtain the most good for himself, he should know that his legitimate share of a common good is much greater than any possible good he can obtain for himself alone.

The remedy for failure to agree for what is best, is to have more frequent meetings and mingling together and exchanging ideas, which are the great factors to build from. Ideas developed have built the great trans-continental railroads over and through mountains of rock that at first and for many years seemed impossible. Ideas have made this the greatest nation of people on earth. Ideas raise the plow boy to president, they connect the current of energy with the wheels of industry.

You have with you here good men high up in knowledge on scientific principles in farming and the various products of the farm; you are here with your own knowledge from practical experience. The combination when applied together must bring success.

The time has passed for a farmer to consider himself rich, or to use the common term, well fixed, from the fact alone that he has a large number of acres, or a large number of cows or other stock, he can be land poor or stock poor, his success depends on how much he can obtain from each acre or each cow. Better a few acres well fertilized, a few cows well bred for the purpose intended and a small product of cheese or butter well made, if success is the object, as it costs you more to continue to own a poor producing acre, a low grade cow or other producing animal, or to make a low grade article of cheese or butter, and in time if you depend on that line of industry alone it will put you out of business.

No branch of industry in the state has made greater progress than the butter and cheese making industry during the past year, and still the opportunities for further progress are very numerous. A vast area of the land suitable for dairy farming is yet undeveloped.

The markets of the world are each year becoming better acquainted with the high grade of the dairy products of Wisconsin, and will take all the surplus, if the product shall become four times what it is now. The opportunities are before you, the success rests with you.

Twenty- four hours may be too short to do what will make one famous, but it is not too short to do something to improve our conditions; the present alone is ours, wasted opportunities may never come to us again. We may start at the lowest step, but if our chosen occupation will bring us to a higher one, we need not be discouraged, for only by perseverance are we able to overcome the opposition which we meet in life; the sweetest flowers are guarded by the sharpest thorns, so our greatest achievements are surrounded by the most trying difficulties.

This splendid gathering is one of the many that proves to the world that no nation has the equal of the intelligent men, loyal mothers, wives and daughters of this country. Are the mothers, wives and daughters getting their share of the benefits from the great help they are in carrying the burden for success in your good work? Is their home being made so pleasant and their surroundings such that they prefer their home to any other place on earth?

With a happy home and earnest,

thoughful and rigid care of your industry, success must crown your efforts.

I have here and present to you also this communication from the city of Menasha, another communication from the merchants of the city, also the Menasha Club to the same effect, and a letter from the Neenah Business Men's Association. That is their guaranty.

Menasha, Wis., March 16, 1909.
Hon. Geo. McKerrow,
Supt. Farm Institutes,
Madison, Wis.

Dear Sir:—The Menasha Club, composed of business and professional men of the cities of Neenah and Menasha, has instructed me as Secretary to extend to you an urgent invitation to have the Round-up Institute for the season of 1910 meet at the said cities.

The citizens in general, as well as the members of the club, wish me to say to you that they will do everything in their power to assist in making the Institute a success.

An excellent place in which to hold the meetings is at your service and the best of accommodations will be provided for those in attendance.

The large farming population within easy reach of our cities is interested and will certainly do their part.

Come to Neenah-Menasha with your next "Round-up," and give us an opportunity to prove the sincerity with which this invitation is given.

Very truly yours,
(Signed) John Callahan,
Secretary.

Neenah, Wis., March 16, 1909.
Geo. McKerrow, Supt.,
Wisconsin Farmers' Institutes.

Dear Sir:—At a meeting of the Neenah and Menasha Business Men's Association, it was unanimously voted to extend an invitation to the Wisconsin Farmers' Institute that a Round-up Institute be held in the cities of Neenah and Menasha, during the season of 1910.

The business men, citizens and adjoining farmers for miles around the territory tributary to Neenah and Menasha promise to join and make this, with your assistance, one of the most interesting meetings in the history of the Wisconsin Farmers' Institute.

The Business Men's Association and the citizens of Neenah and Menasha in general pledge themselves to provide suitable hall and other accommodations to entertain the speakers and to promote as large attendance as possible.

Trusting to have a favorable report from your committee and thanking you for past favors in our behalf, I am,

Yours respectfully,
(Signed) Eli Defnet,
Chairman of Committee on Farmers' Institute.

We are situated in a community that has thirty-seven or thirty-eight railroad trains passing both ways, about eighteen each way a day. We have good accommodations, we believe, for all who will come there. We will try to make it as pleasant as possible, and in order that you may have no fear in coming there, I will mention that we have plenty of churches and schools of the highest order; we have clubs that none of you will be closed out of; we have good hotel accommodations; we also have the State Hospital, a place for the feeble-minded, so that all are invited and can be accommodated. We have, we believe, as near a perfect layout as you could find anywhere, with one exception only, and that is that Mr. Aderhold lives there and occasionally shuts up some of us.

Now, we do hope you will consider this and if you will come we will take care of you.

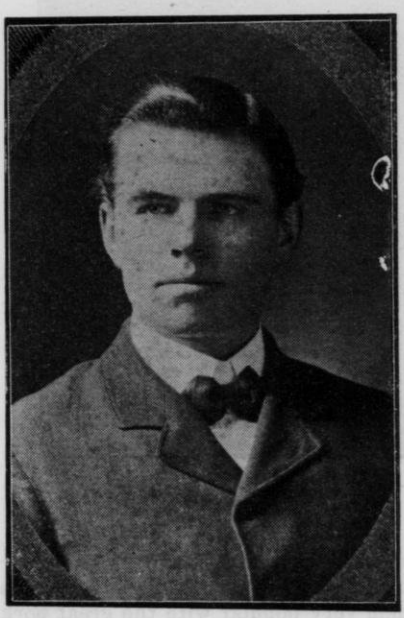
Supt. McKerrow—I am very glad that I have about six months to consider this invitation, because if I had to decide today I don't see how it would be possible to say no, but in six months' time a man has a chance to change his mind. I will say this though, if every farmer and every lady in this audience would promise to go to Neenah and Menasha next year I would promise to recommend Neenah and Menasha for the Institute.

We will consider this matter very carefully, Mr. Cook.

Mr. Scribner called to the chair.

THE POLAND CHINA HOG.

L. P. Martiny, Chippewa Falls, Wis.



Mr. Martiny.

In discussing this breed of hogs, it may be interesting to some to know something of its history and origin. In the first place it is purely an American breed, originating and coming to its high type of development in this country. The Poland China breed of swine originated chiefly in the state of Ohio, in Warren and Butler counties in the Miami river valleys. At that time Cincinnati was the greatest hog slaughtering point in the west and the great excellence of the then grade or common hog of the Miami valley gained a reputation that extended over the pork producing west. We can trace the Poland Chinas back in history to 1835, when they were the common stock of the country with very mixed breeding. By the crossing of various families then known as Big Chinas, Byfield, Bedford and Irish Grazier, the offspring were a large and somewhat coarse hog, black and white spotted and then called by various names as: Magie, Butler County, Warren County, Miami Valley, Poland and China, Great Western, Shaker, Union Village, Dicks Creek, Gregory's Creek and others. A Berkshire cross, introduced along about 1840, gave the black color with white markings, improved symmetry and increased activity. No out-crossing has been done since the year 1845.

At the National Swine Breeders' Convention, held at Indianapolis in 1872, it was decided that this breed should be known and called the Poland

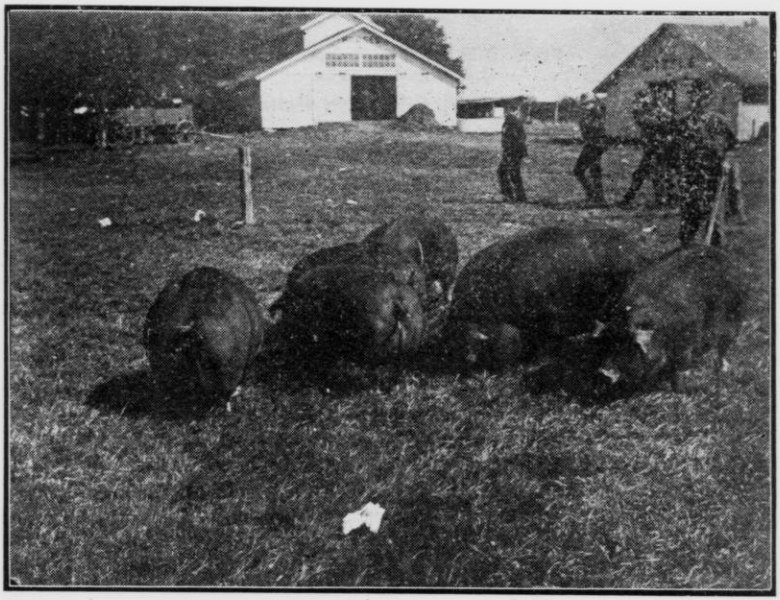
China and it has retained that name to the present date.

No person or persons stand out preeminently as the originators or improvers of the Poland Chinas. The Shakers of Union Village, Warren County, Ohio, are to be credited with much of the improvement made in the earlier days of the breed.

cording associations, the principal one being the American Poland China Record Association located at the Union Stock Yards, Chicago.

Some Characteristics of the Breed.

As to the characteristics of the Poland Chinas, the one that stands out most prominent is their easy feeding



A few of L. P. Martiny's Poland Chinas as seen at the Fair.

The Poland China has found his way into every state in the Union, to a limited extent in Canada and Mexico and has crossed the water to Europe and the Equator to South America. They are without doubt the favorite breed at the present time in the central, western and northwestern states, which include the great pork producing states of the Union.

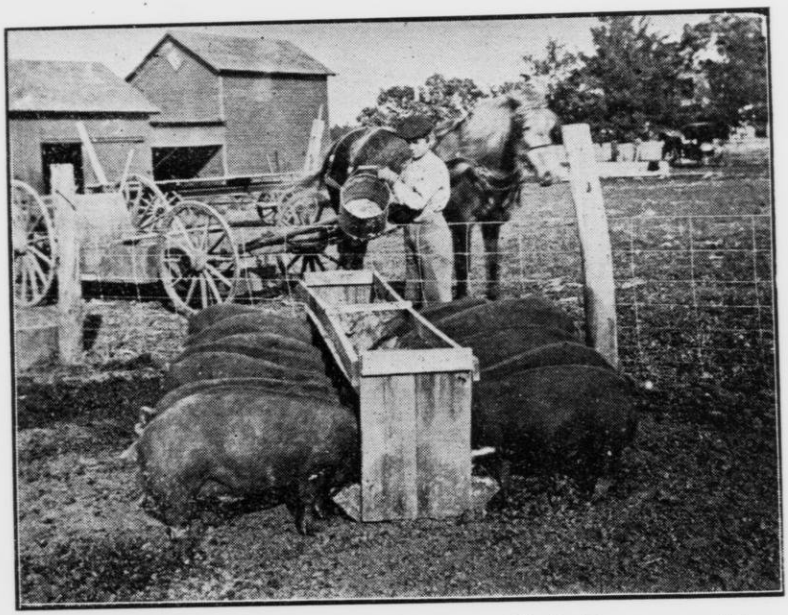
The first recording association of the breed was organized at Dayton, Ohio, in 1878. At present there are four re-

qualities, combined with very early maturity. These qualities have made them very popular with the great pork producers of the corn belt. There is perhaps no other breed of equal size that will mature as young as the Poland China. In size they are classed as one of the medium breeds, being about the same as the Berkshire, Chester White or Duroc Jersey. Being a very large breed in numbers at the present time and covering a great territory, their size varies considerable,

the Poland Chinas of the extreme corn belt being a little smaller and finer in bone than the hogs of the dairy states of the north or the alfalfa states of the central west.

In their growth, under good care and feed, they attain the weight of two hundred to two hundred and twenty-five pounds at six months of age; three hundred to four hundred pounds at one year of age, and the males attain the weight of five hundred to seven hundred pounds in good flesh at maturity and the females about one hundred pounds lighter. It is not uncommon, however, to find specimens of the breed that weigh over one thousand pounds in full flesh.

They are well adapted to any locality where they are supplied with nutritious food and where good care and management is practiced to obtain best results at pork production.



Feeding the Poland Chinas at Chippewa Stock Farm, owned by L. P. Martiny.

The Breeding Qualities of the Poland China.

In regard to their breeding qualities there is often a great diversity of opinion. Being of the rather extreme type which is typical of all our best meat producing animals, that is, low down, broad and deep, the type that encloses the most hog in the least space, it is not reasonable to expect quite as good breeding qualities, in the way of large litters, as from hogs of the rangy, angular types. I will say that their breeding qualities vary according to care used in selection, care given and management. Where Poland Chinas are fed heavily, their good feeding qualities seem to be a detriment to their breeding qualities. Where good results are to be expected in raising Poland Chinas of the best type, great care must be given that

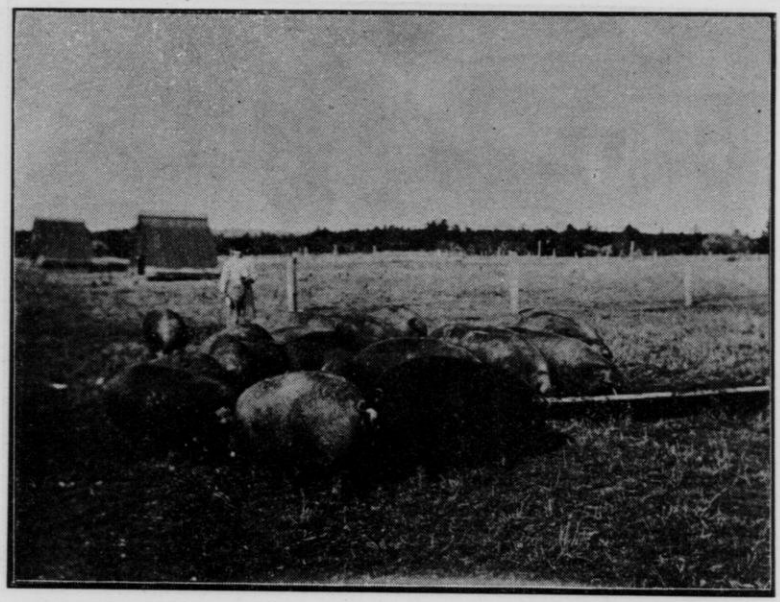
they are not allowed to become too fleshy and furnish them with plenty of exercise. Where proper care is used in selection, feeding and care of breeding stock, they will produce from eight to ten pigs to the litter on the average.

In disposition the Poland China is very docile and very easily handled. Their quiet disposition and freedom from restlessness and viciousness makes them nearly ideal in this respect for feeding qualities.

As to their value for crossing, they are most excellent. In crossing on common scrub stock they greatly increase the feeding qualities by giving a thicker fleshed carcass and a better disposition, characteristic of good feeding qualities and earlier maturity. Where a farmer has sows that lack depth of body, long in head, weak in constitution and possessed of poor feeding and maturing qualities, a good Poland China sire usually gives very good results in the first cross, with continued improvement in each succeeding cross.

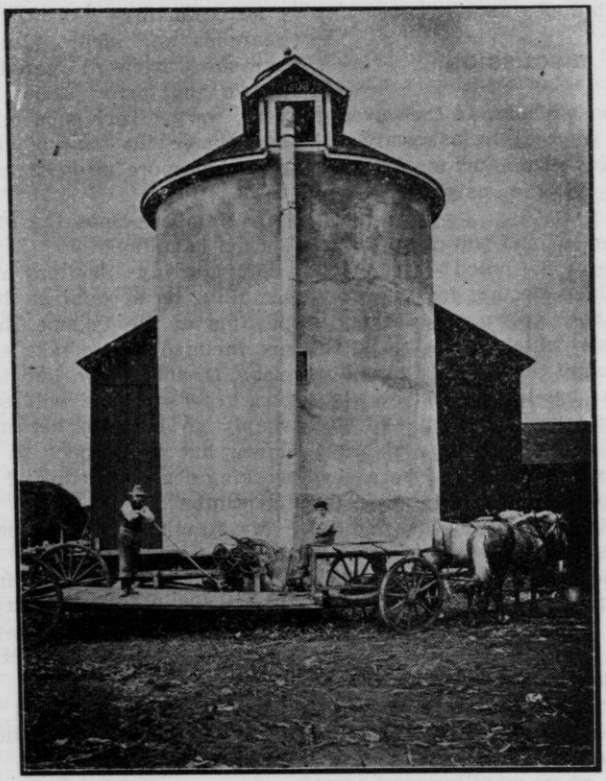
A Typical Poland China.

To describe a typical Poland China in detail, it should be black in color with four white feet, white switch on tail, with some white on nose, face or forehead. A few white spots are not objectionable. The head should be medium to small, broad between the eyes and ears, face nicely dished, nose short with full cheeks. The ears should be drooped, with the break or bend in the ear near the center. It should be fine, very flexible, soft and covered with a fine silky coat of hair. The jowl should be full, firm and neat, carrying fullness well back to should-



Poland China brood sows on Chippewa Stock Farm, owned by L. P. Martiny, with movable pens in the distance.

ers on side and brisket on bottom. A light jowl usually indicates lack of constitution, poor feeding qualities and restless disposition. The neck should be short, deep, well rounded, in the males full and nicely crested. The between fore legs. The back should be broad, straight or slightly arched and carry width well back to hams. The sides should be deep, carrying size well down and full in both front and rear flanks. The hams should be full,



Silo-filling time at Chippewa Stock Farm. Silo plastered with concrete both inside and outside.

shoulders should be broad, deep and smooth and in proportion to size of hams. They should extend well down and be free from any coarseness or openness on top. The heart girth should be full, ribs extending well down, wide and full back of fore legs, free from any creases on sides or sags back of shoulders and well let down deep, broad and carrying well down over the hocks. The tail should be well set on, small, nicely tapering and not too short. The legs should be of medium length, well set apart, straight and nicely tapering, showing plenty of bone and tendon, but free from any tendency to coarseness, as may be indicated by coarse hair, thick skin,

fleshiness and coarse joints. The feet should be short, pasterns short and stand almost perpendicular above toes. The quality of the animal is indicated by a very fine, thick, silky growth of hair. The skin should be thin and free from wrinkles, giving the animal a very smooth appearance.

DISCUSSION.

A Member—What was the average number in your litters last year?

Mr. Martiny—From my mature sows, somewhere in the neighborhood of nine.

A Member—Would you claim that as the average of the breed?

Mr. Martiny—No, not for the breed. They have been grown very largely in the corn belt, which seems to be the natural home of the Poland China hog, and there he has largely lost his vigor by being fed largely on corn, and with that loss of vigor would be lost breeding qualities, so that would be a very high average for the breed, but in the states of Wisconsin, Minnesota and the alfalfa lands of the west, where care is used in selecting the breeding stock and they are properly cared for and fed, I don't think that is a very high average.

Mr. Nordman—What do you feed your pigs at weaning time?

Mr. Martiny—If I could have only two feeds at weaning time, it would be this, flour wheat middlings and some skim milk, but some ground oats with corn and a little oil meal and a little ground barley mixed into a very thick slop, so the pigs will have to chew it, rather than drink it.

Mr. Bradley—In the selection of your gilts, would you prefer a very nice gilt from your litter of three, or a little inferior creature from your nine? Which would you select?

Mr. Martiny—I think I should prefer to select the one from the litter of nine. It does not necessarily follow that large litters produce any inferior pigs more than small litters. I would expect to get as good specimens from the large litters.

Mr. Bradley—From what aged sow do you get your best pigs?

Mr. Martiny—Ususally from two-year-olds and older; although where our sows are well cared for, well grown and farrow at not less than a year, we get very good pigs at that age, sometimes some of our very best pigs, but more often from the older sows.

A Member—Does the old sow need special handling?

Mr. Martiny—She may need special handling, on account of the quiet disposition of the Poland Chinas, which are inclined not to take enough exercise. If you allow her to have her own free will, she will eat and just simply go back to her nest and lie down, but we expect to keep them working a good portion of the time in the winter.

Mr. Bradley—Do you desire to have them farrow in thin flesh?

Mr. Martiny—No, we aim to have them in what we call pretty good flesh at farrowing time, so they will have an abundant milk production for the little pigs.

Mr. Imrie—How do you feed your brood sows during the winter?

Mr. Martiny—This last winter we made a mixture of three hundred pounds of wheat middlings, three hundred pounds of ground barley (barley is about the cheapest food we could use), and with that about one hundred pounds of oil meal. Then with this we mix some air-slacked lime and some salt. We take a barrel about two-thirds full of warm water, put in about a bushel basket of this feed, and then about two heaping bushel basketfuls of finely cut second crop clover hay. It will make a very thick slop,

looks as if it was made almost entirely of clover chaff. We find they digest food better, get more out of the ground feed we give them; also get more out of the clover and it keeps their bowels in better condition, and when the pigs come in the spring they are stronger than where they are fed on highly concentrated food. I consider that every pound of clover hay I can induce my brood sows to eat during the winter is almost as valuable, pound for pound, as a pound of shorts or barley fed to them.

A Member—Why do you feed the air-slacked lime?

Mr. Martiny—There seems to be some mineral element in it that the hog craves. If he has an opportunity, he will chew the plaster off the stone wall.

A Member—Isn't that to get the grit?

Mr. Martiny—They get something, and I have found out that by feeding this air-slacked lime they don't try to root as much as if they hadn't it. It also has a tendency to correct any acidity of the stomach.

Mr. Imrie—About how much do you add to that mixture?

Mr. Martiny—Probably about five or six quarts of this air-slacked lime and about the same amount of salt.

A Member—Wouldn't it be better to mix the lime and the salt together and let them help themselves?

Mr. Martiny—Possibly it would, but we mix it right in the feed.

Mr. Roberts—Charcoal is a better corrective for the stomach, I think.

Mr. Martiny—I think it would probably be better, but we don't have it, so we use the lime, which is very cheap, and we always have it on hand.

Mr. Roberts—What length do you cut your hay?

Mr. Martiny—We cut it about a quarter of an inch long, using the same feed cutter that we fill our silo with. Last fall, after the ground froze up, we cut up several tons of that second growth clover hay for our hogs, to be fed during this last winter.

Mr. Buxton—Have you had experience in cooking barley?

Mr. Martiny—No, we haven't. We never thought of cooking for our hogs, unless it is pumpkins or something we want them to eat especially. We grind our barley and it is fed in the form of a slop in warm water.

Mr. Roberts—I have fed alfalfa and I like it very much, for it is bulky food.

Mr. Martiny—I think alfalfa would be way ahead of clover; I expect to feed it in the future myself. I want to explain one way we have induced our brood sows to take exercise during the winter. I live in Chippewa county and we can grow ordinary Canada peas there very abundantly. We sow these peas early in the spring at the rate of about two and a half bushels to the acre and we harvest them with a mower. We stack these peas without threshing, and then about noon every day in the winter, we throw out a few forkfuls of these peas for the hogs. We scatter them very thinly and the hogs will root over the pea vines all afternoon and they never lose a pea. It induces them to take exercise in that way and I never have had such strong pigs as I have had since I fed them on these whole, unthreshed peas.

Mr. Buxton—In our locality they are advocating cooking the feed. I notice the feed ration you suggest is raw though wet. Wouldn't it be better to boil that?

Mr. Martiny—No, I don't think so. Experiments that have been conducted at our experiment stations do not show any advantage in cooking feed for swine. If you had a large quantity of barley that you wanted to feed and thought they would eat it better, I would cook it, otherwise not.

A Member—Do you soak this feed from one feed to the next?

Mr. Martiny—We do in the summer, but we haven't a place where we can do it in the winter. It would be better if we could.

Mr. Convey—I think it is a serious mistake to cook oats, barley or wheat for hogs. It makes them more indigestible, though they do eat it better, there is no question about that. Cooking seems to make the protein element in the feed more palatable, but I would much prefer to soak the feed rather than to cook it.

Mr. Imrie—You would have to have warm water for soaking in the winter.

Mr. Convey—I wouldn't cook it; the soaking is all right, but the more you cook it the more indigestible it is.

A Member—By burying a barrel in the ground you can soak it all winter.

Mr. Convey—There is an objection to that, a little fellow like me might fall in and not be able to get out.

A Member—I had a worse experience than that; my best sow fell in.

Mr. Stiles—Mr. Martiny says he would feed a small amount of barley. Why not more?

Mr. Martiny—Barley is rather hard to digest and it is rather constipating.

Mr. Stiles—It would be all right if they are running on grass, wouldn't it?

Mr. Martiny—That would be better. We must bear that in mind, barley is a good feed for hogs in every way, but at the same time it is hard to digest and quite constipating. It is all right for pigs after they are three or four months old, weighing about a hundred pounds, but before that time it is hard to digest and has a tendency to produce scours.

Mr. Stubley—Having your pigs come in early in the spring, have you been bothered with thumps? If so, what did you do?

Mr. Martiny—The cause of thumps is lack of exercise. You can tell what is the matter before they get thumps; they get very fat and sleek, broad across the shoulders and fat under the chops. You think they are the finest kind of pigs, then the first thing you know their hair is sticking up, head, ears and tail are drooping, then they lop down and they stagger, their sides are heaving like a heaving horse, they lie down and finally die, and possibly you will lose the whole litter. The main cause of that is lack of exercise, and one good way to prevent that where you have it, is to take the whole litter and run them out of the pen and shut the door, the sow will miss them and they will run around that pen and squeal and try to get in. Let them keep running around, it will do them good. Another way, I take an empty salt barrel and put into that pen and take up those pigs that are affected and put them right in that barrel. The sow calls them and they jump up and down trying to get out; and in that way they get exercise. Since I have learned the cause of thumps, I have never lost a pig from that disease.

A Member—Did you ever have trouble with sore mouth in pigs?

Mr. Martiny—Yes, that is a disease we are to blame for ourselves in nine cases out of ten, and the cause of that is filthiness. By keeping the brood sow and her litter in a filthy place, they are liable to have sore mouth. Some farmers will say that is not true and will tell you how they have the hog pen cleaned out, how they took the shovel and scraped it out and then put in a big armful of clean, dry straw, and yet they got sore mouths. They do not stop to think that this pen may have been used for years and was thoroughly saturated with the germs of the disease. The hog is a very low animal, she drags on the floor and picks up those germs, and the first thing we know the pigs have sore mouths, and if it doesn't kill the pig,

it leaves him a runt anyway. If you have to keep the litter in an old pen, the way is to clean out that pen a few days before hand, cover it with air-slacked lime, or use some of these patent disinfectants, like zenoleum or creosote, saturate the floor thoroughly, so as to kill the disease.

A Member—I had pigs die of that trouble when their pen was perfectly dry and the weather was dry.

Mr. Martiny—It does not necessarily need a damp place, some of the worst places are where it is dry and dusty, where hogs have been before. Then sometimes, where the sow has a large litter, especially if they are very strong, vigorous pigs, they fight each other in nursing and bite each other's lips and start sores in that way. Where you have a case of that kind, it is a very good idea to take a pair of nippers and nip off the tusks close to the gums and you won't have any more trouble. We find in our practice about one litter out of fifteen that we have to take off the tusks. Sometimes a sow gets so she won't own her pigs and you don't know what is the matter. It is simply because her pigs bite her so much and it worries her till she gets up and defends herself. If you just take off their tusks, it will effect a remedy.

A Member—I had my worst trouble with sore mouth when I had new pens and they were all clean. I lost forty or fifty of them.

Mr. Martiny—One year I had quite a loss myself that way, and I began to think that some of the pigs were almost born with the disease. There is no question that it is contagious and where it gets into a herd it is a bad thing, but I think I am safe in saying that in nineteen cases out of twenty the cause is filthiness, but in the other, the twentieth case, I believe it is contagion.

Mr. Bradley—What is your remedy?

Mr. Martiny—Where it is caused by filthiness, the remedy is to clean the place up; where it seems to be contagious, then the best thing you can do is to make a solution of permanganate of potash, about one ounce to ten quarts of water, hold the little pig's head, take the scabs off of those sores and rub that solution in; do that two or three times and they will usually dry up. It is a very simple remedy and there is no danger in using it.

SHROPSHIRE SHEEP.

W. A. McKerrow, Pewaukee, Wis.

Mr. McKerrow.

On studying the different breeds of sheep, their development and breeding, we find the demands of the market, climatic conditions and care have been the main factors in the development of each distinct breed. Prof. John Wrightson, of Agricultural College, London, says: "Agricultural science and literature are between them rapidly taking the romance out of pastoral life, which is sad to lose." However it is disappearing under the influence of commercial enterprise, the spread of science and the difficulties of competition, which have been conducive to the best development of the mortgage lifter and rent payer, the Shropshire.

The origination of this popular breed has been disputed by some. In the Royal Agricultural Society's Journal of 1856 they are described by Prof. Wilson as follows: "In our early records of sheep farming, Shropshire is described as possessing a peculiar and distinct variety of sheep, to which the name of Morfe Common sheep was given, from the locality to which the breed was principally confined." In 1792 the Bristol Wool Society reported as follows in reference to the Morfe Common breed: "On Morfe Common near Bridgenorth, which contains about 600,000 acres, there are about 10,000 sheep kept during the summer months, which produce wool of superior quality, they are black faced or brown, or spotted face, horned sheep, weighing about ten pounds per quarter, and clipping about two pounds per fleece."

As the country advanced and the breeds became valuable for their carcasses as well as wool, the Morfe Common were crossed, but more particularly with the long wooled Leicesters, Cotswold and short wooled Southdown. Others claim the Shropshire is the result of careful selection and development of the original Morfe Common. Youatt states that it was probably the original Shropshire referred to in a work published in 1694 which states that, "Shropshire wool is not to be equalled in its kind by any part of the world."

We find the development of this breed making great improvement, when in 1853 we find the Royal Agricultural Society to report as follows: "The new class of Shropshire Downs was very successful, and it is to be

hoped the society will recognize them as a breed."

They were at this time described as without horns, with faces and legs of a grey spotted color; the neck thick with excellent scrag; the head well shaped, rather small than large, with ears well set on, breast broad and deep with fleece weighing about seven pounds. Thus the Shropshire may be compared with the maternal ancestors which grazed on the Morfe Common sixty years previous. We find the breed had doubled in carcass weight, and increased its weight of fleece at least threefold. In 1858, Prof. Tanner, of England, said: "Only a few years since any mention of the Shropshire Down sheep raised an inquiry, even among intellectual agriculturists, as to their character, and few comparatively speaking knew anything of them."

Shropshires first were recognized in the prize list of the Royal Agricultural Society Show in 1859. In speaking of the Shropshire at the Royal Show Alfred Mansell, one of the most prominent agriculturists in England, says: "Since 1859, despite the great prejudice and opposition of exhibitors of other breeds, the Shropshires have steadily increased in numbers at the Royal shows, culminating in the grand display of 1884 at Shrewsbury, when 875 Shropshires were exhibited against 420 Southdowns, Hampshires, Lincolns, Leicesters, Cotswold, Mountain and all other distinct breeds, being considerably more than double the number of all other breeds, and demonstrating very conclusively that the Shropshire is a sheep that meets the requirements of the present day." The period of development of the Shropshire has been

Champion Shropshire ewe, Wisconsin State Fair, 1909; one year old.

one of comparatively short duration, and yet results have been most gratifying.

While the home of the Shropshire is in Shropshire, England, we find this popular breed in all parts of the British Isles; we find them all over the American continent, both north and south, in Australia, New Zealand, Tasmania, Germany, France, and nearly every civilized country. They have adapted themselves to nearly every condition, both climatic and geological. Alfred Mansell further says: "Another fact worthy of notice is that this breed seems to thrive and become acclimatized in all places if properly cared for, as is proved by the exhibitors extending over a wide area and by the experience of others who have seen the breed flourishing in England, Scotland, Ireland, the United States, South America, Canada, the colonies, France, Germany, Greece and most other continental counties whose soil and surroundings differ to a great extent. The power of acclimatizing itself has not escaped the notice of foreigners who have of late years exported the breed largely."

The Shropshire breed is protected by the largest live stock record association in the world. It was originated in 1884 with its secretary elected to record the pedigrees of pure bred Shropshires. There have been about 225,000 animals recorded in its history.

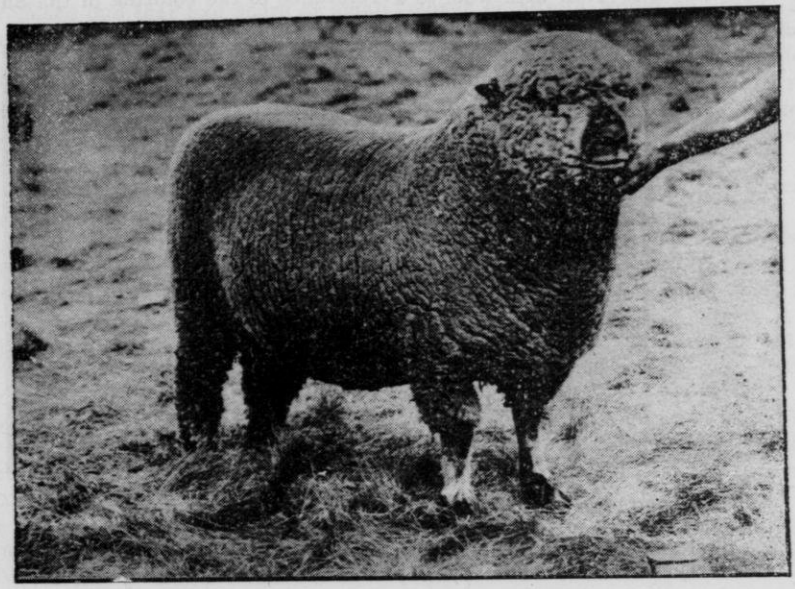
Prize winning Shropshire ram at Wisconsin State Fair and Alaska-Yukon-Pacific Exposition, Seattle, Wash., 1909.

We find this breed used very largely on the western range for improving the mutton production. The lambs are good feeders and will stand more grief than many of the larger breeds.

Clarke beautifully describes the

Shropshire in his book on "Modern Sheep." "The modern Shropshire is a beautiful creation and a living monument to the flockmasters' skill. Luster is added to its beauty by the profit it returns where good management is in evidence. Utility, as is sometimes the case with other 'things of beauty,' has not been sacrificed for beauty's sake alone. A more universal charm than the Shropshire does not exist in live stock breeding circles. No matter in what direction our eyes are turned on the live stock breeders' horizon, Shropshire appears in indellible characters." We find Shropshires in every show yard where sheep are recognized throughout the civilized world in greater numbers than any other breeds.

The British breeders deserve the credit of developing this breed from the old Morfe Common with mottled face and horns to the present day Shropshire with brown or black face without horns. Although this early characteristic sometimes is found in the poorly bred flocks it has been eliminated to a great extent.



Typical Shropshire yearling ram. Winner of first prize at English Royal Show, 1909. Imported by McKerrows at cost of $650.00.

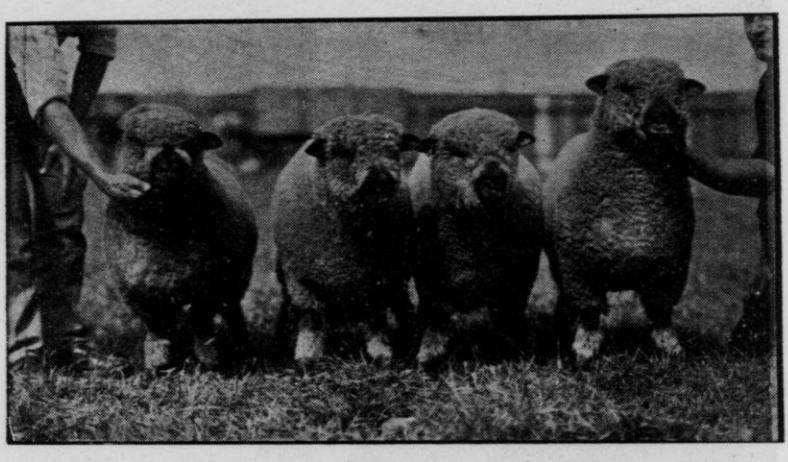
Standard of Excellence of the Modern Shropshire.

The standard of excellence in Shropshires of today calls for a sheep of great constitution, deep and large in the breast and through the heart girth, back wide and straight, and well covered with lean meat or muscle, wide and full in the thigh, deep in the flank. The pink skin is looked for in this particular breed, a brilliant eye and a healthy countenance. In fair

condition when fully matured, rams should weigh 225 pounds and ewes not less than 175. The general appearance should be of symmetry of form, with a leg placed on each corner. The head of the ideal Shropshire should be short and broad, wide between the ears and wide between the eyes, short from top of head to tip of nose. The head should be covered with wool to a point well down below the eyes. The appearance of horns is a great objection. The legs should be well wooled. The neck should be of medium length with good muscular development, especially with the rams, heavier toward the shoulders, set high up and rising from that point to the back of the head.

The wool should be medium, such as is known in our markets as medium delaine and "half combing" wool, strong, lustrous fiber; black fibers are particularly objectionable.

The Shropshire was expressed by Mr. Preece, of Shrewsbury, as he once leaned over the hurdles at the Royal Show of England, and said: "It is a farmer's sheep, a rent-paying sheep, a tenant's sheep, it is a save-all, a frugal living and a quick fattening, hardy sheep."



Typical pen of Wisconsin bred Shropshire lambs. Winners of first prize for pen of four; pen of two and two first prizes, one champion and one second in single classes at Wisconsin State Fair, 1909. Fitted for show by 15-year-old shepherd, McKerrow, Jr.

DISCUSSION.

Mr. Buxton—I want to ask with reference to the coloring of the Shropshire. I have a few that are very well bred, I was careful in buying. Last year I had a lamb from one of my best ewes that had a black face and four speckled legs. This year, from a ewe that was sired by an imported sire, one of the most pronounced and typical of Shropshires ever was, and she has two almost entirely white ears. How is that?

Mr. McKerrow—We see it right here, tracing back to the old Morfe Common that used to be a light color and afterwards a cross of the Cotswold and the Leicestershire. You will trace back to these characteristics. Sometimes very well bred animals will trace back.

Mr. Buxton—Will it be wise to keep that lamb? The other one I traded off for a grade.

Mr. McKerrow—If it is a very well bred lamb, I believe I would keep it, because the offspring is very likely to breed in good colors.

A Member—If you purchased a ram and found you had made a mistake, purchased one that had scurs or small horns, what would you do with him after you found it out?

Chairman Scribner—Dehorn him.

Mr. McKerrow—That would not eliminate the breeding qualities of the sire. Of course we sometimes will find an excellent individual with small scurs, they are an objection, and yet if that individual is so good in other respects we cannot discard him on that account. Of course a light scur that can be eliminated is not a great objection in the show ring, however, it is an objection but the horn is a bad objection, although we find them a great many times in the show ring. It is quite likely to show in the offspring.

Mr. Bradley—What is the best feed for a flock of breeding ewes during the winter?

Mr. McKerrow—I have said a great many times that I thought a very important factor in keeping a breeding flock through the winter was the use of some succulent feed. They are showing more appreciation of this, I believe, in many sections, in the production of succulent feed. They are growing roots over on the other side a great deal for this purpose, and I believe that the root crop is profitable, the most paying crop that we can grow for our flock. However, we have corn silage here, which is a good substitute when it is properly put up. It is a very good feed and will take the place of the root crop to some extent. We find we can feed from two to three pounds of corn silage through the winter to the breeding flock. For rough feed there is nothing better than clover and alfalfa. If we can grow alfalfa we would prefer that to any other feed we can use.

A Member—What grain would you feed?

Mr. McKerrow—The grain feeds that I would use in connection with the clover or alfalfa would be oats and bran with some corn. We have heard some objection to corn, but I believe when we are feeding heavily in protein feeds, with clover, we can successfully feed some corn, I would say one-fifth corn, for the grain ration.

A Member—Don't they get corn enough in their corn ensilage?

Mr. McKerrow—No, hardly, in feeding two or three pounds. I think we can feed some corn besides.

Chairman Scribner—Wouldn't it be practicable to feed a little corn fodder out on a sunny morning, or a little shock corn?

Mr. McKerrow—Yes, we have had good success in feeding corn fodder, although, of course, the corn fodder is not as good as clover and alfalfa, but we have got good results with corn fodder, feeding it as a regular winter ration.

Mr. Nordman—And isn't that a good way to make the ewes take exercise?

Mr. McKerrow—That is a good way, to scatter the roughage a considerable distance from your yards or barns, compelling the flock to go a good distance and getting exercise in that way.

Mr. Nordman—In feeding for mutton production, will it pay to feed very much grain to the ewes in the winter, providing you have got good roots and a good quality of clover or alfalfa hay, except just previous to lambing time?

Mr. McKerrow—I think it pays us to keep our breeding flock in good, thrifty condition, and we must regulate our grain ration according to the condition

of the flock. See that your ewes get lots of good feed and have your flock in good condition when you bring them into winter quarters, and in that case I do not believe it is necessary to feed very much grain in the winter, but, of course, the feeding of grain must be governed by the condition of the ewe flock. We have found it was not necessary to feed any grain rations up to within three weeks of lambing time and have got very good results in this way. There is such a thing as having your flock too fat at yeaning time.

A Member—How are barley and bran for feed?

Mr. McKerrow—Barley we find has the same results with sheep as Mr. Martiny spoke of with hogs; it is constipating, although last spring after we had our sheep on grass we fed barley, together with oil meal, and got good results, but I do not want to feed but very little barley to a ewe flock on this account.

A Member—Do your sheep ever have the stretches?

Mr. McKerrow—They do sometimes.

A Member—What causes it and what would you do for it?

Mr. McKerrow—Stretches is the result of indigestion and constipation due to it. The sheep stands with legs spread apart, fore and aft, shakes itself and walks with straddling gait. It is due to impaction of the stomach and bowels, the result of feeding dry, coarse indigestible feeds. As a remedy, as four to six ounce dose of Epsom give the animal a brisk purgative, salts, then feed some dry, green feed, if possible.

A Member—Isn't dry timothy hay usually the greatest cause of stretches?

Mr. McKerrow—That is a very bad thing in having that constipating effect on the flocks; the stretches is indigestion.

Mr. Bradley—They are stretching for something better to eat.

Mr. McKerrow—Stretching for a different ration.

A Member—I would like to know how they act when they get this "stretches," as you call it, so I can change their feed.

Mr. McKerrow—You will find them kind of drooping around, stretching, as the name indicates, and if they are not relieved they will lie around for two or three days and finally die unless relief is given.

Chairman Scribner—You will find some of them stretched out.

Mr. McKerrow—This question of preparing the breeding flock for the mating season I believe is an important one. We find very little thought given to this one factor in ewes. And we will also find that the successful breeders pay a good deal of attention to the care of the flock at the time of mating. I believe it is important to oversee the ewe flock before they are mated. What I mean by this is to start your flock to doing well, getting them to come forward in condition, have them in the pink of condition and keep them thriving through the mating season. It is probably advisable to keep them on comparatively poor pasture before you wish to mate them; just before mating, probably a week or ten days, put them on a better field of good clover pasture, or rape field, for a short time every day, and you will find you will get a great deal better results for the lamb crop the following season.

Mr. Bradley--They will take care of themselves if they are well taken care of during the mating season on less feed than if you did not have them in good condition. Of course, I do not mean to say that they would not need care, but they will keep much easier.

Mr. McKerrow—Yes, they will thrive much better after they are started to

do well in the mating season and you will find the lambs do much better.

A Member—What can be done for the nodular disease?

Mr. McKerrow—They all say in case of this disease that an ounce of prevention is worth a pound of cure. This nodular disease is one of the worst pests that sheep men have to contend with, especially the farmer in the old farming districts. In England they have the hurdling system, where the lambs are put on fresh pasture about every day, and I believe it is important that we keep fresh pasture for the lamb flock all through the season. The system that we follow is to put the lambs with the flock on new seeding, eight acres. They will run on this piece for about three weeks and after this time have another piece to go on, keeping the lambs on fresh pasture as much as possible. There are several preparations that are claimed to be good as preventatives and cures for the nodular disease, but after the flock is once exposed to it, it is a hard thing to regulate. Joe Wing speaks of giving them tobacco, which I believe is good, but prevention is the great factor in keeping our lambs free from year to year. If you have your flock infested with this disease, I believe it would be advisable to drench the flock at least three times this season of the year with the gasoline treatment and then keep them on fresh pasture.

A Member—Would it be safe to drench the ewes just now?

Mr. McKerrow—No, not if they are going to lamb before May.

Mr. Roberts—It is a fact that sheep pay one hundred per cent profit, and in order to have them pay this, the saying is that a sheep well wintered is half summered and a sheep well summered is half wintered. Isn't that a fact?

Mr. McKerrow—Certainly, it is a fact with sheep as well as with dairy cattle. But our dairymen are beginning to find out that they must take good care of their dairy herd from day to day, because that brings in the dairy production, whereas the sheep owner looks to the fall of the year, when he has lambs to turn off on the market, and often he is not doing as well for his lambs in the spring of the year as he ought.

Mr. Buxton—What is your advice with reference to the time of lambing? I have had experience in early lambs, February lambs and May lambs, and while I have lost a larger percentage of February lambs, my ewes are in so much better condition in the fall that I thought it paid to have early lambs, then in the hot weather of the later summer, the ewes are alone and not bothered with their lambs.

Mr. McKerrow—We like to lamb our ewes in February or March. Of course a man's conditions control the time of lambing. We find that the lambs make better growth in the summer and the ewes are in better condition in the fall for the breeding season the coming year.

Mr. Nordman—Don't you think it pays any man who has a certain amount of pasture that he uses for his sheep to draw a fence through that pasture, just for the purpose of having good, fresh pasture all the time?

Mr. McKerrow—I think that is an important thing; we follow that system; we divide our large fields up into small plats and then in this way the lambs are taken from one plat to another and are always on fresh feed. It is a fact also that when the grass is eaten down very closely, if there is disease among the larger sheep, it is spread to the lambs.

A Member—Can you tell us about how many sheep you can pasture per acre following that system in your locality?

Mr. McKerrow—We can run about one hundred ewes with their lambs on an eight-acre patch for three or four weeks with good results.

A Member—Then it will take about double that to keep them going?

Mr. McKerrow—Yes, that is, it will take probably two of those plats to run them until after haying time, when we have a hayfield on which to turn them.

A Member—Have you ever found it necessary to feed tobacco to your flock?

Mr. McKerrow—I can't say we have found it necessary, but we have fed it. I cannot speak of the results, because our sheep are apparently in good condition and healthy, but last summer we fed nearly two hundred pounds of tobacco. The system that we followed in feeding was to take the tobacco and sprinkle it with water and then sprinkle a little salt over it and feed it once a week; the sheep would eat it very readily. It was an inferior grade of tobacco we got from Milwaukee, and we paid four cents a pound.

A Member—Ever try to have them smoke it?

Mr. McKerrow—Never have yet.

Mr. Buxton—Last year I had a ewe and I considered her my best one; she was very fat when she lambed, twin lambs, and shortly after she began to lose her wool, it came out in large patches, as large as my hat. In a little while both lambs died and she died and her skin was apparently in perfect condition, was not rough or marked at all where the wool came off.

Mr. McKerrow—We sometimes find with ewes very fat in condition at the time of lambing, that check in their going forward condition is conducive to the pealing of the wool. I suppose the condition of the ewe was from the same cause, which caused the death of the lambs through the milk.

Mr. Buxton—I could see no reason for it at all and none of the others got it.

Chairman Scribner—She was overfat.

Mr. Buxton—She was fat when I got her and kept fat; she was the fattest sheep in the flock.

Chairman Scribner—I think she was going down from that cause.

A Member—How often do you feed salt?

Mr. McKerrow—We like to keep salt before the sheep at all times.

Chairman Scribner—Lump salt?

Mr. McKerrow—No, we do not use lump salt. I would just as soon use lump salt, but we feed fine salt and keep it before them all the time.

A Member—If they were fed a lot of it at once, wouldn't it hurt them?

Mr. McKerrow—Perhaps, if they hadn't had salt for a good while. With lambs we should be careful to give them a little at a time until they are used to it.

A Member—I had some that died. How soon would you say they would die if they were going to die?

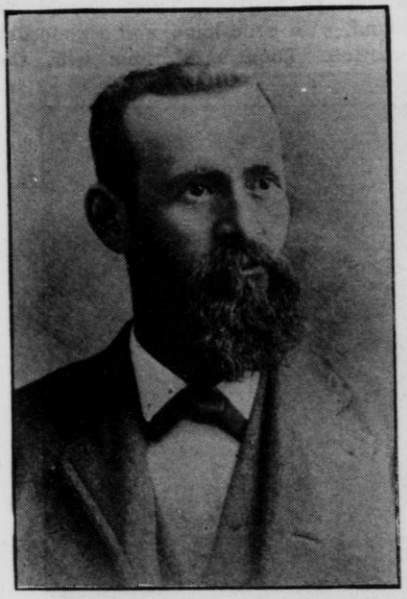
Mr. McKerrow—It would depend on conditions.

A Member—They lived four days.

Mr. McKerrow—It depends entirely on how badly they were affected with the salt.

HORSE BREEDING ON THE FARM.

David Imrie, Roberts, Wis.



Mr. Imrie.

What do we require to succeed in stock raising? First, the right men; second, the right location; third, the right kind of stock, and fourth, the right feed.

In Wisconsin, I think we have all of these for breeding and rearing the best horses; we have intelligent farmers, the climate cannot be excelled, the right feeds are everywhere abundant and the quality of our stock is improving year by year. This is largely due to Dr. Alexander, of the University of Wisconsin, in his energetic efforts to cull out the unsound and grade stallions in the state. Having all these things in our favor, why not raise more good horses?

According to the Government report a few years ago, the horses of Wisconsin ranked twenty-four per cent higher than those of Iowa and Illinois and fifty-six per cent higher than those of Kentucky. Part of this is due to the good water and the great variety of grains and grasses raised in Wisconsin.

In talking to a commission man in the Chicago Chamber of Commerce, he told me he received his best oats from Wisconsin and eastern Minnesota. They were brighter and heavier, thereby making better feed.

We were told at one time that electricity and gasoline were going to take the place of horses on our roads and streets, but the demand for good horses is as great as ever; in fact, there have been more three and four-year-olds sold on the Chicago market in the last two or three years than ever before.

What does this mean? They do not want these young horses, as they only last a few years when put to hard work on the city streets, but not having older ones they were obliged to take them. It means, then, that we don't have horses enough and we won't have for a good many years to come.

Only a few men succeed in raising trotting horses, as it requires a good deal of time and skill in their development. Perhaps more men would succeed with the coach horse than with the trotter, but the work on the farm, such as plowing, harrowing and drawing the binder, is not the best to develop good knee and hock action and a farmer cannot be on the road all of the time and succeed very well farming.

The Draft Horse the Farmer's Horse.

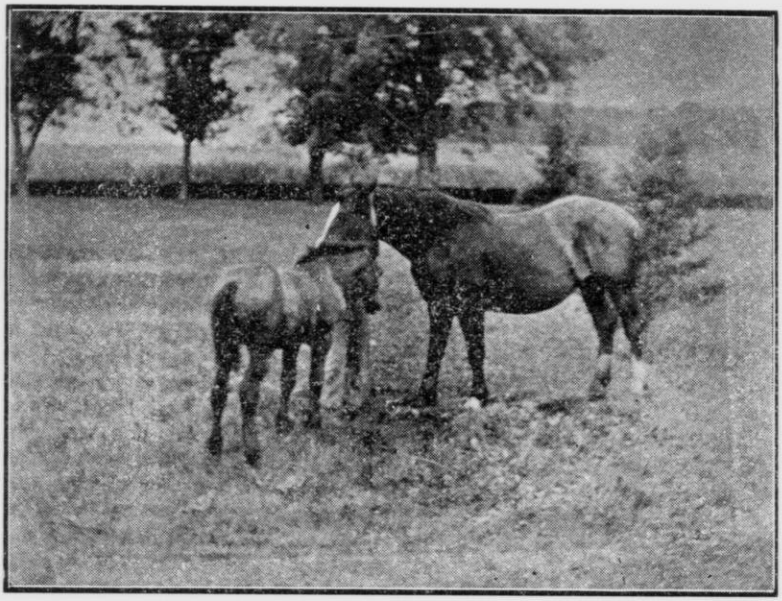
In my estimation, the best horse for the farmer to breed is the draft horse, as it can be developed and do a good deal of work at the same time.

Having determined to breed horses, do not make hash of it by using a Percheron for a year or two, then switch over to a Clydesdale and then a Belgian, but select your breed and then stick to it and in a few years you will have practically pure breds. And the farmers in a community should have the same breed if possible, as they will sell far more if buyers can buy a carload without much travel. Most of the old farmers here can remember how buyers used to flock to Mondovi every spring and fall to buy Greely colts and the good prices received for them.

How to Make a Success of Breeding.

To make a success of breeding, we must keep our best mares. They should be of good weight, not less than fourteen hundred pounds and heavier would be better. They should be sound, with good bone, and a good disposition. Then mate them with the best stallion obtainable, regardless of service fee. What is five or ten dollars in the price of a horse, and the difference between the colts from a pure bred and a scrub stallion is often from twenty-five to one hundred dollars.

After having the good mares and a good horse, see that the mares are well cared for. They can be worked steadily all of the time; in fact, they are better for being worked. If not at work, give them a good roomy yard or field

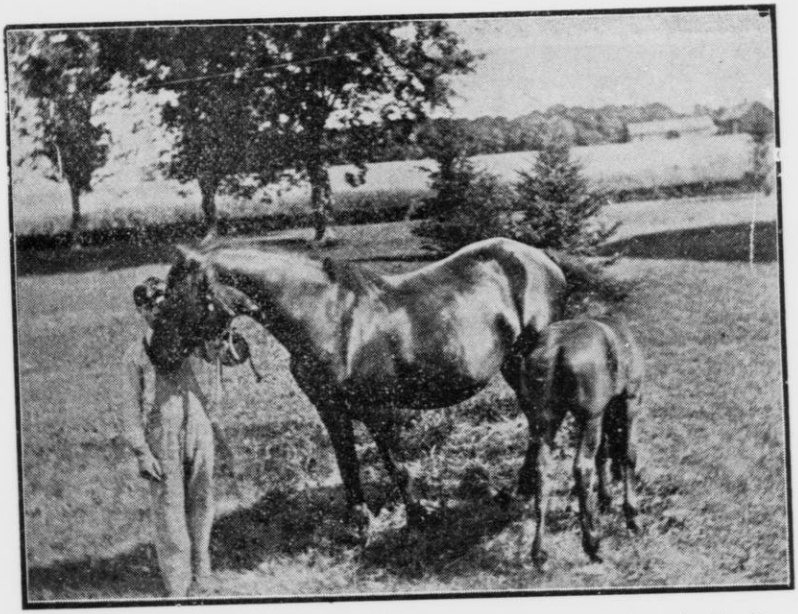


Good type of 1,600 pound brood mare. "Bonnie View" horses.

to run in every day when not too stormy. We work our mares up to foaling time, then give them a good clean box stall to foal in.

Be on hand when the little fellow comes and see that everything is all right. Disinfect the navel with a good

Feed the mare lightly for a few days. We let our mares rest after foaling for ten days or two weeks and then they are put to work, using them very carefully at first and bringing them in in the middle of the forenoon and the middle of the afternoon to



Another good Grade Percheron brood mare but under sized, although her colts sell well owing to their quality. "Bonnie View" horses.

disinfectant. I like Dr. Alexander's prescription the best of anything I ever used. It is one-half ounce of corrosive sublimate in one pint of boiling water acidulated with one dram of hydrochloric acid. When cold add two drams of tincture of iron. Apply two or three times a day until the navel is healed.

See that the stall is kept clean and dry. Clean it out thoroughly twice a day and dry it with land plaster, air-slacked lime or coal ashes, and keep the bedding clean.

let the colts suck. We never let the colts follow the mares while at work.

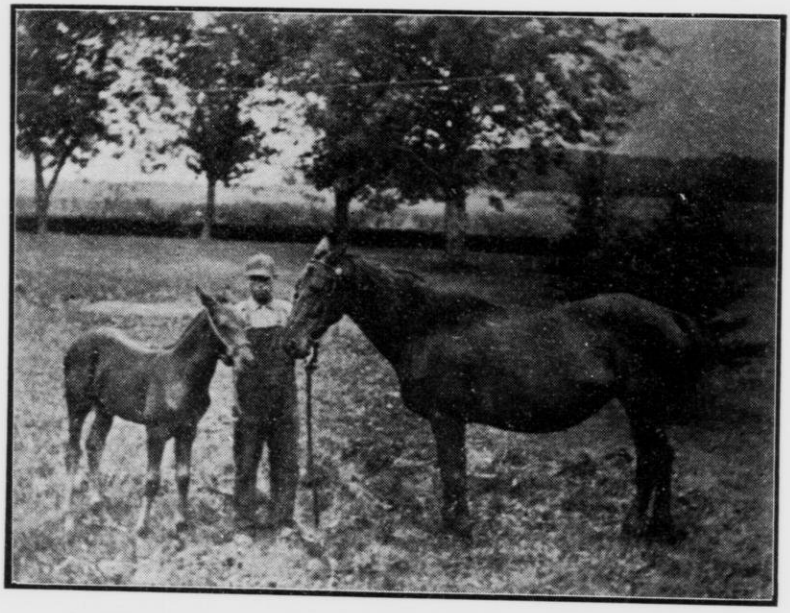
Care of the Colt.

The colt should have a roomy box stall. If you have two colts keep them together when the mares are at work, as there is no animal that likes company better than a colt. As they get older, see that they have plenty of good clover hay and bright oats to eat. It is well to have a little pasture near the barn and let them in to this when the mares are at work. Have this

fenced with good woven wire, high enough so they cannot get their heads over it. The pasture should be arranged so they can run into the barn to get away from the flies. Leave the cover to the oat box open, so they can help themselves. Keep a pail of water in the stall where they can reach it. After a little you can mix a little skim milk with the water, later give them clear skim milk, but let them have what water they want at all times. Some colts will take skim milk at once, but be careful and not give them too much to commence with, say two quarts at first, and as they get accustomed to it you can give them five or six quarts twice a day. This you can feed all winter and they will go onto pasture in the spring in fine shape. If they are eating oats and drinking milk at weaning time, there will be no setback, which always occurs if they are not.

When they are about a year old and on the pasture, we gradually wean them from the oats and milk and they get nothing but pasture until fall, when they are again fed grain and hay.

We always stable all of our colts at night, but they have a roomy yard or field to run in in the day time, so that they get plenty of exercise.



A different type—Roadster bred. "Bonnie View" horses.

We always break our colts to harness before they are three years old. Get them used to the harness before spring work begins. Work them only half a day at a time to commence with and see that their collars and harness fit them well.

When the weather gets warm, clip your colts. By so doing you may avoid sore shoulders. If a colt gets a sore

shoulder, let him rest a few days and heal it up. If you continue to work him and the sore keeps getting worse, you may have a shoulder that will always bother you when he is put to hard work.

We aim to sell all of our geldings before they are seven years old. When you intend to sell your horses, see that they are in proper shape. They should be fat, as that is what the market demands. Feed them on good wholesome food; corn can be fed to quite an extent at this time, with bran and a little oil meal.

By breeding the right horses, those with weight and quality, I know of no class of stock that will give better returns for our high-priced feeds (considering the amount of labor involved) than good draft horses.

DISCUSSION.

Mr. Houser—What do you clip your colts for?

Mr. Imrie—Our horses are out during the day all winter and they have long coats and when we start to work them if they should fall away in flesh, as they usually do, they are full of scurf, we always notice sweat under the collar, they are uneasy and the shoulders will scald easily, but if they are clipped they dry up and we can clean them nicely.

Mr. Houser—Do you mean to clip the entire body?

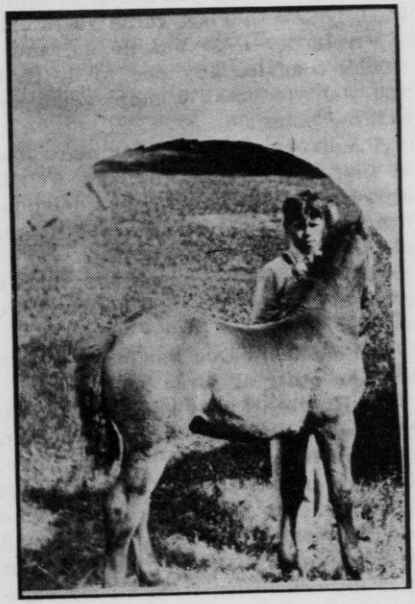
Mr. Imrie—Yes, when the weather gets warm. If it should be cold weather, or for any reason we stop in the field, we blanket them, but we don't do it until the weather gets warm.

Mr. Houser—How long have you practiced that?

Mr. Imrie—Three or four years, and I never had a colt catch cold. We do this with some of our older horses, too. Some of them do not shed as they should in the spring, so we clip them.

A Member—What is the reason they don't shed?

Mr. Imrie—There are different reasons. As soon as the weather begins to warm up in the spring the horse should shed, if it is in proper condition, but you can't keep them always in good shape.



Draft colt 3 months old and his young groom on "Bonnie View" Farm.

Mr. Houser—You are going to keep these colts until they are three years old and work them, as I understand. As a prerequisite to that, they should be in good condition; otherwise they ought not to be worked.

Mr. Imrie—We aim to have our colts in good condition; still it is almost impossible to put a colt to work through the spring and keep it right up. We don't work them hard when they are three years old. We usually have

brood mares and we don't expect any of them to do a full day's work. We hitch up one of these with a colt and work it awhile in the forenoon, and another in the afternoon, and in that way we do not overwork either of them, but when one of the mares foals, perhaps we have to work a colt all day.

Mr. Houser—Do you advise breeding them before they are three years old?

Mr. Imrie—I do not do so, and I wouldn't advise any one to do it, if you want to break a mare when she is three years old.

A Member—We have one mare that is four this spring and she weighs sixteen hundred pounds; our neighbor has a full sister to ours and she weighs nineteen hundred pounds.

Mr. Imrie—We sometimes find a great difference in weight between two sisters.

The Member—One was foaled at two and the other at three years.

Mr. Houser—I have had considerable experience both ways; breeding when they are two and when they are three, and it is considerable of a question at what age they should be bred. Some of the best authorities recommend breeding at two, and stop at three, but it is my conclusion from all my experience that I would not breed until they are three and keep right on from that. I have not had satisfaction in breeding two-year-olds such as I would like.

Mr. Imrie—Our best breeders are those that have been raising colts every year without any misses.

Mr. Jacobs—You say you work your mares shortly after foaling.

Mr. Imrie—From ten days to two weeks. We never let the colts run with the mares. If I could have conditions as I like, I would have them drop their colts right after the spring work; some are dropped as early as the first of April and some the middle of June.

Mr. Jacobs—What is your feed for a brood mare for the winter?

Mr. Imrie—If I had only one grain feed, it would be good oats, but this year they are getting more corn than they ever got before, because our oats are so poor. They are getting about six quarts twice a day and corn silage; then we have some clover hay of course.

Mr. Houser—Would you feed ensilage to a stallion?

Mr. Imrie—I couldn't say about that.

Mr. Houser—I can. Do not feed any ensilage to a breeding stallion. You will breed all sorts of trouble for yourself if you do; you will destroy his prepotency.

A Member—Do you recommend leaving the oat box open to the colts?

Mr. Imrie—I never knew of a colt eating too much oats. In one of our stables, where most of our colts are kept, they can't get at the oat box. The box stalls are really double stalls. There are two feed boxes in there, and the colts are kept in there in the winter, and when they are ten days or two weeks old, we tie the mare up, then we feed the colt in the other box and it is so fixed that he can get all the oats he wants, we get the rope hitched just right, so the mare won't wind it around the colt's neck, and fix it with a stick, so that it is safe.

A Member—Do you ever have any trouble with your colts sucking the mare in trying to get them to drink skim milk?

Mr. Imrie—Yes, we have trouble sometimes. We don't have any difficulty in getting them to drink the skim milk after we wean them, as a rule, though I have had one or two that I couldn't get down to it.

Mr. Convey—That was probably Holstein milk.

Chairman Scribner—Mr. Convey is out of order.

Mr. Michels—If it is true of stallions, as Mr. Houser says it is, why wouldn't it be true of bulls,—that ensilage destroys their prepotency?

Mr. Convey—I have been feeding it to bulls for twenty-two years and saw no bad results.

Mr. Houser—I have known of disastrous results in feeding it to young stallions, and it has cost me a lot of money. I have had troubles feeding it to bulls, too.

Chairman Scribner—Same here.

Mr. Houser—Here is the man who fed the champion cow at the World's Fair and he ought to know more about it than all of us. I saw it discussed recently in one of our leading agricultural journals, and they took the position that it did have a disastrous effect. I suppose it is the acid.

Mr. Convey—There can be no possible reason for it, unless too much is fed; if an animal of that kind was offered too much of any class of feed, forcing it, trying to get it in condition, it might cause trouble. We haven't had any trouble and we also feed it to horses and brood mares to a limited extent.

Mr. Houser—It is all right for brood mares and for cows, but it is bad for males.

A Member—How is carbolic acid as a disinfectant for a colt's navel?

Mr. Imrie—It does very well. Perhaps two per cent, you don't want to make it very strong, but this I spoke of works better than anything we have ever had, and it kind of cauterizes it.

A Member—Two per cent is not strong enough to cauterize.

Mr. Imrie—No, I said that this that I recommend does cauterize.

Mr. Convey—It isn't wise to use carbolic acid strong enough to cauterize it anyway.

A Member—Would you advise feeding corn to a colt?

Mr. Imrie—Yes. I would take two ears of corn and shell that, after the colt was weaned, and mix it with oats. It depends on the size of the colt and the size of the ears of the corn, and then I would watch the colt and see that it acted all right.

Mr. Houser—Did you ever feed your young colts any alfalfa for succulent feed with molasses?

Mr. Imrie—No, I never have.

Mr. Houser—I have been feeding some this winter and I have found it more satisfactory than anything I ever fed, ground alfalfa and sugar-molasses.

Mr. Imrie—You have to make little experiments between colts that are drinking skim milk after they are weaned and those that are not. It is just the same as a calf, if you have plenty of skim milk and you feed this calf longer than the rest, you find he is growing better than the rest of them. I suppose you could feed it up to two or three years without doing any harm.

Chairman Scribner—I saw quite disastrous effects of feeding too much skim milk in the southern part of the state. A man showed me a nice colt, that is, a colt with a nice body, but his legs were all out of proportion; he was overfed with skim milk.

Mr. Houser—I don't believe it was the skim milk. I raised a colt that weighed up to 1,475 pounds when it was fifteen months old, he is five year old now and in as good shape as any horse in the state.

Mr. Imrie—Do you mean he had milk up to fourteen months?

Mr. Houser—No, only up to a year old.

Mr. Imrie—I can see no reason for this case Mr. Scribner spoke about. We know that skim milk is a bone and muscle-producing feed and that ought not to swell the joints, or any-

thing of that kind. I think perhaps that was a case of navel infection. I have had it in the last two years, and we finally killed the colt. Pus would form, the joints would swell up and break, and it kept on until he died from this disease. It is blood poisoning, really.

Chairman Scribner—This was a horse man, he had fed very liberally, a pailful twice a day, and he thought that was the trouble.

Mr. Imrie—We never feed more than half a pail. Didn't this colt get a setback just at weaning time?

Chairman Scribner—No.

Mr. Houser—What else did he eat.

Chairman Scribner—A little oats.

Mr. Houser—I would give him a lot of oats.

A Member—I find the best way to feed a colt oats is to keep them before him all the time.

Mr. Houser—Yes, and if the oats are as poor as we have been having for a few years, you better mix a little corn with them.

I am going to tell you a little secret; when you want to feed a horse for show at the fair, don't skim the milk, I don't care how old he is, give him some whole milk and it will do more for finish and style and general attractiveness for that horse than anything else you can feed him.

Chairman Scribner—Would you add any molasses to that?

Mr. Houser—Yes, molasses is good, but I would rather have the milk than molasses, and it won't do your horse any harm.

Supt. McKerrow—What do you think of sugar and alfalfa for working horses?

Mr. Houser—I haven't tried it for working horses, but I have fed it to my mature horses and have got wonderful results. It does not lay on excessive fat, but it puts them in splendid condition, their hair is bright and lively and they seem to be healthy, extremely so.

Mr. Martiny—I don't think that the molasses has any bad effect.

Mr. Houser—No, the proportion of molasses is so small it doesn't have any effect, it only makes the food palatable. I think the most virtue is in the alfalfa.

Mr. Bradley—The Government, for the last few years, has been feeding molasses and sugar to the cavalry horses, and they have found it good feed.

Mr. Convey—I believe a mixture of corn and molasses is a good thing.

A Member—What about fall colts?

Mr. Imrie—We have never raised very many. If I had any fall colts, I would like to have them foaled in the latter part of August or September and not wait until late in the fall. Those we have had have been broken when they were two and a half years old and they seemed to do just as well by working them carefully as the three-year olds.

Mr. Houser—I have had quite a lot of experience raising fall colts, and we like to have them come along in September and October, after the flies are gone, and then run with the mare during the winter and spring.

Mr. Convey—We have had considerable experience with summer and early fall colts, and our most serious objection is the flies, say, if a colt comes in the middle of the summer, it is better to keep the mare in doors during the day, and let her out at night, feed her generously during the winter and also let the colt run with the mare.

Mr. Imrie—We never allow our colts to run with the mares and we like the colts to come after the flies are gone. We have our heaviest work in the fall usually, you see.

A Member—If the colt comes in October, most of the hard work is done.

Mr. Imrie—We plow till it freezes up.

A Member—Many years ago we sent our mares out to work and left a colt in the stable, but one cow gave all her milk to that colt and we got fifty dollars for that colt in the fall, where for a common colt we would get twenty-five dollars.

Mr. Imrie—Your colts will do better on not too rich milk.

A Member—Yes, this wasn't our best cow.

A Member—At what age would you advocate weaning the colt?

Mr. Imrie—We are obliged to wean them in the fall, when the hard plowing commences, usually about October or before, so that we have not always weaned at the same age. We have them coming from the first of April up to the first of June. I would rather have them follow their mothers from the first of April to the first of September if I could.

Mr. Michels—If they are drinking milk quite freely, you can wean them quite young and they will do very well.

Mr. Imrie—If you have some old mares with colts at pasture that you are not working, I would bring them in every night and morning during the summer and let them have some oats along with these mares. They can learn to eat oats before they go out at all. I have seen colts that would lose fifty pounds in two weeks simply by not being taught to eat oats before they are weaned.

Mr. Houser—I think the question of weaning colts is a very important one. It depends very much on how you keep the colts, when you can wean them. If you keep them as Mr. Imrie has described, in the barn, while the mare is at work, where they can have access to hay and oats and water mixed with skim milk, I believe four months is the best time for the colts and for the mothers, both for the mothers now and on account of the colts that are coming later. Four months is the best time if you have prepared the colts for weaning.

A Member—I never wean a colt until after New Year's, then I shut him up about as Mr. Imrie does, where he can get water and oats and hay, but I never let him go out of the barn.

Mr. Imrie—The colts that we have are with the mothers and yet the way we treat them we can wean them most any time.

A Member—In clipping your colts, do you notice whether it makes the coat heavier of necessity?

Mr. Imrie—Oh, no, not any more than you would if you cut your own hair.

A Member—A person has to be careful then about overheating the colts?

Mr. Imrie—Yes; usually the work we have for the mares is plowing corn, or some such work as that. We have to use our mares near the barn so as to bring them in in the middle of the forenoon and the middle of the afternoon; we take it easy for just a round or two before coming in, so as not to have them too warm.

QUACK GRASS.

Chairman Scribner—I think we may spend a few moments talking about quack grass and how to get rid of it, if it is a possible thing to do. I understand that over in Mr. Bradley's district they have considerable quack grass, and perhaps if he will start the discussion, we may be able to draw out some way of getting rid of this terrible pest.

Mr. Bradley—There is a good deal of quack grass up in St. Croix county, but I am not here this afternoon to tell you that I have killed out very large tracts of quack grass, because I have not happened to have it on my place. However, within a mile of where I live my brother had a farm of one hundred and twenty acres, and right alongside of his farm there was a forty that for years had been covered solid with quack grass. It was owned by a widow who was in the city of Madison and for six or seven years before he bought this forty, their crop was usually seven or eight bushels of wild oats and quack to the acre, until it got so it didn't pay to do anything with it at all. My brother was afraid it would spread on his farm and he wanted to stop it, so he finally bought the forty, and, sir, he stopped it pretty well. He bought this right after harvest. They had finished threshing out the shock and she had not got a dollar's worth of grain to the acre. He bought it, put the plow in and plowed it and then put on the disk and disked it, and harrowed it and raked it and hauled off a good many loads of the quack grass roots and burned them, and I don't believe the ashes will grow.

Supt. McKerrow—Are you sure?

Mr. Bradley—No, I am not sure. But he kept at that several times during the fall, he took half of the forty, one twenty acres at a time, and he kept that up, until it froze up, he went over it three or four times in the fall with the disk and the harrow and the rake. Then in the spring, just as soon as he could get onto the ground again, he put on the disk and the harrow and the rake and went over it, then he let it go until he had finished putting in his oats and barley, and as soon as he finished putting in the grain, he went at this twenty acres of quack grass again, disking and harrowing it and raking it, and kept at that work two or three times until late in May, perhaps the last week in May, when he planted it to corn. At that time you see it had had a lot of work, had been gone over six or seven times, so that it was thoroughly worked up, and most of the quack grass had been moved from the top. He planted his corn later than usual, because he wanted to get it thoroughly worked. He had good seed and the corn came up fine, the weather was, as I remember, nice, and that year I think he got the biggest crop of corn on that twenty acres that for twenty years before had not paid for working it. There is occasionally yet a spot, perhaps a quarter of an acre, where the quack is not entirely killed, but on almost all the balance of the land it is entirely free from quack.

Another neighbor right close by, that was thoroughly saturated with quack three years ago, has worked on his farm and has almost entirely gotten rid of the quack. In the fall he plowed it. There had been a grain crop and he plowed it early in the fall, disking it and harrowing it two or three times, and the next spring he sowed that as early as he could with a pea crop, put in about twenty acres of peas. There were tons and tons of quack in the ground, but the peas came up and they ripened pretty early, and he turned in a hundred and fifty or a hundred and seventy-five pigs, and they went after those peas, and when they got through with the peas they rooted up a whole lot of quack, they made that whole field look pretty sick. Then as soon as he took the pigs off, he put the plow right on and plowed it at least twice between that and the fall, disked it and harrowed it two or three times. The next spring he went on that land early again and disked and harrowed it, and he planted corn late in the season, perhaps the first of June, after he had thoroughly worked it up. He put on corn in check rows

and this fall you wouldn't find one spear, where you would have ten millions three years ago. That is about all there is to getting rid of quack grass.

A Member—How deep do you plow?

Mr. Bradley—Not very deep, three or four inches. In poor land the roots will go down deep. Quack is one of the best things under the sun to make land good. That is a strong statement, but you let a forty be seeded down to quack for ten or twelve years and not growing anything else, you won't need to put on a shovelful of manure. My brother didn't, and still he got sixty or seventy bushels of corn to the acre where it had not raised five bushels of oats to the acre. You see when he had worked it and put in the corn, there was lots of fertility there.

Quack isn't so bad; if you go after it right, you can clean it up.

A Member—Don't you think the roots ought to be hauled off and burned always?

Mr. Bradley—It is probably safer. You see you might think they were completely dried up, and yet if a little rain comes they will come to life again.

Another thing. One of my neighbors had a field in which there were little spots, not very big, of quack, and two years ago he went to work and covered those spots with tar paper and put straw on top of the paper about a foot deep, and last fall I couldn't find one of those spots of quack.

A Member—Is it necessary to put on the straw, as well as the tar paper?

Mr. Bradley—Yes, something to keep the tar paper down.

A Member—I have heard of putting on dirt to hold the tar paper down.

Mr. Bingham—I came from a country where there is perhaps as much quack grass to the square mile as in any portion of this state. Two years ago I planted out ten acres of cherries on a man's farm that was pretty well covered with quack grass. I was to take care of that orchard for three years. He grew lots of beans in the orchard, and I found it took lots of hard work. So last spring I planted that field in corn and put good thorough work on it, shallow cultivation, and we practically killed out that quack grass on that ten acres and grew as large a crop of corn as was ever grown in that county. There is no doubt that good thorough work will kill quack grass in one season if you keep it from getting above the ground. We had a place of about one and a half acres where nothing had been done, and we found they had cut off that quack grass for a number of years, and those roots came right up. We found that burning off the quack grass is all right, the roots are close to the surface. If you plow that ground shallow, you can kill it out by good thorough work, but if you encourage it, you better leave it alone, because after cultivation the spreading of those roots will just stimulate the quack grass. You must do it thoroughly, or let it alone.

Mr. Imrie—Quack grass is an awful nuisance and it is spreading all over the country. I have not had experience killing it to any great extent, but I have seen my neighbors kill it. The best results I have sent were by plowing it in and keeping after it, as these gentlemen have said. Where it gets into a pasture for a year or two, the roots seem to come near the top. They plowed in the fall and then in the spring they went at it and kept working up to the last ditch. It is good soil, fertile; quack grass seems to thrive on that kind of soil. Then, last June they sowed German millet and they never let any of the grass get sprouted. It was plowed every other

week or spring-toothed or disked, it was all broken up. Last June, as I say, they sowed German millet on there quite thick, this fall you couldn't see one spear of quack. I suppose there is a little, he ought to put on corn next year and cultivate it and then I think that field will be clear. We have some spots that are spotted around and that is what I am going to do with them.

Mr. Scott—I notice that one Institute worker speaks of the experience of his brother and another of his neighbors, but they don't speak from their own experience. I suppose they would have us infer that they never had quack grass on their farms.

Mr. Imrie—I have got it.

Mr. Scott—I have had a little experience myself. Now I have plowed the ground shallow in the fall and if you do that, you will kill some of those roots by freezing. Then work it up in the spring and plant an early variety of potatoes, but plant them late. That gives you an opportunity to work it up more, say, to the 10th of June. For instance, you are planting the Early Ohio potato, or some such variety as that; you can give that soil a good working up to about the 10th of June, and then plant potatoes and cultivate thoroughly, cultivate and hoe thoroughly. I have killed quack grass in one season, if the season happened to be reasonably dry. You can take off the crop of potatoes pretty early, and that gives it another working, and in that way you can work your soil most thoroughly and not give up the use of it for a year. You will get good returns in the crop of potatoes.

Supt. McKerrow—Mr. Hill has had some experience along this line, haven't you, Mr. Hill?

Mr. Hill—I haven't had the experience of killing it as Mr. Bradley had.

Chairman Scribner—I have been troubled with quack grass and I find that I can kill it out absolutely by summer fallowing and in no other way. The only way of doing it is by summer fallowing. I have taken this method: I cure my alfalfa on that land, then after the second crop plow shallow, disking or dragging in the fall, and again in the spring. If the roots do not get a hold on the ground, they are bound to die out in this time, and I keep that up till about the first of August, until I sow alfalfa alone and succeed in getting a very fine stand of alfalfa and killing quack grass, Canada thistles and everything.

Mr. Bingham—I agree with Mr. Scribner about plowing thoroughly, because we find a little quack grass in our country. Farmers don't like to give up their land for a year without a crop. I undertake to say that fifty per cent of my brother farmers here have got quack grass and they are keeping still about it.

Mr. Houser—It is the nature of this insidious plant to reproduce in different ways. If you cut off the seed it won't kill it, the roots will run for miles, they have run nearly all over my farm. I got religion one summer and that religion was to exterminate every bit of quack grass on my farm. I kept a man on my farm, but you can't always tell what is being done when your back is turned. I believe the only way to get rid of it is the way Mr. Scribner suggests, and that is by a thorough season of summer fallowing, giving up the use of the land entirely for one year to exterminate that grass. I do not agree with my good friend, Mr. Bradley, that quack grass is not so bad. I used to have a neighbor that said it was splendid for pasture, permanent pasture, the cattle liked it. That is what makes it so dangerous. You can raise corn on a quack grass field, but you cannot raise oats or barley after the field is once taken possession of by quack grass,

and you can't cultivate it out of that grain ever. The more you cultivate, the more you will spread it, and the worse the pest becomes. It is worse than the Canada thistle, ten times worse, because you will tolerate it and you go along and think it is not so bad and finally you will find your farm is cut in value by reason of that quack grass having taken possession of it.

I don't believe there is an authority in this state that can spend too much time or eloquence or argument in convincing the farmers of this state that they have got to make everlasting war on it to get rid of it.

Mr. Roberts—I agree with friend Houser here that quack will spread; even good woven wire line fences won't keep it out. I found some of it on my farm, perhaps a quarter of an acre in each patch. Three years ago this coming spring it began to show in a clover pasture. It was a wet season and we couldn't keep it down. The next season I put some ground into cabbage, just a little cabbage along where this quack was, and there is one of the crops that will help to clean the land by the amount of thorough cultivation of the ground. I hoed it out all summer long, clear on up to the first of September, and last season I put a strip of corn again on this same ground in order to kill the quack out if there was any left, but I failed to find any there at all, and it was cleaned out just by working it thoroughly with the cabbage crop the year previous. I agree with friend Imrie that putting in German millet is a good thing to kill Canada thistles and other things, except quack.

Mr. Imrie—It is all right for quack, too.

Mr. Roberts—I had some land that was covered with Canada thistles and I manured it thoroughly during the winter and allowed this ground to lie until the first of June, when the thistles grew up to a good height ready to go into blossom. Then I plowed it to a good depth with a heavy chain on the plow, burying the thistles in the bottom of the furrow and the roots were up in the air. Then I sowed millet and so thickly that you could count the thistles on your fingers on about three acres of ground. That killed the Canada thistles.

A Member—Did you ever try burning Canada thistles?

Mr. Roberts—No, sir.

A Member—About ten years ago I found a patch about two rods square. My boy was up to a neighbor's and he told him to burn them up, and we did so, and we never saw one afterwards, and we did that also with quack grass. We piled a lot of straw about six or eight feet square and we burned it and I am willing to take any man there in the spring and show him that there isn't a bit left.

Mr. Bingham—I burned the brush that I took from this orchard I spoke of and the Canada thistles grew up where the brush pile had burned four or five, yes, six feet high.

Mr. Nordman—I have a piece of new land on my farm on which there happened to be a thick growth of Canada thistles. This land is an old slashing that contained a large number of brush piles. A year ago last summer we went out to clear up these brush heaps, and last spring Canada thistles came up on those old brush piles worse than any place on the field.

A Member—I put a little gasoline right on the ground on a dry morning and that is the only way I can find that we can get rid of the Canada thistles, but do not do it when it is raining, it will do no good.

Adjourned to 7:30 P. M.

EVENING SESSION.

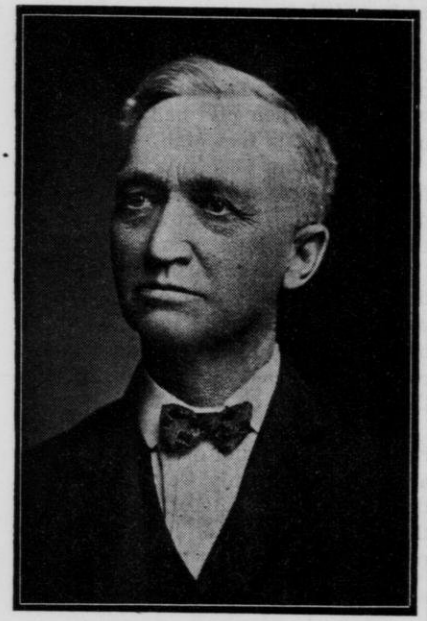
The convention met at 7:30 P. M., Wednesday March 17, 1909. Superintendent McKerrow in the chair. Music, Farmers' Institute Quartette.

Supt. McKerrow—The first topic we will take up this evening will be one of a very practical nature, that of the present and future work of the Wisconsin Live Stock Sanitary Board.

Twenty years ago this winter it was my privilege as an Institute worker to be for the first time in the city of Mondovi with the gentleman conducting that Institute who will present this subject tonight, so that to the older farmers of Buffalo county this gentleman is no stranger, and he is no stranger to the majority of the farmers of Wisconsin.

PRESENT AND FUTURE WORK OF THE WISCONSIN LIVE STOCK SANITARY BOARD.

Hon. John M. True, Madison, Wis.



Mr. True.

The live stock of the state of Wisconsin has an estimated value of $156,864,000, divided as follows: Horses, $70,834,000; cattle, $66,418,000; sheep $3.967,000, and swine, $15,130,000.

The prosperity and financial resources of our agriculture are closely identified with this class of farm property, as represented in the various industries growing out of, and dependent upon it.

Lack of judgment in selection, care and breeding of live stock annually takes from the farmers of our state vast sums of money and seriously reflects upon their intelligence and business capacity; but in this free country of ours, where by virtue of his freedom a man is permitted to do many foolish and inconsiderate things, we may only correct these personal weaknesses by the slow means of educational processes. But while lenient in the dealing with the weaknesses and incapacity of individuals in the management of their

own business, the law does not permit a person through ignorance or incapacity, to endanger the interests of his neighbor, and to prevent this, certain safeguards have been established.

One of these has been built up to protect the live stock interests of the state against diseases of a contagious or communicable nature. All farm animals are subject to diseases of this character, and but for legal restraint and control on the part of the Government, State and National, they would become general throughout the country, practically paralyzing all of our industries based upon live stock enterprises. Among these diseases, those of the most serious character, may be classed as glanders in horses, tuberculosis in cattle, and tuberculosis and cholera in swine.

The Personnel of the Live Stock Sanitary Board.

To provide for the control and eradication of these diseases, the State has provided a Live Stock Sanitary Board, to which has been delegated a wide police authority in dealing with these diseases wherever found.

This Board is composed of the State Veterinarian, the Bacteriologist of the State University and three members of the State Board of Agriculture. The State Veterinarian is the chief executive officer of the Board under its general direction, attending to the enforcement of laws relative to live stock diseases.

Some of the Problems to be Faced by This Board.

Though scab in sheep and cholera in swine are almost constantly with us to a greater or less extent, there have been no violent outbreaks of the latter in recent years. Glanders in horses, being of an exceedingly contagious and virulent character, though much less frequent since the passage and enforcement of the law relative to inspection of Western Range horses, is still scattered over the state.

The most serious disease problem that confronts the Wisconsin farmer today is that of tuberculosis in cattle and hogs. Unlike glanders in horses and cholera in swine, where external appearances or extreme evidences of illness are present, the insidiousness of the disease of tuberculosis largely increases its danger.

Farmers not familiar with the disease, even in the presence of widespread contamination, refuse to believe that the disease exists until convinced by the slaughter and examination of animals, or by death directly as a result of the disease.

Beyond question, the proper application of the tuberculin test is a remarkably sure means of ascertaining the presence of bovine tuberculosis. I say the proper application of the test, realizing that not "anybody who can read a thermometer, can make a test," as the tester should know enough about cattle to be able to determine whether any peculiar conditions of the animal prevail that would affect the temperature at the time of making test.

It is not unreasonable to believe that five per cent of the cattle of the state are affected with tuberculosis. Upon this basis of calculation, 62,500 milch cows are in the dairies of the state furnishing milk and cream and butter and cheese for human consumption that are affected with a disease, deadly in its character to the animals themselves, and capable of being communicated to other animals and to man. This condition of affairs is now so fully recognized that nine of the leading cities of our own state have passed ordinances requiring that milk and

cream sold within their borders must be from tuberculin tested cows, and responding to this requirement, farmers in the country adjacent are quite generally testing their herds.

I cannot conceive of another situation where public property and public health were so seriously menaced, that would be tolerated for a single month. Note the excitement in a farming community where anthrax or hog cholera seem to be epidemic. How the people clamor for immediate, heroic action to stop the disease. But in dealing with bovine tuberculosis, ignorance, prejudice and dishonesty seem to have joined hands in an effort to prevent the discovery and extermination of a pest before which all other animal diseases dwindle into comparative insignificance. As an evidence of the communicable character of this disease, may be noted the increasing prevalence of tuberculosis in swine, where losses are becoming so heavy from diseased animals that when slaughtered are found unfit for food, that our great packing establisments are appalled at losses sustained. Of the number of hogs killed at an abattoir in our state during the past winter twenty-five per cent of the animals slaughtered were more or less affected with tuberculosis, and quite a percentage of these were tanked.

The germ of the disease is the same as is found in cattle and is communicated to swine either through the by-products of the dairy, or by their feeding upon the droppings of cattle.

Recent investigations have greatly strengthened the belief that the germs of the disease of tuberculosis in animals, if not in mankind, are oftener taken into the system through the channel of the digestive organs than through the lungs. While in cases of human tuberculosis the sputum containing disease germs is thrown off by means of spitting, the animal does not spit, but swallows its sputum, which passes through the digestive organs to be expelled in its excrement. This doubtless accounts to a considerable extent for the increase of tuberculosis in hogs that are allowed to run with diseased cattle, and added to this, is the spread of infection through the skim milk of affected cows fed to swine.

It also suggests a means of contamination of milk that has not generally been considered, that, when we admit the filthy habits that in some dairies obtain in milking, cannot be wholly disregarded, namely the pollution by means of particles of excrement dropping from the cow into the milk at milking time, thus affecting not only the milk of the individual cow, but that of the whole herd, when poured together.

It has been determined that not only the milk from diseased cows, but cream, ice cream, butter and cheese made from infected milk retain the germs of disease, as nothing in their process of manufacture interferes with the life of the disease germ.

The Sanitary Laws of the State.

The present laws of the state dealing with tuberculosis are inadequate, even when a faithful attempt is made to enforce them, to the requirements of the situation. Cattle from outside of the state can be, and are being constantly shipped into the state regardless of healthfulness or otherwise;—they have but to be classified as "feeders," as they almost invariably are, and are admitted without test, and often sold as breeding or dairy stock.

Again, while the State is annually paying out large sums of money for cattle found to be tuberculous, in an effort to encourage the farmers of the state to dispose of diseased animals and thereby rid the state of the pest

there is no law, at present, to prevent the sale of diseased cattle.

An ignorant or unprincipled individual, under any pretext, may advertise and sell at public auction an infected herd and scatter the disease to a dozen neighboring farms. What the State should do, and do at once, is to require that all cattle brought into the state be tuberculin tested, and that all such animals within the state be tested before a sale or transfer of same will be allowed.

If a man still wished to keep a diseased herd and poison himself and his family with its products, and provided that he did not expose his neighbors' cattle, he could do so, but he would not be allowed to spread disease at will.

Following closely upon this law should be another, forbidding the sale of milk, cream, butter or cheese, the product of untested cattle.

In the near future, provision should be made for the post-mortem inspection of animals slaughtered for human food. Where this inspection is carried on under the direction of the United States Government, as it is in most large cities, the condemnation of cattle and hogs as unfit for food is a frequent occurrence, but in the meat markets of our villages and smaller cities, and upon our farms, large numbers of diseased animals are slaughtered, cut up, and sold, that are thoroughly diseased and unfit for human consumption.

Probably no state in the union has handled the question of bovine tuberculosis more effectively and at the same time economically than Wisconsin, and no state has been as generous in its dealings with the unfortunate owners of diseased stock. As a result we are well in advance of our sister states in the healthfulness of our cattle, but only by eternal vigilance can the work we have commenced be brought to a successful termination.

The State Live Stock Sanitary Board has, during the past winter, been in receipt of from two to three thousand doses of tuberculin from the Government each week, which has been sent out free of charge to applicants, with the provision that the same be used by parties competent to make tests, and that reports of such tests be made to the Board upon blanks furnished.

It is believed that the State Legislature, now in session, will pass some measure that will materially aid us in this work, and it is sincerely hoped that the farmers of the state will enter heartily and intelligently into this work that means so much to their material prosperity.

DISCUSSION.

A Member—Can this tuberculosis be transmitted from cattle to horses?

Mr. True—No. Horses have never been known to have tuberculosis, horses and sheep seem to be immune. We find poultry to be affected.

A Member—Can you tell how it is transmitted to poultry?

Mr. True—No, no positive reason, except that we have found by investigation that the poultry was running with affected cattle and undoubtedly feeding upon the excrement.

A Member—Can hogs be tested for tuberculosis without being slaughtered?

Mr. True—I never have known of any tests being made.

Music, duet, piano and mandolin, Mr. and Mrs. S. Bauson.

Chairman McKerrow—It was my privilege last fall to be at two of the hearings of President Roosevelt's Country Life Commission, one at Washington and one at Madison. One

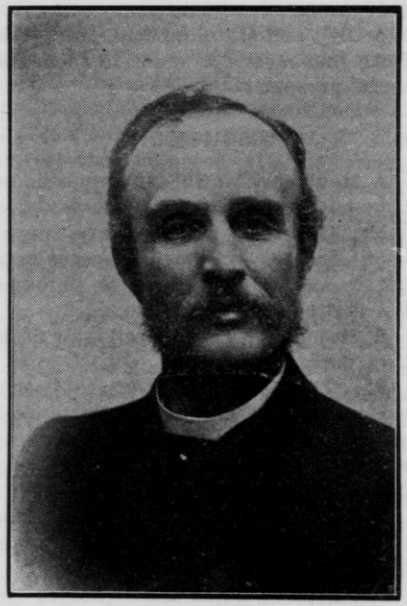
of the subjects brought up at each of these meetings and discussed was that of co-operation among farmers.

Wisconsin has had a good deal of co-operation among farmers in the way of co-operative cheese factories and creameries, as well as along other lines.

Tonight we have with us a gentleman who has given this subject considerable thought and will now address you on that topic.

CO-OPERATION.

Geo. F. Comings, Eau Claire, Wis.



Mr. Comings.

"God said:—
I will have never a noble,
No lineage counted great,
Fishers and choppers and plowmen,
Shall constitute a state."

Emerson.

"It is characteristic of the statesman to understand the situation, to be able to explain it to others and to be above personal considerations."

Pericles.

I take it in their last analysis justice, love, brotherhood and democracy are closely allied in meaning and lead to the same social ideals. In the field of intellect, of politics, of religion, democracy has already achieved a complete victory, in theory at least, and to a large degree in practice. Its next conquest is in the industrial world. To quote Dr. Lyman Abbott, "democracy is not going backward but will go forward and its next victory will be in the field of industry." In the January, 1909, magazine, "The World's Work," so clever and far sighted a man as Mr. Andrew Carnegie, under the title of how "Labor Will Control Capital," forecasts the industrial state and quotes approvingly the following from John Stuart Mill. "The form of association, however, which, if mankind continue to improve, must be expected in the end to predominate, is not that which can exist between a capitalist as chief, and workpeople without a voice in the management, but the association of the laborers themselves on terms of equality, collectively owning the capital

with which they carry on their operations, and working under managers elected and removable by themselves."

It was Lincoln's belief that labor preceded capital and should own it, in opposition to the slave-holder's idea that capital should own labor.

Certainly democracy will be applied in the industrial field, and will by and

themselves more readily of business opportunities and improved methods, but it is found that the organizations which bring them together in the work of their lives, are used for social and intellectual advancement.

"The co-operative plan is the best plan of organization wherever men have the right spirit to carry it out.

Farm home on "Silver Spring Farm" of Mr. Comings, Eau Claire, Wis.

by break the existing despotism there, as it has heretofore in religion and politics.

Is this co-operative organization, this mutualism needed?

The President's uplift commission reports three great needs for the farmer and speaks of this one as follows: "First, effective co-operation among farmers, to put them on a level with the organized interests with which they do business." In his message to Congress the President says as follows: "Where farmers are organized co-operatively they not only avail

Under this plan any business undertaking is managed by a committee; every man has one vote, and only one vote; and every one gets profits according to what he sells or buys or supplies. It develops individual responsibility and has a moral as well as a financial value over any other plan."

As to the necessity of organization among the common people, one might as well question the need of the militia arming if going forth to meet in battle the regulars of a dozen wars. The Bible voices the power that comes from organization in the verse "how

should one chase a thousand, and two put ten thousand to flight." All history corroborates the statement of the inherent power and good of co-operative organization.

The Golden Age of Brotherhood.

The old Jewish prophet three thousand years ago spoke of the time, "when swords should be beaten into plow shares, and spears into pruning hooks and men would learn war no more." Again he says, "the time shall be, when the wolf and the lamb and the leopard and the kid, and cow and the bear, all shall dwell together in peace." The Herald angels proclaimed "Peace on earth, good-will to men."

Paul taught his hearers that they were members one of another, and likened this intangible social organism to the physical body. "The hand cannot say to the foot I have no need of thee, or the eye to the ear I have no need of thee, but all fitly joined make a perfect body."

Rev. Geo. Dunne, D. D., says, "We begin therefore to realize as never before the great fact of the solidarity of man. Society as a great throbbing life-giving organism is slowly finding its rightful place in our thought.

"The solidarity of man is for the first time being deeply realized. The great doctrines of the Fatherhood of God and the brotherhood of man have been proclaimed to men through many centuries, but they are now being held by men as veritable truths from heaven."

Said one of the great dailies of Chicago, editorially, speaking of the gathering of the warships off the coast of Italy, just after the terrible disaster that came to that country: "It is a holy alliance of humanity in wrestle with the harsh and inscrutable powers of the earth. And it foreshadows a day that shall surely dawn upon the earth when men will put an end to the fearful cruelty and waste of internecine war, and will unite not only on great and exceptional occasions but in steady and perpetual concord to bring all the resources of organized science and art to bear upon the difficulties and dangers of earthly existence.

"Man against man, we have fought each other into feebleness, and bled each other 'to the white;' we have starved and shivered, and burned and languished with sickness and wounds. Nature has risen up against us menacing, terrific—sometimes it has seemed as if she were mocking—because we have spent our strength in mastering one another, and have come crippled and debilitated to the conflict with the elemental forces.

"Yet all the prophets have foretold it, and perhaps in this century it will come to pass, that the immemorial struggle of man against man shall give place to a concert of all human powers—of head, and heart, and hand—against the dangerous mysteries of existence and the natural shocks that flesh is heir to."

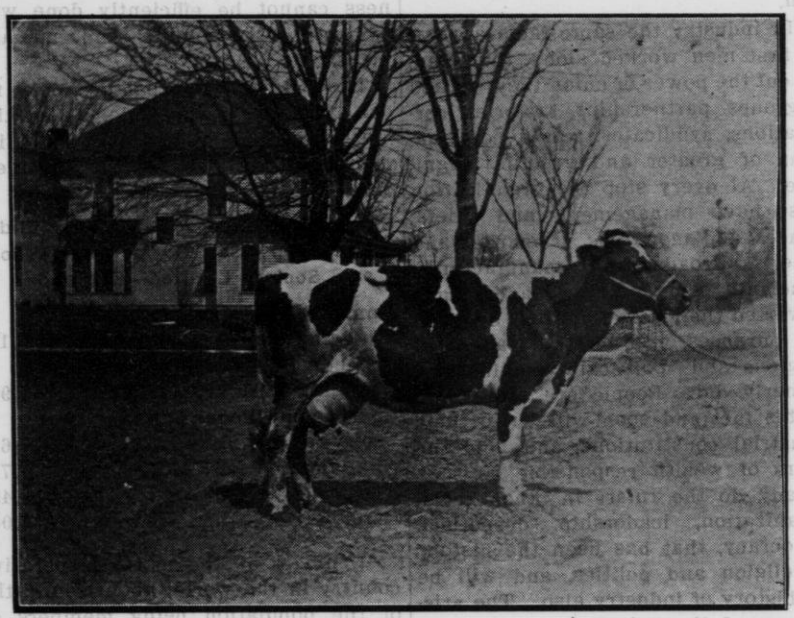
This unity of life is taught by a thousand voices in the world of Nature. The leaf on the topmost branch, kissed by the sunlight and fanned by the summer breezes, whispers softly to the tiny rootlets down in the moist earth—We are one. The little lake far away on the mountain, almost hidden from sight, and the brook dashing down the mountain-side, send the message to the great ocean—We are one. The spark from the miner's hammer way down in the caverns of the earth flashes out to the great sun—We are one. The islands of the sea, and the continents, whose shores are washed by the waves, are always saying—We are one—We are mother earth.

Mulford says, "Christianity affirms the law of love and sacrifice. It af-

firms the principle that no man liveth and no man dieth to himself. The law of Christ becomes the law of humanity. Bear ye one another's burden and so fulfil the law of Christ. The bond of society is in the truth, wherefore speak every man truth with his neighbor for we are members one of another."

Professor Frank Parsons says, "Industrial evolution began in the same way as political evolution, has passed through the same stages, according to the same laws, and subject to the same causes, and must inevitably end in the same way.

"In early times men fought alone; then they found that they could win



Virgo Beauty Mechthilda, 15 lb. butter in 7 days at 3 years of age. Silver Spring Farm, Eau Claire, Wis.

Bishop Phillips Brooks said, "Men's dreams are after the perfect world of mutualism. Men will think of it in the midst of the deepest subjection to the false conditions under which they are living now. This new life where service is universal law, is but the coming in of the life of God upon man, the coming into the inlets of our life of the great ocean life that lies beyond."

Is co-operation possible, practical in industry? Yes surely—and inevitable.

their battles better in groups. So tribes, and nations, and empires grew. At every step the organization required leaders, and chiefs, kings, generals, and emperors came into being. By and by the leaders abused their power using it for selfish purposes. Then the people awoke and arose in their might and wrote their Magna Chartas and their Declarations of Independence and made their rulers responsible for the use of their power.

"In religion it has been the same. At first men wondered and worshiped alone, then churches and systems of churches were formed. At every step the union was led by some man of peculiar power. When the priests felt secure they abused their trust. A few in the north of Europe rebelled, and Luther established democracy in religion.

"In industry the same facts appear. At first men worked alone, then finding out the power of union they worked in groups, partnerships, factories, corporations, syndicates, trusts, combinations of greater and greater magnitude. At every step the organization must have management, and chiefs, princes and monarchs of market and mine, railroads and manufactures, came into being. These leaders have preverted their power to their own selfish purposes, just as the leaders of religious and political combinations formerly did. People are awakening to this fact and soon will write their industrial constitutions, and hold the rulers of wealth responsible as they already do the rulers in other fields. Organization, leadership, despotism, democracy, that has been the history in religion and politics, and will be the history of industry also. The aristocracy of the priesthood is broken. The aristocracy of birth is dead. But the aristocracy of the dollar is in the meridian of its splendor."

Co-operation Demonstrated.

One of the greatest revolutions known in history has been wrought out by slow evolutionary processes in European countries in the last sixty years. In a recent magazine article, N. O. Nelson, of St. Louis, a millionaire manufacturer and an acknowledged authority, for years an investigator and writer on co-operative subjects, says: "It would take pages to tell of the marvelous story of the Rochdale store system in Britian with its two and one-half million members, its five hundred million annual trade, sixty million profits, seventy million manufacturers, and its thousands of members' dwellings. The thoroughness and volume of their business refute utterly the assumption that business cannot be efficiently done with democratic ownership and management."

The following is a balance sheet for one of the great wholesale co-operative stores of England and shows the immense magnitude of the business done:

Statement of Accounts for Year Ended December, 1907, Co-operative Wholesale Society Limited—England.

Number of retail societies holding shares	1,139
Number of members belonging to retail societies	1,768,935
Share capital loans and reserves	$26,278,603
Net sales for 1907	$120,462,720
Net profit for 1907.....	$2,374,455
Employes	17,000

"Denmark is the most co-operative country in the world, about four-fifths of the population being members of co-operative societies. In twenty years their exports of butter, eggs and bacon have risen from eighteen million to eighty million and of this sixty-two million are produced by co-operative societies and exported by their federal agencies."

Germany has more than three thousand co-operative banks whose loans are more than five hundred millions a year and so well managed that not a penny has ever been lost by them.

Co-operation Right at Hand.

Our public school system, of which we are justly proud, is the largest co-

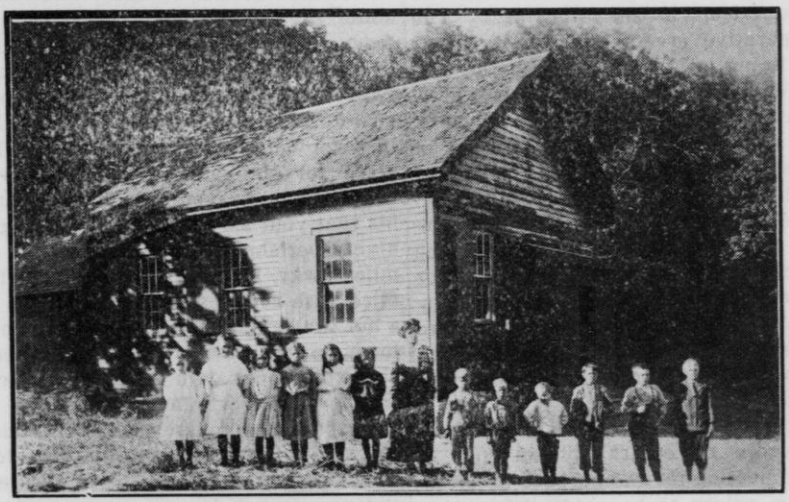
operative institution in the world. The rural division needs revolutionizing.

An Ideal.

A central building to which all the children of a township can come. This building equipped with kindergarten, intermediate, grammar and high school grades; a manual training and domestic science department; a course of study as different from that of a city school as life in the country is different from life in the city; a course of study and training that will educate for country life, instead of away from it to the city, as is done at the present time.

Let this central building have a nice hall for social entertainment, and have the school a great center for social life.

Have a fortnightly farmers' club meeting, where the problems of life can be freely discussed. Never or until doomsday, will the common people gain co-operative spirit, unless they meet more frequently in social intercourse. Talking over the telephone will not do any more than courtship by 'phone would suit.



The little red schoolhouse. The best co-operative association in the world. "Let us butress these walls of democracy."

Gov. Hughes.

Breeding Associations.

Every township should have a breeders' association, affiliated with a larger county organization of the same kind. So long as scrub bulls are used to head dairy herds, scrub farmers will be largely in evidence. "A farmer is known by the company he keeps as well as other people."

Testing associations have been a tremendous uplifting force in Denmark. Let us try their magic power on American conditions.

Building Silos.

Building and filling silos in a co-operative way is an A. B. C. lesson, but will be helpful, and likely to prepare for a harder lesson in the great field of industry.

Co-operative Creameries.

In a recent issue of the Minneapolis Tribune, under the title "War on Creameries," is the following: "The co-operative creameries of Minnesota are lining up for a fight with the central dealers. It is a fight for self preservation on the part of the farmers, and a fight for the complete control of the state's dairy product on the part of the latter.

"Investigation shows that the central creamery men have adopted the policy of raising the price paid for cream to farmers, where there is competition, and of cutting the price where there is none. Statistics show that the co-operative concerns pay higher prices for butter fat.

"It was but a short time ago that managers of central plants held a state meeting for the purpose of agreeing on prices to be paid. Of course, what they agree on as prices at this time does not count much, for the co-operative creamery compels them to pay up wherever there is competition, but should they succeed in killing off the co-operative creamery so it could not compete with them, the prices they agree on will cut a big figure with the farmer, and in turn with every town in the state. The thing for the farmers and everyone else interested in the welfare of the dairy interests of the state to do is to help the local co-operative creamery in every way they can."

Every fake, fraud and humbug that has for its ultimate the undoing of the farmer, is helped along by the farmer himself. In fact it could succeed only through the farmer's assistance. The undoing of the co-operative creameries and the resulting loss of millions upon millions of dollars to the farmers of the northwest, will be made possible, because of the ignorance and selfishness of the farmer. You will hold a cent so close to your eye that a thousand dollars six months away cannot be seen. You will strike your colors before the soft solder and blandishing smile of a handsomely dressed man from town, who will flatter you, lie to you, and win you. He will quote figures to you, to prove that your butter maker is robbing you in the test for butter fat, and also in the price for the same, and will prove conclusively to your satisfaction and his that your salvation is in shipping a highly perishable article hundreds of miles away, in hot cars, to a hot city, filled with hot men, and where there is a hot time going every night in the old town, and you farmers pay for all these hot experiences. Oh farmers, countrymen, brothers, why not stand for a square deal for yourself, and stand just as valiantly for the square deal for your neighborhood? You will not get, and you do not deserve a square deal for yourself, till you are a square man yourself in all life's relations.

Co-operation and Politics.

The smooth politician and suave centralizer man talks so convincingly of the honest, virtuous, intelligent farmer—Yea, verily, the main prop in the social structure, but until farmers, practical farmers, appear in large and influential numbers, in congress and in the state legislatures, they will continue to be, as they are, a thoroughly exploited class. If, as you have been so often told, you are the most moral and intelligent of any class, then from your ranks in large numbers should come the congressmen and lawmakers for all the land.

Until you appear in the halls of legislation in some other garb than that of a humble supplicant, you will continue to get the contempt you deserve; you will be counted "only as hewers of wood and drawers of water."

Co-operation and Religion.

"Do not pray for tasks equal to your powers; pray for powers equal to your tasks." The great essential truth of christianity, the Fatherhood of God and the brotherhood of man, is a broad enough creed for all to subscribe to and rally around. With this emblazoned on your banners, and with hearts aflame with the spirit of unity, you will become more terrible to the entrenched powers of evil than an army with banners.

And there will be a new earth—for the Lord hath spoken it.

Music, Singing by Quartette.

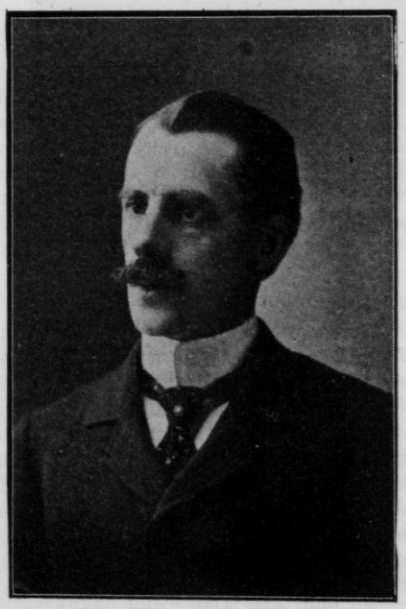
Adjourned to 9 o'clock A. M., Thursday, March 18, 1909.

THIRD DAY.

The convention met at 9 o'clock A. M., Thursday March 18, 1909. Mr. W. C. Bradley in the chair. Prayer by the Rev. Mr. Bland.

PROFIT FROM A HEN.

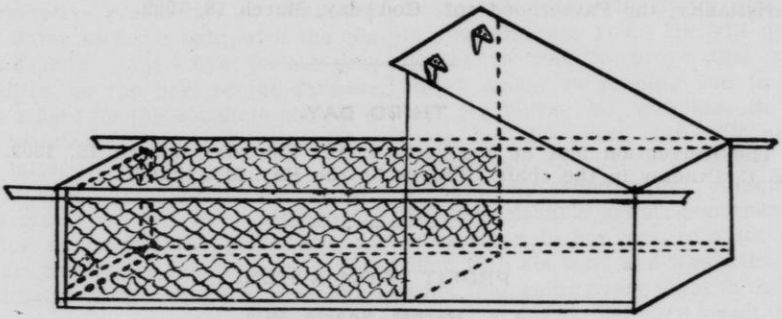
J. L. Herbst, Sparta, Wis.



Mr. Herbst.

Probably no line of work interests as many people in our state as the subject of poultry. Nearly every farmer and a good many city folk engage in the raising of poultry to a greater or less extent, yet with all these that are interested in this line of work, there are only a small per cent who make a success from a money standpoint of view. Those who engage in rearing poultry on the small city lot, do so more from the fancier's standpoint of view, while the farmer engages in the business more for the supply of eggs and meat. When we take into consideration the amount of money invested, labor and feed required, in taking care of the average flock upon the farm, there is a greater profit derived than from any other department of the farm. There is no question but what the flock is a profitable asset on the farm during the spring and summer months, because at this time of the year what we get from them

is practically all clear gain. But little feed is required, and if the fowls are allowed the freedom of the farm, as in most cases they are, they will pick up waste feed about the farm, various weed seeds, bugs and worms and plenty of grit, which are all necessary for the best production of eggs. This is practically what is done on most of our farms about seven months out of the year, and the balance, whatever it is, in nearly all cases will be in favor of the hen. Yet this same flock during the winter months, as a rule, is an unprofitable department of the farm. In most cases the results can be traced to the owner of the flock and the cause, mostly carelessness on the part of the owner to properly breed, feed and house the flock. As a rule, the flocks upon our farms are bred for a double purpose, namely, the production of meat and eggs. It is necessary, therefore, that we cast about for the breed which will answer these purposes best.



A cheap and handy brood coop.

The Breed.

Probably no other live stock can boast of as many breeds as are found in poultrydom and as one who expects to be successful should take a fancy to his breed he should not have trouble in making the selection of his breed.

There is a vast difference in size of breeds, from the small twenty-two-ounce Bantam to the twelve-pound Brahmas and Cochins; in color the solid white, black, mottled, spangled and barred, and, in fact, most any color one could wish for, so one should not have any trouble to suit his fancy as to color.

In making the selection of breed, however, one must be governed somewhat by the market. Birds that sell best on the block should be medium in size, plump condition, with yellow skin and legs. Most all of our American breeds have these requirements and by careful selection at breeding time one can build up a profitable laying strain from this class of birds, such as the Plymouth Rocks or Wyandottes.

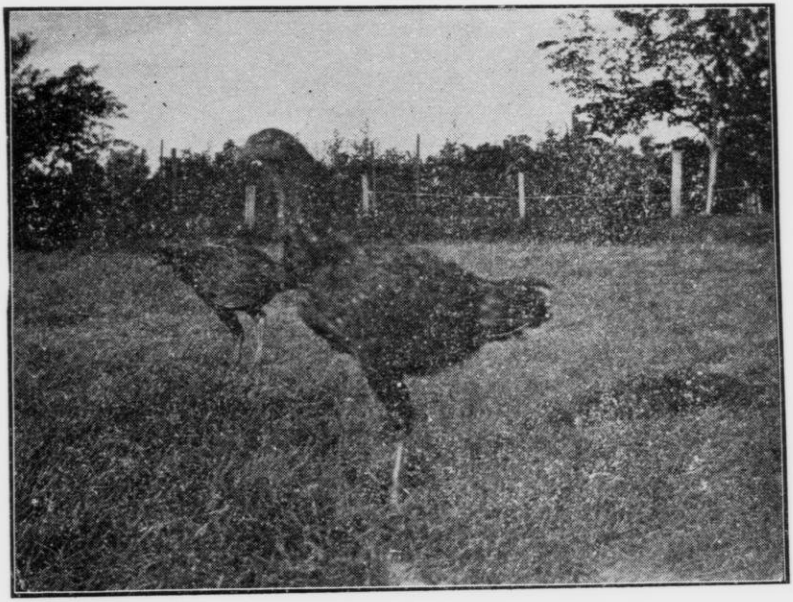
Breeding.

The common practice of breeding from the flock as a whole has done more harm than anything else in making the flock unprofitable as egg producers. Breeding from birds that produce but one or two clutches of eggs during the year will produce birds of like nature and breeding a sire that has not the laying quality and characteristics bred in him cannot but help to make the situation worse.

The success with egg production

must begin with the breeding. When you have a hen that will lay a large number of eggs each month during the winter, breed from her. The trait of superior egg production is a habit that may be acquired and transmitted. A hen whose ancestors were poor layers cannot be expected to be a good layer. No amount of coaxing or coddling whose dam produced only a limited number of eggs.

He should have a good constitution, showing short beak, broad head and bright eye, neck short and stout, breast of good width carried well forward and of fair depth. The mating of such a sire to a flock of hens bred from laying ancestors cannot help to



A promising broiler.

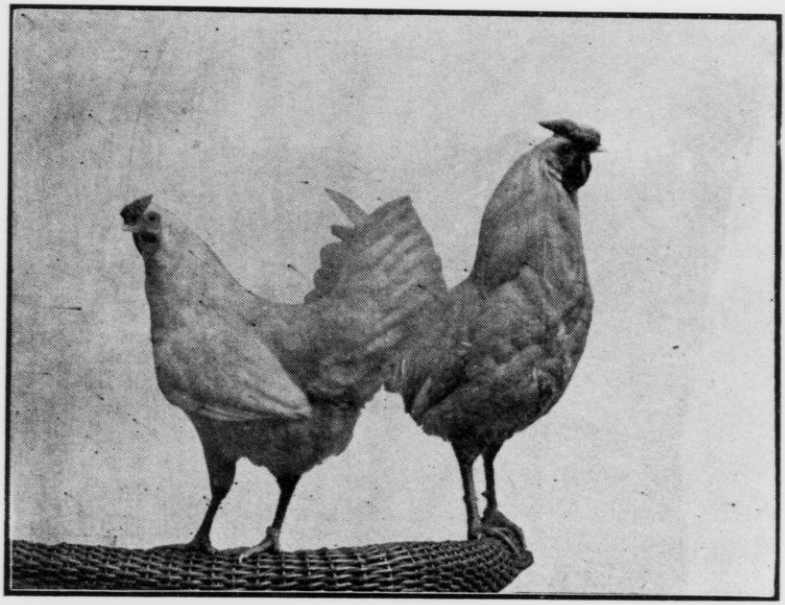
with mash or feed will induce her to produce an unusual number of eggs, because the trait of superior egg production was not acquired by her ancestry and could not therefore be transmitted to her.

The selection of the male to head the flock should not be neglected. He should have been bred from productive ancestry. The male is half the flock and if his dam and grandam were good producers, he should be worth much more as a sire than those give good results with proper feeding and housing.

The breeding pen should be yarded separate from the whole flock, selecting for this pen only the very best egg producers, and this should be done each year. One male with ten or twelve females will give best results and eggs will be of stronger vitality for incubating purposes. The breeding pen should be well cared for. Quarters should be roomy, well lighted and ventilated. The quarters should

at all times be kept clean and disinfected. A variety of grain feed, green cut bone and green feed is absolutely necessary to insure fertile eggs, and grit and water should be kept before them at all times.

The young stock should be hatched early, giving plenty of free range, a variety of feed to insure a rapid growth, so as to be well matured before cold weather sets in. They should be accustomed to go in their winter quarters early in the fall. Much damage is done by allowing the young stock to roost out in the open places where they are exposed to cold fall rains and winds, and many a promising bird has been unfit to go into winter quarters to give the best egg production.



Rose Comb White Leghorns. Good egg producers.

Winter Quarters.

Care should be taken to make the winter quarters as warm as possible, not forgetting that proper ventilation is absolutely necessary. Birds accustomed to plenty of fresh air and exercise cannot be expected and will not do the work fitted for them if confined in close quarters. The summer condition must continue as nearly as possible during the winter months, and this condition can be helped considerably by providing suitable winter quarters.

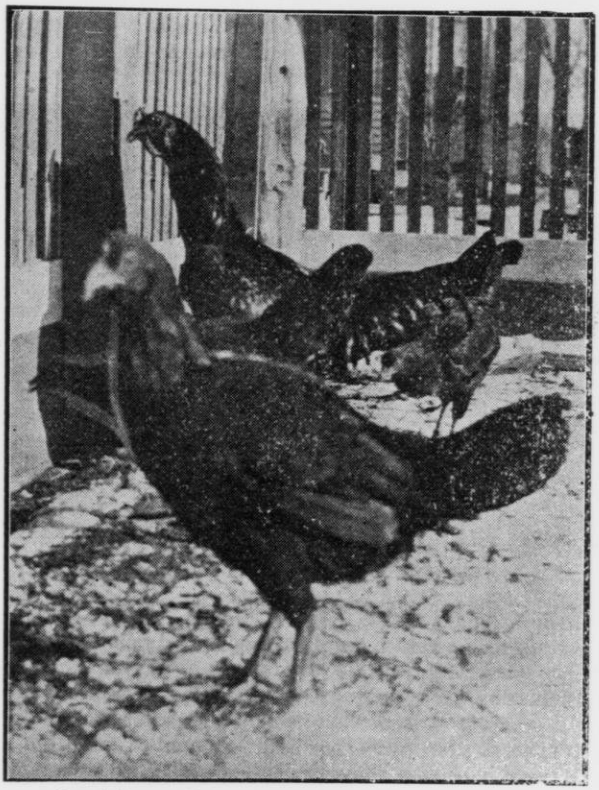
While warmth and ventilation are necessary, plenty of light should enter also into the winter quarters. While glass fronts answer the purpose during the day and warm up the quarters, at night such an arrangement would make the building cold and where such a front is used wooden doors or cloth curtains should be used to cover the glass at night.

The temperature of the building should be kept nearly even to give best

results. Extremes of cold and warm cannot give good results and less feed is required where the quarters are kept moderate.

Instead of allowing the birds to be out in the open, as is the custom on most farms, a scratching shed should be constructed where the birds can go and exercise during the day time. A cheap shed of this nature can be built of frame work, open to the south and covered with straw or corn stalks. In this shed should be kept a liberal bedding of straw or litter in which the grain ration should be placed.

Special care should be given to the roosting quarters, that they be kept clean and disinfected. In order that this may be done quickly, the inside arrangement should be built accordingly. Walls should be smooth with nothing nailed to them. Where nests and roosts are nailed to the walls, excellent places are made for the mites to harbor in. Mites will seek the dark cracks and crevices during the day and at night swarm upon the fowls, sapping the blood from them. The nests and roosts should be arranged upon brackets, so as to be easily removed, taken



Good type of market fowls, broad back and deep breast.

out and cleaned with whitewash to which has been added some good disinfectant. The walls should be whitewashed at least twice a year, in the fall just before housing for winter and again in the spring.

Feeding.

With the proper selection of birds made to winter, our attention must be turned to the feeding in order to secure the required results. The variety of feed must be maintained. At a time of year when egg production is at its best, the birds secure a great variety of feed and a small portion at a time. The laying hen, as a rule, is continually moving about, getting plenty of exercise while feeding, and with these conditions at hand during winter the production of eggs can be increased. Regularity must also be observed. The common practice of feeding the birds after all other chores are done cannot give good results. The birds are down from the roosts when the first light of day comes, ready for feed, and a mixed ration of grain should be at their disposal when they come down from the night's rest. Cracked corn, wheat, oats, barley and any grain to be had, should be mixed up well and a light amount thrown into the litter in the scratching shed. Another feed can be given the middle of the forenoon, another at noon and at night a full feed of corn. Especially is this to be recommended in very severe weather. We must remember that birds that have free range get a small amount of feed at one time and plenty of exercise while doing so. Feeding in small amounts and often gives much better results than heavy feedings at long intervals.

HERBST'S SCOTCH COLLIE.

A good protector for poultry from rats, hawks, etc.

During the day the birds should have access to green feed and a ration of meat or green cut bone. Where birds are accustomed to having green feed and cut bone before them at all times, they will take only a small amount of it, but where it is supplied only at intervals of several days, they can be thrown out of condition very easily by an over amount of these feeds. Mangels, cabbage, beets or

clover leaves are good green feeds and green cut bone or skim milk will act as a substitute for the bugs and worms. Along with the feed one must not neglect to keep before the birds a liberal amount of grit that the feed may be well masticated, and water kept before them in clean vessels at all times is absolutely necessary to give the best results.

DISCUSSION.

Mr. Matteson—Next to milk and cut bone, what would you recommend, providing those are not accessible, as an animal food ration?

Mr. Herbst—I have never had occasion to use anything else but those two, green cut bone, the bone that we get from the butcher's pounded up, and skim milk used in a mash. I have often used tallow scraps, they can be had at the butcher's for this purpose.

Chairman Bradley—How would it be to take some of our old canners that we get one and a half cents a pound for and make them up into thirty-cent eggs?

Mr. Herbst—Where one has a large flock of fowls it can be frozen and answers the purpose very nicely.

Mr. Matteson—Don't you think that is one of the most enonomical feeds that can be fed on the farm,—some of these old canners?

Mr. Herbst—You certainly can get a great deal more out of them in this way.

A Member—What machine do you use in working up bone?

Mr. Herbst—I let the butcher use the machine. I had what is called the Humphrey bone machine, but it will take a man like Mr. Matteson or Mr. Scott to run one of those machines, I don't care about it myself, they run too hard.

A Lady—Which is the better, cooked or raw meat?

Mr. Herbst—Of course, cooked meat is probably a little better, but what I mean by green cut bone hasn't very much meat in connection with that bone.

A Lady—How are the scraps from the butcher shop?

Mr. Herbst—Tallow scraps will answer the purpose, but you must be careful in feeding those. Butchers frequently will salt them pretty heavily and it will do a good deal of harm if you feed hens salted scraps.

A Lady—Is it necessary to feed that in the summer?

Mr. Herbst—Not where they have free run, that is, old stock. Of course the young growing stock should be supplied with some green bone occasionally, but the old stock that has the run of the farm will get nearly enough ration on insects and worms.

A Member—Do you need any other grit besides oyster shells?

Mr. Herbst—You certainly do. Feeding oyster shells does not answer the purpose, you must have grit in some form.

Mr. Matteson—Generally speaking, don't you think oyster shells do more harm than good, speaking in the light of your own experience, from the all-the-year-around standpoint?

Mr. Herbst—You can overdo that by giving them too much of it. They will eat a very large amount of the shell if it is before them and they have no other grit. You should feed the shells very sparingly.

Mr. Matteson—How is crushed crockery for chickens?

Mr. Herbst—That will answer for a small number of chickens. I don't think it will pay to smash up crockery on purpose to get the grit.

A Lady—How do you stop your hens from eating their eggs this time of year?

Mr. Herbst—Chop their heads off, that is the quickest way.

The Lady—Suppose you have a colony that has started the egg-eating habit?

Mr. Herbst—In a case of that kind, of course they will bear watching, and you can quite often discover the hen that is doing the mischief, but if you had a flock that were all eating eggs, I will admit it would be a hard proposition. But lots of times this can be prevented. Many times the nests are not arranged properly for your birds, the pullets, when they begin laying, sometimes will drop the egg upon the floor and it is broken, and of course the other birds get accustomed to those things. The nests should be darkened as much as possible, so that if these birds do happen to get into these darkened nests, they are not as liable to discover the broken eggs. As a rule, where they have a meat ration before them, they are not as hard to break of this habit.

Mr. Matteson—It is quite a habit to break up. I have tried a good many of the cures we have seen advertised, and I know of nothing better than just simply shoveling a path right through the entire length of my yard and putting a chunk of these old canners at the extreme end of the yard and compelling them to go its entire length. In this way they will get in such a hungry state that they will forget to go to the nests. I have had to resort to that a good many times.

A Lady—What kind of fowls do you keep?

Mr. Herbst—I am breeding the buff Plymouth Rocks, the Cornish Indian and the rose comb Leghorns.

Mr. Aderhold—You have a Scotch collie, too.

Chairman Bradley—For laying for men like Aderhold.

Supt. McKerrow—He ought to have an Irish setter.

A Member—What do you use in place of shells, Mr. Matteson?

Mr. Matteson—The prepared grit probably is the best. I would depend on having that on hand at all times and keeping it accessible to your fowls at all times. It is some hard granite rock crushed to the proper size, and also we use large quantities of fine, sharp gravel and keep it accessible in the feeding houses where they can get it at all times. I want to explain what I meant by the statement that oyster shells do more harm than good, in feeding them you get such a hard shell to your egg the little chick can't break its way out.

A Member—Do you feed a mixed grain ration?

Mr. Herbst—Yes. I carry a variety of grain, as great a variety as I can get, wheat, corn, oats and barley, all mixed up together. It is best to feed your birds a little of it oftener and a very little at a time. It is a good plan to always leave them a little hungry during the day time.

Mrs. Ransom—In feeding that meat from the butcher's, we found after a little while our butcher wanted to make money off of us, and we found it was well to look up something else that wasn't of much value to the butcher, so we hunted up a horse somewhere that wasn't of much value to the butcher and we got him to slaughter that horse and we divide the quarters among us and we find that very satisfactory. I like the canner all right, but Swift has use for that canner and he hasn't for the horse and it makes good feed.

A Member—I wonder what the butcher did with the other part of that horse?

Mrs. Ransom—We needed it all, we used the bones and the meat. We find if we all go to the butcher, it don't work very well.

Mr. Herbst—I never have been bothered to any extent with the egg-eating proposition. I have used preventives; that is, by keeping what I think is the right kind of feed before them. Where you keep a supply of meat feeds and green feeds, a variety of feeds before them, I don't think you

will have much trouble with the egg-eating habit. We certainly have got to make the winter conditions as near to summer conditions as is possible, in order to get the best results. In most cases, where birds upon a farm have free range, they get plenty of exercise and a variety of feed, and you know this time of year there is always a supply of eggs, but in the winter we, as a rule, house these birds up in very close quarters and they don't get any exercise and they are fed, in a good many cases, simply on corn. Now, just as soon as you take all these conditions away from your birds, you cannot expect they are going to produce any eggs. We have got to furnish them the food and the exercise that they have been accustomed to getting.

Mr. Matteson—From a winter standpoint and the standpoint of profit, would you recommend anything past a year old, or would you recommend the early hatched pullet as a winter egg producer?

Mr. Herbst—I prefer keeping the birds for two years. So far I have not been able to find much difference in the yearlings and the two-year olds, but after two years, as a rule, they decline in the yield of eggs. Occasionally we have birds that will continue doing fairly well in the third year, but it is not our custom to keep them after they are two years old, unless we have some specially good birds.

Mr. Matteson—You say you have not found much difference. What do you mean, in the number of eggs or the profit?

Mr. Herbst—In the number of eggs and in the profit. Of course it is pretty hard to say what is the exact profit on a hen, because I am not keeping the same number of birds continuously; I am disposing of birds, but the time of year when we should get these eggs is during the winter months when the price of eggs is high. I don't care whether my birds produce very many eggs during the summer months or not, I would just as soon they would not. With eggs at twenty-five and thirty cents a dozen during the winter months, it ought not to take a very long time to make up for the time that they have lost in the summer.

Chairman Bradley—Putting Mr. Matteson's question in another way, will your spring pullets lay more eggs the first winter than your yearling or two-year old hens?

Mr. Herbst—As a rule they will not in the winter.

Mr. Matteson—Is that what actual experiments carried on averaging the years prove, that equal profit is obtained from the yearling and the two-year old with early hatched pullets?

Mr. Herbst—I can't say.

Mr. Matteson—I think the fact is that there is not less than four times the profit from early hatched pullets than from the two-year old, and at least there is as much profit from the early hatched pullet as there is from the yearling; that has been my experience.

A Member—How early hatching have you reference to?

Mr. Matteson—That would depend upon the class of fowls that you are speaking about. What class of fowls have you?

The Member—Plymouth Rocks.

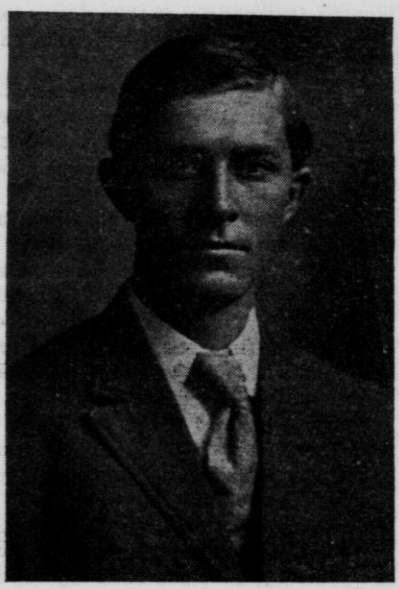
Mr. Matteson—I have my machines set now, probably about eight hundred eggs.

A Member—That is not convenient for every one.

Mr. Matteson—It is not really necessary upon the farm, providing you can colonize them, but they should be out early just the same.

LAND DRAINAGE.

E. R. Jones, Madison, Wis.



Mr. Jones.

My talk will deal with a subject which is as old as Noah. Even in his early day the inhabitants of the earth were brought to realize the damage that could be done by too much water. To my mind it is significant that when punishment was sought for the sinners of the earth, neither fire, nor famine, nor fever were chosen. The flood was selected as the most efficient punishment of them all. With the appearance of the first rainbow, the flood of old receded, but hundreds of thousands of rainbows have followed and there are still some pretty wet spots left even in Wisconsin. Water we must have, but too much is too much. Its removal is known as land drainage. Surface drainage is applied to the surface water. Underdrainage removes the water which fills the pore spaces of the soil itself. With the rising market value of land, the amount of drainage to be done and how it is to be done, are big agricultural factors in Wisconsin.

The lands needing drainage may be grouped into three general classes: First, we have broad expanses of muck and peat marshes that have standing water on their surfaces during the greater portion of the year. They need surface drainage first, then underdrainage. Second, we have flat clay areas and ravine bottoms, which though they have no standing surface water, are soggy and cold until June or July each year. Dig a hole with a post-hole digger in these soils and in half a day's time, there will be water standing in the hole—perhaps nearly to the top of the ground. These soils need underdrainage. The third class of land needing drainage is made up of these areas lying along sluggish streams that overflow their banks. Both their surface drainage and their underdrainage may be good most of the time, but a single flood will sometimes ruin a corn crop. In the aggregate there are in Wisconsin, belonging to these three types of land, about seven million acres—one-fifth of the total area of the state.

On these seven million acres, a large part of the water, if it escapes at all, must evaporate. This evaporation requires energy—energy is used up and energy means heat. The temperature of an upland soil is frequently more than two degrees lower on a day when evaporation is rapid than

on a day similar in temperature, but with other conditions unfavorable to evaporation. Then too, when a soil is saturated with water, the sun's rays in the spring must warm up not only the soil, but the unnecessary water that it contains, and the 15th of May is apt to find such a soil too cold to allow the optimum germination of corn. When the warm rain comes, a soil saturated with cold water cannot drink in the warm rain water. Is it any wonder then that a wet soil is also a cold soil?

It is strange, but nevertheless true, that last season some of the soils that were the wettest in May were suffering the most from the drought in August. The corn in the ground that was wet in May thought it was going to be wet the whole season and consequently sent out only a shallow system of roots—one so shallow that it could not reach down into the moist soil when the drought came. The corn on the well drained soil with its normal root development, was deep enough to gather moisture from the moist sub-stratum. Then too, the deep-rooted plant had access to a bigger volume of soil, and hence to more plant food than its shallow-rooted brother. These are but a few of the benefits of drainage.

Well, what are we going to do about it? Did you stop to think why the water seeped out of the soggy clay soil into the open post-hole? It was simply because the force of gravity could make the water trickle down the side of that big post-hole easier than it could draw it down through the finely divided pore spaces of the stiff clay. You removed a certain amount of friction that opposed the flow caused by gravity. Some areas have been effectually drained by nothing more than a hole through the almost impermeable clay into the porous gravel or sand beneath. The secret is out: Give gravity a chance and the superfluous water will take care of itself.

The best way to illustrate the problems encountered in laying out a

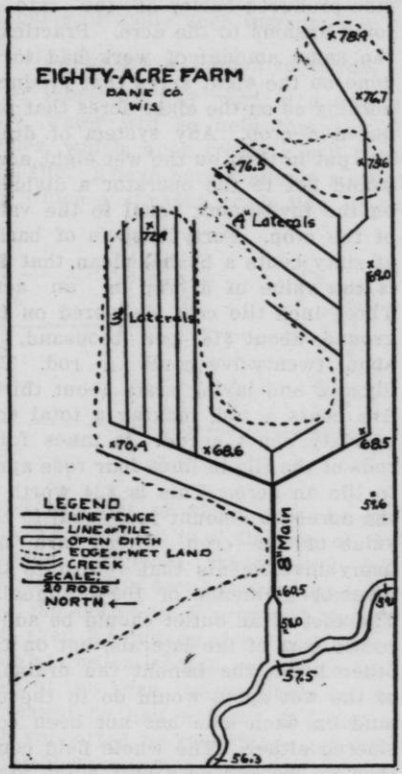


Figure 1.

drainage system is to give a concrete example. The area shown in Figure 1 is typical. The numbers on the map show the elevations of the surface of the ground at points whose elevation should be known. The point marked 72.9 is 4.3 feet higher than the point marked 68.6. It is evident that the greater part of the eighty has a liberal surface slope. Yet on the eight acres upon which the three-inch

laterals are proposed, last season barley could not be sown until May, and after seeding it did so poorly that the weeds got the start of it. The crop was not worth harvesting. It had to be mowed, while the upland on either side produced barley at the rate of forty bushels to the acre. Practically the same amount of work had to be done on the eight acres that produced nothing as on the eight acres that produced a crop. Any system of drainage put in then on the wet eight acres would net to the operator a dividend on the investment equal to the value of the crop. Forty bushels of barley at sixty cents a bushel mean that $24 is the value of a crop on an acre. Three inch tile cost, delivered on the ground, about $15 per thousand, or about twenty-five cents a rod. The digging and laying costs about thirty-five cents a rod, making a total cost of sixty cents a rod. It takes forty rods of the tile in lines four rods apart to tile an acre. This is $24 worth to the acre—an amount just equal to the value of the crop. There are not many investments that return to the investor dividends of 100% annually. The cost of an outlet should be added to the cost of the laterals, but on the other hand, the benefit the drainage of the wet spots would do to the upland on each side has not been considered either. The whole field could then be worked as a unit much more easily than now, when it is virtually divided into three irregular parts. For this reason I take the position that areas of this general type—the wet post-holes surrounded by tillable land—are the first on any land that should be tile drained. To find those soggy wet places, try the post-hole test. When the surface of this eight acres was apparently dry last October, a post-hole three feet deep, had three inches of water standing in it when it had been opened only an hour.

Details of the System.

The outlet is entitled to primary consideration. Notice that the land near the bank of the creek and back as far as twenty rods is only half a foot above the water in the creek. It would be unwise to lay tile with less than two feet of earth to cover them. An open ditch must be dug as indicated, until a depth of about three feet is obtained. Into the head of this ditch the main tile may discharge. The sizes of mains and laterals are indicated on the map. The parallel laterals on the right are four rods apart. On the right, where the subsoil is more sandy, larger laterals, though less frequent, are advised. The main is larger than would be required if the area were not located so near to the foot of the upland, where seepage will be comparatively great.

The principles noted above are of general application and in conformity with those laid down in Bulletin 138 of this Station, even—it is hoped—in the case of the retentive clay subsoils of portions of Clark and Marathon counties. It is true that tile laid in these subsoils will remove water more slowly than from a more open subsoil, but how much more slowly, and how much the efficiency of the tile will be thereby impaired, have not as yet been conclusively demonstrated. During the coming season the Experiment Station expects to install a system of tile drainage on one of the most retentive soils in that locality.

How to Use a Level.

Some of you have been wondering whether to ascertain elevations as indicated on the map, an expensive instrument is necessary. It is true that an instrument with a telescopic sight is both more convenient and more accurate than the one I am going to de-

scribe, although perhaps more expensive—yet not so much so when it is remembered that four or five farmers may put in ten dollars apiece and buy between them an instrument that would suffice for them all for years. However, a carpenter's level is an instrument that nearly every farmer has, so let us learn how to use it for drainage purposes. Drive a flat-topped post in a convenient place and set it on a level provided with "rifle-sights." Center the bubble by sliding a wedge under one end of the level. Have a rod-man hold a rod on all points within range of the instrument, whose respective elevations are desired. The difference in the rod-readings represents the difference in the elevations of the points observed, and the largest reading is always on the lowest point. Care should be taken to sight at all times with the same end of the level toward the observer. Where the points observed are equidistant from the observer, the error caused by the possible non-adjustment of the instrument is eliminated. To test the adjustment of the sights, see if the same difference of elevation is obtained between two points when observed at unequal distances as when observed at equal distances.

If, however, careful preliminary observations taken thus with a carpenter's level show that there is less than two feet of fall across a forty, a level with a telescopic sight should be used in the installation of the system. The Experiment Station has a limited number of these instruments, which it loans for a small rental fee to graduates of the Short Course and to others capable of using such instruments.

How to Dig a Trench to Grade.

If there are any sags in a line of tile, water will be held there at all times, which, upon freezing will burst the tile. I have here a simple method by which a straight grade line, of desired gradient or slope, may be obtained. Figure 2 is a diagram of the scheme. Suppose there is a fall amounting to a foot between the head and the outlet of a proposed line of tile, then by putting the tile 3.5 feet deep at the outlet and only three feet deep at the head, the available fall is increased by half a foot. If I nail a lath supported by two stakes 1.5 feet above the ground at the outlet, it will be five feet above the bottom of the proposed ditch. A lath two feet above the ground at the head will be five feet above the bottom of the ditch there. Furthermore, I know that the second latch is 1.5 higher than the first. If I nail two or three more laths on a line with the two thus set, they will all be on a line parallel to the proposed grade line and just five feet above it. Give the man finishing the ditch a stick five feet long and tell him to dig until he can hold that stick in a vertical position on the bottom of this trench and have the top on a line with the grade laths, and the ditch

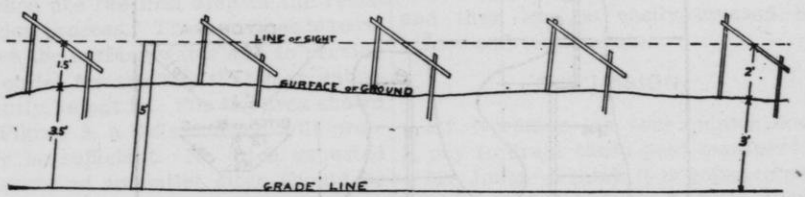


Figure 2.

wil be dug to grade at all points on which the stick is so held.

Co-operation.

Look once more at the eighty-acre farm in Dane county. The water in the creek is so high that only a portion of the land can be tile drained. As it is, all that can be done to improve the drainage of the flat, low land along the creek is to construct shallow ditches. The creek should be deepened and straightened. But before this can be done, the neighbor below must also deepen and straighten his ditch. Then, also, the neighbor above will be benefited and should be made to pay a portion of the cost. At least three land owners, and perhaps many more, are concerned. The same inter-relation of land owner exists on the area—shown in Figure 3—the same as exists in perhaps five

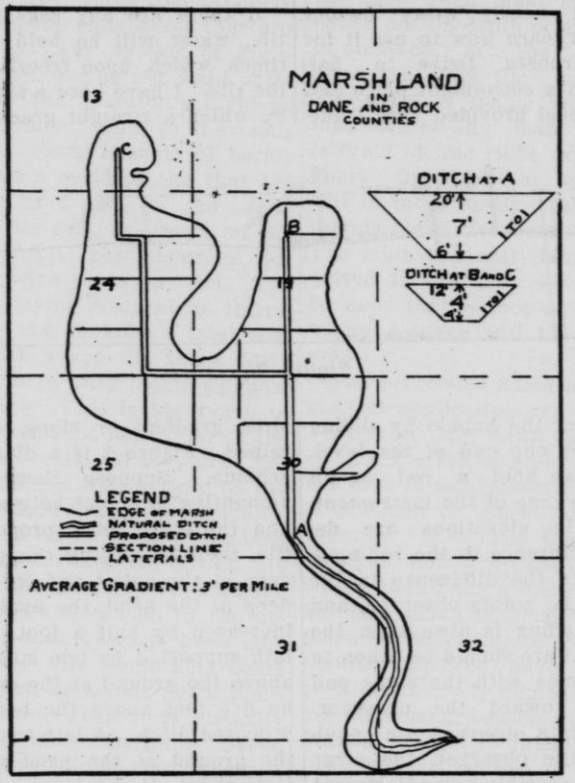


Figure 3.

million acres of land. Yet none need to worry on this account. Wisconsin has drainage laws enforced under the direction of the Circuit Court and designed to give every land owner a square deal, and to prevent any one or two land owners from playing dog-in-the-manger at the expense of the rest. About 300,000 acres have been organized under these laws into drainage

districts. The laws are fully explained in Bulletin No. 138 of this Station.

Upon both the area shown in Figure 1 and that shown in Figure 3, the survey and plans were made by the Department of Soils of the College of Agriculture. For this work no charge is made except for the traveling expenses incurred.

Open Ditches.

Upon large areas—those upon which co-operation is necessary — open ditches are the first step in the reclamation process. Their purpose is to remove the surface water and to provide an outlet for the tile that may subsequently be put in. For the area shown in Figure 3, a 6x7x20 ditch will probably be sufficient. No ditch expected to serve as an outlet ditch should be less than six feet deep after it enters the marsh proper and eight feet is better. A ditch should be so designed that the ratio of the area of its cross-section to the number of linear feet whereon the flowing water is in contact with the sides and bottom of the ditch is at a maximum. It can be demonstrated then that a semi-circular ditch is the most desirable.

In the majority of drainage districts ditches six or eight feet deep have been put in at a cost of about four dollars per acre for all marsh land within a half mile of such ditches. Shallow ditches, two or three feet deep, along forty lines aid in conducting the surface water and some soil water to the outlet ditch.

In conclusion the relation of surface drainage to tile drainage should not be overlooked. Plow lands should be so marked out that the dead furrows will lie in the direction of the greatest slope. Even on tiled areas, the aid of these furrows is sometimes necessary to effect a quick removal of superfluous water. On areas receiving a large run off from surrounding upland, it would be impractical to put in a main tile large enough to take care of all the water. A shallow ditch with sloping sides—made perhaps with a road grader—will serve as a safety valve to aid the tile in emergencies. The tile should not be placed directly beneath such a ditch or depression, unless there is at least two feet of earth over the tile to protect it from sudden freezing. With the main tile near, these ditches will have dry bottoms, except during flood flow, the grass will sod over the sides and they can be easily crossed by teams and implements.

DISCUSSION.

Mr. Nordman—In your opinion does it pay to drain these peat marshes?

Mr. Jones—I think it is going to pay in the long run, but the drainage movement ought to begin in the southeastern corner of the state and work northward, first, because land values are higher, and second, because the marshes have generally reached a further stage of decomposition in the southeastern part of the state. Peat is nothing more or less than vegetable matter that has partially decayed. Where so much vegetable matter accumulates, acidity develops and prevents decomposition, unless there is lime in the upland to leach down upon the marsh to sweeten it. The marshes in the Wisconsin River Valley, which are surrounded and underlaid with an unglaciated sand, have not been thus sweetened. Wisconsin is unfortunate in that our first drainage districts were organized in these poorer marshes, but when the better marshes are drained, the value of marsh drainage will be brought out.

Mr. Scott—Mr. Jones has stated that there are some sections where the underdrainage will probably not be perfect. What are you going to do with those?

Mr. Jones—The system of furrow drainage that Mr. Scott has developed on his farm and which has been described in one of the Farmers' Institute Bulletins, is a cheap way of removing a large part of the detrimental water, but I am from Missouri, you must show me before you can make me believe that lines of tile through the wet sags, to work hand in hand with the furrows, will not be a profitable investment, even upon these retentive soils.

Mr. Scott—I have already shown Mr. Jones and he won't believe his own eyes. I can show him further millions of acres in the state of Wisconsin that cannot be underdrained successfully. I have underdrained many acres of clay and I got it into my head years ago that there were no classes of clays but what could be underdrained, and I went up into north central Wisconsin, fully believing that we could underdrain those clays. I have dug ditches eight feet deep right through that hardpan clay. We kept records on that work so that we know all about it. We had over 14.68 inches of rainfall last summer in fifty-eight days and there was water standing on each side of that trench. The sides of those trenches were moist all the time, yet not one gallon of water ever reached the bottom, while there were gallons of water standing on either side.

Mr. Jones—Haven't you noticed, Mr. Scott, that drainage improves with the length of time the tiles are in?

Mr. Scott—That is true if there is any drainage, but that drainage must start first. If it is never started, it doesn't do much good. I have got underdraining that has been in five years and not one gallon has ever gone through that service.

Mr. Jones—I propose to try a fair, conclusive experiment in tiling these retentive clay soils, by installing on a typical area lines of tile at different depths and frequency, and I will bind myself to abide by the results. In the mean time, let us profit by the experience of twenty-five years of tile drainage in Wisconsin, of which Mr. Scott's line of tile is one of the few unsuccessful ones.

Mr. Scott—I would not have you infer for one moment that I am opposed to underdrainage; I realize as well as the Professor, or any one does, the value of underdraining where it can be successfully done. I have drained many acres of clay subsoil upon our old farm in Winnebago county. There are miles of underdraining on that farm, successfully working, although I thought it was as stiff as any in the state. Yet my experience in the north central part of the state has shown me that there is another class of clays there underlain with sand through which water will not percolate. I will be glad, indeed, if, by any method suggested by the Professor, water could be made to percolate these heavy clays, but I don't see how he is going to change their quality. I would be glad to co-operate with you in any experiment along these lines, but as yet we have been unsuccessful, and I am sure there has got to be some other method proposed. I realize that the drainage of that section of the state will mean the increased valuation of millions of dollars to that section and I believe it is a very important question, and I only regret that our University has not taken up this question before.

Chairman Bradley—I think they will take it up now.

Mr. Jones—It is because we have not had money enough that we have not taken it up before.

Mr. Roberts—I am a firm believer in tile drainage, indeed I have been called a crank on tiling in my own community. I have tiled on low land and

higher land and a good deal of the high land tile drainage works both ways. It is like humus in the soil, we know it is a good thing in a wet time and it is also a good thing in a droughty time, and I don't know of any investment that a man can make on his farm that will pay as large a dividend as investing in tile drainage.

Mr. Scott—Providing it will work, and it will work in southern Wisconsin.

Chairman Bradley—I hope Mr. Scott and Mr. Jones will get together next summer and demonstrate this thing to the satisfaction of both.

Mr. Scott—We are together now as far as any co-operative spirit is concerned.

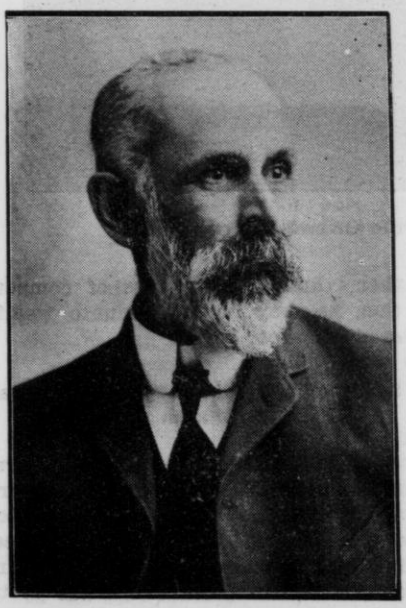
Mr. Jones—I only want to say in closing that we should not let one little unsuccessful three hundred foot piece of tiling give the whole proposition a "black eye;" Mr. Roberts and hundreds of other Wisconsin farmers have sucessfully tiled the stickiest kind of a blue clay subsoil.

Mr. Scott—I wouldn't give it a "black eye" in southern Wisconsin or eastern Wisconsin, or even up along Lake Superior.

Mr. Jones—And I hope soon to see Mr. Scott recede from the stand he has taken taken on tile drainage in north central Wisconsin.

A COW PER ACRE.

H. D. Griswold, West Salem, Wis.



Mr. Griswold.

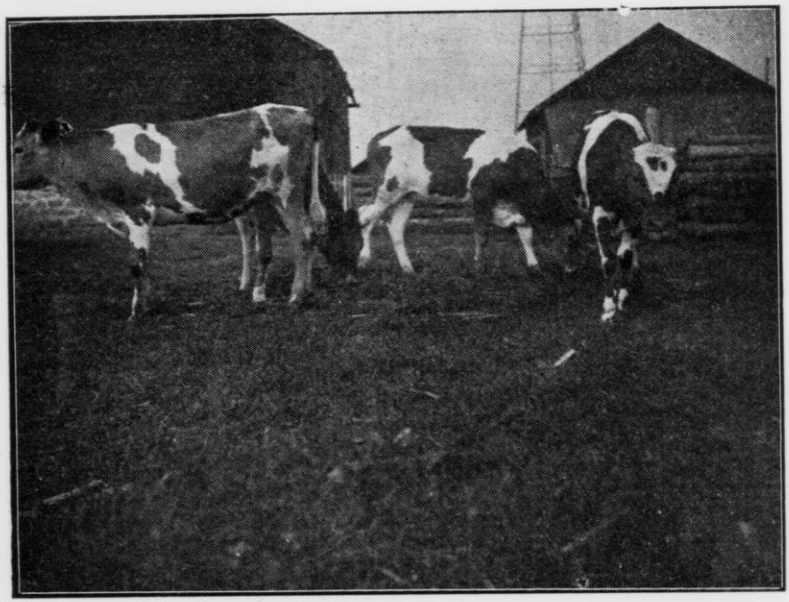
That one cow to the acre can be kept I know, but you will smile and say, how?

In the first place, the land must be good, and in a high state of fertility. Big crops of corn saved in the silo, alfalfa hay cutting three crops in a season, successfully cured, sugar beets or mangels, will produce an immense amount of cow feed per acre. Oats and peas sown together and cut for hay, followed by rape, also yield large amounts of feed. Pasturing is a wasteful method on high-priced land. The silo and soiling crops will support more cattle that pasturing. But why not take more land?

In the first place, we are getting short of land, our new lands are being all taken up. Our government is spending millions of money to irrigate the desert lands and bring them under cultivation, also to open ditches and drain our swamp lands to increase the agricultural area, when we already

have good land near market and convenient in every respect but lying almost idle for want of knowledge. Our large farms are for the most part poorly tilled, robbed of their fertility because the owner will not keep the necessary amount of stock or needed help to work them properly.

business man or the politician puts in his work he can succeed. The professional man spends four years in college and three or four more in his special line of work and continues this by constantly keeping in touch through papers and magazines with all the discoveries in his special line, and even



Guernsey calves of the Griswold herd.

The history of our nation shows that in the past our population has doubled in twenty-seven years. That means that twenty-seven years from now we will have practically twice as many to feed from the same land; that means that our acres must produce nearly twice the present product.

Again, our young men cannot buy one or two hundred acres of land at one hundred dollars each and expect to pay for it in the old way of farming, but a few acres can be bought and by the same careful thought and study that the professional man or the then, through the stress of competition, he may not attain unto wealth or distinction.

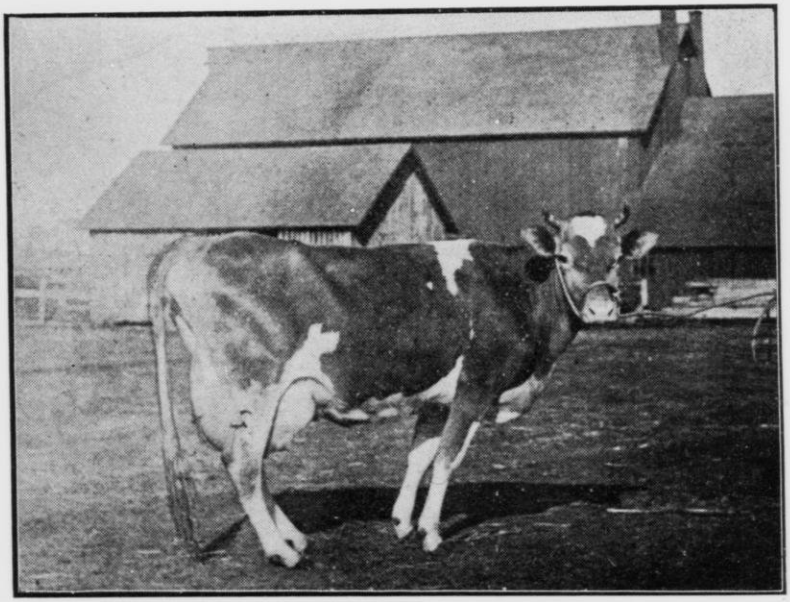
Some of the Advantages of a Small Farm.

The advantages of the small farm are many. The hauling of manure and of crops is carried on much faster on account of the shorter distance. In using a manure spreader, a team and man will haul two loads forty rods in the same time required to haul one load two hundred rods. The

same is true in nearly all the hauling. Shorter distances in getting from the buildings to the work is an important item. Less fencing is required, less seed has to be furnished, smaller amount of capital, smaller taxes and general expenses are proportionately less.

best helps for her work. Neighbors are nearer on the small farms; social and school privileges more available. The farm home can be made the most beautiful spot on earth. Why not make it so?

We commenced with one cow on our little farm of sixty acres, but have



Marie B., 21505, born April 19, 1906, bred and owned by H. D. Griswold, West Salem, Wis.

The hired help question is practically eliminated, as the man and his children can do the work themselves. The work can be done in season and the farmer can drive the work instead of the work driving him.

The home on the small farm can be kept more sacred; the housework made lighter. Instead of buying more land, put a heating plant in the house and a water system and sewerage. The home is a co-operative institution in the best sense of the word and the wife should have her full share of the

been able to increase our herd to fifty head of cattle, besides horses and hogs. We have increased the fertility of the farm till it is able to produce practically all the feed for this number. We feel that we have just begun to realize the possibilities of the farm and although we are not yet keeping quite one cow to the acre we can accomplish that at no distant day and at the same time receive a corresponding profit.

I love my wife, my children, my home and my cattle. My little farm

has been there from creation and will be there till the end of time. It is mine only in trust, not mine to rob or destroy, but to cultivate and improve for those that shall come after. And because I love these things I care for them and they give back to me blessing a hundredfold.

Guiding Star, 12423, born July 23, 1907, owned by H. D. Griswold.

There is a great field opening up in agriculture and the young man who will put the same thought and study and hard work into it that are put into these other lines of business can achieve the comforts and the luxuries, the pleasures of a more quiet, independent life and possibilities yet unknown. And when we get these educated, thinking farmers, we will keep one cow to the acre and we will feed the world.

DISCUSSION.

Chairman Bradley—I think it is a good thing for us to hear about these little farms. There are so many of us Wisconsin fellows that are not satisfied until we have the whole world and want to put a wire fence around it, and the probability is that if we only had sixty acres and loved our wives and our children and our cows and other animals the way Mr. Griswold does we would be a good deal better off.

Mr. Matteson—And don't forget the chickens.

Chairman Bradley—And we should probably take better care of them all and be happier in the long run.

Now, bring out your questions about the feeding of that cow that is carried on an acre of farm land growing one hundred dollars' worth of cow product from each acre.

Mr. Houser—I was looking very anxiously for Mr. Griswold to tell us that he kept the cow to the acre, but

he only keeps fifty cows on sixty acres. Now, tell us about that, what part of this sixty acres is in pasture?

Mr. Griswold—About fourteen.

Mr. Houser—And you pasture fifty head of cattle, horses and hogs and all on fourteen acres?

Mr. Griswold—No, we do not pasture all this stock on it. The younger stock is kept in the barn. We have two silos.

Mr. Houser—The most of your stock, then, is fed in the yards, around the barn?

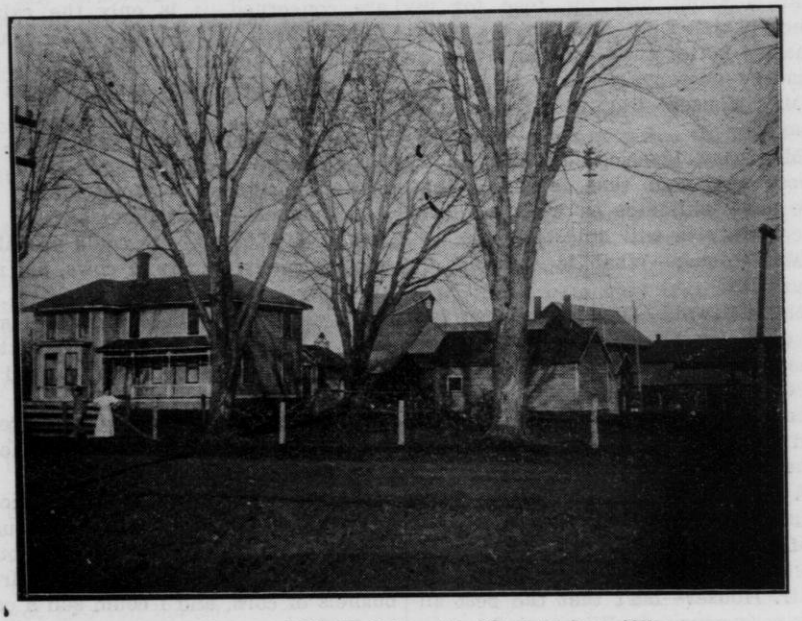
Mr. Griswold—The younger stock is fed in the barn,—in the stable, and the older stock is turned out and fed; with the pasture we feed ensilage.

Mr. Houser—How many cows do you keep?

Mr. Griswold—We keep twenty to twenty-five.

Mr. Houser—Then really the title of your paper, while it is not misleading, means that you keep what is equivalent to a cow to the acre; you do not pretend you are keeping sixty cows on sixty acres?

Mr. Griswold—No, sir; we keep what is equivalent to fifty head of cattle.



Farm home of H. D. Griswold, West Salem, Wis.

Mr. Houser—And you can only do that by soiling, very largely?

Mr. Griswold—Yes.

Mr. Houser—We find here, Mr. Griswold, on our very best land, in a very high state of fertility, that it takes an acre to pasture a cow, and I think that is true in every part of the state if the land is given up entirely to pasture.

Mr. Griswold—But I can get a great deal more out of my land in crops than I can in pasture. You turn cattle on pasture on good land and they

will tread down and destroy more than they eat. My two silos hold two hundred tons of ensilage, and I filled them both this year. I measured the land when I got through, so I know what I am talking about. I filled those two silos from ten acres of land and that was well matured corn, twenty tons of silage to the acre, and I figure that that is about half the feed for my stock, which I get from the ten acres. That is better than running over one hundred acres to get it.

Mr. Houser—Did you weigh that silage?

Mr. Griswold—No, I did not; I don't know any man that is doing that. We have estimates on what a silo of a certain size will hold.

Mr. Houser—What is the size of your silo?

Mr. Griswold—One is eighteen feet in diameter by thirty-two feet deep. The other is twelve feet in diameter by twenty-four feet deep, and we filled them just as full as we could fill them and filled them slowly, so they had time to settle.

A Member—What kind of corn do you fill them with?

Mr. Griswold—That was Wisconsin No. 7, White Dent.

Mr. Houser—Isn't that the best silage corn grown in Wisconsin?

Mr. Griswold—I think so, I like it best.

Mr. Legler—Is it checked or drilled corn?

Mr. Griswold—It was drilled about six inches apart in the row, one kernel in a place, rows three feet eight inches apart.

Mr. Convey—Do you think it is possible to get the best results from cows that are roaming over a large pasture, as they will do if they have a lot of room?

Mr. Griswold—I have seen pastures I should hate to turn my cows in; I would be afraid they would tire themselves out before they got enough to eat.

Mr. Purse—Would you rather turn out your cows and keep the young cattle up, or the other way?

Mr. Griswold—I never have tried keeping cows up in the summer, although I keep them very close in the winter. As far as the young cattle are concerned, it is only the calves that we keep up. All the other young cattle are turned out.

Mr. Houser—What kind of cows do you keep?

Mr. Griswold—I keep Guernseys.

Mr. Houser—Could you keep as many Shorthorns or Holsteins?

A Member—He wouldn't have to.

Supt. McKerrow—He could probably keep as many pounds of cows, but not as many cows.

Mr. Griswold—There are cows and cows. I didn't talk about that, that isn't my subject, but I don't intend to keep any but the best.

A Member—Do you buy some feed stuff beside what you raise on these sixty acres, or not?

Mr. Griswold—Yes; but I sell corn and hogs and I get more than enough to pay for all the feed I have to buy. We have sold two or three hundred bushels of corn, and I could sell a carload of hay.

Mr. Stiles—What do you do on the rest of your farm, what are your other crops?

Mr. Griswold—We put in our sixty acres about twenty-three acres of corn, we have about ten acres of hay and last year about nine acres of oats, and the rest was in pasture and garden and taken up with buildings.

Mr. Scribner—Which is the least profitable crop that you raise on your farm?

Mr. Griswold—The grain.

A Member—About what do your cows average you in a year?

Mr. Griswold—My cows bring me in

about one hundred and twenty dollars a year for the cream, and then the calf brings me an average of eighty dollars more, making about two hundred dollars apiece in the year.

Mr. Convey—You spoke about confining your cows in the winter; how close do you keep them in?

Mr. Griswold—In the winter they stay in the stable all the time.

Mr. Howard—Where is that cream marketed?

Mr. Griswold—Most of it in the city of La Crosse.

Chairman Bradley—And what does it bring you per pound for butter fat?

Mr. Griswold—Our creamery pays us an average of thirty cents a pound for butter fat, and this cream that I send to the city brought me an average of thirty-three cents for butter fat, three cents above what the creamery paid.

A Member—Did you veal your calves?

Mr. Griswold—No, sir; I did not. Eighty-dollar veal is a pretty high price.

Mr. Howard—What do you keep, full bloods?

Mr. Griswold—I have full bloods now, but I have been keeping grades till the last year or two; I have now got into full bloods.

Mr. Scribner—Mr. Griswold has been one of the most successful men in grading up a herd of dairy cows of any man in the state of Wisconsin. All of his interests and all of his work have been along that line. He has had the experience and he has the cows, and all of the people on that farm are working with their full interest to carry out that proposition so as to have a herd of thoroughbred cattle.

Mr. Houser—I think this is one of the most important subjects before this Round-up Institute. I think it brings out in a very strong way one of the strongest points that can be brought out, and that is, that a small farm is the most profitable, and it ought to carry a lesson to many farmers in this audience who are trying to work too much land; they ought to operate their farms better and keep better stock on smaller acreage.

Are these grade calves you get eighty dollars apiece for?

Mr. Griswold—No, sir; they are full blood, but I got good prices for my grades when I had good grades, when I had my herd graded up so that I had three-quarters and seven-eighths blood, I got from twenty-five to fifty dollars apiece for those grade calves, and for good graded cows I got from seventy-five to one hundred and twenty-five dollars apiece.

Mr. Aderhold—Mr. Griswold carries his farm in a very high state of fertility, and if you can do that, do you think there would be any danger in having more land?

Mr. Griswold—I am not looking for more land. We have all the work we can do on that sixty acres.

Mr. Convey—Can you get very much better returns from your pure breds, except in the sale of stock, than from your high grades?

Mr. Griswold—Not as yet, because we have only just started with full bloods, and nearly all of our full bloods are very young, just two-year-old heifers, most of them. Of course I shall hold onto them.

Mr. Herbst—What are the average returns from your farm, approximately?

Mr. Griswold—Forty-five hundred dollars.

Mr. Herbst—And how much help do you have?

Mr. Griswold—I have usually one man and I have one boy that is there all the time. One boy goes to school and helps nights and mornings about milking.

Mr. Convey—Mr. Griswold's boys

are graduates of the University; that is where all this credit belongs; they are graduates of the regular University course.

Supt. McKerrow—They are sixty-acre boys.

Mr. Griswold—Out of the four I have got one farmer.

Mr. Convey—You did well.

Mr. Griswold—Two of the boys had too many wheels in their heads and they are engineers.

A Member—In case a man did not have a silo, would you advise planting corn for forage as thickly as you do it for your silo?

Mr. Griswold—No, sir; for a field crop I would plant a little thinner, but for the silo would figure on the fodder as well as the ear, and we get more tons to the acre by planting it in this way.

Mr. Houser—You wouldn't try to get along without a silo, would you?

Mr. Griswold—No, sir; I would not; I wouldn't know how to get along without the silo, and couldn't consider the cow to the acre proposition at all.

A Member—How many years, properly handled, will it take to pay for that silo and for the machinery that it takes to run it?

Mr. Griswold—This larger silo that I have cost me two hundred and fifty dollars. We did the work ourselves in putting it up, and I figured that at the end of the first year it had paid for itself.

Mr. Jacobs—How much did the silo increase the capacity of your farm, the number of cattle that you handle on it?

Mr. Griswold—I can't tell you exactly, but I know this, that before we had the silo we were carrying eighteen cows and we were getting about eleven hundred dollars a year for cream, and after we got the silos we could carry twenty to twenty-five head of cows and we were getting twenty-four hundred dollars in a year for cream, practically doubling the income.

A Lady—Could you do that selling to a co-operative farmers' creamery?

Mr. Griswold—That would depend somewhat on the creamery; there is a great difference in co-operative creameries.

Supt. McKerrow—Well, the one at West Salem.

Mr. Griswold—It wouldn't have made very much difference, three cents a pound for butter fat.

Supt. McKerrow—Probably paid fifteen dollars a cow less. Over in Waupaca county there is a Scandinavian settlement and a good many farmers are making from seventy to ninety dollars on the average from their cows, taking the cream to the co-operative creamery. One man has made up to $96.32 as an average on his thirty-two cows, and there were a dozen or fifteen making about seventy-five dollars a cow. There wasn't a single herd of registered cattle, some few registered cattle, but they were grade herds, and they were making that wonderful showing, which is surely a great credit to them.

A Member—Is your farm comparatively level?

Mr. Griswold—Yes; every bit of it is good land.

A Member—There would be some difficulty in raising corn successfully on a rolling farm.

Mr. Griswold—They raise corn with us on land that is very rolling, but they are careful about running their lines up and down hill and cultivating up and down hill, because it washes pretty badly if you do. Of course they cultivate crossways as much as they can and be safe.

Mr. Buxton—This question has come to me which I could not answer, and I wish Mr. Griswold would answer it,

whether it is best to raise your own heifers, or buy them after they are three years old, with their first calves?

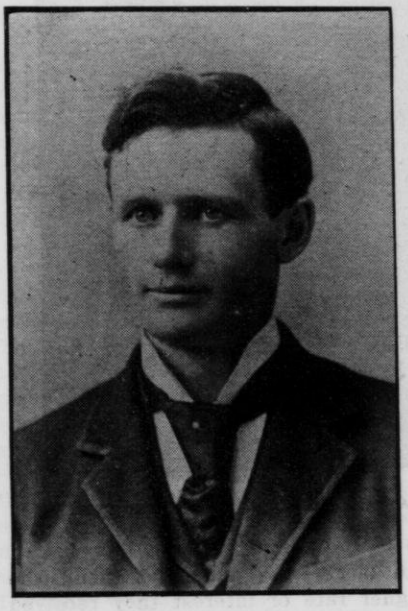
Mr. Griswold—I have had to raise my own almost entirely, I couldn't depend on buying.

Mr. Scribner—Which would you rather have first,—a bull or a silo?

Mr. Griswold—A bull.

A FARMER'S CREAMERY.

W. F. Stiles, Lake Mills, Wis.



Mr. Stiles.

At the present time creameries may be divided into two classes, local and centralized. The latter is a creature of comparatively recent origin, but I am sorry to say that in many localities it is slowly but surely absorbing its smaller and weaker competitor and I am afraid that, like the seven years that followed Pharaoh's dream, after it has them all swallowed up, the land will be in a much poorer condition that it was before, and, like the Egyptian of old, the dairyman will be in bondage to the creamery trust. But who can stop this short-sighted stampede of the farmers? Thinking only of today, they know not what they are doing for their future welfare.

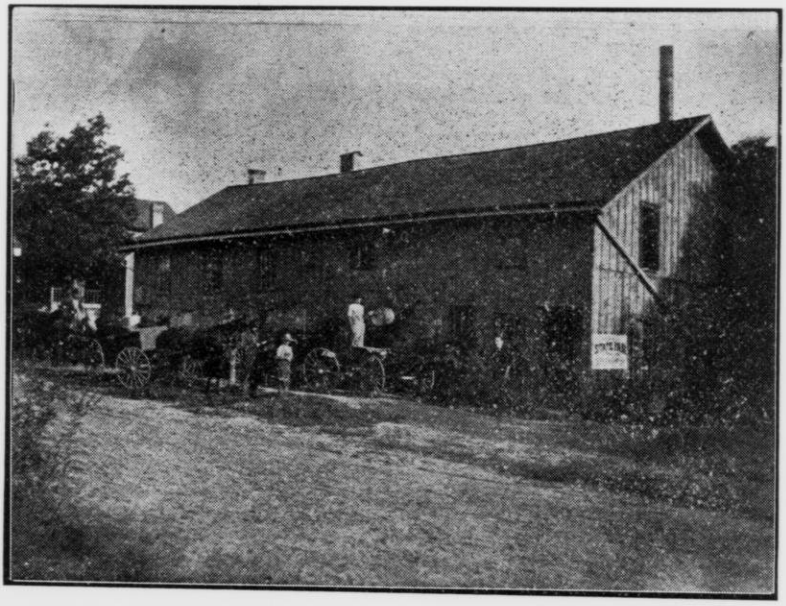
Have the dairymen any cause or reason why they should leave the local creamery and sell their milk or cream to these larger concerns? Before attempting to answer this question, let us look a moment into the history and management of the creamery.

History and Management of the Creamery.

The local creameries have been built and managed in three ways: By private ownership, stock companies and co-operative. When the creameries were operated by private individuals and there were other creameries in the same localities, the operator was obliged to pay about as much for the milk as did his competitors, or he would lose the trade. Thus competition, which was sometimes carried too far for the good of the product, insured the farmers nearly the full value of their milk. In those localities where most of the creameries were owned by private parties, it did not

take them long to discover that instead of competing with each other for the milk, it would be much more profitable to combine and divide up the territory and then run the business for what there was in it. It was then that the dairy cow did not look as profitable to the farmer as before.

ment, they were usually willing. This has been the mistake from the farmers' standpoint of many of the stock companies. Those parties who owned stock and did not furnish milk naturally wanted the company to pay liberal dividends, for, as they furnished no milk, none of it came out of them, so



Farmers' co-operative creamery, of which W. F. Stiles is manager.

The second way of starting a creamery was by the stock company plan, sometimes miscalled "the co-operative creamery." The manner in which these were organized was to have the farmers subscribe for a certain number of shares of stock and as the farmers would rarely subscribe for enough stock to build and equip the creamery, the business men in the nearby village or city would be appealed to to take the remainder of the stock, and as they were promised a good rate of interest on their investment the larger the annual dividend the higher rate of interest they received for their money. But how about the farmers who were furnishing the milk? Sometimes it was an easy matter to fool them and make them believe that if they were getting a large dividend on their stock they were making money fast. Those, however, who could and would take the time to study and think a little about the business, could readily see that if a large sum of money was set aside to pay a high rate of interest on the stock, then each

month's check which they received for their milk, would be so much less. If all of the creamery stock was owned by the farmers furnishing milk, then it would not be as bad, for in that case they would get their money at the end of the year. The only chance of the farmers not getting their full share of the profits would be in the case of farmers furnishing large amounts of milk but only owning a few shares.

When a man invests his money in creamery stock, he is entitled to good interest on his money, for in a way it is a risky business, but when they get to paying as high as fifteen per cent on investment, I cannot blame the farmers for wanting to sell to the large centralizers or go out of the dairy business.

There are a few factories in the state which might be called strictly co-operative, that is, everything is owned and managed by the farmers. Each one pays for operating and maintaining the factory according to the number of pounds of butter fat he delivers during the year. The greatest obstacles in the way of farmers managing their own creameries are the small, petty jealousies which exist among them. It is a shame that this should be. If the farmers could only believe in and act on the old maxim, "United we stand, and divided we fall," how much better it would be for their welfare.

Another factor which aided the large companies and centralizers in getting control of the farmers' milk, or more properly speaking, cream, was the hand separator. The hand or farm separator enabled the farmers to get their products in a form that could be held for a few days without serious injury and the volume was so reduced that the cost of transportation was greatly diminished. Thus it was easy for the men who were soliciting cream for the centralizers to get the farmers to ship their cream by simply offering a little more for it than the local creamery was paying. I do not wish to condemn the hand separator. It would be better to say that it has been an abused blessing. I believe that it is for the best interests of farmers to keep the manufacture of their products under their own control as much as possible. We should learn that our interests are mutual. When we allow another party to manage our business for us, he usually sees that his profits are taken out first, and then, if there is anything left, he will divide with us.

The three most essential requirements to make a farmers' co-operative factory successful are a fair knowledge on the part of the farmers about the business in which they are engaging, a willingness on the part of each to do his share, and a certain number of pounds of milk or cream furnished. Like all other lines of business, to a certain extent, the larger amount of business done the lower the cost per hundred pounds for the manufacturing of the product, which in this case is butter.

In selecting the manager of a creamery, one of the most important qualifications to be sought is honesty. This must stand ahead of business ability. Both, however, are very important. Combined with these qualifications, get as much common sense and tact in the one man as you can. The manager should be familiar enough with the butter business to be able to explain to the different patrons the reason why milk and cream do not test the same at all times, what is meant by such terms as "overrun," and what should be the relation between the price of butter and the butter fat. For the reason that overrun is a little difficult for many farmers to understand, most private factories

prefer to pay the same price per pound for butter fat which they receive for butter, telling the farmers that they will make the butter for the overrun.

In order to make this a little clearer, I have prepared a table showing why the price of butter fat and butter do not always bear the same relation with the changing price of butter.

100 lbs. butter contains 82 lbs. fat, 15 lbs moisture, 3 lbs. salt, etc.

100 lbs. at 20 cents per lb. equals $20.00; cost of making, $3.50; net returns, $16.50.

$16.50 divided by 83 equals 19.8 cents for each pound of butter fat delivered.

100 lbs. at 30 cents per lb. equals $30.00; cost of making, $3.50; net returns, $26.50.

$26.50 divided by 83 equals 31.9 cents per lb. of fat delivered.

Or, looking at it from the price of making for the overrun,

17 lbs. overrun at 20 cents per lb., is $3.40.

17 lbs. overrun at 30 cents per lb., is $5.10.

The law fixes the per cent of water which butter may contain. It must not be over sixteen per cent, or you are liable to a fine, and so a man doesn't want to work too close, but say that fifteen per cent is the average, it takes about eighty-two pounds of fat to make one hundred pounds of butter. The difference between the price of butter fat and butter is different, according to what you get from the butter. If you have one hundred pounds of butter and sell it for twenty cents, you will get twenty dollars. The cost of making is about three dollars and fifty cents a hundred, on the average, depending a good deal upon the number of pounds the creamery is producing; that leaves sixteen dollars and fifty cents. It really takes about eighty-three pounds, because there is always more or less loss; you can't skim right down exactly, there is some loss in churning and some in the buttermilk, and so we must allow for a certain loss. So we will say the average will be about eighty-three pounds of butter fat to make one hundred pounds of butter. If you get sixteen dollars and fifty cents for one hundred pounds of butter after paying for making, that will mean you should get nineteen dollars and eighty cents for one hundred pounds of butter fat. If you sell your one hundred pounds of butter for thirty cents, instead of twenty, the cost for making is just the same whether you get twenty, thirty or forty dollars per hundred pounds, so you have twenty-six dollars and fifty cents left; divide that by eighty-three and that gives you 31.9; you get paid for your oil or butter fat about thirty-two cents per pound. Some factories prefer to take the overrun for the making; the overrun is seventeen pounds, and figuring that out, it will bring three dollars and forty cents at twenty cents a pound, but at thirty cents a pound it will bring five dollars and ten cents, so in case you get thirty cents a pound your overrun will bring much more than enough to pay for the making.

I again appeal to the farmers to keep the ownership and management of the local creameries under their own control. I warn you that if the centralizers and private companies succeed in obtaining control of the creamery business, then, just as sure as night follows day and winter follows summer, will these large companies pay the farmers as low a price for the milk as they dare and still have the farmers continue in the dairy business. The factories will be run for their interests instead of for the farmers'.

This has been the history of every big combination. Look at the oil trust, the beef trust, the steel trust,

and every other form of business which has become monopolistic in its operation. What reason have we to believe that the centralizers will be more generous in their treatment of their patrons? There is not the slightest ground for hope. Look at the history of the operations in Kansas, Nebraska and portions of Iowa and Minnesota. As soon as the local creameries were closed, the price of milk went down.

In what direction can we look for help to drive back this mighty wave which is fast engulfing the dairy industry? The dairymen and they alone hold the key to the situation. Will they use it, or will they allow the door to be opened wider and wider and let the wave depression sweep in and drive all before it? I appeal to the farmers to work together for our own interests, and not give the best results of our labors to others, whose only interest in our welfare is the hope that we may be short-sighted enough to use our strength and energy in such a way that they may get rich out of our labors. Let us lay aside our differences, ideas and beliefs and see that at least in a business way our interests are one. Others only profit by our jealousies. Therefore, let us not have them. Our interests are mutual; then let us co-operate and enjoy together the fruits of our hard-earned labors.

DISCUSSION.

Mr. Michels—Isn't it necessary in many places that two or three small creameries shall combine together or else the centralizer will come in and take their whole work out of their hands,—where they are opposing each other?

Mr. Stiles—Of course it is better to make up a large amount of butter in the same factory than in two or three. This matter the farmers must take hold of themselves, they ought to get together in a meeting, talk over their matters, see what the sentiment of the meeting is, and decide what they want to do. It is because of their contentions and jealousies,—all wanting to be leaders,—that they get into this trouble.

Mr. Michels—You will find that condition everywhere. There is another point that the co-operative creameries are not taking advantage of, and that is the special markets in our larger cities. Take the market for ice cream alone, it is something that is growing very rapidly, and I think it is to the dairyman's interest to develop that so far as it is necessary for private enterprise to do so. I believe we should encourage that private enterprise in developing these special markets. I am not afraid of private enterprise if we can keep it out of these great big trusts, but I don't know any way to do that.

A Member—This three dollars and fifty cents you have there for the cost of manufacturing does not include the delivery of the cream?

Mr. Stiles—I think it ought to. If you have a large creamery you can send out your wagons, and I think you can make up your butter for three and one-half cents, and it ought to include hauling the stuff to the factory. A great many factories can do it for less than that.

Chairman Bradley—Yes, a great many factories haul it for two and one-fourth cents, haul it and make it.

Mr. Stubley—We have a little co-operative creamery in our town, and for the last year it has all been gathered cream. Five wagons go out every day; last year our output was one hundred and forty-seven thousand pounds for the year and it was made for 2.17 cents per pound.

Mr. Nordman—If Mr. Senty is here from this county, he can give us

some very valuable information along this line as to the cost of producing cream.

Chairman Bradley—We would like to hear from him.

Mr. Senty—It cost us one and one-half cents last year. That includes just the expense at the building. The hauling was in the neighborhood of 1.8 for a pound of butter fat.

Mr. Aderhold—Does that include the interest on the money invested and depreciation in the property?

Mr. Senty—Yes. Last month the cost of manufacturing a pound of butter in our factory was two cents and two mills, and this month is one of the poorest months of the year. Part of last year it was only one cent and five mills; that included the amount we put in the sinking fund. Ours is a whole milk creamery. There are only about twenty of us. None of us has to drive over a mile.

A Member—Is it possible for one creamery to realize from two to five cents a pound more than an adjoining creamery?

Mr. Stiles—Why, yes; it depends very largely on the amount of stuff the creamery is putting out, but when they are delivering the same kind of cream and to the same market, I don't see how one creamery can pay more than the other.

A Member—We have adjoining creameries; one pays from two to five cents above our creamery, and the farmers drive past our creamery and go to the other, where they say they get five cents more on the Chicago market. It doesn't seem to me those adjoining creameries can be doing it honestly.

Mr. Aderhold—Some of these farmers that go past a creamery with their cream and take it to a distant creamery to get two or three cents a pound more, if they knew just how much butter fat they were hauling in their cans, they probably would not go that distance; but they don't know how much butter fat they are getting.

A Member—Their argument is that they have been in the business so much longer than we have that they can afford to go down in their sinking fund and pay more.

Mr. Michels—How long will their sinking fund last?

Mr. Stiles—It won't last any longer than it did out there in Kansas or Minnesota, where a lot of local creameries closed up and the price of cream went down, but the price of butter didn't go down. It is simply a matter of jealousy in many cases that they will run off to another creamery, but of course where people offer more for the cream, as long as a man can get a cent or two more a pound, he is going to take it, but it is a short-sighted policy in the long run.

A Member—I think the reason for that is that the other factory would make a good many pounds of butter.

Chairman Bradley—I know at Osceola a few years ago it was costing them six cents a pound to make their butter. They had a butter maker at fifty or sixty dollars a month and he was churning twice a week, and only getting a little dab each time. Across the river they were making their butter for less than two cents a pound, because they were getting two tons of milk a day. They were a very few miles apart.

Mr. Stiles—The cost of manufacturing, where you get about five thousand pounds of milk delivered a day, which will make about three hundred pounds of butter, ought to be about two cents a pound.

Mr. Michels—What was your overrun last year?

A Member—I think it was twenty per cent, about.

Mr. Aderhold—I don't see how these

people could do it for one and one-fourth cents.

A Member—I don't see why a creamery can't make as much butter out of thirty pounds of cream as a farmer can, churning his own churn. I have tried it for over two years and I get from a pound to a pound and a half. It was separated in the same separator, milked from the same cows and by the same man.

A Member—It is possible that the butter contains more moisture in the factory, they get a larger overrun perhaps in the factory.

Mr. Michels—How do you know how much butter the factory got out of it?

A Member—I take the duplicate that they give me.

Mr. Michels—That was the butter fat, wasn't it?

A Member—They gave me the amount of cream that came to the creamery and the amount of butter fat.

Mr. Michels—You ought to get more butter than butter fat.

Mr. Scribner—The trouble is a good many people don't understand the difference between butter fat and butter.

Mr. Stiles—On your statement it appears they told you the number of pounds of cream you delivered at the factory and how many pounds of butter fat that cream contained. But when you churned, you got not only the butter fat out of it, but sixteen pounds of water in a hundred pounds of butter, and some salt and other things; if you figured all those things your two statements would come somewhere near corresponding, that is probably the main reason for the difference.

Mr. Michels—He had to get thirty-five pounds of butter where the creamery gave him thirty pounds of fat, just about that.

NORTH WISCONSIN FARMS.

E. Nordman, Polar, Wis.

Much the greater portion of northern Wisconsin is known to be land that is capable of the highest development in an agricultural sense. The climate, soil, markets and transportation facilities are all such as to make it a country of splendid opportunities for persons of limited means. And yet when we come to investigate conditions, we find this section settling up rather slowly. One reason for this is that people do not move in very fast because of greater attractions elsewhere, but another reason is that many of those who do move in are discouraged after a few years of experience and move out again. There are several causes for this failure of northern Wisconsin to attract more permanent settlers, one of which is undoubtedly the rapid advance in the price of wild land. Another cause is the lack of discretion on the part of new settlers in purchasing a suitable piece of land, and still another is a lack of knowledge of the best and cheapest way of improving wild land and of making a living from it.

It is also a fact that much trouble comes from new settlers purchasing

more land than they have any use for, and as debts are usually incurred for this land, they needlessly burden themselves with taxes and interest from the start.

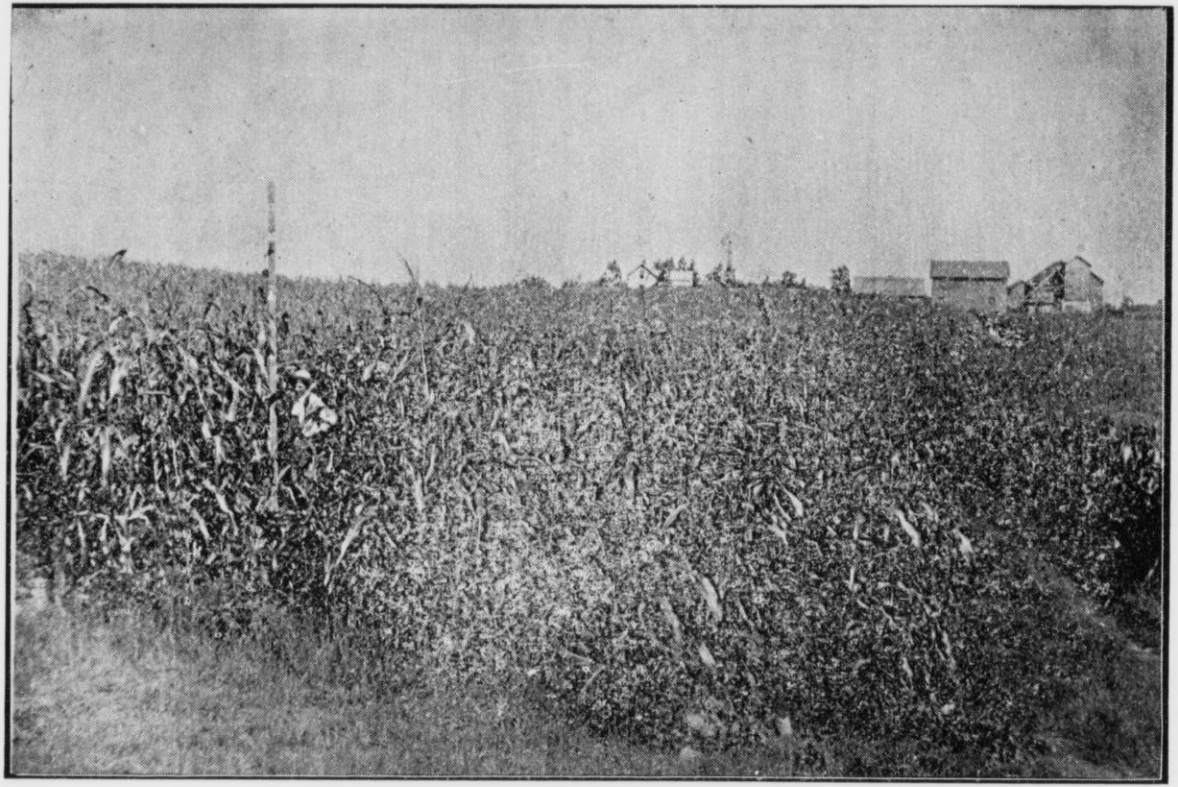
There is all kinds of land in northern Wisconsin, from the utterly worthless to the very best there is for farming purposes, and the new settler should be sufficiently well informed to enable him to exercise proper judgment in making his selection of the tract he intends to make a farm of. Any of the loam lands that are dry, fairly level and reasonably free from stone or other serious obstructions, will make good farms if they are accessible to market. As between the heavy clay loams and sand loams, I prefer the latter, because crops will make a quicker growth on them and this is a distinct advantage in the latitude of northern Wisconsin, where the growing season is short at best.

In their natural state, the sand loams do not, as a rule, contain as much plant food as do the clay loams, nor will they make quite as good pasture land, but they more than make up for this deficiency by being easier to work and more responsive to manures and cultivation.

The amount of land to purchase depends upon what a man wants it for.

Getting ready for the corn crop by winter manuring.

If his purpose is to establish a dairy farm, I would advise him to let eighty acres be the outside limit of his purchase. The average settler can buy eighty acres of cut-over land, reserve twenty acres of this for a wood-lot, and have all the work he wants to do making a dairy farm of the balance and bringing it up to the highest state of profitable production. By confining his labor to sixty acres or less, he will also make more money and farm with greater satisfaction than if he spreads his work over a larger area. Clearing land is now a different proposition than it was five or ten years ago. At



Flint corn that yielded 12½ tons of silage per acre from a fairly well matured crop.
Some of this corn grew to be 11 feet high and through the month of July grew at the rate of more than three inches per day. Nordman home and silo in background.

that time cut-over land usually contained a considerable quantity of merchantable timber, which could be sold and the proceeds used to help clear the land or help make other improvements. No such timber is now available on this class of land, unless in exceptional cases, so that settlers must depend upon their farming for what they get out of their land.

Clearing the Land.

The first work of clearing will have to be done with an axe and a brush scythe. The brush should be cut low and together with the small down-stuff should be piled on old tree tops. If the piles are fired in a dry time, the greater part of this rubbish will be disposed of, and what remains must be pulled together with a team, piled up and burned.

Profitable Crops for the New Settler.

The new settler should recognize the fact that northern Wisconsin is distinctly a dairy and sheep section and should plan to keep either cows or sheep as soon as he can, but in the start he should add to his income by raising vegetables and berries, preferably potatoes and strawberries. These products grow well in most sections of northern Wisconsin and afford a certain and substantial income to the beginners on new land who will grow them.

The farmers of this region are making the same mistake that farmers have made everywhere in the early history of farming communities, that is, they impoverish their land by selling their hay and grain crops, instead of keeping suitable live stock to feed out what they raise. It may be urged as a justification of this way of doing that it is too expensive for the beginner to make his live stock interests keep pace with his clearing operations. But to this argument I reply that surer and more substantial progress can be made if less work be put into clearing and greater efforts directed toward keeping cows enough to consume what is raised on these clearings.

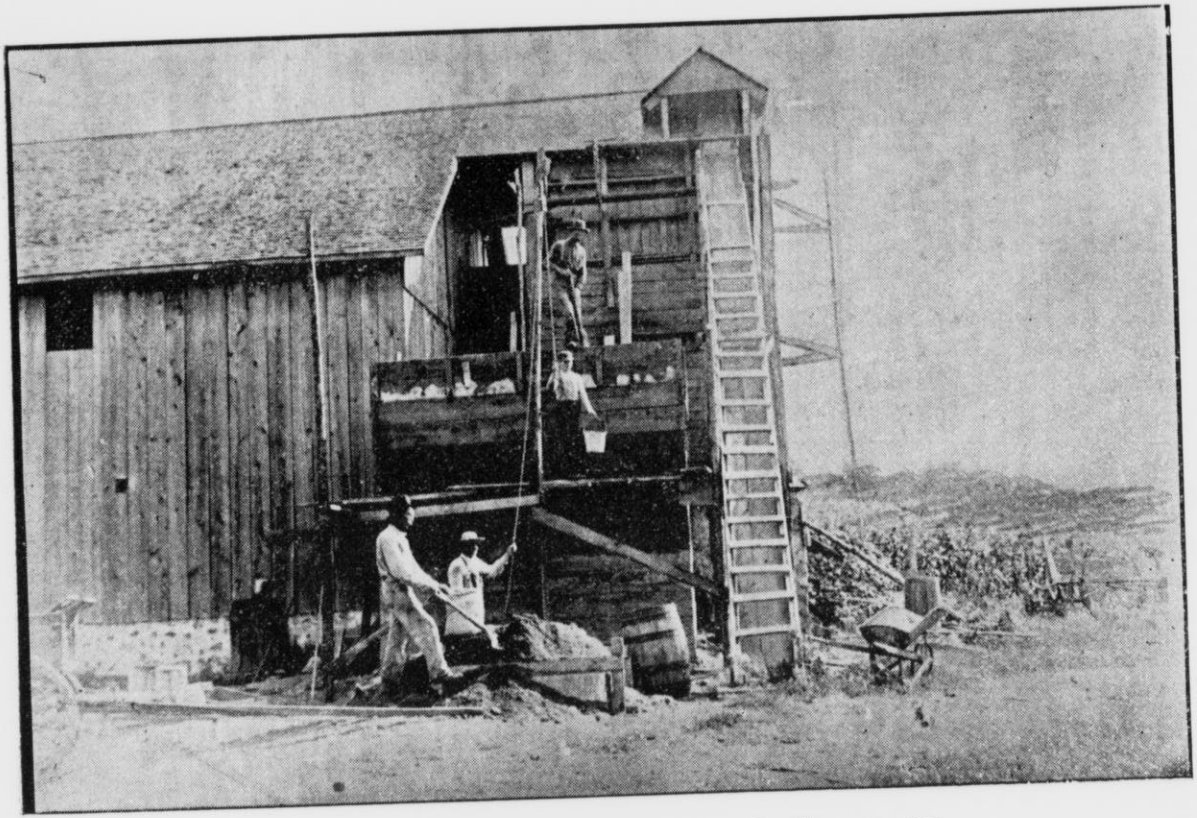
Establishing a Dairy Herd.

New settlers should procure cows for their dairy work that have been bred along dairy lines, as such animals will return greate profits for feed consumed than cows that have been bred for other purposes, or for no purpose at all. Of greater importance than the breed, however, is the feed and care of these cows. Clover and corn should be the principal crops raised and fed, though millet and oats and peas cut green for hay also make valuable feed, as well as a good nurse crop to seed clover with.

For the first few years, the corn will have to be fed to the cows out of shocks, since it usually contains too much moisture to be stacked or stowed away in large quantities, but when land enough has been cleared so five acres of corn can be grown each year, it will pay to construct a silo. Some may consider it too expensive at this stage of the farm's development to construct a silo, but the fact is, the farmer must have some kind of store room for his feeds at any event, and considering storage capacity, no building can be constructed so cheaply as a silo.

The matter of silo filling machinery will be solved for the small farmer, as well as the large one, when farmers learn to co-operate in the labor of filling silos as they do now in the threshing of their grain.

If the feeds that I have recommended are raised in a rotation, fed to cows and the manure carefully saved and applied to raise larger crops, it will be practical for the farmers of this



Building another silo on the Nordman farm for the corn crop.

This new silo will hold 100 tons of silage; is made of concrete, one part cement to four parts of gravel and four parts of cobble stone; is well reinforced with No. 9 wire and cost $38 for the material which had to be purchased. Was built in three weeks by our own help, part of the time three men working at it and part two.

section to support a cow per acre of their cultivated land. This implies, of course, that the pasturing is to be done on wild land, which, as a rule, furnishes good feed for cows up to the middle of July. After this time, these pastures must be helped out with feed supplied from the cleared land.

The Pasture.

Just a word as to pastures. There is a great deal of land in this section on which brush has been killed, either by pasturing or by fire, that can be cheaply converted into excellent pasture land. The way to do this is to log the land and then give it a good harrowing with a spring tooth drag. The harrowing should be done in the spring of the year, just when the frost begins to go out of the ground. Sow a mixture of clover and grass seed before harrowing and keep the stock off the land until the middle of June. It pays well for the extra work involved to have pastures divided so that stock can be compelled to graze off part of the field at a time, leaving the other part to freshen up and grow better grass.

Removing Stumps.

In most parts of northern Wisconsin, stumps are the worst obstructions we have to deal with in clearing the land. Hardwood stumps can be removed quite cheaply by the use of dynamite after they have been cut about six years.

A crop of grass being cut for hay in Northern Wisconsin.

A hole should be bored or punched under the stump, and the dynamite placed so that it will be located at about the center of resistance. Enough dynamite should be used on the hardwood stumps to throw them clear out of the ground, as it is poor economy to use less and afterward be compelled to employ labor of men and teams to grub and pull snags out of the ground.

Alfalfa in Northern Wisconsin.

I believe that in the well drained loam sections of northern Wisconsin, every farmer should begin to sow al-

falfa for his stock. There does not now seem to be any question of its being adapted to the loam lands of this section.

To get a stand, prepare the land by giving it a good coat of manure and by plowing it as early in the spring as weather conditions will permit. Harrow frequently up to the middle of June, at which time sow about fifteen pounds of good seed per acre. If the weeds come up and threaten to smother out the alfalfa, run a mower over the ground and clip the weeds back.

In conclusion, I wish to venture the opinion that northern Wisconsin is destined to become one of the finest agricultural communities in the United States. Not indeed because of its superior soil fertility or of the greater intelligence of its people, but rather because the environments in this region will compel this condition. The difficulties that stand in the way of clearing this land and of bringing it under cultivation, are no bar to the thrifty, hardy home-seeker, who cares to own and improve only enough of this land to make a good living and to provide for the future, but they are eternally against that style of bonanza farming that permits of large areas being robbed of their fertility by a few men, whose only interest in the locality where their land is located is the money they can make by exploiting its natural resources.

DISCUSSION.

Mr. Scott—How do your pastures compare as between northern and southern Wisconsin?

Mr. Nordman—I have never observed conditions in southern Wisconsin enough to know very much about that, but from all I can learn, I judge they are better with us. I know, however, that in northern Wisconsin it pays to be a little careful and handle our pastures in the right way. We have good pastures for our stock up to about the first to the middle of July; after that time, unless the pastures are divided as I have indicated, the feeds get short and we are obliged to feed on clover or something else.

Mr. Josef—Perhaps I am as much interested in clearing lands as any one in this audience; that is, taking hold of a piece of land in the woods that way to turn it into a dairy farm. It is pretty expensive business, and I don't know any way to get around it.

Mr. Nordman—I will tell you how we get around a part of the expense. We cut this land off, then we take a spring tooth harrow and tear it up and sow it in grass seed, clover and timothy, and we leave that seeded in this manner until the stumps get about six years old, and after that we can remove the stumps very cheaply with dynamite. In the meantime, in order to keep the land producing a profitable crop, it will be necessary to feed these feeds out to your live stock and keep applying manure to this land just as you would in other cases.

A Member—How much per acre would it cost to dynamite those stumps?

Mr. Nordman—That all depends. In some parts of northern Wisconsin a great deal of the land has been cut over a number of years ago and the larger stumps have been rotted out, or rotted enough so that they are very easily removed. In other cases, where the stumps have been cut more recently, it costs more, of course. I should say that on the average it would cost something like six or eight dollars per acre on these hardwood lands. Pine lands are different again, and I do not know anything about them. I have never blasted pine stumps.

Mr. Josef—I have never succeeded in getting good pasture on land where

I cut off trees, unless I made a thorough job of burning. I use a twelve-disk harrow, and I think on any new land the disk is good. I went right in between the stumps and cut it up and seeded with clover and timothy. Last spring I did that and I had a whole lot of feed. I would like to ask, how much dynamite do you use for a big oak stump?

Mr. Nordman—I don't know. We have large hemlock stumps, or had them on our farm, and the most we require for any of them after they have been cut six or eight years is three pounds to the stump, forty per cent dynamite; that means six sticks.

Mr. Purse—You can do it cheaper than that. I have had some experience in blowing out new stumps three feet in diameter. The cheapest thing we found was to hire a man to go in on those stumps and cut the biggest roots and blow out the stumps with one and a half sticks.

Mr. Nordman—I think that extra hired man would cost more than to use the extra dynamite.

Chairman Bradley—It would in our country.

Mr. Josef—Do you find any difficulty in starting alfalfa in the northern part of the state?

Mr. Nordman—We did until we knew how. In the first place, we used the nurse crop to seed with, and that proved a failure. Then we began inoculating, and that didn't do much good, but later on we sowed alfalfa alone on land that was well prepared and there was a good stand. Of course we sowed at the right time—the middle of June.

A Member—Do you consider it more profitable to grow alfalfa than to raise clover where it grows naturally on that land?

Mr. Nordman—You have to sow clover and timothy as well as alfalfa.

A Member—But clover doesn't need the preparation that alfalfa does.

Mr. Nordman—It it a question. You know this growing of alfalfa is in the early stages all over the state, and we are experimenting to a greater or less extent. We figure that after a short time we won't have very much more trouble growing alfalfa than we do clover.

Mr. Buxton—I have found in several years' experience in getting rid of stumps that it is economy in the long run to use large charges of dynamite in small holes.

A Member—It takes more dynamite to blow out pine stumps than other kinds. I have seen the time when a charge of dynamite goes up through the center of the stump and leaves the roots there.

Mr. Nordman—In that case you have to put in a larger charge. In some cases, we take a post-hole digger and go under the stump so we can get the dynamite right where we want it.

Mr. Buxton—Here is my experience with two pine stumps. I hired a man who pretended to know all about it. I paid him two dollars and a half a day for two days' stumping. He put two and a half pounds under a large pine stump and split it open in the center and we had an explosion that ran a hundred and fifty feet in the air, and that is all we had. I waited two years, because I didn't want to take the time, a day and a half, to get that stump out. In the other case, I put five pounds of dynamite under a stump; it was more than four feet across the top. It lifted it completely out of the ground and there wasn't a root left but what a single horse could pull out.

Mr. Scott—I think this in an important subject. Of course we laugh about the methods of burning brush piles and all that sort of thing, but

even in the cutting of brush it is not every man, I don't care how well educated he may be, that knows how to cut brush most economically. We have discarded the clumsy brush scythe entirely and we use what we call the weed scythe, we keep it sharp and it is as good a common mowing scythe as we can find. Now, about blowing up stumps, we find that the same amount of dynamite will have a great deal more effect when the ground is soft; that is, in the spring if the ground is full of water it will have the best results. We have used big augers and big braces, but now we use just the common crowbar; we can punch a hole very readily with that, and then we take this dynamite, one stick after the other, slipping them in so that the charge will pack tight, and we find better results in packing that way rather than to put two or three sticks together in that hole. Now, about pine stumps; if they do not blow out entirely, we pack the hole and burn them all out again. Never burn off the crown of a pine stump first, because you have those great big roots around and you have got to dig them out one at a time.

Adjourned to 1:30 P. M., same day.

AFTERNOON SESSION.

The convention met at 1:30 in the afternoon.

Supt. McKerrow—Now we are coming to a discussion of the breeds of dairy cattle, and we want you to remember in this discussion this afternoon that there is to be no fight between the breeds of cattle any more than of men. There is plenty of room in Wisconsin for the Scotchman and the German, the Dane and everybody else to come in.

Mr. Convey—How about the Irish?

Supt. McKerrow—They will squeeze in anyway.

So there is plenty of room in Wisconsin barns and pastures for Jerseys and Holsteins and Guernseys, and even a few other breeds. The great object which we have in mind in this discussion is to make Wisconsin the best place for all classes of people and all kinds of live stock. So in these discussions, do not think for a moment that there is to be any cross purpose between the breeds, it is simply a question of how to make each breed the best of its kind, and that is why these different breeds are on our program; they are all adapted to Wisconsin conditions; they all have a place here.

Mr. Nordman called to the chair.

CLEAN MILK.

E. L. Aderhold, Neenah, Wis.

Mr. Aderhold.

In making inspections of milk at creameries and cheese factories, we frequently have occasion to find fault with from ten to thirty per cent of the milk offered, the usual criticisms being "too much foreign matter and unclean or rusty cans."

The foreign matter may consist of blossoms of trees, bugs, flies, spiders, chaff, etc. However, a little less than one hundred per cent of it consists of dust, dirt, or dung that falls from the cow into the pail.

Aside from the foreign matter, there probably are very many instances of milk contamination that are not readily noticeable at the time of delivery.

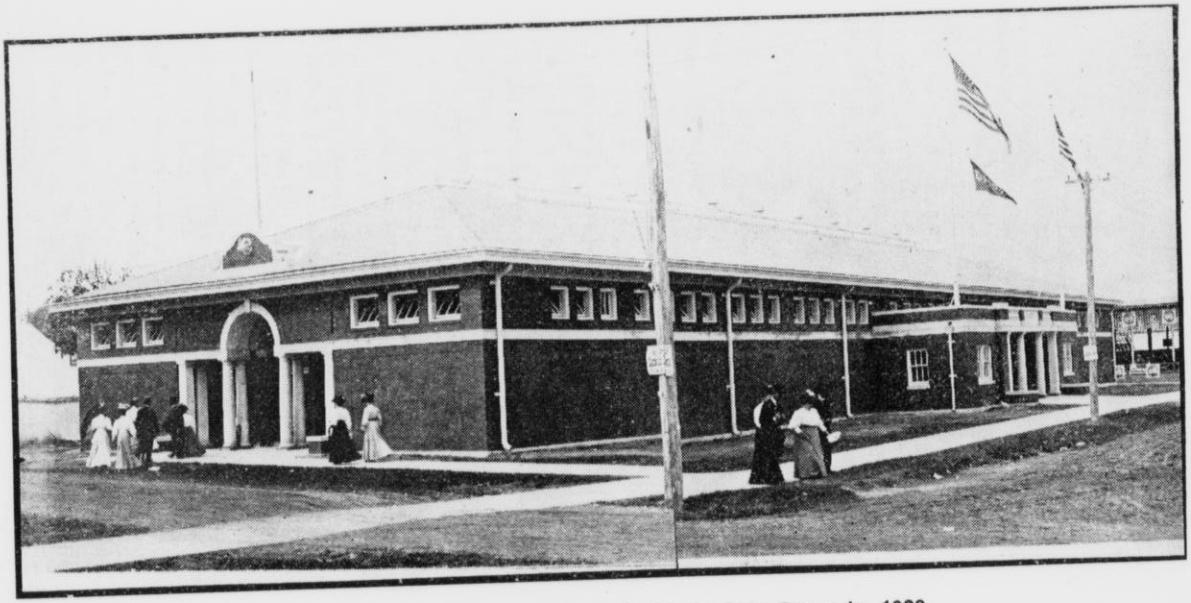
We are told that the lungs of a cow contain about fifteen hundred square feet of very thin membrane for the blood to spread in; that the air in the lungs is changed some fifteen to twenty times per minute; that once in fifty seconds, or less, all the blood in the cow's system is driven to this thin membrane and exposed to air for purification and recharging with oxygen; that milk is elaborated directly out of the blood. We know, too, although many of us have not given it a thought, that during the process of milking air adheres to the stream of milk on its way to the pail, is carried beneath the surface and rises in minute bubbles, thoroughly aerating the milk.

This can be illustrated by filling a glass jar or tumbler with water and forcing into it, with great speed, a small stream of water, which will show that considerable air is carried below the surface.

It follows, then, that the presence of noxious gases and foul odors in the barn cannot fail to injuriously affect the milk, first, through the blood, and subsequently by contamination while being drawn from the cow.

Last winter a milk exhibit was arranged in connection with the Dairymen's Convention at Barron, the samples of milk brought in by the various farmers being judged and scored according to its purity. In that contest the highest scoring milk was furnished by L. P. Martiny, of Chippewa Falls, whose cow barn is equipped with the King system of ventilation and has a cleanly kept cement floor.

Mr. Martiny had simply taken pains to prevent dirt from getting into the milk and had drawn said milk in an atmosphere that was comparatively fresh and pure, and it goes without saying that the utensils were sanitary



New Dairy building on Wisconsin State Fair Grounds, 1909.

and that the milk was promptly cooled to check fermentation.

That is about all there is to the production of clean milk, assuming, of course, that the cows are healthy and their food wholesome.

How to Produce Clean Milk.

The production of pure milk involves healthy, clean cows, wholesome food, well ventilated, sanitary barns, clean udders, sanitary utensils, prompt cooling and further protection against dust, flies and other contamination.

It is as easy to find twenty poorly ventilated, ill-smelling barns as to find one that is satisfactory. It is as easy to find six dairies where udders are not cleaned before milking as to find one where they are. The cows in many Wisconsin herds are thickly coated with filth for six months out of twelve, said stuff being suspended over the pail at milking time.

Some of the filthiest milk I ever saw was in the summer time and it came from cows that were otherwise clean, but were compelled to lie in a barnyard over night and the barnyard dirt was allowed to fall into the pail.

A Properly Equipped Barn of Great Importance.

Most of our cow barns are as yet far from the ideal barn, not so much as regards the building proper as in the matter of arrangement and equipment, the objectionable features being the lack of good ventilation, rotten, leaky floors, and a bad class of stalls. The high manger on which the cow is tied does not permit her to lie down without first backing up, which compels her to lie in filth. Such mangers should be discarded. The stall should fit the cow as to length and line her up to a commodious gutter. The fastener should permit the cow to lie down without first stepping backward. Give the cow a clean place to lie in in winter and in summer, too.

The floor should be tight, preferably of cement construction, and the King system of ventilation should be faithfully installed.

Utensils.

We find many utensils that are not adapted for milk purposes, such as galvanized iron pails and tinware having creases, fissures and pockets that are next to impossible to cleanse. We find many cans from which the tin is worn away, giving the milk a rust flavor.

Some Dairy Laws.

The high milk prices which have prevailed for several years have not been conducive to cleanliness on the part of milk producers. It is not difficult to find milk producers who have made no efforts to deserve high prices for their milk or cream, and it might be well for such farmers to study the following laws, recently passed:

Milk which shall be drawn from cows that are kept in barns or stables which are not reasonably well lighted and ventilated, or that are kept in barns or stables that are filthy from an accumulation of animal feces and excreta or from any other cause; or milk which shall be drawn from cows which are themselves in a filthy condition; or milk kept or transported in dirty, rusty, or open-seamed cans or other utensils; or milk that is stale, putrescent, or putrid; or milk to which has been added any unclean or unwholesome foreign substance; or milk which has been kept exposed to foul or noxious air or gases in barns occupied by animals, or kept exposed in dirty, foul, or unclean places or conditions, is hereby declared to be unsanitary milk.

Cream produced from any such aforesaid unsanitary milk; or cream produced by the use of a cream separa-

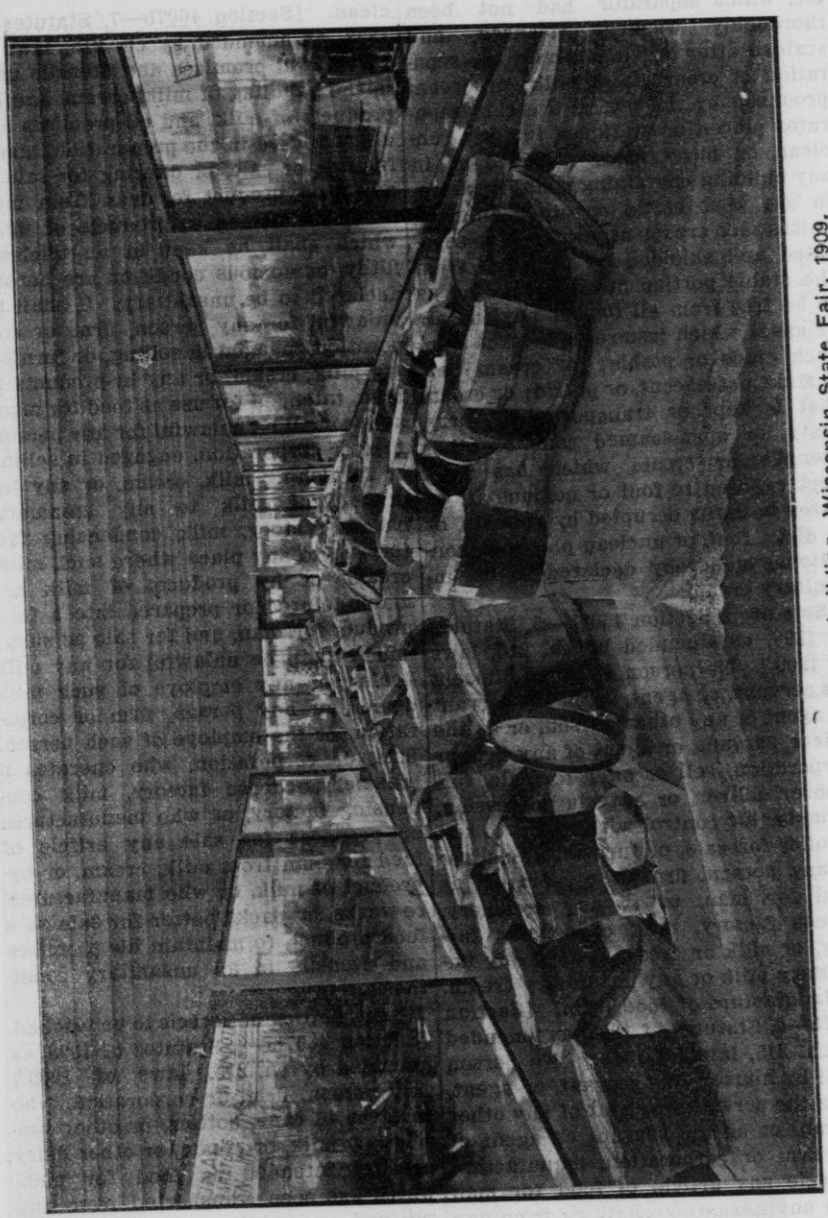


Exhibit of butter in new Dairy building, Wisconsin State Fair, 1909.

tor, which separator had not been thoroughly washed, cleansed, and scalded after previous use in the separation of cream from milk; or cream produced by the use of a cream separator placed or stationed in any unclean or filthy room or place or in any building containing a stable wherein are kept cattle or other animals, unless such cream separator is so separated and shielded by partition from the stable portion of such building as to be free from all foul or noxious air or gases which issue or may issue from such place or stable; or cream that is stale, putrescent, or putrid; or cream that is kept or transported in dirty, rusty, or open-seamed cans or other utensils; or cream which has been kept exposed to foul or noxious air or gases in barns occupied by animals, or in dirty, foul, or unclean places or conditions, is hereby declared to be unsanitary cream.

Sale of. [Section 4607b—5, Statutes of 1898, as amended by ch. 215, laws of 1909.] No person shall by himself, his servant, or agent, or as the servant or agent of any other person, or as the officer, servant, or agent of any firm or corporation, sell or offer for sale, furnish or deliver, or have in possession, or under his control with intent to sell or offer for sale, or furnish, or deliver to any person, firm or corporation as food for man, or to any creamery, cheese factory, milk condensing factory, or milk or cream dealer, any unsanitary milk or any unsanitary cream.

Manufacture of food from. [Section 4607b—6, Statutes of 1898, as amended by ch. 215, laws of 1909.] No person shall by himself, his servant, or agent, or as the servant or agent of any other person, or as the servant or agent of any firm or corporation, manufacture for sale any article of food for man from any unsanitary milk or from any unsanitary cream.

Premises and utensils to be kept clean. [Section 4607b—7, Statutes of 1898, as amended by ch. 215, laws of 1909.] All premises and utensils used in the handling of milk, cream, and by-products of milk, and all premises and utensils used in the preparation, manufacture, or sale, or offering for sale of any food product for man from milk or cream or the by-products of milk, which shall be kept in an unclean, filthy, or noxious condition are hereby declared to be unsanitary. It shall be unlawful for any person, firm, or corporation engaged in selling, or furnishing milk, cream, or any by-products of milk, intended for use as food for man; and it shall be unlawful for any person, firm or corporation, engaged in selling or furnishing milk, cream, or any by-product of milk to any creamery, cheese factory, milk condensing factory, or to any place where such milk, cream, or by products of milk are manufactured or prepared into a food product for man, and for sale as such; and it shall be unlawful for any milk dealer, or any employe of such milk dealer, or any person, firm or corporation, or the employe of such person, firm, or corporation, who operates a creamery, cheese factory, milk condensing factory, or who manufactures or prepares for sale any article of food for man from milk, cream, or by-product of milk, or who manufactures, re-works, or packs butter for sale as a food product, to maintain his premises and utensils in an unsanitary condition.

Cans, bottles or vessels to be washed. [Section 4607b—8, Statutes of 1898, as amended by ch. 215, laws of 1909.] Any person, firm, or corporation, who receives in cans, bottles, or other vessels any milk, or cream, or other dairy product intended as food for man, which has been transported over any railroad or boat-line or by other common carrier, when such cans, bottles, or vessels are to be returned, shall

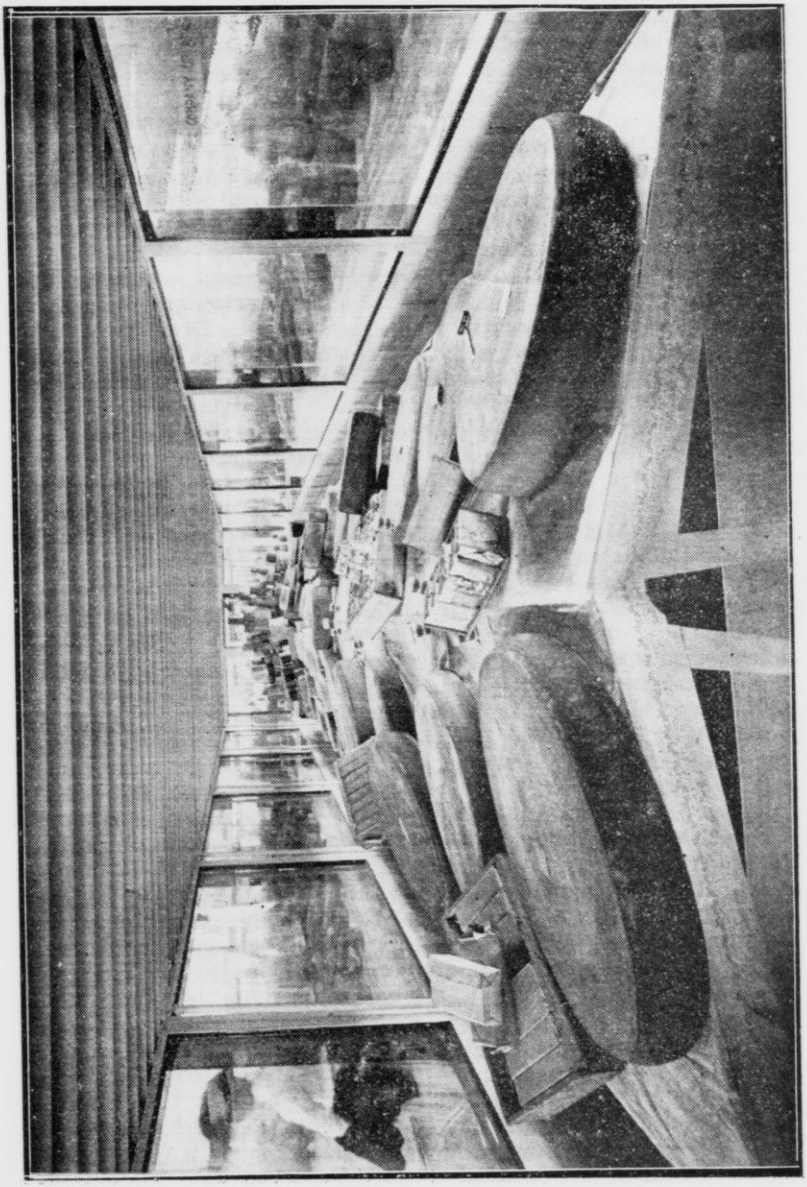


Exhibit of cheese in new Dairy building at Wisconsin State Fair, 1909.

cause the said cans, bottles, or other vessels to be thoroughly washed and cleansed before return shipment.

Penalty for violating either of the preceding five sections. [Section 4607b—9, Statutes of 1898, as amended by ch. 215, laws of 1909.] Any person who by himself, his servant, or agent, or as the servant or agent of any other person, or as the officer, servant, or agent of any firm or corporation, who violates any provision of this act shall, upon conviction thereof, be punished by a fine of not less than twenty-five dollars nor more than one hundred dollars for each and every offense, or shall be imprisoned in the county jail not less than thirty days nor more than sixty days.

[Section 1, ch. 334, laws of 1909.] 1. It shall be unlawful to manufacture or prepare for sale food as defined in section 4600 of the statutes, unless in the process of its manufacture for sale or its preparation for sale it is securely protected from filth, flies, dust or other contamination, or other unclean, unhealthful or unsanitary conditions. It shall be unlawful to store or offer or expose for sale or sell for food as defined in section 4600 of the statutes, unless it is securely protected from filth, flies, dust or other contamination, or other unclean, unhealthful or unsanitary conditions.

DISCUSSION.

A Member—How about the fitting of the manger?

Mr. Aderhold—Do you use these stalls with chains across from the back of the partitions, with the adjustable headrack in front? That is one good style of stall which furnishes cleanliness and comfort if it is properly handled.

A Member—I haven't got them; my neighbor has the stanchions, both the wood and the swinging.

Mr. Aderhold—I don't believe in using the rigid stanchion. I have seen cows that seemed very uncomfortable with the rigid stanchions. They should be so arranged that the cow can move with comfort and can be adjusted according to the size of the cow. If we have some stalls that are shorter than others to start with for our young stock and then a chance to set that fastener ahead or back, adjust it, we can line them all up pretty well. There is an adjustable swinging stanchion on the market.

Mr. Eliason—I am using that and it is very satisfactory, the James Adjustable.

Mr. Buxton—I agree with Mr. Aderhold that the most important question in regard to dairying is the matter of cleanliness, and there is not a particle of doubt but what nearly all of us will bear improvement in that direction. I undertake to say that there is not an article of food that goes on the table that contains so much filth as milk and its various products. I don't want the market for butter spoiled or for the cream of the farmer, but I think if the consumers of the country knew the character of some of the stuff that is taken into the stomach, they would be running up and down the highways and byways of the country asking that something be done. There is a story told of two old burghers of Berlin who made up their minds there was something wrong in the milk furnished their city, something that wasn't exactly cream or butter fat, and they called on their national chemist to make an investigation of the milk. The investigation was made and a report was made to the city council. Of course he made it in Berlin Dutch, but translated into classic English it read something like this: "You want the citizens of Berlin to wake up and wake up quick. You are drinking in your milk twenty-one tons of cow manure every year."

Now, I don't say that we stand on the same footing in that respect, but we know there is any quantity of filthy habits in regard to the dairy business, and it counts in many ways. It is an injury to the clean dairyman and it is an injury to every consumer.

A Member—I would like to have the gentleman explain that system of ventilation.

Mr. Aderhold—You will find it thoroughly explained and illustrated on page 144 in last year's Farmers' Institute Bulletin. The air is drawn out of the barn at the floor. The cow's nose is pretty close to the floor and the foul air ought to be taken away from the floor where she breathes. The fresh air comes down to the floor to take its place so the cow can use it. These outlet flues ought to begin about ten inches from the floor and it is quite important to have them stick up higher than the ridge of the roof and have them not closed up too tight on top. I find a lot of them spoiled because they put a cap over them and pretty nearly shut them off. I think it would be better not to cover them at all in any way, but if they are covered, there should be a big open space.

Now, the inlet flues—the fresh air should enter at the ceiling where the heat is, and if we had an opening going directly through, it would allow the heat to flow out here, but we don't want to let it go out; by running those flues down on the outside, three or four feet, it prevents the heat from flowing out, because the warm air is lighter than the cold air outside and the light air won't work downward against the heavier air. These inlet flues are smaller, four to six inches in diameter, and they ought to be not over ten feet apart, a little air coming in all around. It is a very simple system of ventilation.

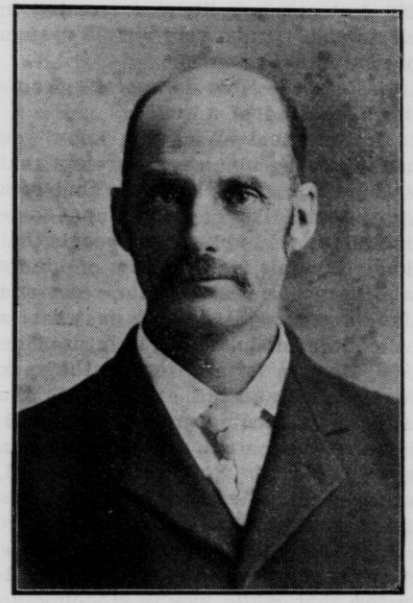
A Member—How do average people like that kind of a stall?

Mr. Aderhold—Well, you know you can't find any number of farmers that will agree to like the same kind of a stall; some like one kind and some like another. I know some people that don't like this, and I know of others who have been using it for years and like it very well. This is what is called the Model stall; it is used on Gov. Hoard's farm. Here is the rack to feed coarse stuff and here is the manger for feeding grain or cut feed. Here is the partition and there is a cross piece like this for each stall, which is the adjustable feature in this case, adjustable to a long or a short cow. This cross piece makes a cow step ahead to lie down; it is so adjusted that while she is standing up her hind toes will be behind that cross piece. That is where she would naturally lie down, but she doesn't like to lie on the cross piece and the result is she moves ahead and keeps clean.

Chairman Nordman—Now, ladies and gentlemen, begins the battle of the breeds, which Superintendent McKerrow assures us is not going to be carried on with stuffed clubs.

THE JERSEY COW.

F. H. Scribner, Rosendale, Wis.



Mr. Scribner.

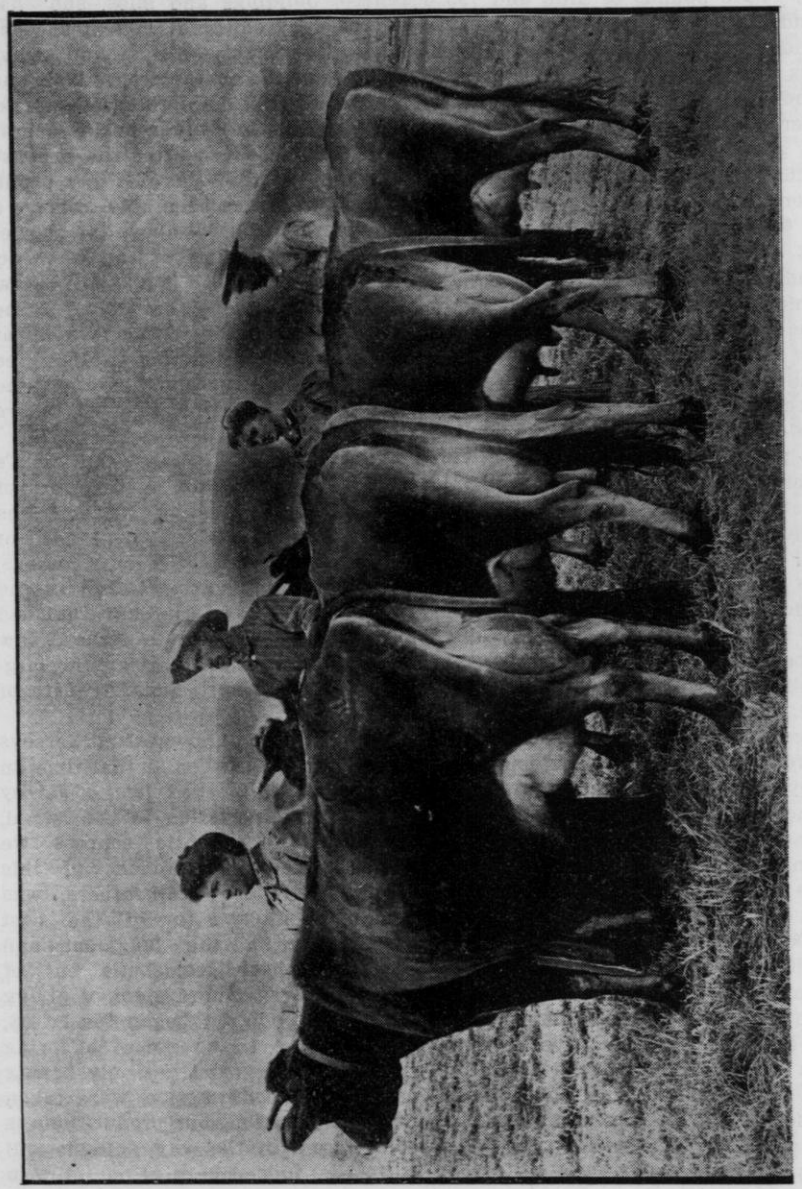
In the preparation of this paper on the Jerseys, it is not my intention to belittle or speak disparagingly of my neighbor's breed, for all have their good qualities and good individuals are found in them all, and the old saying, "To be injured is a less misfortune than to be the injurer, and he who defrauds makes holes in his own pockets by which he loses more than he steals."

Probably the strongest and best claim for the Jersey is as a butter cow. As such she stands unbeaten, reports are constantly coming in of remarkable performances of cows of this breed, and she has proved herself one of the most economical producers of all the dairy breeds. The fat globules in Jersey milk being much larger than that of any other breed has made this milk more desirable for butter-making, and analytical tests by best authorities have shown that butter made from milk of this breed has shown more firmness, more resistance to heat, better texture or grain, better flavor and general high quality, by reason of a larger proportion of the more delicate fats.

The weekly test had always been the strong point of the Jerseys and until within recent years very little had been done to work out the real worth of a cow, and that is her yearly production, and possibly the efforts of our sister breed, the Guernseys, along this line have had their influence to encourage more work along this line among Jersey breeders, and to this end in May, 1903, a Registry of Merit was established by the American Jersey Cattle Club, the club paying one-half the expense of making the test, providing the cow qualifies or makes the required amount, and Prof. Woll, of the Wisconsin Agricultural College, says: "The system adopted by the A. J. C. C. is the best system of testing cows that has been arranged for by any breed association," and up to June, 1908, 361 cows have been entered in this Registry and thirty-two bulls. A bull to be eligible must have at least three daughters from as many different dams that have entered the said Registry.

Some Yearly Jersey Records.

Within the last year three cows have made remarkable yearly records.



Four typical Jersey cows, owned by C. E. Parfet of Colorado.

Financial Countess, a Colorado cow, gave 13,248 pounds of milk and 795.3 pounds fat, or an equivalent of 935 pounds butter. Adelaide of Beechlands, an Oregon cow, gave 849.62 pounds fat, equivalent to 999 pounds butter, and Jacoba Irene, an Illinois cow, gave 17,253 pounds milk and 954 pounds fat, equivalent to 1,122 pounds butter. This cow has given in the last three years 42,064 pounds milk, 2,332 pounds fat, equivalent to 2,745 pounds butter. She has proved herself not only the Champion butter cow of the world, but as a breeder and producer combined has never been equalled, having dropped a living healthy calf each year.

An objection to Jerseys often heard from persons not well acquainted with the breed, is that the cows are small, too small to suit farmers generally. While it is true that there are many small Jerseys, it is also true that there are many of good size and any breeder can, with a little effort, build up a herd large enough for any dairy purpose. It is by no means unusual to find herds weighing around the one thousand-pound mark .

A good many men with beef in their eye fairly detest the "cat-hammed" Jersey, but they came to stay and today no breed of cattle can be found in so many places as the Jerseys, and by looking over the records of registered cattle in the United States I find there are 40,000 Guernseys registered, 158,000 Holsteins, and 279,500 Jerseys, or 81,000 more Jerseys than Guernseys and Holsteins combined.

The Jerseys have won their way in spite of prejudice. Some call them "lawn ornaments for the rich man," but it is just as true they have proved themselves the poor man's friend as well, and many a man has said, "The Jersey has made me what I am today, she has lifted the mortgage from my farm, she has made all the improvements on my farm in the way of fences, buildings and silos, she has educated by children; in fact she has made life worth while." And why? Because of the characteristic born and bred into her of doing things economically and like any other business it is only what is saved after the expense is taken out that there is any profit, so the Jersey has been able to leave a good margin of profit above the market price of feed and labor and when occasion has permitted to make comparative tests with other breeds, as at the World's Fair at Chicago in 1893 and at the St. Louis Exposition in 1904, the Jersey led the race, and to use the slang phrase, "showed them all where to get off."

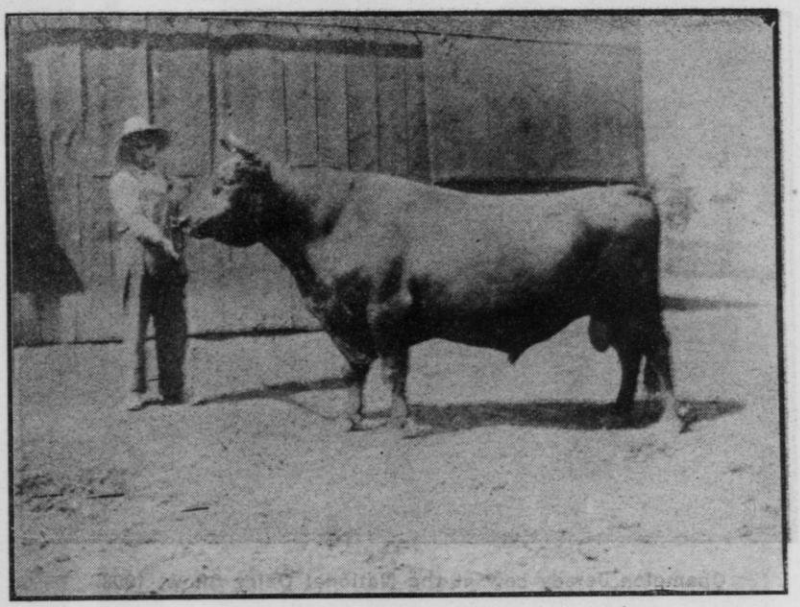
The Wisconsin State Dairyman's Association has taken up the work of forming cow testing associations throughout the state. All kinds of cattle were tested, Scrubs, Jerseys, Guernseys and Holsteins, and of the two thousand cows that have finished up their year's work, a Jersey cow leads them all, having given the largest returns for each dollar's worth of feed.

Very little was known about Jerseys previous to 1789, when at that time an act was passed by the Island of Jersey to prevent importation to the Island, and from all authentic sources we learn that the improvement of this breed, like that of all others, was brought about by a few of the best farmers who had the judgment and foresight to breed from bulls out of superior cows. The system of giving points for pedigree began in 1838, which on the Island meant offspring of prize winners and not only beauty and general confirmation were taken into consideration, but productiveness as well, and by the way, animals will in time be judged here at our fairs in much the same way; cows that can enter the Registry of Merit, and have

produced daughters also that qualified, and bulls with a long line of Registry of Merit daughters.

Refutation of Some Mistaken Theories.

It is a prevalent but mistaken idea that Jerseys are generally small milkers, but their habit of persistency when followed through the entire year with the scale and milk sheet has proven that they are not such small milkers after all, and one cow on our farm averaged forty-five pounds of milk per day, her full milking year, and the great cow Jacoba Irene averaged over forty-seven pounds per day for the entire year, and Loretta D milked up to sixty-two pounds her best day. Cows of the Holstein breed have been called the large milkers, but when we compare the amount of milk given per one hundred pounds of live weight, as in the case at St. Louis, it is found that the Jerseys produced 526 pounds of milk in 120 days for each 100 pounds of live weight, and that the Holsteins produced only 479 pounds of milk for each 100 pounds of their live weight, so the Jerseys proved the larger milkers by twenty-nine pounds to every one hundred pounds of live weight, and if large yields in proportion to size show constitutional vigor, then the Jersey has by far the best of the argument.

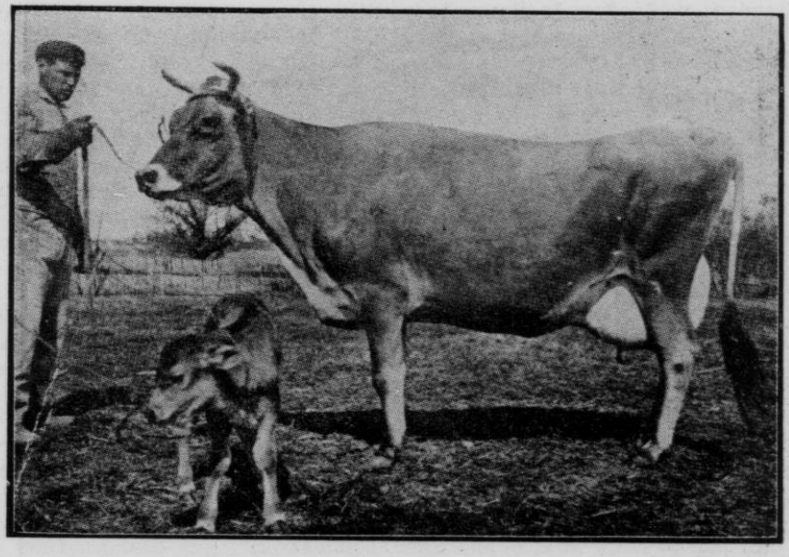


Champion Jersey bull at the National Dairy Show, 1908.

Who ever saw anything but a picture of a Jersey cow on a milk wagon? This in itself proves that Jersey milk is the standard of excellence, as it not only carries the highest per cent of fat, but the highest per cent of solids not fat, and the tests have proven that they go along in practically the same proportion.

One theory advanced against the Jersey, that she is weak in constitution, is entirely without grounds. Constitution is something that cannot be measured or determined. I have in mind an uncle of mine who I don't think ever weighed over one hundred and twenty-five pounds, but he has been wound around the tumbling rod and nearly every bone broken in his body, and several times since a leg has been broken, and he has been run into by a locomotive and yet at eighty-six years of age he walks around as spry as can be, and so the Jerseys, although smaller than some breeds, yet do not lack in constitutional vigor, and this taken from the English Board of Agriculture says "the cattle from the channel islands are healthy and subject to no particular disease."

We often hear that the Jersey is delicate and must have the best of care, feed and treatment. I will admit that she must have good care, feed, etc., and what breed may I ask will thrive without this? Did the great Guernsey cow Yeksa Sunbeam make her great record on northern Wisconsin air and sunshine alone, or the great Holstein cow Colantha 4th's Johanna, did she pass the winter months on the warm side of a barbed wire fence? No. If one must have an animal to stand such a test he better get the buffalo and done with it. The secret of success in the Jersey breeding business is the aiming directly at an objective point in every step, and if American breeders have insisted on one thing more than another when selecting a sire it was that he should be out of a great producing cow; rather than following along in any particular line, American breeders may have ignored type, but they have consistently followed butter capacity; the cows that did the work at St. Louis were all of the old American butter families developed here as the result



Champion Jersey cow at the National Dairy Show, 1908.

Jacoba Irene, champion Jersey butter cow, and bull calf born at National Dairy Show, Milwaukee, October 14–24, 1909.

of the American idea. Our climate and generous feeding have changed many of the characteristics of the Island cattle and have a tendency to make more bone and coarsen the animal. These seem to be desirable traits, for none of the fine Island type ever got a peep into the St. Louis show, but it was the large, strong type that did the work.

The dairyman seeking to build up a profitable working herd seeks this kind, and as the highest object of pure breeds will be for a long time the improvement of the common stock, we must cater to this trade, and the long line of breeding for a specific purpose bespeaks for itself the results that must necessarily follow. Only one and one-half per cent of the cattle in the United States are full blood and if the Jersey breeders are to furnish over one-half of the sires to head herds of common stock through the country, what a field for work, and I do not know of any business proposition that I could recommend so safely as the raising of pure bred stock, for the demand is steadily increasing from year to year. The average dairyman receives an income from milk alone, the breeders of pure bred stock double or triple the income from milk and again double it in the sale of stock. Of the people taking part on the program of this Round-up Farmers' Institute, I find that nearly one-half of the farmers that are keeping stock as a business are breeding the Jerseys. If so many sensible men think they are the best, there must be something in it.

DISCUSSION.

Mr. Imrie—The cow that gave forty-odd pounds a day during the whole year, did she raise a calf during that year?

Mr. Scribner—Yes, she did and one the next year.

Mr. Griswold—Do you lay much stress on bringing up your calves and yearlings?

Mr. Scribner—I do lay a great deal of stress on that. I think we do not get our best workers unless the calf and heifer have been raised a good strong animal. I take lots of pains with my calves and I like to feed them generously, but not overfeed them, to keep the heifers growing. A man said to me the other day, "I like to feed my cows, because I can see something coming after, but I can't see it from my yearlings." You never can grow good cows unless you have good heifers growing up into maturity.

Mr. Stiles—At what age do you have your heifers drop their first calves?

Mr. Scribner—It depends on the heifer. If she is a good, nice, strong heifer, a good size, it will pay to freshen her at two years of age; if not, I like to give her a little more size. We find that our heifers that freshen at two and a half years old have made really our best workers; they have a little more size, a little more constitution.

Mr. Michels—Does the fact that Jersey milk carries a very large fat content make her a more economical producer of butter than she would otherwise be?

Mr. Scribner—Yes, that has been proven very near home, we have put them up in comparative tests, and as in Chicago and St. Louis we have found she is an economical producer.

Mr. Michels—In selecting a sire, which do you lay most stress on, the dam or the sire?

Mr. Scribner—I put a great deal of stress on both. I like to see the mother; I think of the two I prefer the mother, and I want a mother that is a good worker, I want her to be a good looker, too. I like to have a grandmother who is a good looker and a good worker, and the longer line of

record work I have behind the sire the better I like it; but I want the immediate ancestry to be good, I don't like breaks in this order. I want specially the dam and the grandam to be good workers. I don't want to find these good workers way back forty or fifty years ago, I want them close by.

Mr. Buxton—What limitations do you put upon the heifer in the matter of growth as to the tendency to fatten? I have four that I am giving special attention to now, and one of them on the same feed has a greater tendency to fatten. They are all in good condition, but this one is ready for the butcher all the time.

Mr. Scribner—At what age?

Mr. Buxton—They are now a little past a year.

Mr. Scribner—Are they bred?

Mr. Buxton—Yes.

Mr. Scribner—That is where the judgment of a man has got to come into play. He has to use his own judgment in regard to feeding each particular animal. If one animal is inclined to flesh, you have got to watch out for it all the time. Of course I think when a heifer has been bred four or five or six months, then a little flesh is not objectionable, but too early in the game I would be watchful of it, I would change the feed on that heifer a little. That may be a tendency that is born in her, and if that is true, you have got to be all the more careful.

Chairman Nordman—Do you find that the heifers throughout the country are too fat as a rule, kept too fat through the winter?

Mr. Scribner—I don't think many of them are troubled that way. A heifer wants to be fed liberally. I believe in a good sized animal, a good sized cow, a good big frame. We believe they will make the best workers in the long run.

A Member—What is a cow worth when you get her raised? What did she cost you to raise her?

Mr. Scribner—Oh, I don't know; I don't figure on that very much. They have all got to be raised, the good ones and the poor ones. We can raise a heifer that is a better worker than any cow we can go out and buy, unless we are willing to pay a good round price. The feed we feed these heifers is not expensive. We start them on whole milk, and then on to skim milk with a little oats, a little silage, a little pasture, so really the cost of growing a heifer isn't so much after all, and we get big returns on the business side of it and get a lot of pleasure in the process.

A Member—What time do your cows freshen?

Mr. Scribner—We have to have cows freshen all the while to keep our supply about the same, because we furnish city cream. Under other circumstances, I would have my cows winter workers when prices are high, and then a calf dropped at that time can be grown better through the winter, and when spring comes it is ready to turn out on grass.

Mr. Bradley—What is there that makes a change of character in a man when he changes from breeding Shorthorns to Jerseys and makes him act like a millionaire?

Mr. Scribner—I will leave it to the crowd.

Mr. Bradley—We used to have a man here in Wisconsin named Will Dixon; he used to go around blowing about his Shorthorns, then he went up to Minnesota and bought some Jerseys, and the first thing we knew, he began to act and look like a millionaire. We asked him how it was, and he said, "When I was breeding Shorthorns, I didn't have money enough to buy new clothes, and now I am breeding Jerseys and I have plenty of it."

THE GUERNSEY COW.

Chas. L. Hill, Rosendale, Wis.

Mr. Hill.

The Guernsey breed of cattle originated and were developed on the Island of Guernsey, one of the channel islands near the coast of Brittany in France. They are supposed to be a mixture of the large red Normandy and little black Brittany breeds. However, little is known about it, but it is known that as long ago as 1789 laws were passed on the Island forbidding the importation of any live cattle, and the breed has been kept pure since that time.

The first Guernseys were brought to America in 1831 and taken to an island called Cow Island in Lake Winnepesaukee, N. H., and this herd has been kept pure all these years. Later importations commenced about 1850, and in the early seventies the Massachusetts Society for the Promotion of Agriculture brought some into New England. They were, in the early years, in the hands of men who made no attempt whatever to bring them to public notice, and few tests were made. The first thing to attract attention to the breed was without doubt the very yellow milk the cows gave. This very quality is even today adding greatly to their popularity, for in every city where Guernsey milk is sold in competition with that of any other breed, it rapidly supplies the best trade. In both England and in America there is a growing impression that with this natural yellow color there is a special and very desirable flavor. This seems impossible, but every milk dealer handling Guernsey milk, as well as that from other breeds, declares it is true.

Chief Characteristic of the Guernsey.

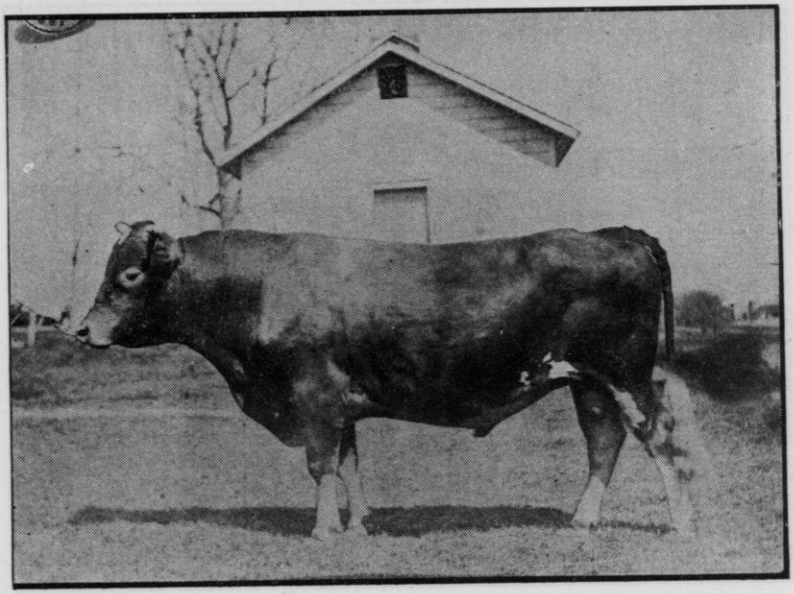
The chief characteristic of the Guernsey is her ability to produce the most economically of any breed high colored milk, cream and butter. In every trial where all breeds have been tried together, she has won in these particulars. At the Pan-American Exposition Model Dairy Test ten breeds competed and the Guernsey was awarded first prize for net profit in production of both fat and churned butter, and also made butter for the least cost per pound, and returned the largest profit on one dollar invested in feed. This is illustrated in the following table:

	Profit for $1.00 of feed cost per lb. of butter.	Fat.	Butter.
Guernseys	$9 31	$1 67	$1 60
Jerseys	9 48	1 63	1 55
French Canadians	9 76	1 55	1 60
Polled Jerseys	9 80	1 54	1 46
Ayrshires	9 81	1 54	1 51
Red Polled	10 27	1 43	1 39
Holstein	10 93	1 27	1 17
Brown Swiss	11 14	1 24	1 20
Shorthorns	12 10	1 06	1 01
Dutch Belted	13 27	86	84

Guernsey	$28.23
Jersey	18.67
Holstein	6.71
Ayrshire	9.64
Shorthorn	9.32

Practically the same results were obtained for ten months' test at the New York Experiment Station in 1891–1892.

Guernsey	$27.60
Jersey	22.17



Glenhaddon, 10,700, A. G. C. C. First at Minnesota State Fair, 1908, and first at National Dairy Show, 1908. Owned by Chas. L. Hill, Rosendale, Wis.

The Guernsey butter also scored higher for the whole six months, especially for flavor and color.

In a nine month's test carried on in 1889–1890 at the New Jersey Experiment Station, the five breeds tested showed the following profits per cow for butter fat produced:

Holstein	5.75
Ayrshire	3.67
American Holderness	4.65
Devon	4.30

Of course in all such tests, too few individuals are tested to make results very reliable.

Establishment of First Advanced Registry Based on Yearly Production.

In 1901 the American Guernsey Cattle Club established the first Advanced Registry for dairy cattle that was based on yearly production of milk and butter fat. All records are made under the supervision of an agricultural experiment station. We thought that the yearly production was the only true measure of a cow's value.

classes, which are arranged by ages, are as follows:

	Milk.	Fat.
	Lbs.	Lbs.
Class A, mature cow, Yeksa Sunbeam	14,920.8	857.15
Class B, 4½ to 5 yrs., Itchen Daisy 3rd	13,636.8	714.1
Class C, 4 to 4½ yrs., Yeksa Rose	11,710.4	678.16
Class D, 3½ to 4 yrs., Robiline 2nd	11,761	603.59
Class E, 3 to 3½ yrs., Dolly Bloom	12,674.83	623 94
Class F, 2½ to 3 yrs., Yeksarose	11,275.5	638.49
Class G, 2 to 2½ yrs., Dolly Dimple	14,009.13	703.86

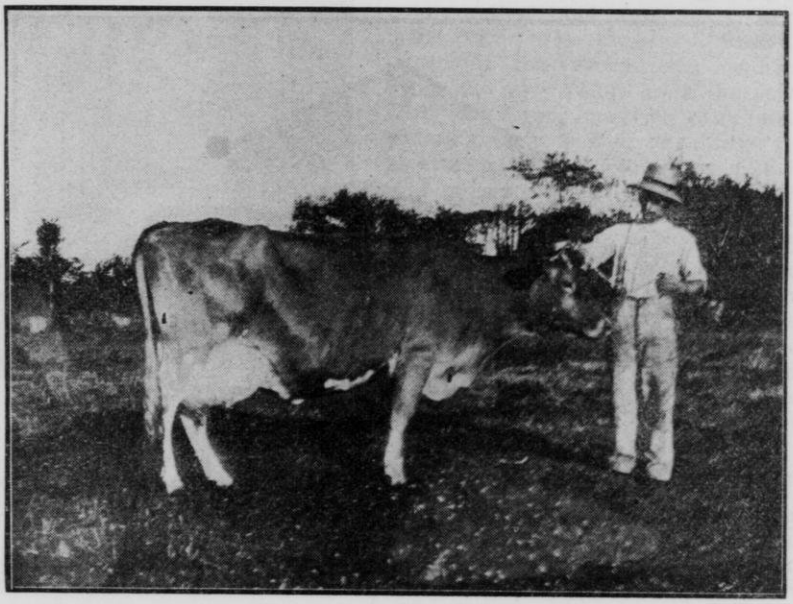


Photo taken on the Island of Guernsey by Chas. L. Hill.

Up to this time, March 1, 1909, 796 official records have been made and the average production of the whole number is 7,851.22 pounds of milk, 405.75 pounds of fat, with an average per cent of fat in the milk of 5.075. The ten largest records average 14,470.4 pounds milk and 745.54 pounds fat.

The largest records in the different

The last named cow, Dolly Dimple, is now under retest and making a very large record. For the first 110 days she gave 6,541.7 pounds milk and 307.24 pounds fat. Age considered, she is easily the best cow of any breed yet developed.

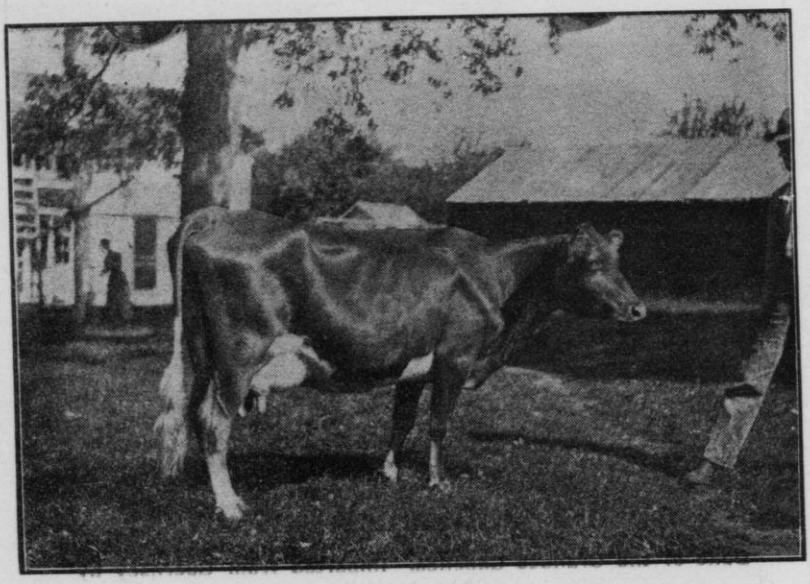
Several cows have been tested for more than one year and a few of these records will be of interest:

Dolly Bloom 12770:
At 2 years old, 8,841.58 lbs. milk, 453.83 lbs. fat.
At 3 years old 12,674.8 lbs. milk, 623.93 lbs. fat.
At 5½ years old, 17,297.5 lbs. milk, 836.21 lbs. fat.

Her daughter, Dolly Bloom of Langwater, made 12,024.5 pounds milk and 632.34 pounds fat at five years old,

Itchen Daisy 3rd 15630:
At 2 years old, 9,958.7 lbs. milk, 533.83 lbs. fat.
At 4½ years old 13,636.8 lbs. milk, 714.1 lbs. fat.

Yeksarose 16610:
At 2½ years old, 11,275.5 lbs. milk, 638.49 lbs. fat.
At 4 years old, 11,710.4 lbs. milk, 678.16 lbs. fat.



Twilight Lonan, champion Guernsey cow, National Dairy Show, 1908. Owned by Chas. L. Hill, Rosendale, Wis.

and Dolly Dimple above mentioned is also her daughter.

Modena 11779:
At 3 years old, 580.32 lbs. fat.
At 6½ years old, 686.47 lbs. fat.
At 8 years old, 728.46 lbs. fat.

Her daughter, Maid of Modena, made 450.76 pounds fat at two years old and 616.9 pounds at six years old.

Countess Fantine 14730:
At 2½ years old, 9,399.6 lbs. milk, 502.59 lbs. fat.
At 3½ years old 11,363. lbs. milk, 582.33 lbs. fat.

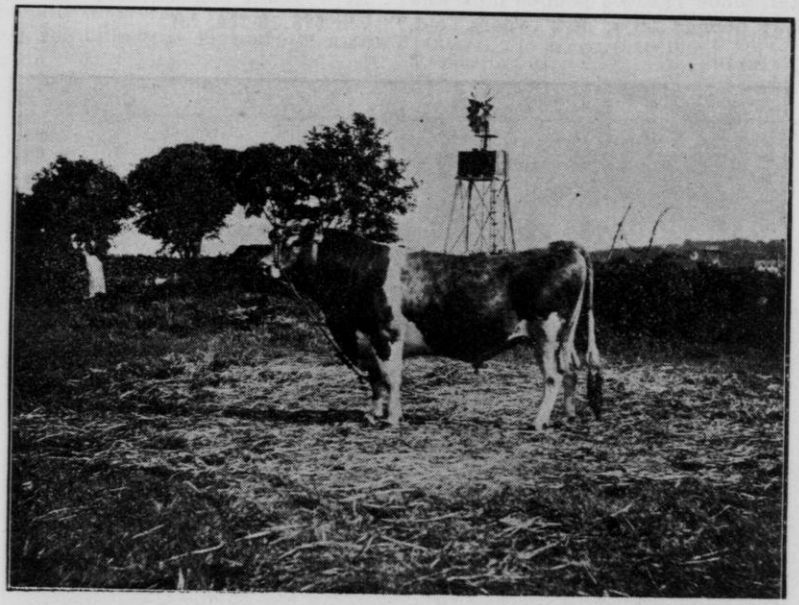
Dairymaid of Elm Place 14197:
At 3 years old, 9,045.8 lbs. milk, 473.47 lbs. fat.
At 6 years old, 12,176.9 lbs. milk, 668.36 lbs. fat.

Selma of Pinehurst 14521:

At 3½ years old, 8,567.8 lbs. milk, 544.6 lbs. fat.

At 5½ years old, 9,593.1 lbs. milk, 615.97 lbs. fat.

Her daughters Selma 2nd and 3rd, made respectively 430.01 and 473 pounds fat at two years old.



Duke of the Grandes Capelles. Imported from Guernsey by Chas. L. Hill.

Stanford's Princess 11740:

At 4½ years old, 9,288.2 lbs. milk, 547.17 lbs. fat.

At 5½ years old, 12,279.7 lbs. milk, 725.65 lbs. fat.

She is now making a much larger record.

In closing I will say that if you want a medium sized cow, quiet in disposition, with good teats, and easy milkers, that will give the very largest returns possible for feed consumed and that give the yellowest milk of any breed, get the Guernsey. She will not disappoint you, for she pleases all who own her.

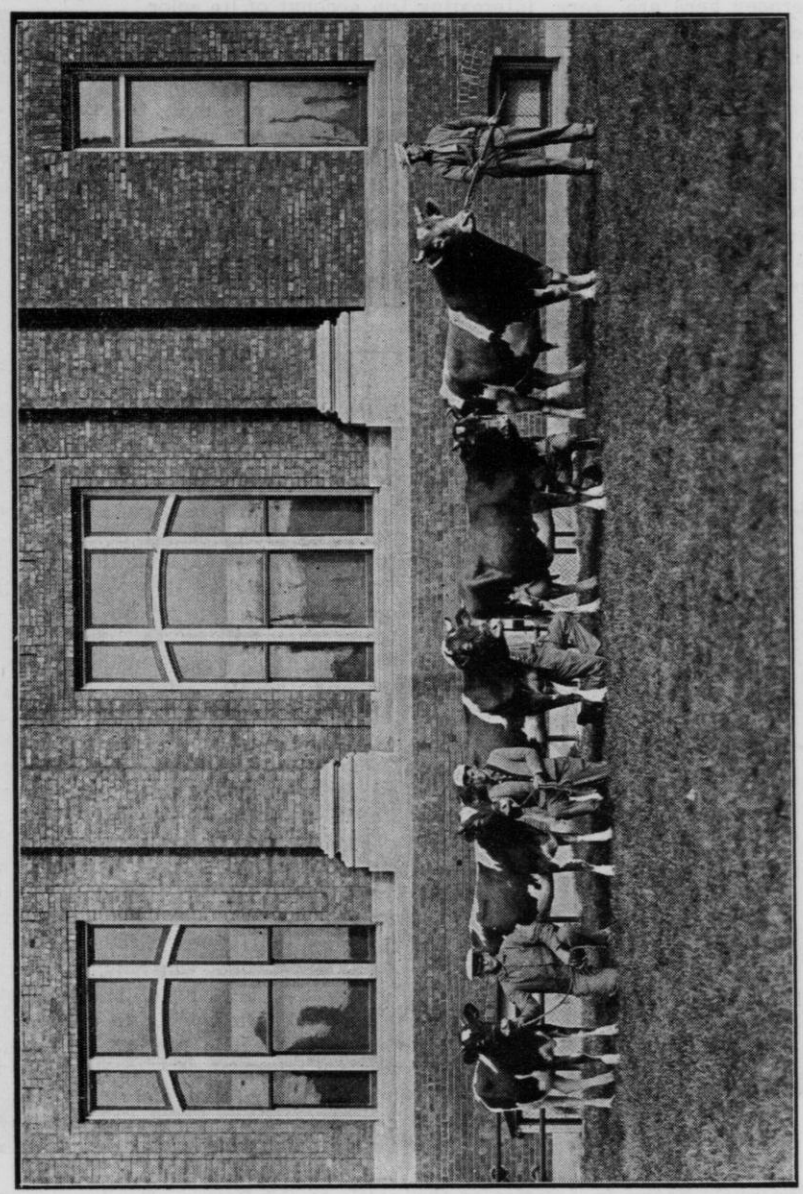
DISCUSSION.

Mr. Buxton—We often hear the statement that a two-year-old heifer's calf is not as good as an older cow's. Would you discard a heifer's calf?

Mr. Hill—No, I would not. Sometimes they are a little smaller at the beginning, but are eventually just as good.

Mr. Griswold—Is it not the owner's fault if the result is not satisfactory by crossing the Guernsey on common stock?

Mr. Hill—We could not point to a better example of such a result than the result in Mr. Griswold's own herd



First prize Guernsey herd at National Dairy Show, Milwaukee, 1909. Owned by Wm. M. Jones, Waukesha, Wis.

The records he gave of his grade Guernsey herd are very interesting. The Guernsey grades are in great demand at this time. Prof. Haecker, of Minnesota, recently paid $1,940.00 for nineteen two-year old grade Guernsey cows, and I have known of them to sell in our community at prices up to $125.00 apiece, and the demand far exceeds the supply, and the reason is that Guernsey milk far exceeds in color that of any other breed. Where it is in competition in the cities in the milk trade it takes the highest class on account of its color.

Supt. McKerrow—Dolly Dimple holds one of the world's records at this time, doesn't she?

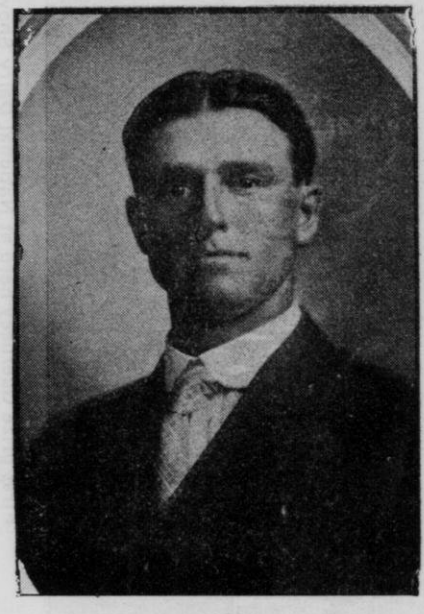
Mr. Hill—She does, the largest record of any cow of her age; 703.36 pounds fat as a two-year-old, and will make over 900 pounds of fat this year as a three-year-old.

Supt. McKerrow—Who owns her?

Mr. Hill—Mr. Ames, of Boston.

THE HOLSTEIN COW.

L. G. Legler, Juda, Wis.



Mr. Legler.

The cattle known in America as the Holstein-Friesians belong to the short-horned, lowland race, native to the low-lying, fertile lands of Europe, bordering on the north sea, of which race, from a dairy standpoint, the Holstein-Friesian family is most highly developed. These cattle might have been better named Friesians, since Friesland and the neighboring provinces of Holland, is the central home from which this breed has been so widely disseminated over the old world, and from which some ten thousand head of foundation stock have been brought to America.

The Friesian people are among the most conservative of the Germanic races, still holding to and speaking among themselves the old Friesian language of Holland, although able to speak the Dutch, which is the official language. They have been equally conservative in holding to the ancient industry of cattle rearing, an occupation for which their low-lying lands are especially fitted, and as the Roman historian, Tacitus, speaks of them nearly nineteen hundred years ago as cattle breeders, paying a tribute in cattle to the Roman Empire, so we find them today making dairy husbandry their main industry, holding

Madrigal Netherland Pet, 45,150, 24.85 lbs. butter in 7 days; 4.25 per cent fat.
Has five sons in three states at head of herds. Owned by L. G. Legler, Juda, Wis.

mainly to one occupation down through the centuries and passing the business from father to son, and it would be strange indeed if their breeding of cattle did not reach a very high degree of development. So it is in no way surprising that we should find these Friesian dairymen possessed of a breed of cattle which, as an all-around dairy breed, is superior to any other breed known.

While in character the Holstein-Friesian cattle are a dairy breed, we must not lose sight of the fact that in Holland they are never allowed to pass the age of seven years. At this time they are fattened for beef and the calves are known on all markets as being prime veal and making the best for the time spent in getting ready for market.

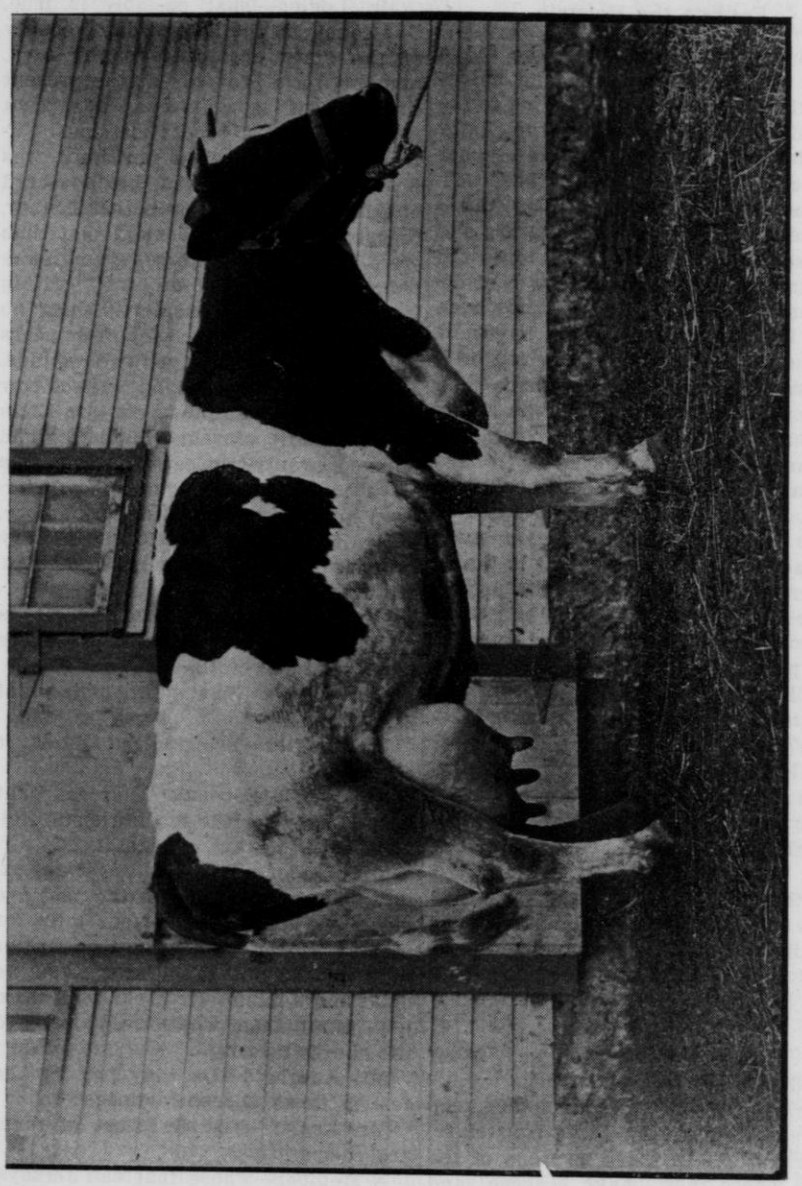
This breed reaches its full maturity at about five years of age; reaching full height at two and one-half to three years, and each year for the two following years adding about one and three fourths inches in length, three-fourths of an inch in width of hips, and two inches in girth of chest. Mr. S. Hoxie, former Superintendent of the Holstein-Friesian Advanced Registry, states that the average measurements of cows upwards of five years of age received for entry in the fourth volume of the Advanced Register were as follows: Height at shoulders, 51.8 inches; height at hips, 53 inches; length of body, 64.9 inches; length of rump, 21.4 inches; width of hips, 21.9 inches; girth at smallest circumference of chest, 75.6 inches. He states that the average weight of these cows was 1,262 pounds, and the average measurements are of those that might be deemed typical animals of what is technically known as the milk and flesh form, and this is the most popular in America.

The first association of breeders of this breed was formed in 1871, the first herd book being published the following year. The present Holstein-Friesian Association was formed in 1885 and this was composed of two earlier associations. This is, at the present time, one of the largest, if not the largest association of any pure bred dairy cattle in the world.

Progress of a Breed Rests With the Breeder.

The production can and should be enlarged, and this rests with the breeder. The first point is that the average man is not careful enough in selecting the sire he wishes to use. Many a man in buying a pure bred sire, not only in Holsteins but any breed of cattle and other farm stock as well, will ask for a pure bred, registered animal, and does not ask one word as to whether the dam and sire have records of any kind as to production, as would be the case in the dairy breed. Then the next point is that the farmer or breeder, as a rule, is not a good feeder. This is being demonstrated by the cattle in the eastern states, where the land is of a poor quality and feed is high-priced. In order to enable the cow to do as she should, she must never be at a standstill from the time she is a calf until she has passed her time of usefulness.

The feeding problem is shown very markedly in this breed of cattle by the official records. Take two young heifers of equal breeding and capacity and place them together; keep one under ordinary farm conditions and the other under conditions such as they should be for pure bred stock. The cow that is well fed and cared for and made to develop her capacity will respond by giving good results; she will make a much larger record and greater profit to the owner, as well as be a help to the breed, while the cow that is not given the same good care and feed will not show results; her development will not be marked enough.



Lady America Wayne De Kol, 16,800 lbs. milk in 11 months; 92 lbs. best day.
Owned by L. G. Legler, Juda, Wis.

Feeding the Holstein.

The Holstein cow should be fed a large amount of roughage and a less quantity of grain feed, according to the cow, than any other of the dairy breeds, owing to the fact that in her native land, where she has been developed for many hundred years, she is compelled to feed mostly on grass and hay as the grain is too high to be fed profitably. This marked degree of development on grass and hay has been bred in these cattle so long it is now second nature to them to be fed on a ration containing more roughage than grain and concentrated feeds. This roughage should contain a large amount of protein, so the cow will have at least three or four pounds when in milk. This feeding is demonstrated by these cows, as in Holland the one main characteristic of registration is that a heifer must, with her first milk period, make 11,000 pounds of milk, and there have been cows brought to America that produced from 20 to 30,000 pounds of milk per year, while the cows in this country are numerous that milk 18 to 25,000 pounds.

DeKol Cremelle, one of the champion cows for milk, gave 26,684 pounds in a year; best day, 119.7; best 100 days, strictly official, 10,017 pounds, or a little over 100 pounds of milk for 100 days, and the champion butter cow, Colantha 4th's Johanna, gave over 27,000 pounds of milk and made 998 pounds of fat, or 1,247 pounds of 80 per cent butter.

DISCUSSION.

A Member—Have you any other breed of stock on your farm?

Mr. Legler—No, sir, we don't keep any cattle except pure bred Holsteins.

Mr. Stiles—In those sections of the state where they make cheese and have condensing factories, would not the Holstein cattle be better adapted for those parts of the state than any other?

Mr. Legler—That possibly is true. Our county is the largest dairy county of the state according to the area, and there are probably at the present time about seventy-five per cent grades and pure bred Holsteins. Fifteen years ago, when our herd was first established, it was the first herd of pure bred Holsteins in that county, the predominating breeds at that time were Ayrshires and Jerseys, and many people commented on our getting in Holsteins and considered them no good, but it was a very few years only before they changed their minds. Last week I was talking with a cow buyer who was shipping cows to Elgin and different points in Illinois, he had shipped twenty-two carloads from one town near Belleville, and they averaged him seventy-seven dollars apiece.

Mr. Imrie—In what form of dairy product do you sell your milk or manufacture it?

Mr. Legler—In our county, it is manufactured into butter and cheese and condensed milk.

Mr. Imrie—What proportion of cheese?

Mr. Legler—Principally all of it cheese.

Mr. Imrie—Doesn't that account very largely for the popularity of Holstein cattle in that community?

Mr. Legler—Possibly to some extent, but on our farm, for the past five years, we have used all our milk for making butter, so we have separator milk to feed our young stock, and we make more money from our milk making butter than when we patronized the cheese factory.

Mr. Aderhold—Do they pay by the test in those cheese factories?

Mr. Legler—No, sir; most of them are co-operatives.

A Member—Those that had Jerseys, have they run them off, what have they done with them?

Mr. Legler—I started in with Jerseys and I sold the whole bunch to

Mr. Pevey of Minneapolis, and went into Holsteins.

A Member—Pevey died.

Mr. Legler—Yes, and I would have died if I hadn't quit.

Mr. Geo. C. Hill—The next change you will sell the Holsteins and buy Guernseys.

Mr. Legler—No, I think when I change the next time, I won't be bothering with cows at all.

A Member—Would you still retain Holstein cows whether you were producing butter or cheese?

Mr. Legler—Yes; I just stated that we were making more out of our milk at the present time by using it for butter purposes than we did when we were making cheese.

Mr. Houser—Do you make more per cow than Scribner does out of his Jerseys?

Mr. Legler—I don't know what Mr. Scribner makes.

Mr. Houser—What do you get per each cow?

Mr. Legler—I haven't figured it exactly, but figuring up the amount of butter we sold, the cows averaged just about one hundred dollars apiece for products sold in milk. Then the calves are worth a good deal, about ninety dollars apiece.

Mr. Houser—You don't veal those calves either?

Mr. Legler—No; we could hardly get that price for veal.

Mr. Houser—What is the average test of your cows?

Mr. Legler—About 3.4 per cent. There is quite a large number that are running over four per cent. This is one characteristic of the Holsteins, they go up very fast, their tests used to be, some of those same cows, below three per cent. On the whole they have raised the test about two-tenths of a per cent in ten years.

Mr. Scribner—According to Prof. Wing's figures reported to the State Board, the Holsteins do not advance.

Mr. Legler—Mr. Wing took it from the standpoint of the aged cows' class for all. If you only take from two-year old heifers, you would see a more marked increase.

Mr. Scribner—Don't you think the Holstein people are as a rule making a mistake in not paying more attention to the ruling on your cows, the way you work it?

Mr. Legler—The really true record of any cow is what she can do in a year, and not in seven days, that is right.

Mr. Buxton—In raising the percentage of butter fat in the Holstein breed, aren't you lowering the quantity of milk?

Mr. Legler—Yes, that is true in any breed.

Mr. Buxton—Why not let them alone?

Mr. Legler—Because man is not built that way.

Mr. Buxton—One of my neighbors came to me with this question and I couldn't answer it; he is going to build up a herd, he hasn't anything but the commonest kind of scrub cattle, and the question he put before me was whether he shall get Jersey cows—I might say first he won't have anything but a Holstein or a Jersey grade, and he asks, "Shall I use the Jersey cows and a Holstein sire, or shall I get Holstein cows with a Jersey sire?" Now, what would you advise?

Mr. Legler—I would advise him to leave the crossing entirely alone.

Mr. Buxton—But he won't do that.

Mr. Legler—He better quit business then. If he has an inclination toward a Jersey cow, let him take her; if he wants a Holstein cow he ought to take her, and there are good ones amongst all of them, and every man should act according to what he likes best. If you like one person, you can do better living with that person than to be obliged to live with another person you don't like. You have got to live

with your cows if you ever expect to make a success at it.

Mr. Imrie—Don't you think those records of Mr. Wing's were pretty far fetched?

Mr. Legler—Yes, I do.

A Member—You say that the production of milk from your cows will average about one hundred dollars a cow. Can you tell us about what it costs to produce that one hundred dollars apiece from those cows?

Mr. Legler—We figure that it costs us on the average about forty to forty-five dollars for every cow that we keep on the farm, and this includes hired help, interest on the money invested in land, the money invested in buildings and the feed that we purchase besides that we raise on the farm.

Mr. Scribner—How much does it cost to milk a cow?

Mr. Legler—I never figured right down how much it cost to milk a cow. Part of the time our men are milking eight cows and sometimes fifteen and twenty.

Chairman Nordman—What do you say it costs you to feed your cows, Mr. Scribner?

Mr. Scribner—Not very much different from what Mr. Legler says, but I think perhaps the difference is due, as he says, to the characteristic of the Holstein cow; she has more capacity for coarse food rather than so much concentrated feed.

Mr. Legler—We raise a great deal of silage, feed a large amount of silage and alfalfa hay; those are our principal feeds for our cows, and we raise that ourselves on our own land.

Mr. Scribner—How many tons of alfalfa hay will one of those cows eat per year?

Mr. Legler—I haven't got it figured down that close. We feed them according to the production. There are hardly any two cows receiving the same amount of feed in the barn, and we have ninety-three in the barn at the present time, milking. The average is about thirty to forty pounds of silage a day and all the alfalfa hay they can eat and clean up in good shape every day, just feed enough so they have a pretty fair appetite for the next meal.

Mr. Scribner—And the average grain ration?

Mr. Legler—I don't know; we have never computed it. We feed only a small amount of grain when the cows are first fresh and a short time before freshening.

A Member—What time do you have most of your cows freshen?

Mr. Legler—They start about the first of October and are practically all fresh by the middle of April. We do this on account of having the larger flow of milk at the most convenient time, so as to work in the help.

A Member—In that question of cost of production, Mr. Legler didn't say how much he allowed himself in that operation of getting one hundred dollars on each cow. He could probably go out in any other line of work and get twenty-five hundred dollars a year, from that to five thousand dollars, and I think that should be considered.

Mr. Legler—I take all that is left for my time after the expenses are paid.

The Member—So you are earning a big salary.

Mr. Legler—Well, sometimes.

The Member—The average farmer in the state gets, well, perhaps sixteen or seventeen dollars a month when he ought to get one hundred. It takes superior talent to do that kind of work, and his time should be charged for, the same as he could get in any other line of work.

Mr. Legler—There is no doubt that one man can get a larger amount of income from a cow than another. If that income is not received from the cow, it is generally not the cow's fault.

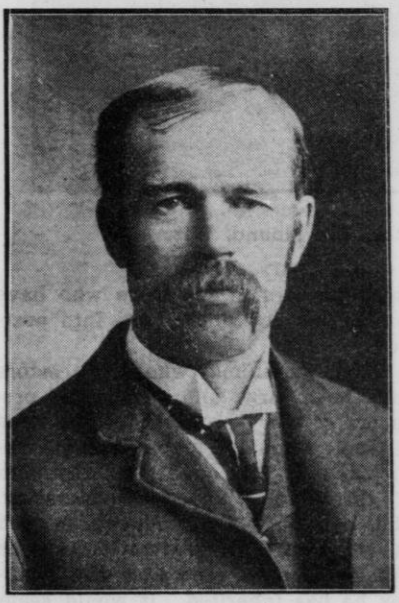
If the farmers of this country would put themselves in the same position and fit themselves the same as Mr. Scribner and Mr. Hill and Mr. Griswold and these other gentlemen that have spoken here, and many others in this state and other states that I can refer you to, the products of the cows of this country would be at least four times as much as they are at the present time, and would realize four times as much profit consequently to their owners; those owners would have to have one-fourth as many cows as they have today to do the same business that they are doing today.

A Member—Can the percentage of butter fat be changed by feed?

Mr. Legler—No, sir.

GRADING UP THE DAIRY HERD.

E. C. Jacobs, Elk Mound, Wis.



Mr. Jacobs.

For the man who is in the dairy business, that is, one who is trying to make a profit from cows by milking them, it is very essential that he have right ideas, clearly defined, as to the breeding of dairy cows, for, except in rare cases, it will be both profitable and necessary to raise the cows on the farm that are to constitute the dairy herd. The dairyman must realize that he is a breeder in as true a sense as is the man who is raising registered cattle, that his breeding operations are governed by the same laws, and that to succeed it is necessary that they be as intelligently followed.

In all breeding operations there should be a definite purpose in view, with a definite idea ever in mind to accomplish that purpose. Breeding for function or performance, like speed at a certain gait in the horse or profitable milk production in the cow, is more difficult than breeding for form alone and is attended with rapid retrogradation if right principles are not adhered to in both breeding and care. So if the function of high yield and profitable production is to be fixed in the dairy herd intense enough so that it will be reproduced with reasonable certainty, it will be absolutely necessary that all side issues and crosses be eliminated

from the breeding operations and undivided attention be given to building up the dairy capacity and heredity of the herd, as the problem will be large enough and there will be room enough for improvement without being handicapped by trying to establish in the same herd at the same time the opposite function of making beef, for, as a rule, it is only those animals which are able to specialize, that is, those in which some function has been developed beyond the normal, that are able under present conditions to make profit. There seem to be many who embark in the dairy business and are afraid to really trust the dairy cow, so they load her down with what look to them like life preservers in the shape of beef or veal production, until the poor cow is unable to make any headway while she is yet too far from the shore of success to navigate a life preserver.

Farm home of E. C. Jacobs, Elk Mound, Wis.

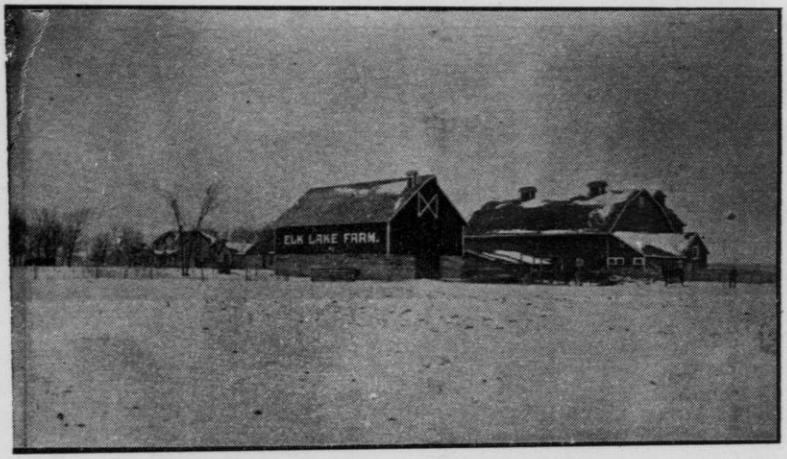
The Sire of Chief Importance.

Since the early days of the Farmers' Institutes, when the Hon. Hiram Smith answered the question of "How to start in the dairy business" by saying "Buy a bull," the Farmers' Institutes and the agricultural press have constantly emphasized the necessity of keeping a pure bred dairy bull at the head of the herd, and I can but repeat this advice, not because I have anything new to offer, but because, as I shall show a little later, there are a great many dairy farmers in the state who have not as yet put this advice into practice.

Select an animal whose ancestors have been large and economical producers of dairy products, or the sires of such animals, giving special importance to the quality of the dam of the animal under consideration. Then see that his individuality is such as will justify the expectation that he will be able to reproduce the qualities he has inherited. It would seem as if it should be unnecessary to say do not cross or mix the breeds, yet we find men who will mate animals of different breeds and tendencies, thinking to combine the good qualities of different breeds in one, in their ignorance not realizing that they have

destroyed the prepotency of both breeds, which had taken the students of animal life centuries to build up. So I repeat with emphasis, stick to the dairy breed of first selection. Keep an individual record of each cow and strictly enforce the law of the survival of the fittest.

herd of 20 cows, one-half of their calves being heifers, there will be raised in five years 50 heifers whose combined earning power will have increased $1,075.00 per year by having been sired by a well bred dairy bull, such as can be bought for from $50.00 to $200.00.



Farm buildings of E. C. Jacobs, Elk Mound, Wis.

Does it Pay to Grade up a Dairy Herd?

But as to the financial side of this subject, will it pay to grade up the dairy herd? Although the evidence is at hand on every side as to its being profitable to do so, I will submit the evidence of only two witnesses. Prof. Hopper, of Illinois, after a study of 20 herds, 478 yearly records, during three and one-half years, reports that with the same care and feeding, the cows that were the result of grading or breeding through animals with dairy blood in them averaged 268 pounds of fat a year, while those of indiscriminate and reckless breeding averaged but 182 pounds of fat, a difference of 68 pounds of fat, which, at 25 cents a pound, amounts to $21.50 a year per average cow. This means that in a

From Bulletin No. 127 Indiana Experiment Station, conclusions drawn from the study of 197 yearly records of cows, show the difference between systematic and no grading was 64 pounds of butter fat per cow. The average profit in graded herds was $36.04; in ungraded herds, $19.62. The non-graded herds charged three and one-half cents more per pound for butter fat than the graded herds. Added to the increased earning capacity at the pail, these cows will have an added value for breeding purposes of no mean importance and taking both together the purchase of a dairy bred bull would seem such a profitable investment that we should naturally expect to find at least two on every dairy farm, but as they are not sold by canvassing agents

or mail order houses, such is not the case.

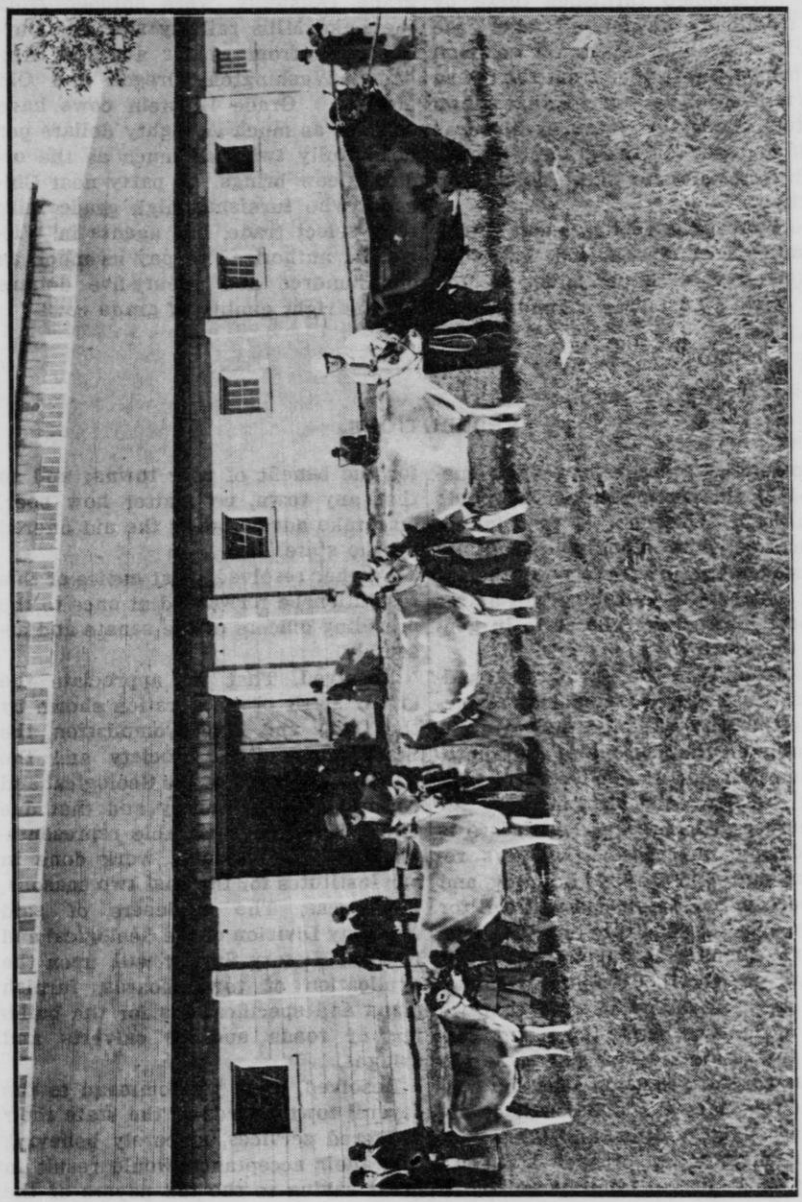
Although Wisconsin is a great dairy state and credited with having more high grade and pure bred dairy cattle than any other state and does not lay claim to being a great beef producing state, yet we find from an examination of the different herd books that 849 breeders in the state are recording animals in the herd books of the different beef breeds, while there are only 766 recording animals in the herd books of the dairy breeds. There are said to be about 1,250,000 cows in Wisconsin, about 100,000 dairy farmers contributing to creameries and cheese factories the milk of 900,000. Although we cannot determine or estimate with any degree of accuracy the number of pure bred dairy bulls in the state, yet the number of breeders recording cattle in the herd books, as well as observation of the cattle throughout the state, leads to the conclusion that a large number of beef bred bulls and a still larger number of grade or scrub bulls are being used in herds kept for dairy purposes. These figures also indicate that each breeder of dairy cattle will have to furnish on an average 130 bulls to supply one for each dairy farmer.

Jersey herd and farm of E. C. Jacobs, Elk Mound, Wis.

I quote the following from the Saturday Evening Post of February 20, 1909:

"Because dairying is its greatest agricultural industry, and because our farmers live on their own small farms, with their families of children about them, and because they are becoming highly intelligent along agricultural lines, Wisconsin is becoming the greatest state in the Union for breeding pure-bred dairy cattle.

The call for dairy stock is enormous. The Elgin dairy district, which supplies Chicago with milk, probably absorbs



First prize Jersey herd at Wisconsin State Fair and National Dairy Show, Milwaukee, October 14–24, 1909. Owned by Dixon & Bruins, Brandon, Wis.

fifty thousand head of dairy cows a year. Wisconsin furnishes these by the trainload, picked all over the state by traveling buyers. A common cow brings the farmer from thirty-five to forty-five dollars. A cow that shows Holstein, Jersey or Guernsey blood as a half or three-fourths grade will command from fifty to sixty dollars ordinarily.

The Lake Mills region, about thirty-five miles east of Madison, has gone extensively into the breeding of Holstein cattle. Last year a hundred and forty thousand dollars' worth, mostly grade Holsteins, were shipped from the Lake Mills railway station. Buyers came from as far away as Alabama, Washington, Oregon and Old Mexico. Grade Holstein cows have sold for as much as eighty dollars per head, fully twice as much as the ordinary cow brings. A party near Chicago, who furnishes high grade milk to a select trade, has agents in Wisconsin, authorized to pay as much as one hundred and twenty-five dollars for the right quality of grade cows."

RESOLUTIONS.

The following resolutions were submitted by the committee and adopted:

Whereas, Wisconsin is fast taking the lead as a live stock state and any encouragement in the way of better stock and better conditions will be for the best interests of the state in general, therefore,

Resolved, That the Farmers' Round-up Institute here assembled recommends that the present legislature act favorably on the passage of the appropriation bill for the Wisconsin Live Stock Breeders' Association.

Whereas, The present legislature is considering the passage of laws regarding state aid for road building, and

Whereas, Such state aid will call for the yearly expenditure of a large amount of money throughout the state,

Resolved, By the Closing Farmers' Institute at Mondovi in 1909 that we believe the two most important features in a state aid law should be (1) a most careful provision that the control of the state aid funds shall be absolutely out of politics, and (2) a plan for the distribution of such state aid in the most just manner possible, so that poor towns will not suffer for the benefit of rich towns, nor rich towns for the benefit of poor towns; and so that any town, no matter how poor, may take advantage of the aid offered by the state.

Further resolved, That copies of this resolution be forwarded at once to the presiding officers of the senate and assembly.

Resolved, That we appreciate the kindly spirit of co-operation shown by the Dairy and Food Commission, the State Horticultural Society and the Highway Division of the Geological and Natural History Survey and that due credit be given their able representatives for the valuable work done in our Institutes for the past two seasons.

Whereas, The engineers of said Highway Division of the Geological and Natural History Survey will, upon the application of town boards, furnish plans and specifications for the building of roads and of culverts and bridges,

Resolved, That we commend to the several town boards of the state their proffered services, sincerely believing that their acceptance would result in great saving to the tax payers of the respective towns accepting such assistance.

Whereas, The Farmers' Institutes of Wisconsin have been a powerful agency for good and have possibilities of exerting still greater influence upon the farming interests of the state,

Resolved, That the farmers assembled in the Twenty-third Annual Closing Institute are heartily in favor of the passage of Assembly bill No. 632, placing the control of the Farmers' Institutes in a commission consisting of representatives of the various agricultural interests of the state.

Resolved, That we are heartily in favor of a parcels post and urge upon Congress its early adoption.

Whereas, General information on dairy barn sanitation and improved cow stalls is not available to cow owners, therefore

Resolved, That the management of our State Experiment Station be requested to issue a bulletin for the purpose of furnishing such information.

Resolved further, That copies of this resolution be sent to the president of the University, to Dean Russell and to W. D. Hoard.

Resolved, That we urge farmers to have more of a spirit of co-operation and that they learn to unite on stock breeding by communities, co-operative creameries, farmers' insurance companies, buying and selling of seed grains, building and filling silos, and in every other way possible.

Resolved, That we urge the legislature of Wisconsin not to repeal or moderate the law compelling the inspection of commercial feed stuffs.

Resolved, That a copy of each resolution relating to legislation be forwarded to the proper legislative body.

Whereas, The citizens of Mondovi have exerted every effort to make the Twenty-third Annual Closing Institute a success in every way and have striven to provide every comfort possible to those in attendance and have by their endeavors again testified to their regard for the Institute movement,

Resolved, That we hereby make an expression of our appreciation for their many courtesies and favors.

WOMAN'S DEPARTMENT.

COOKING SCHOOL.

Held at Mondovi in Connection with the Closing Farmers' Institute, March 16, 17, 18, 1909.

Conducted by Miss I. Adella Sater, Orfordville, Wis., and Miss Edith L. Clift, Chicago, Ill.

Assisted by Mrs. A. J. Buxton, Wittenberg, Wis., and Mrs. Norah E. R. Perkins, Milwaukee, Wis.

Stenographic Report by Miss Nellie E. Griffiths, Madison, Wis.

FIRST SESSION.

Tuesday Afternoon, March 16, 1909.

INVALID COOKERY.

Miss I. Adella Sater, Orfordville, Wis.

It has been said a carefully regulated diet has in numberless cases proved one of the best, if not the very best, correctives of disease. Hard as it is to select a diet for the well, it is often more so to select one for the sick or convalescent, for nowhere are thought and judgment more required than in selecting food for the sick. Foods that are appropriate for persons who are enjoying good health are often not suitable for the sick, and individuals who are not over-fastidious when they are in good health often become so when weakened by disease. While in all acute diseases, and even in a great many chronic cases, the diet should be under the personal supervision or management of a physician, yet whether the patient will get sufficient nourishment or not depends largely on the tact and attention of the nurse. There may be times when a properly trained nurse cannot be employed, so it may be the duty of some member of the family to carry out these orders in an exact and intelligent manner. Often the housewife has been busily engaged in attending to the everyday wants of a family, may be an excellent cook, yet is not familiar with the principles involved in making properly a cup of broth or gruel or an egg nog.

Selection of Foods.

In order to properly nourish a patient it is necessary that the food be easy to take, easy to digest and easy to assimilate.

A physician has given the fundamental principles underlying feeding the sick as follows:

First. Avoidance of all articles that

disagree with the existing conditions of the patient.

Second. The giving of food best adapted to relieve the digestive organs of unnecessary labor and at the same time maintain nutrition.

Now, I know much of this belongs to the duties of a physician, yet there are times when a knowledge of the digestion, absorption and assimilation of our food materials and the best methods of preparing them would be very helpful.

Diets are usually divided into three classes: Liquid diet, light diet and convalescent diet or full tray.

Under liquid diet we have the different cereal waters, such as rice, barley, oatmeal, toast water, clam water, beef essence, beef tea. Fruit juices are given to fever patients sometimes, as they are cooling and refreshing and mildly stimulating. Egg nogs are given when a large amount of nourishment is needed.

Milk is a valuable food in invalid cookery and in case of typhoid fever is a food par excellence, but in some other cases is not so well borne. When plain milk disagrees there are various ways of modifying it, rendering it more agreeable and more digestible to the patient. The simplest method is by adding one to three ounces of lime water to each glass. Sometimes salt or any of the cereal waters may be added.

A liquid diet is given every three hours and the following is a sample:

8 A. M. Three-fourths of a cup of hot milk.

11 A. M. Three-fourths of a cup of chicken broth.

2 P. M. Egg nog.

5 P. M. Albumenized milk or cocoa.

8 P. M. One-half of a cup of hot milk.

A light diet contains a little more solid food that a liquid diet and is usually given three times a day, occasionally five, depending upon the case.

Under semi-solids are classed the gruels of various kinds, tapioca, sago, oatmeal, etc., soft custards, mushes, etc., milk, cream, toast.

Breakfast. Poached egg on toast, coffee, soft custard.

Dinner. Broiled mutton chop, toast, egg nog.

Supper. Milk toast, cocoa.

For a convalescent diet or full tray, great care should be used in prescribing and preparing.

For breakfast, mush with cream and sugar, a poached egg on toast, with possibly a cup of coffee, would be acceptable.

For dinner, soup with rice, broiled steak, baked potatoes, peas, bread and butter, and a light dessert, a snow pudding or ice cream.

For supper, minced chicken on toast, lemon jelly or fruit, sponge cake, cocoa.

Regularity of Feeding.

It has been known for some time that is was necessary to give drugs at stated intervals; it is just as essential to give food at regular intervals, as the appetite usually comes on at certain times, and if the meal is not forthcoming may disappear. "Regularity in feeding is conducive to the welfare of both sick and well."

The wishes of the patient should be carried out whenever practicable. A tactful nurse should carefully note the patient's likes and dislikes, still there are times when we cannot carry out these wishes, for we know that during the first weeks of convalescense after typhoid many a relapse, and even death, have been caused by the misguided kindness of friends and relatives in this respect.

Do not consult a patient about his menu; if there is anything he especially desires you will be informed.

Food should be served in small quantities, the sight of too much food often destroys appetite.

Avoid monotony in serving; have as great a variety as allowable, even when liquid diet must be adhered to. Various broths, etc., have their places in the physician's list of possibilities.

All food should be tasted before it goes to the patient, never in the presence of the patient. If there is anything wrong you will find it out, but do not let the patient find it out.

Great care should be taken to have the food fresh, do not let it acquire any unpleasant taste from standing. A stale egg in an egg nog may be the means of turning a patient forever against this form of nourishment. Have everything fresh when serving.

If the patient is weakened by disease, serve the food in such a form that he can get the nourishment he needs without inducing fatigue. Place patient in comfortable position, so he can get the food easily. If four or five things are allowed at one meal, do not put them all on tray at one time; serve a little at a time. Always serve the food in small quantities, not in large amounts.

Then the temperature of the food must be taken in consideration. If anything is to be served hot, see that it is real hot, and if it is to be cold, see that it is cold; do not serve it lukewarm.

In setting the invalid's tray, use your daintiest china, glass and silver; have the linen spotless, and change the china, silver and glass if possible. Occasionally add a blossom or a vase of flowers to cheer the patient. Avoid having too many things on the tray at once.

Our program is as follows:

Egg Nog Egg Lemonade Rice Water
Albumenized Milk Oatmeal Gruel
Chicken Soup
Creamed Chicken on Toast
Egg Junket with Whipped Cream
Rice with Dates

I will give you two recipes for egg nog, one in which the whole egg is beaten and the milk added to it, and the other where the white and yolk are separated.

Egg Nog I.

Recipe.

Beat an egg very light; add to it one tablespoon sugar, a few grains of salt; a slight grating of nutmeg or vanilla may be used for flavoring; mix thoroughly, add two-thirds of a cup of milk and strain.

Egg Nog II.

Recipe.

Beat yolk of egg very light; add one tablespoon sugar, a few grains of salt, nutmeg or vanilla for flavoring, and two-thirds of a cup of milk, and add the beaten white of an egg. Stir well before serving.

Egg Lemonade.

Recipe.

Make a plain lemonade, allowing the juice of one-half of a lemon and one tablespoon of sugar to one cup of water. Fill a glass half full and add the stiffly beaten white of one-half of an egg and two heaping tablespoons of whipped cream.

This must be served immediately, if allowed to stand the egg and cream will separate.

Albumenized Milk.

Recipe.

Put the white of an egg in a tumbler, add one-half cup of milk, cover tightly and shake until well mixed, or beat with a Dover egg beater.

This is not very palatable, well people would not enjoy it, but it is very, very good to serve in some cases where there is a great deal of nourish-

ment needed and it must be in liquid form.

Egg water is the white of an egg added to water and this may be flavored with fruit juice. Fruit juice cannot be added to albumenized milk.

Question—Could it be flavored with vanilla?

Miss Sater—Yes.

Beef Essence.

Recipe.

Cut beef into small pieces after removing all the fat; place in fruit jar, cover closely, place jar on a heavy fold of paper, or on a trivet in kettle, and surround with cold water; heat water gradually and let stand several hours; strain and press meat to obtain all the juices; salt to taste.

For beef essence chop the beef very fine, place it in a fruit jar, place the jar in cold water and gradually heat the water, but do not let it boil; allowing it to stand several hours.

Beef Tea.

Recipe.

Put one pound of finely chopped beef, a pinch of salt, with a pint of cold water in a suitable dish and allow to stand for an hour, stirring occasionally; let it warm gradually and simmer for two hours, care being taken that it does not at any time reach the boiling point. Or may be treated same as Beef Essence.

Beef tea is the chopped beef put into water, more like a broth, and it does not contain as much nourishment as the beef essence. We used to think if we gave an invalid a cup of broth we were giving a great deal of nourishment. It is stimulating, not especially nourishing.

Under the same head we have the gruels; oatmeal, tapioca, sago, arrowroot gruel. Gruels may be made more nutritious by the addition of the white or yolk or the whole of an egg, or cream. They should not be too thick. Any breakfast mushes may be thinned with water, milk or cream. Gruels should be thin, not to sweet, nor too highly flavored and served very hot.

Fruit juices are often very good, especially in fever cases, for they are mild and stimulating and are good for the acids they contain.

We also make rice water, barley water and oatmeal water. They are all made the same way and added to the milk when plain milk is not easily digested.

Rice Water.

Recipe.

Two tablespoons of rice, two cups of cold water, milk or cream, salt. Pick over rice, add to water and boil until rice is tender; strain and add rice water to milk or cream as desired. Season with salt and reheat.

Barley Water.

Recipe.

Three tablespoons barley, four cups cold water, salt. Pick over barley and soak in water over night, or for several hours; boil gently one and one-half hours; strain.

From Prepared Flours.

One tablespoon flour to one pint of boiling water. Boil fifteen or twenty minutes, strain.

Oatmeal Water.

Recipe.

One cup fine oatmeal, two quarts water. Add oatmeal to water and keep in warm place one and one-half hours; strain and cool.

Strain through cheese cloth, add the white of an egg and sugar, if the patient likes it, just a little.

The addition of barley water and lime water are two ways that modify

milk so it is made more agreeable and more easily digested, barley water especially.

We can use barley flour in making the barley water, and in case you do that use one tablespoonful of the flour to one pint of water.

Question—How did you prepare the rice water?

Miss Sater—Two tablespoons of rice to two cups of water and allowed it to stand over hot water for two or three hours.

Question—You did not wash the rice first?

Miss Sater—Yes, the rice was washed and dried on a cloth.

There are two ways of cooking rice, boiling and steaming. For boiled rice pick over and wash rice; add slowly to boiling, salted water, so as not to check boiling of water. Boil twenty minutes, or until soft, which may be determined by testing kernels. Drain in coarse strainer and pour hot water over it; return to kettle, cover, place on back of range, and let stand to dry off, when the kernels are whole and perfect. When stirring rice, always use a fork to avoid breaking kernels.

For steamed rice, put salt and boiling water in top of double boiler, place on range and add gradually well washed rice. Boil five minutes, cover, place over boiling water and steam forty-five minutes, or until kernels are soft; uncover that steam may escape.

A boiled custard is often acceptable to an invalid, but do not make it too sweet. The recipe calls for one-fourth of a cup of sugar to a pint of milk; for the sick about three tablespoons to a pint of milk makes it sweet enough.

Rice with Dates.

Recipe.

Two quarts boiling water, one tablespoon salt, one cup of rice washed. Add rice slowly to boiling water; cook until soft, drain and dry off.

For the dates, take one-half pound of dates washed and stoned, one tablespoon sugar, one-half cup water. Cook until soft.

Make a border around a dish of boiled rice lightly heaped up; fill center with cooked dates and serve with whipped cream.

We are ready to serve the rice with dates. We cannot always draw the line between dishes for the well and the sick. There are times in the convalescent diet that dishes made in our everyday cooking will be just as good as any other if they are prepared properly. Custards are very good in invalid cookery, especially the soft custard, baked custard is often served. Ice cream may be served when made of cream. Patients like it, and in most cases physicians allow it, and patients will get the cream when they will not take it in any other form.

Egg Junket.

Recipe.

Separate the whites from the yolks of two eggs, beat the whites until dry and the yolks until thick; gradually add the yolks to whites, beating constantly. Heat one pint of milk until lukewarm, about 98 degrees F., dissolve in this one-fourth of a cup of sugar, add one-half teaspoon vanilla extract and pour over the beaten eggs; stir in one teaspoon liquid rennet or one-half junket tablet dissolved in two teaspoons of cold water and turn into sherbet glasses. Let stand in a warm place about half an hour, or until firm, then chill. Serve with a tablespoon of whipped cream sweetened and flavored.

There are several kinds of desserts made from junket, as cocoa junket, chocolate, caramel, plain, etc. The same is true in custards; we may have a soft custard, a baked custard, a caramel or a chocolate custard. Even if the diet is very limited, monotony may

be overcome if a little thought is given to the subject.

Oatmeal Gruel.

Recipe.

Stir one-half of a cup of oatmeal in one quart of boiling salted water; cook two or three hours in a double boiler, press through strainer, dilute with milk or cream, reheat and serve. May be made more nutritious by the addition of beaten eggs, either the white or yolk, or both.

Chicken Soup.

Recipe.

One quart standard chicken broth flavored with onion, celery, sweet herbs, etc., one pint milk, one-half cup cream, salt and pepper, whites of two eggs, two tablespoons fine, quick cooking tapioca, yolks of two eggs.

Scald broth, stir in the tapioca and let cook over hot water (double boiler) until transparent; add the milk scalded; remove from fire and stir in the beaten yolks diluted with the cream; let thicken without boiling, then turn into the tureen, adding salt and pepper; arrange on the top the whites of eggs beaten dry with a few grains of salt and poached by spoonfuls on hot water or milk.

There is not much nourishment in the broth, but the ingredients that are added give considerable.

The whites of the eggs are cooked the same as for boiled custard, the whites are beaten and cooked on hot water, not boiling water. If water is kept at the boiling point the meringue becomes tough and hard. It is made just the same for the soup as for custard.

Foods containing albumen should be cooked at a low temperature. This is one of the best examples showing the effect of heat on albumen. The white of the egg is one of the purest forms of albumen that we have. The same thing is true of meat as of the white of the egg, so there are two rules we must remember in cooking, foods containing starch must be thoroughly cooked and foods containing albumen must be cooked at low heat.

In adding the yolks of the eggs to the soup, add the hot liquid to the egg mixture instead of the egg to the hot liquid. Do not add the yolks of the eggs until you are ready to serve the soup or it may curdle.

Creamed Chicken on Toast.

Recipe.

One and one-half cups cooked cold chicken cut in dice, one cup white sauce, one-eighth of a teaspoon of celery salt. Heat chicken dice in sauce, to which celery salt has been added; serve on toast.

This is medium sauce. Proportions, two tablespoons butter, two tablespoons flour to one cup liquid. Thin sauce, one tablespoon butter, one tablespoon flour to one cup of liquid. For a thicker sauce, one-third of a cup each of butter and flour to one cup of liquid, which is used for croquettes, etc.

Have the butter bubbling hot, add the flour to the hot fat, then add the liquid slowly and finish cooking over hot water.

If you wish a richer sauce, use part cream and part milk.

Question—How did you prepare the tapioca for the chicken broth?

Miss Sater—The tapioca was washed and dried and cooked in the chicken broth.

Question—What proportion?

Miss Sater—Four tablespoons to one quart of broth.

Question—How much chicken did you put in this amount of sauce?

Miss Sater—One and one-half cups of chicken to one cup of sauce, using mostly white meat.

Question—Would you prepare chipped beef in this way?

Miss Sater—Just the same way and serve it on toast.

Directions for Making Stock.

Cut meat in small pieces and place in cold water, allowing it to stand about one hour, then place on range and bring to boiling point slowly, then set back on range where it may be kept below the boiling point for five or six hours. Atwater gives effect of different temperatures on meat as follows: "If meat is placed in cold water, part of the organic salts, the soluble albumen, and the extractives, or flavoring matter, will be dissolved out. The extent of this action depends upon three things—the amount of surface exposed to the water, the temperature of the water, and the length of time of the exposure. The smaller the pieces, the longer the time, the richer will be the broth and the poorer the meat. By placing meat in boiling water, allowing the water to boil for a few minutes, then lowering the temperature, the albumen on the surface will be coagulated, and the crust thus formed resists the dissolving action of the water and prevents the escape of the juices. The resulting broth is correspondingly poor."

Question—Do you take the scum off?

Miss Sater—Yes, that is strained out. This scum, by the way, is a part of the soluble albumen that has been dissolved.

Soup meat should not be thrown away. If our soup has been made properly there is not much juice in the meat, it has lost all its flavoring matter, but much of the albumen is still in the meat and it should be utilized in some way. It can be put through the meat chopper, rather a highly seasoned sauce added and be made very palatable. A seasoned tomato sauce is very good to serve with warmed-over meats.

Question—How much water do you use when making soup?

Miss Sater—One pound of lean meat to one quart of water, or one pound of meat and bone, using one-third as much bone as meat, to three-fourths of a quart of water.

I am sure I do not need to say anything about skimming the broth. Greasy soup is not appetizing or palatable, and especially to those who are ill. Remove the fat by skimming, using blotting paper, by straining through a cloth wet in cold water, or, best of all, by cooling the soup, when all the fat rises to the top and it can be easily removed.

Question—When do you add the salt to the soup?

Miss Sater—At the beginning; the salt will draw out the juices.

A Lady—I would like to know some more about the beef essence.

Miss Sater—For the beef essence we cut the beef into small pieces after removing all the fat; place in fruit jar, closely covered, place jar on a heavy fold of paper or on a trivet in kettle and surround with cold water; heat water gradually and let stand several hours; strain and press meat to obtain all the juices, salt to taste.

There is no water added to it, it is just the juice of the meat that is drawn off. If placed in hot water it would coagulate the albumen on the outside and prevent the escape of the inner juice, it would be retained in the meat, so we place it in cold water and heat it gradually, letting it stand for several hours, then it is strained and pressed to obtain all the juices.

Question—Do you mean you leave it on the stove all the time, or do you remove it after the water is hot?

Miss Sater—I set it back on the stove.

I think perhaps one of the hardest

things we have to do is to coax the invalid to take the nourishment after it has been prescribed and prepared. We know how hard it is to get sick people to eat and so much depends on how the nourishment is taken. A baked potato is often given to an invalid where a boiled one would not be allowed. The reason for this is that the potato is baked in a hot oven, so the starch is changed to dextrine, which is one step in digestion. That is why I think our housekeepers should be interested in food materials. We should become interested in this matter and know something about the composition of foods, whether they contain starch or albumen. We do not know whether it is to be cooked at a low heat or a high temperature. There is plenty of reading matter on the subject which can be procured at a nominal cost.

SECOND SESSION.

Wednesday Afternoon, March 17, 1909.

MEATS.

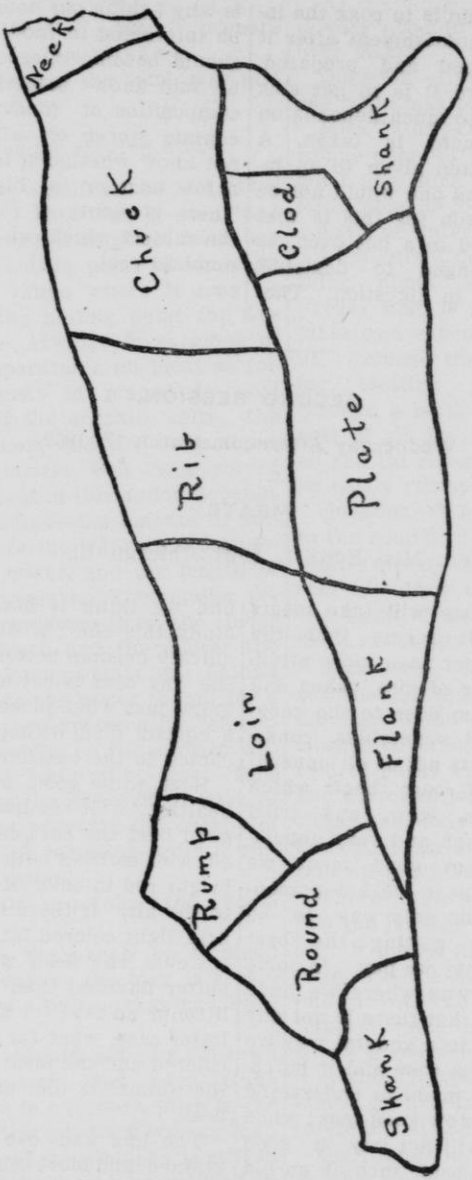
Miss Edith L. Clift, Chicago, Ill.

This afternoon we will take meats for our subject. It seems that the average housekeeper pays more attention to the making of pies, cakes and doughnuts than she does to the cooking of meats and vegetables, consequently we find it is not at all unusual to have a piece of roast beef which tastes more like a stew, and fried steak which is tough and very unpalatable. If we want good meat we should visit the meat market personally, for that is the only way to be quite sure we are getting the best pieces for the money we pay. In some of the smaller towns where we have only one meat market there is not any choice for us, but in a general way we find that is not the case and if butchers could only be made to understand that the women know good meat when they see it and will not pay a good price for inferior beef, such as an old dairy cow, conditions would then soon change.

We have here the cuts of beef with the description of the different cuts, and we think if housekeepers would study this chart a little they would quickly become better acquainted with the way beef is cut up and would also know just what piece they wanted for a certain dish without leaving all the choice to the butcher.

Beef, to be good, must come from a healthy, well nourished animal. In good beef the best cuts are fine grained, well mottled with fat and lean, and bright red in color after being exposed to the air. If there is a thick layer of firm, light colored fat over the loin and rib cuts, the flesh will be juicier and better flavored than when there is little or no fat over these cuts. In the latter case, what fat there is is dark colored and the meat is tough and dry; the animal is old, under-fed or losing flesh.

The loin and rib cuts are finer grained and more tender than the other cuts and require less cooking. They are the finest cuts for steaks and roasts. The other cuts are not so tender, but are juicier, and some of



Cuts of Beef.

them contain less bone than the finer cuts, and when properly cooked are as well flavored and equal to the loin and rib cuts in palatability.

The less tender cuts require long, slow cooking to soften the connecting tissue, and for this reason do not make the finest steaks and roasts. As less than twenty-five per cent of the beef is contained in the loin and rib cuts, they sell for a much higher price than round, chuck or any of the other cuts, because the profit must come from the finer cuts. Many people who cannot afford it, buy these expensive cuts because they do not know how to cook the other parts and make them attractive and appetizing. As the Atwater tables show, those cheaper cuts are just as nutritious as the others. Some of them contain less bone, and they are much cheaper, and when properly cooked are deliciously flavored and more satisfying than the badly cooked steak or dry roast.

Food Materials (as purchased).

Animal food.	Refuse.	Water.	Protein.	Fat.	Carbohydrates.
Beef, fresh:					
Chuck ribs	16.3	52.6	15.5	15.0	....
Flank	10.2	54.0	17.0	19.0	....
Loin	13.3	52.5	16.1	17.5	....
Porterhouse	12.7	52.4	19.1	17.9	....
Sirloin steak	12.8	54.0	16 5	16.1	....
Neck	27.6	45.9	14.5	11.9	....
Ribs	20.8	43.8	13.9	21.2	....
Round	7.2	60.7	19.0	12.8	....
Rump	20.7	45.0	13.8	20.2	....
Shank, fore	36.9	42.9	12.8	7.3	....
Shoulder and clod	16.4	56.8	16.4	9.8	....
Fore quarter	18.7	49.1	14.5	17.5	....
Hind quarter	15.7	50.4	15.4	18.3	....

Description of Cuts of Beef.

The halves of beef are divided into hind and fore quarters by cutting between the twelfth and thirteenth ribs, leaving one rib in the hind quarter. The flank is cut from the hind quarter, leaving the loin, rump, round and shank. The loin includes the porterhouse, sirloin and tenderloin cuts.

The fore quarter is cut across the ribs. The lower part includes the plate, clod and shank. The upper part includes the rib, chuck and neck.

Cuts Arranged According to Market Value and Desirability. Highest Priced First.

Loin—This cut includes short steaks, porterhouse, sirloin and tenderloin. The tenderloin is a long muscle that may be stripped from beneath the loin, but when it is removed it destroys the value of the porterhouse steak. The first few cuts from the loin are called short or club steaks, because they contain no tenderloin. Steaks cut from the beginning of the tenderloin to the beginning of the hook bone are called porterhouse. They are the choicest and highest priced cuts in the beef. The remaining cuts in the loin are the sirloin.

The tenderloin when sold separately is deficient in fat, and hence must be larded and then roasted or broiled. The loin is cut into steaks and broiled, occasionally sold as roasts, though expensive and no finer for roasting than are the ribs.

Rib—This cut consists of seven ribs, called prime ribs; the cut is made close to the shoulder blade and separates it from the chuck. It is sold as roasts, being cut into one, two or three rib pieces. One rib piece usually weighs about four pounds. The ribs are removed and the piece rolled and called a rolled roast. If the ribs are left in it, it is called a standing roast. Dealers sometimes remove the ribs from the cut and sell it as steaks, called small steaks.

Round—This cut consists of very

juicy, lean muscle and but little bone. It is sold as steaks, roasts and for beef tea and beef juice. It is excellent for pot roasts, stews, braizing or casserole of beef and for beef loaf.

Rump—This cut contains the end of the hip bone and joint. There is considerable bone, but the remainder makes very good steaks and roasts. It is also excellent for pot roast, boiling, braizing, stews and mince meat.

Chuck—This cut is next to the prime ribs cut and similar to it, but contains more bone and gristle and is not so tender. It makes a very good, though large, roast, and is sometimes sold as steaks and by some preferred to the round, because it is mottled with fat. It is excellent for stews, pot roast, boiling, braizing and mince meat.

Clod—This cut is back of the brisket and below the chuck. It is sold for boiling, stews, braizing and mince meat.

Flank—This cut comes from below the loin. It is boneless and coarse, but of good flavor. Flank steak is sometimes cut from the lean muscle on the inside of the flank. This steak may be scored across the grain and broiled. It is also rolled and braized. Flank cut is used for stews, boiling, and rolled and corned.

Neck—This cut contains juicy, tough meat. It is used in stews, soup and Hamburg steaks.

Plate—This cut comes from below the ribs. It has layers of fat and lean and the ends of the ribs. It is used for boiling and corning.

Shank—These cuts are the fore and hind legs. They are tough and contain bone and tendons. They are used for soup, cheap stews, and mince meat.

This afternoon we will cook beef, pork and veal, and make croquettes with the dark meat of the chicken left over from yesterday. First of all we will start the beef cooking, for it will take the longest time to cook. We have a one rib roast, but the bone is taken out and it is rolled. This makes it more convenient for carving, but it will take a little longer to cook than it would if left a standing roast. By leaving in the rib, the meat will have a better flavor, but we often sacrifice flavor for convenience.

Roast Beef.

Recipe.

Wipe meat with damp cloth, place in baking pan with bone side down, dust lightly with pepper; if there is no fat with meat, get a piece of suet, cut it up and place around beef. No matter what part of beef, the oven must be very hot. After the first twenty minutes, cool off oven a little, then add one teaspoon salt to the fat, or place on top of roast, baste meat every ten minutes and allow fifteen minutes to the pound for cooking. To make the gravy, lift out beef, pour off fat, scrape together all brown sediment from around pan; allow two tablespoons flour to four of fat, mix well; then add hastily one pint water or stock, boil up well, add one-half teaspoon salt, one-half saltspoon pepper, strain and serve.

Some people ask if we advise browning the meat in an iron pan first. We would if the oven was not hot, but it always should be to commence the cooking.

Question—You do not add salt?

Miss Clift—No, not until the outside is thoroughly seared. The salt draws out the juices of the meat and by adding it afterwards we keep the juices in, and get the flavor of the salt by constantly basting it. Put the salt in a corner of the pan and then the meat will become quite nicely seasoned by constantly basting.

We proceed in almost the same way with pork, only that we add the salt in this case before the cooking is com-

menced, the reason is because there is not the amount of red blood that we have in the beef. We take the flour sifter and sprinkle the pork with flour, in this way we will get a prettier crust on the pork. You can use the flour on the beef if you care to, but it browns more readily than pork will so it is not as necessary. We will place the pork on the top shelf until browned and then lower it, for we should never forget that pork needs cooking at a lower temperature than beef. Slow cooking intensifies the flavor of the pork, but destroys the flavor of beef. You will notice we add no water to the pork. It will be found to have a much better flavor when cooked without water, and we can always have sufficient fat with our pork so that there is no fear of scorching it.

Question—How long do you allow for a piece of pork that size?

Miss Clift—This is a piece of pork from the loin and so will not need so long a time as a thicker piece would. We have here three pounds and will allow it one hour; if it were a larger piece it would require a little less time in proportion. We baste the pork as we would any other kind of meat, but it is not necessary that it should have so much attention as beef. We make our gravy for the pork in the same way that we would for the beef, but we must always take care that our fat in the pan does not get too brown. If you do not care about having your gravy very brown, you will find that by using the milk with the flour you have a very good gravy. Two level or one rounding tablespoon of flour to one cup of liquid will be found the right proportions for any gravy or sauce. When we say a rounding spoonful, that means as much above the bowl of the spoon as below.

It is very essential that pork should be very thoroughly cooked. It is one of the hardest meats to digest, even when well done, so we must be very careful to see that it is never at all pink in color.

Question—Do meats lose any of the nourshing qualities if they are overcooked?

Miss Clift—Yes, we think beef more nourishing if not so thoroughly cooked through, and it is much more easily made into some warmed-over dish if the goodness has not all been cooked out of it. Basting the meat frequently will do a great deal toward keeping it moist and juicy.

Question—Supposing you were boiling the meat, should it then be cooked long?

Miss Clift—We would allow fifteen or twenty minutes to the pound, according to the thickness of the meat to be cooked; it is hard to give any exact time for meat differs so much in thickness, all depending, of course, on the cut of meat we are using. We think it very advisable to have the exact weight, for one can then tell just how long a time a piece will need.

We will now baste the beef, for it has been cooking fifteen minutes. For this I have an aluminum spoon; it really makes so much difference to us whether or no we have proper tools for our use, and a spoon with a long handle is very necessary for this purpose, otherwise one would often have burnt fingers I am afraid. Probably some of you have already had the disagreeable experience of your spoon slipping in the pan while you were attending to the meat. This trouble can be avoided by using a very long spoon.

Question—If you used a covered roaster, you would not need to baste your meat.

Miss Clift—That is true, but although the covered roasters are excellent for pork, chicken, turkey or

mutton, if you wish, yet we do not care to use one for beef. The reason is, when using a covered roaster the steam condenses, therefore keeps the meat moist and we like better to cook our beef without any steam. It is true it saves a little work, but we think we are amply rewarded for our extra work by the good flavor our beef will have.

Of course, Yorkshire Pudding is served as a complement to roast beef and I will give you a recipe for it which is a thoroughly reliable one, but in that, as in so many other things, the success of the pudding lies chiefly in the baking.

Yorkshire Pudding.

Recipe.

Two eggs, one cup flour, one pint milk, one level teaspoon salt. Beat the eggs until light, add milk gradually, mix with the flour, mix and beat hard; if at all lumpy put through strainer.

When we want to make Yorkshire Pudding, we take a little fat from the pan in which we are cooking the beef,—a safe rule is two tablespoons of fat to one pint of milk, then we are sure we will not have a greasy pudding, put the pan in the oven, and when smoking hot pour in the batter, bake in a moderate oven. If using one pint of milk allow twenty to twenty-five minutes. Never have the pudding cooked until the dinner is ready, for there is no way in which we can keep egg mixtures perfectly light. Cut in pieces and serve. Always pass the gravy at the table with this pudding, for if left to stand with the gravy on it, it will get heavy.

Question—You would not cook the pudding in the pan with the beef?

Miss Clift—In the old country they do that quite a good deal, but it seems the right kind of rack is not to be found on this side, but we think it better to cook it in a separate pan, for then we have something with which to make gravy, and when we bake it in the same pan the pudding absorbs the gravy, for the rack stands in the pan with the meat upon it. In this way it is impossible to save any gravy.

Question—If your gravy is not brown enough, how would you make it so?

Miss Clift—By using brown flour which has been previously baked in the oven until a golden brown; we may add a half teaspoon of "Kitchen Bouquet." This is a vegetable preparation which comes in small bottles especially for this purpose.

We will now prepare the veal. This is the rule we will follow:

Veal with Tomato Sauce.

Recipe.

One slice veal from leg, one-half pint canned tomatoes, one onion, one tablespoon parsley, one teaspoon salt, one saltspoon pepper. Cut up the veal into pieces, roll in flour and brown with the onion in hot fat; bring the tomatoes to boiling point and pour over veal; add parsley, salt and pepper and bring to boiling point, then simmer for one hour.

If we wanted the veal to look very nice we would dip it in egg and bread crumbs and fry it in the usual way, but we think for everyday use maybe this rule will answer quite as well.

Question—How do you like the aluminum frying pans as compared with steel?

Miss Clift—We think they are very satisfactory, but the average woman thinks they are too expensive, she cannot afford them, but they do not cost any more than the others, for the aluminum with care will last many years, longer than granite will. Some

granite will chip off, which is very unsatisfactory, because we get particles in our food and it has been known to cause trouble a great many times; but after all, a good iron frying pan is a comfort in any kitchen and is, we think, preferable to steel.

We will have to use butter today in which to brown the veal. We would prefer pork or bacon fat, or any other good drippings. Butter burns so quickly it is most unsatisfactory for frying purposes. It is because we heat fat to a high temperature that makes fried foods so indigestible. When fat is cooked in this way it is irritating to the stomach. This afternoon we are adding tomato sauce to the veal and that will make it very much more digestible than if we fried it entirely in this way.

Another nice way to cook a cheaper piece of veal would be to cut it up and stew as you would beef. Bay leaf makes a very good flavoring for this dish.

If you never used veal in a pot roast, do so by all means, but it needs flavorings, a little parsley, a slice of onion, bay leaf and two or three cloves and pepper corns are all good. It is a good plan to save over any fat you have left from this and use it in making gravy for other dishes. You will find a little of the fat gives quite a pleasant flavor to almost any dish.

This morning we prepared the lamb with barley and put it in the fireless cooker.

Stewed Lamb With Barley.

Recipe.

Take two pounds of the neck of lamb or mutton, cut up into chops, put into saucepan with one-half cup pearl barley, two small onions, half a carrot, two and one-half cups boiling water, three level teaspoons salt, one-half teaspoon pepper. Stew slowly for two and one-half hours.

We have used a fireless cooker all winter. Those of you who are interested in them will probably be more so when you have used them for a short time, because they are very good things indeed for anything that requires slow cooking.

The box we have been using is just a plain wood box, 12x12x12, lined with asbestos, with wool cushions. The box should have a cover which can be fastened firmly; the cover to ours is fastened with ordinary window fasteners, which make a very close, firm cover. The pail, a two quart granite pail containing the food to be cooked, is firmly packed with the wool cushions. It is not necessary to have a box made especially for this purpose; a candy or a lard pail could be utilized. I have seen one made from an old tin trunk with cushions stuffed with chicken feathers, the feathers having been baked in a slow oven for a long time and put in cases just like little cushions and placed around the dish, keeping one in the bottom, or pieces of woolen goods could be used.

Question—You spoke of wool. Is that asbestos wool?

Miss Clift—No, it is the prepared wool that you use for comforters. When our box was made cook-boxes were not as well understood as they are now. Cotton batting is used a good deal in Wisconsin and it answers perfectly. Just so long as the box is kept air-tight it will be all that is necessary.

The main thing to remember in using the fireless cooker is that everything that is put into the box must be put in at the boiling point.

This stew would make a very cheap meal, either for dinner or supper. We find we can get the stewing meats for eight or nine cents a pound.

Question—Could beef be used in the same way in the cooker?

Miss Clift—Certainly, but not ac-

cording to this rule. We do not care to have barley with our beef, but we have a beef stew that we could cook in the cooker—anything that needs slow cooking could be cooked in a cook-box.

When we are using a new rule we think it is advisable to taste the food before it is quite done, then if it tastes sufficiently of the flavorings we can remove them. People usually get tired of certain things by using them to excess.

In making this stew we cook it just below the boiling point. We first add the boiling water, let it come to the boiling point and then just keep it simmering, that is one reason why we advise the use of the cook-box so much, because it is so much easier than keeping it on the back of the stove where it may cook too hard.

We are broiling steak this afternoon; for this we have a piece of porterhouse. Perhaps some of you will say you cannot afford porterhouse, but for occasional use we think we can if we only go about our meat buying in the right way. If we have a cheap piece of meat one day, another day we might be able to afford a better piece. If you buy round steak for this purpose, be quite sure it is a good, tender piece, for you can never make tough meat tender by frying.

Question—Do you find that the juices run out when you are broiling it? What do you do to save the juice?

Miss Clift—We have a hot fire and it sears it quickly, and after it is seared, we cannot lose the juices.

To Broil Steak.

Recipe.

See that the fire is bright and clear, put the steak on the gridiron, turn often, and allow ten or fifteen minutes according to the thickness of the steak; dust with pepper and salt, serve very hot. Steak is never so good if left standing.

If we were not broiling it in this way, we would pan broil it.

To Pan Broil Steak.

Recipe.

In the first place, be sure to have your steak a little more than one-half inch thick to pan broil it. Make an iron pan very hot, rub it quickly with suet, then put in your steak. Never put the fork in lean meat, always in the fat. Just as soon as one side is seared, turn over, turn several times in the cooking; add pepper and salt; serve on a hot dish.

If you wish to make gravy, melt two tablespoons butter and stir one of flour into that, then add one cup boiling water, or use less flour and half the amount of water. Never pour the gravy on the steak, for that will spoil it. Serve in a separate dish. Maitre de Hotel butter is very good with steak, and some of you may be tempted to make it when you find out how good it is. We would not advise to make this every day, but for a change now and then, this is Mrs. Farmer's rule for it.

Maitre de Hotel Butter.

Recipe.

One-fourth of a cup of butter, one-half teaspoon salt, one-eighth teaspoon pepper, one and one-half tablespoon chopped parsley, three-fourths tablespoon lemon juice. Work the butter to a paste, stir in all flavorings, shape in a roll; when quite firm cut in pieces the size of a dollar and place on steak.

Croquettes.

Recipe.

Two cups cold meat, one-half teaspoon salt, three tablespoons butter, one-fourth cup flour, one teaspoon

onion juice, a grating of nutmeg, one cup milk. Put meat through chopper, then melt butter, add flour, stir until smooth, then gradually add milk. Cook for three minutes, then stir in meat and seasonings, mix well, spread out on a plate and put away until perfectly cold. Make into cones or balls; dip into beaten egg and roll in fine bread crumbs; fry in deep fat.

We use two cups of meat and one cup of the sauce. This is the same cream sauce that was made yesterday, only thicker, and then we add the seasonings to that. We have here a little mace; we think this is one of the seasonings that should always be kept handy and it is one of the good things to use with made-over dishes. The bottled mace is the most convenient to buy, the whole mace has to be pounded. It is the outer part of the nutmeg, or the husk, and has a very good flavor indeed. Just a grating of nutmeg in the mixture is very good, also a little paprika. Get a good brand of paprika sooner than a cheap one. These cost twenty-five cents; you can get them for fifteen cents, but it will not have the good flavor that this has. We need so little that it certainly lasts a long time. We think it is especially good in croquettes and the different made-over dishes; paprika, pepper, salt, and mace are the flavorings we have used in the croquettes.

We will make our cream sauce for the mixture now and then stir the flavorings and meat into it. We find so many people get their sauce either too thick or too thin, then the croquettes will not roll up as they should. People will raise the question that frying is indigestible and is not good for us, but we think if the mixture is properly fried it will not be so bad. Anything that is well fried should not leave any mark of grease at all upon a napkin.

Question—In croquettes can you use any kind of cold meat?

Miss Clift—Yes, beef, veal or mutton.

Question—Do you ever use pork?

Miss Clift—No, it is too fat.

Question—Is it just because of the fat?

Miss Clift—Yes, chiefly, but the pork does not seem so suitable for this dish.

A Lady—I asked about the pork because I know that farmers' wives always have so much left-over pork on hand and there are so few recipes for using it. I have used it in hash and thought it was very good, but if the folks had known it was pork they would not have eaten it, so that is why I wanted to know if you used it in croquettes.

Miss Clift—We are always glad to experiment with a new dish and will try pork in croquettes.

Now, make just little cone-shaped or round croquettes and be sure to mold them into shape, otherwise they will break when they get into the hot fat and will not look at all pretty. We do like, whenever possible, to have our food looking nice as well as tasting good.

We find some women have trouble in shaping croquettes. Perhaps that is one of the hard parts of it, but we think if the mixture is of the right consistency it is not so difficult. A croquette mold is nice, but few women have them, so we are just going to use our little spatula and will mold them in that way. We do not like to make them too large, because small ones will cook more quickly and are very much nicer for serving. Two cups of meat makes quite a quantity of these little meat balls.

Question—Did you make those with white sauce?

Miss Clift—Yes, they are made just as we tell in the rule.

Always have plenty of crumbs when you are going to make anything like this. It is so easy to keep the dry pieces of bread. It is best to keep them until they are quite dry and then put them through the meat chopper and have them quite fine. The cracker crumbs will do, but we do not like them as well as we do the dry bread crumbs because they will absorb more fat; you will find the bread crumbs are more satisfactory.

Mrs. Buxton has a very good rule for the use of cold pork. I would be glad to have her tell you about it.

Mrs. Buxton—I would like to tell you how I get rid of cold meats. I find there is so much cold pork left, and beef, and different kinds of meat, so I contrived this way of using it. I put it through the meat chopper, put mashed potato with it, take a spoon and mix it up, form it into a loaf and let it stand in the loaf, but instead of frying it in the same way that hash is fried I cut it in nice slices and fry it in hot fat; slice it nice and thin and fry it quickly on both sides. We find it was relished very much by everybody in the family. If you do not have a food chopper, chop it as you do the hash, slice it, or form it into balls and fry it, but do not tell your family it is hash.

Question—What seasonings do you use?

Mrs. Buxton—I just use salt. Many people like a little onion, or something like that. I am not in favor of very much seasoning, I use very little pepper, but of course you can season it to your taste. For this recipe I use any left-over meat.

Rules for Frying.

First. When the fat begins to smoke, drop a piece of soft bread into the fat; if it browns in forty seconds it is right temperature for any cooked mixture.

Second. Use the same test for uncooked mixtures, allowing one minute for bread to brown. Fresh fat should be used for batter and dough mixtures. After these, fish, meat and croquettes, fat should be frequently clarified.

Always have the fat smoking hot, otherwise you will not have good results.

A Lady—It is hard to find out just when the fat is hot enough.

Miss Clift—If you will follow this rule, you will find it is just right.

To serve the croquettes we heap up mashed potatoes, then push the croquettes into the soft potato. It makes a little more trouble, but you will notice it makes a very pretty dish, especially if you use a sprig of parsley in between the croquettes.

If you want to cook croquettes before you are ready to use them, you can put them on a paper and then in the oven until they are warmed through.

You all understand just how to go to work to fry the croquettes?

Question—The fat must be smoking hot?

Miss Clift—Yes, the fat must be hot, but you can get it too hot. We like to see them just a nice light brown, which we can always get by being sure that the fat is at the right temperature.

We always strain the fat; never put it away without straining, then you have all the little brown particles removed.

Question—What do you use for a strainer?

Miss Clift—Just a little ordinary wire strainer.

If you want to clarify fat it is very easy to do so, and we think it is quite well, if we have cooked anything in the fat until it is quite brown, that we should clarify it. This can be done by melting the fat and adding raw po-

tato cut in small pieces, heating the fat gradually. When the fat ceases to bubble and potatoes are well browned, strain through double cheese cloth. The potato absorbs any strong flavors.

We have said nothing yet about the making of soups, and it certainly is very necessary that every woman should know how to make good soup, although we are told that soup does not contain the nourishment we once thought, but it certainly is a very appetising stimulant.

The great mistake the average woman makes is that she must boil meat long and hard; this is not so. Follow the directions and you will find you have a delicious soup without wasting it in steam. This is a very cheap soup and you can make it richer by adding less water, but we have found these proportions quite good.

Beef Soup.

Recipe.

The leg or shin of beef is best for this. Two pounds of beef, one tablespoon dripping, one carrot, one turnip (small), one onion, two quarts cold water, a few pieces of celery, a sprig of thyme, marjoram, parsley and bay leaf, three cloves and six peppercorns. Wipe meat with damp cloth and cut into small pieces. If you have marrow fat, use that instead of dripping. Make the dripping hot in iron pan, brown half the meat on all sides, add the water to meat and bring to a boil on a very slow fire; simmer gently for four hours, then add all the seasonings, cook for another hour, add salt and strain.

We cut the meat in small pieces and cover them with water. Never wash meat, just wipe it off. Of course when we say meat, we do not mean poultry. Put chicken in the water and wash it, but wash quickly, but with the meats it is never necessary to put them in the water. If they are so unclean, then they are not fit for use. Take a clean cloth, wring it out of fresh water and then wipe off the outside of the meat. When you wash the meat you wash away so much of the goodness. You will find that the water is quite pinkish in color.

Question—In cutting up poultry, do you wash it after you cut it up?

Miss Clift—No, you do not put it into water after cutting it. We wash it thoroughly first, before cutting it up.

You will notice in the soup that we do not add the seasonings until the soup is cooked.

We find, generally speaking, that vegetables will cook through in one hour, because we cut them in small pieces. We do not have to boil the meat because we put the vegetables in, they will cook by simmering in that time if cut into small pieces.

We will serve the veal to you and the croquettes and we will take out the mutton stew that we put in the cook-box this morning.

Question—In the tomato sauce with the veal, how much do you use?

Miss Clift—We follow the rule I have given you; one cup of tomato sauce. The measuring cups always hold half a pint.

We want to pass the pork and beef so you can see just how they are roasted. They are well browned on all sides and that is how we think they should be, always well browned, because then we get the good flavor as well as the nice appearance.

We are often asked what can be done with the soup meat, it is so tasteless. This is very true, for we have got most of the flavor in the soup, but there is still quite a good deal of nourishment in the beef, and we think a meat and potato pie which we have used in our work this winter may prove helpful to some.

Meat and Potato Pie.

Recipe.

Take two cups of any cold meat passed through the mincing machine, add three-fourths of a cup of gravy, put into a baking dish, make smooth over top, then spread mashed potatoes one inch thick over top. Score with fork and place in rather hot oven for thirty-five minutes.

If you are using soup meat, anything that hasn't any gravy, then use cream sauce. It is very nice and always blends so nicely with the meat. It does happen sometimes that we have no gravy of any kind to use. We have never tried pork in the meat and potato pie, but we think it might do all right if there was not too much fat on the pork. Perhaps we could use the fat for frying, or any other purpose, as pork fat is very delicious for frying veal, or any of those things.

Chicken with rice on top is very good indeed, or the rice can be used with the beef, in place of potatoes, but always remember to have plenty of gravy or sauce with the meat.

Question—Are you going to tell us how to construct a home-made cook-box?

Miss Clift—I think you can tell from my description just how to make the box.

Question—Do you cook oatmeal in it?

Miss Clift—Yes, it is perfect cooked in the box. All the foods that need to be cooked a long time can be cooked in the box.

Question—Then you would heat it at supper time?

Miss Clift—Yes; then put it in the box, take it out in the morning and stand it on the stove until it is very hot. Oatmeal wants to be quite hot to serve with milk or cream. This winter in our demonstrations we have been cooking oatmeal in the box the first day and then using it up the second day, according to the following rule:

Oatmeal with Apples.

Recipe.

Pare, core and slice apples, sprinkle with sugar, cover with the oatmeal and bake until the apples are cooked, about twenty minutes.

This makes a very nice supper dish. We serve cream with it if we have it, but it is very good without.

Rice can be cooked in the cook-box in one hour, but we like better to cook the rice in boiling water as it was yesterday.

Question—When you cook rice as a vegetable, do you put salt in the water?

Miss Clift—Yes.

And now we must close, but I would like to say a few words about the carving of meats. This is an accomplishment that is very often neglected among our girls. If only they would understand how very much more pleasure one has in eating meats that are cut in thin, even slices, instead of thick chunks, we would then have the difficulty removed, but unless they can be made to understand that it is part of their education, we cannot hope for better things.

Be sure the knife is quite sharp before bringing it to the table, for with a dull knife no one could hope to make a success of the carving. In carving the steak, cut around the tenderloin part first, then on the other side, removing the sirloin. Carve the meat from the bone to the edge, serve a slice of tenderloin and sirloin to each person, not forgetting the gravy. To carve the rolled ribs of beef, always cut around it in thin, even slices, never downwards, nor across.

Parsley always improves the appearance of a dish.

If the veal is cooked in one whole slice, then cut across as you would the steak.

Unless there are any more questions, we will now close our lesson, hoping it may prove useful to at least a few.

THRID SESSION.

Thursday Afternoon, March 18, 1909.

THE COMBINATION OF FOODS.

Miss Edith L. Clift, Chicago, Ill.

It seems that this subject "The Combination of Foods" does not get so much attention as it deserves and when we hear of so very many people suffering with dyspepsia it is time that we looked into the matter a little more than we have been doing, for no matter how well food is cooked, if it is not served in the right proportions we certainly do not get the best results.

There are three important divisions in the preparation of food for a family, wise buying, good cooking and careful serving. When buying foods, the housekeeper should know how much she can afford to spend in foods for a week or month. She must also remember the individual needs of each member of the household.

The art of cooking finds its field between the choice of food and the serving of the cooked dishes at the table. No journals for combinations of foods can be devised so complete that continuous care is not required in every step of the process.

Few housekeepers have the time or take the trouble to keep accounts as they should do of their weekly expenditures. Fewer still know anything of the relative proportion of protein, fat and carbohydrates which is placed on their family table week by week. The housekeeper who never goes to the grocery and market and does not study the market reports is, rarely, an economical buyer. She is liable to go on in the same old routine instead of having a little change sometimes, as she will have if she is able to see for herself what is in the market. There are bargains to be had in food as well as in clothing if one looks out for them. A reserve store of canned foods is always a great aid to any housekeeper, as she is always sure then of being able to serve an appetizing meal to the unexpected guest.

As to what we shall eat, or how much of this or that, will depend largely upon ourselves, but it is certainly true that if every mother knew how best to feed her children, we should hear less of headache than is now the case. Very often too much food is taken at one meal, or it may be too much of one kind. One kind of meat or fish with potatoes or rice and one other vegetable and a simple salad, dessert or pudding is quite sufficient for the everyday dinner.

To prepare meals for a family year in and year out is not an easy task, for the housekeeper has to remember not only the cost and nutritive value

of the foods, but the whims and notions of her family. The ability of the human being to talk makes him much harder to feed than the animals, who must accept the balanced ration given them and which we hear farmers so heartily recommending of late. Were we women to give the farmer a balanced ration, which would probably prove just as good for him as the other is for the cattle, we would venture to predict a rather uncomfortable time for some of the wives and mothers.

There is without a doubt a great deal of harm done by giving children their own way in so great a measure in regard to foods. It is no unusual thing for a child to say he does not like this or that before ever tasting it and the weary mother with a sigh takes away the plate and asks what he would like to have. We do not think it is right to force a child, for we all have our likes and dislikes, but try to coax the little ones to eat all kinds of food that are good for them. In this way you will be doing a great deal of good, for they will then be able to enjoy whatever they may have to eat, wherever it is served.

Some Sample Combinations.

Some of you may like to know what we think would be advisable to eat in a general way. To commence with breakfast. If we can take it, there is nothing better for us than a dish of oatmeal, providing it is thoroughly cooked. Served with cream, it is a very good food for young or old. The many breakfast foods we have on the market contain very little nourishment. If it were not for the cream and sugar we add to them we would have little food value with any of them. It would seem that the good, old fashioned breakfast of bread and milk for children is fast dying out. For this we are sorry, for it most certainly is a very good food, and we think is much more suited to a child going to school than the fried potatoes and buckwheat cakes which are quite often served. There is nothing wrong with either of these foods for an occasional change, but if taken very often they are too great a task on the digestive powers. If some of our grown-ups would take milk instead of coffee for breakfast once in a while, we think we would hear less of nervous prostration.

So often we feel dull and stupid after a meal and if not really suffering from a headache we feel there is something wrong and quite often we could trace this back to the meal we have eaten, if we took the trouble to do so.

We have such a variety of vegetables on hand during the summer months and we would do well to eat more of these and less meat during the warm weather. Among the green or succulent vegetables most commonly in use are the different varieties of cabbage, all of which are good for us, asparagus, carrots, celery, cucumbers, egg plant, horse radish, vegetable marrow, onions, peppers, radishes, rutabaga, spinach, summer squash, Swiss chard, tomatoes. None of these vegetables aid very much in the building of tissue and flesh, but they are very good for us in many ways, and some of these contain iron and it is much pleasanter to take medicines in this way rather than in the form of drugs. You will notice that with different kinds of skin troubles a doctor will order green vegetables to be eaten daily, and one of the reasons why he would do so is that we may benefit from the iron and mineral matter they contain. It is most certainly true that we would all require less medicine if we took more of these vegetables.

Macaroni and rice are both very

good foods, but because they too are starchy foods should never be served with potatoes. Either one will take the place of potatoes and make a very pleasant change.

We would never serve beef and beans, but pork and beans, beef and potatoes. Cheese and macaroni make an excellent supper dish. Sir Henry Thompson tells us that "gluten macaroni, weight for weight, may be regarded not less valuable in the economy than beef or mutton." Served with cheese, macaroni makes a very good substitute for meat, so when we have macaroni and cheese for supper do not have beef or any of the protein foods. There are so many good things we can make with beans that we can sometimes substitute these for meat at the evening meal.

Another little thing is most of us eat too much pie. The question is at once raised, what is the matter with pie when we use good butter, lard and flour, but it is not those things in themselves that are harmful, but because they are mixed together and baked at a high temperature that makes pastry to be indigestible. Milk puddings and some of the simpler desserts are much more wholesome. Custards are so easily made in the fireless cooker and with fruit form a very dainty yet nourishing dessert.

Prunes, with or without cream, and a light cake make a very good supper dish. Oatmeal and apples cooked together make a variety for breakfast, besides using up the cold oatmeal which we sometimes have left over.

We think it will be sometime before we use a truly balanced ration, but if we consider these things a little more we will find that it is greatly to our advantage to have done so.

And in conclusion let me say that haste and worry and over-feeding make more dyspeptics than any combination of things eaten. Leisure, agreeable company and moderation in eating preserve health more than peculiar bills of fare or prescribed ways of using them. Cheerfulness promotes health. Let us take care to remember that "Cheerful looks make every dish a feast."

DISCUSSION.

Question—Are cheese and macaroni considered very digestible and wholesome?

Miss Clift—Cheese is not generally considered one of the most easily digested foods, but a good many of us have no trouble in taking care of it, and when we consider that a pound of cheese contains about twice as much nutritive matter as a pound of meat, it is well worth while to use it for a change; using it with the cream sauce as we do, it is more easily digested than when eaten alone. We should take care not to cook the cheese rapidly; if we do this, it will most certainly be very hard to digest. To cook macaroni always have ready a large kettle of boiling water, drop the macaroni into this and see that it is kept boiling during the cooking. If cooked in warm water and not very thoroughly it is very indigestible and unpalatable.

Question—What is the proper meat to use for a boiled dinner? Some people use beef and some pork; I mean when using all kinds of vegetables.

Miss Clift—Both of these meats are quite good for a boiled dinner, especially in the cold weather. We can use a variety of vegetables, but never cook beets in the kettle with the meat. Cabbage is generally cooked with a boiled dinner and tastes quite good, if not cooked too long, but it is better to cut the cabbage up into small pieces and then you will not have to allow it so long, but if you are in the habit of cooking it as we do in a ket-

tle of freshly boiling water and serving it with a cream sauce, you will not care for it cooked with the meats, we think.

Question—Would you salt the cabbage when cooking in the boiling water?

Miss Clift—Yes, we salt the water for all vegetables that grow above the ground when we commence cooking.

Question—Do you cook it in a kettle of water?

Miss Clift—Yes; some people make the complaint that we lose some of the mineral salts in that way, but the flavor is very much improved and it is also very much more digestible.

Question—Do you like fruit desserts after a meal with cabbage or onion?

Miss Clift—That would depend a great deal on the fruit you were using. No one would think of serving cabbage and strawberries, for instance.

Question—How can you prepare horseradish to keep it for winter use? I have tried it, some people do it very successfully, but I have never had any success with it.

Miss Clift—I have never tried it. Is there any one in the audience who can tell how to keep horseradish successfully?

A Lady—I know one good way to do and that is to dry it. Grate it as fine as you can and bottle it up and use it with vinegar.

A Lady—I tried it with vinegar, but it turned dark and flavor changed.

Question—If beef and beans are not a good combination, what about beans and mutton?

Miss Clift—That would be equally bad, pork and beans are the most suitable combination and many of us use the two together without quite knowing why. The reason is that the pork is a heat-producing food and the beans muscle-making, therefore when we use the two together, we get practically the same combination as when we use beef or mutton and potatoes. People of the arctic region live largely upon fats, which produce great bodily heat, while in the warm southern climate very little fat is required.

In conclusion let me say that many of us would be a great deal better off if we ate less meat and more vegetables and the expense of the table would be considerably lessened.

HELPFUL HINTS TO FARMERS' WIVES.

Mrs. A. J. Buxton, Wittenberg, Wis.

First of all I would like to speak to the farmers' wives about a garden. It is one of the necessary things a farmer's wife is entitled to—a good piece of ground with a good fence around it to be used for the purpose of raising vegetables and small fruits. I would like to know how many farmers' wives have a good fence around their garden (I see only one hand raised) to keep the chickens and occasionally a cow or horse from destroying what you are trying so hard to raise. When you go home, do not give your husbands one minute's rest until they have promised you a good fence and then you see that they fulfill their promise.

I am certain of one thing, that when a farmer's wife has a good garden she works for it. We moved onto an unimproved farm eight years ago. Out of the eight years we lived in town three years, giving us five years of experience in farming. We cleared and got ready a piece of ground for

a garden, about one-fourth of an acre. I got the seed in the ground at the proper time and in a short time the prospect for a good crop of vegetables looked very encouraging, but the garden was not fenced, so there was trouble all summer from the chickens and our neighbors' cattle. When fall came the neighbors had had more benefit from my labors than I did, and I declared that I would not put another seed in the ground until the entire garden spot was enclosed with a four-foot wire mesh fence. This was done the following spring, and I have enjoyed a good garden ever since.

I have friends who bought their land from the government more than thirty years ago, and to this day the stock and chickens practically ruin the vegetables every summer. How many seasons would a man plant the same piece of ground and never be able to reap more than one-half of a crop, on account of horses and cattle destroying it? I am positive he would have it well fenced in the second year.

We want a balanced ration as well as our stock. We do not want to live on meat, bread and butter, potatoes, coffee and cake or rich pastries the year around, but want with this at least once a day a few good vegetables, beginning in the spring of the year with asparagus, one of the best vegetables grown, and every farmer should have a good bed of it in the garden, onions, lettuce, radishes and spinach, also cress come next. Of these we want at least four plantings about ten days apart, the same with corn, peas and beans, followed with carrots, beets, cabbage, turnips, rutabagas, parsnips, brussels sprouts, endive, kohlrabi, celery and many other kinds of vegetables too numerous to mention.

Vegetables Canned by Mrs. Buxton.

I know this means hard work for some one, and it is usually the farmer's wife who has to look after this

part of the farm in connection with the poultry and general housework. The latter is all she ought to do, or has strength to do, yet she knows if she does not hoe and weed the vegetables they will be sadly neglected and her garden would be like a certain man's who said his garden looked good twice a year—in the spring when he planted it and in the fall when he mowed down the weeds.

Last summer during Mr. Buxton's absence I had charge of the farm and adopted the plan of saying to my son and hired man before breakfast or immediately after dinner, "I would like you to do ten or fifteen minutes' work in the garden," As a result, in two or three weeks' time everything was cared for so that I did very little work myself and never had a better looking garden, nor did any of the crops in the field suffer.

Canning Vegetables for Winter Use.

It is said that necessity is the mother of invention. In order to have corn, peas, beans, tomatoes, etc., to use during the winter and not feeling able to buy these vegetables as I had done heretofore, I had to invent a way of canning or preserving everything in the line of vegetables and fruit I could get.

In canning be sure that your cans are clean, wash them as carefully as you would your tumblers or your cut glass. Before using scald the cans several times, or better still, sterilize them by putting them on the stove in cold water and allow it to boil for at least one-half an hour. The greatest danger is in the cover—never use one unless it has been boiled and then rinsed with boiling water.

I started with canning beans. I prefer the wax or butter bean, as they are sometimes called. Pick them when they are at their best, wash, string and cut them as for table use, fill the cans with the cut beans, then fill with cold water, put on rubbers and covers and screw them on as tight as you can with your hands, but not air tight, as there might be danger of them bursting. Make a rack to fit the bottom of the boiler (I made mine of lath and have used it for seven years), place cans on it and fill with cold water within three inches of the top of the cans, boil two and one-half hours, then remove cans from the boiler, tighten covers, or if the water has evaporated too much unscrew cover, fill can with boiling water, put cover on air tight, replace cans in boiler and let boil for ten or fifteen minutes longer.

I had such good success with the beans that I tried peas next, then corn. The sample I have with me is not a perfect one. I brought it to show that corn may be canned without a preservative. Score down each row of grains, then with a dull knife press out the pulp, pack into jars, add water if not juicy enough and proceed same as with beans, but boil three hours, and after tightening cans boil fifteen or thirty minutes longer. Try canning corn in this way and you will like it better than using a preservative, even if it is recommended by the Pure Food Law.

Question—You put nothing with it at all?

Mrs. Buxton—Only a little water if there is not sufficient juice.

The next thing I tried was tomatoes. In our part of the state we have a hard time to get them to ripen, the seasons are so short. I plant the seeds in flower pots in March, put five or six seeds in a pot. After the fourth or fifth leaf is formed I transplant them into tin cans, one plant in a can, and leave them there until all danger of frost is over. That is sometimes until late in June, many of them are in blossom and little tomatoes are formed. If you are careful in remov-

ing them from the cans, they will not wilt but keep right on growing. Last summer I picked seven bushels of ripe tomatoes and felt well repaid for my trouble.

For soup and sauce to serve with meats I put them through a sieve or strainer. I had one made to order, as the holes are too large in an ordinary colander to reject the seeds. Buy a cheap three or four-quart tin basin, have the bottom cut out and a piece of perforated tin put in its place, being careful to select a piece with perforations small enough so that the seeds cannot pass through.

Cut out stem ends of the tomatoes, quarter them and boil until they are soft, work them through the sieve with a potato masher, put them back on the stove and allow them to boil about five minutes, fill your cans and seal them; they will keep indefinitely. If at any time you want catsup, add spices and vinegar to suit your taste, heat, and it is ready for use. I have noticed farmers in our community buying catsup by the gallon jug and do not know what they are getting. I claim if farmers cannot know what they are eating, who on earth can? I object to the spice in factory-made catsup. A very little cayenne pepper, salt and vinegar added to the tomatoes makes a very desirable catsup.

Fruit canned by Mrs. Buxton.

In fact, people, as a rule, spice and season their food too highly. I have eaten pumpkin pie so highly spiced with ginger, cloves, cinnamon and nutmeg that if the hostess had not told me it was pumpkin pie I never should have recognized it as such.

Question—What about our stomachs?

Mrs. Buxton—Yes, what about our poor stomachs? I heard a temperance lecturer say that mothers made drunkards in their kitchens. I believe she

told the truth. Our children are fed so many highly seasoned dishes that by the time they get to be young men and women they demand something stronger to drink than water or ordinary tea or coffee. Highly seasoned food creates thirst. If you are in the habit of using a great deal of spice, try using less and less. Finally you will get so that you can make pies, sweet and sour pickles, etc., without using any spice at all and have them pronounced excellent.

A Lady—I think pepper makes people more peppery.

Mrs. Buxton—That is just where the trouble comes in. If your children are very cross and irritable watch their diet. This will apply to older people as well. We will go back to putting up tomatoes. To have them to use as a vegetable, a good way is to remove the skin, cut them in halves, or if you use the Economy fruit jars, you can leave them whole, fill the jars, if their own juice does not cover them fill jars with water or extracted juice from tomatoes, put on covers and boil in boiler for thirty minutes. You may sweeten some for sauce and also make preserves.

Rhubarb, or commonly called pie plant, may be canned without sugar. This is something every farmer's wife has in her garden; a dozen cans or more never come amiss during our long winters for pies, puddings, as well as sauce.

Cut it into small pieces, pour boiling water over it, and let stand thirty minutes, strain through colander, put in porcelain lined or aluminum kettle, add as much water as desired, let boil a few minutes, or it may be put into the cans and boiled in boiler, the same as tomatoes.

A Lady—I put mine in cold water without cooking and put in soda when I take it out of the cans.

Mrs. Buxton—I object to the soda.

Question—Don't you find it keeps in better shape if you put it into the cans raw?

Mrs. Buxton—Yes, it does; but the same is true if you prepare it as I stated, fill cans and boil in boiler or in the oven, and you will find that it will not be necessary to use soda.

I like to can and pickle beets early in the summer when they are young and tender. For pickling, boil, peel and slice them, fill cans, heat vinegar, add one-third water, a little salt and sugar, fill cans to overflowing while it is boiling hot, screw covers on air tight. For canning, boil them until nearly tender, remove skins, put into cans, fill with cold water and boil in boiler for one hour.

About a month ago I went down cellar to examine the beets which were packed in sand and found them as hard and crisp as they were in the fall. I cooked them and chopped them fine, added a little vinegar and butter and let them boil for a few minutes, filled and sealed the can. I feel certain they will keep indefinitely. The color is not as good as it would be had they been canned earlier.

Question—Do you find that you can get too many beets in in proportion to the vinegar?

Mrs. Buxton—No; I have not had that experience.

Question—Wouldn't the beet salad be red if made when the pickles are made?

Mrs. Buxton—Yes, it would.

When you are boiling your vegetables for dinner, allow twice the quantity you want to use, have your cans ready and as soon as the vegetables are done fill the cans with the vegetable and liquid, seal and they will be ready for use (in spring or early in the summer) for soup or in any described way.

I have these things on what I call my "emergency shelf" and find them

very handy, especially when I have a small dinner prepared for my own family and have three or four friends come in just as we are ready to sit down to eat our frugal meal. In a few minutes I can have broth, beans, peas, corn, as good as fresh, or carrots, much to their surprise.

Take Care of the Windfalls in the Orchard.

I think many farmers are very careless in caring for their apple crop. The ground is covered many times during the summer with choice apples, lying there to decay, often because the wives are too busy helping their husbands in the fields and maybe prices are low at that time of the year, or they think it does not pay to bother with them. In the fall prices are higher, so the best fall and winter apples are sold and the culls put into the cellar for winter use for the family. As a result, long before the next summer puts in its appearance, there isn't a fresh or canned apple to be used, when with a little trouble and expense dozens of quarts could be saved. The children would enjoy them if no one else would.

They may be canned without sugar by boiling them in a porcelain or granite kettle and canning in the usual way, but be sure your cans and covers are clean.

Crab apples may be baked in a granite pan (do not use a tin pan), sprinkle sugar over them and nearly fill the pan with water, leave the stems on the apples. When done so you can pierce them easily with a tooth pick, they are ready to put into the cans, fill with the syrup and seal. It is best to have a little syrup such as you would prepare for ordinary fruit to fill the cans in case there should not be enough in the pan.

The winter crab Hyslop, or the Briar sweet crab are excellent put up in this way. They are fine for the children's school luncheons.

A Thought About Our Children's Diet.

My children get light lunches for their dinners when at school. Instead of cake and pie I give fresh or canned fruit, raisins and nuts. Mothers are often careless or thoughtless about their children's diet. I was visiting at a farm home a few years ago where there were five children attending school. For breakfast we had buttermilk pancakes. When the children were ready to put up their lunches I heard them complain about having to take cold pancakes for their dinner. They said they were tired of them. The mother replied, "You take cold pancakes for your dinner or nothing at all." The children had five cold pancakes apiece for their dinner. There was not a loaf of bread in the house. The mother's excuse was, "I keep forgetting to put yeast cakes to soak." Hot biscuits for supper, indigestible pancakes for breakfast and the same for the children's dinner. In my mind there is no excuse for such a state of affairs in any home. I consider it next to criminal. Give your children good, wholesome food, plenty of well cooked vegetables, fruit, eggs, and good bread and butter, milk or water to drink, never tea or coffee.

A Lady—I find there is nothing nicer than canned apples for sauce.

Mrs. Buxton—Yes, and more healthful than many other kinds of fruit.

You will notice the sample of apple butter I have here is rather light in color. This is so because it does not contain cider nor spices of any sort, nor is it made after the pound for pound rule. One-half as much sugar as apple, allow it to boil until it has a glassy appearance, seal jars with parafin. You will find it more wholesome and it will keep as well as when made after the old method.

If you have not already tried baking fruit in the oven rather than cooking it in an open kettle, I wish you would do so. (The principle is the same as when boiling in the boiler.) I have with me peaches, pears, pineapple, quince, raspberries and blackberries canned in this way. I prepare the fruit at night, fill the cans with the fruit, then fill with syrup, put on the covers, and in morning place the cans in a dripping pan partly filled with water, put in the oven and allow to boil slowly for thirty minutes. Peaches, pears, pineapple, etc., require longer cooking, from one to one and one-half hours. Always have extra syrup hot and ready in case any cans need refilling. In this case it is best to place the cans back into the oven for a few minutes. In this way you do not lose any of the natural flavor of the fruit and it is taking care of itself while you are getting the breakfast.

Do not sweeten fruit too much, one cupful of sugar for a quart of fruit is ample for any fruit. Blueberries, mulberries, etc., require only one-half a cupful to the quart. Fruit almost as rich as preserves is not wholesome, but it is the only way some people can keep their fruit at all, because they are not careful in washing their cans, nor do they pay any attention to the kettle or utensil the fruit is boiled in. I once saw a woman pickling pears in an old tin dishpan, and she wondered why they looked so black. Keep a good granite or aluminum kettle especially for your fruit.

More About Clean Cans.

A friend told me a few summers ago that she was tired of canning fruit, it would not keep. She thought it was cheaper to order it from Curtis Bros. I had occasion to go into her cellar shortly after she told me this. When I saw the condition her empty cans were in, I said, "My dear I understand why you have been having such poor luck with your fruit, your cans have not been washed properly." "Oh, yes," she said, "but I wash them again before putting fruit into them, so they are perfectly clean." A can needs more than ordinary washing after standing with mold on the inside of the can and cover for six or seven months. After washing them carefully they should be boiled in clean water for at least an hour, especially the covers.

Question—Do you advise putting the cans in a warm oven to dry?

Mrs. Buxton—Yes, it would be all right to dry them in that way, but I prefer wiping them with a clean towel, the covers the same, and always wash the covers when you do the cans, never with the tinware.

High Bush Cranberries.

I brought a sample of high bush cranberries, marmalade and jelly. Either is nice served with poultry. They are easily grown and every farmer should have at least half a dozen bushes in the garden.

Question—You raise them on the farm?

Mrs. Buxton—Yes, we planted three bushes five years ago and I want three more.

A Lady—We raise them in town.

Preserving Meats of Different Kinds.

Last fall Mr. Buxton killed a calf. We had veal until we were tired of it. I thought I would experiment with a little of it. I had some handy that had been put through the food chopper. I boiled it about ten minutes, put it into a can and sealed it. After I learned I was to speak at this meeting I opened the can and found it as fresh as when I put it in. I brought it to show what the farmers' wives

can do. There is no reason why we cannot have cans containing pork, pork sausage, beef, veal, mutton and chicken on our emergency shelves.

Soup Stock.

You may also have soup stock ready for use at any time. I try always to have some on hand. It comes very handy in case of sickness. When you are boiling beef, veal, mutton or chickens get a few cans ready and fill them with some of the broth. It will keep as long and as well as anything else.

When we consider that every housewife has to prepare 1,065 meals every year, it certainly is no small task and requires a great deal of planning. That is why I like to have at least three hundred and fifty quarts of canned fruit and vegetables in the cellar. If I haven't the sugar, I can the fruit without. Apple, currant or berry juice may be canned without sugar and made into jelly at any time.

Mrs. Ransom—I wanted to ask you if you had ever tried the cook-box in canning berries?

Mrs. Buxton—No.

Mrs. Ransom—I have found the very best way to put up berries is in the cook-box. We used that old method before we knew what we were doing. I take the fruit, pack it in the can lightly, then heat the syrup, pour it over the fruit, put on the covers, put the cans in boiling water and set them in the cook-box, and I have found it very satisfactory and very easy. People ask me why my strawberries taste so different from others. If you haven't a cook-box, you can use a pail and throw some old rugs, or something, over it, and you will find you will have a very fine flavor to your canned berries. The appearance is just the same as if canned in the oven or in the boiler. Of course it is an easier way, for you do not have to have a fire and you do not have to stay at home to watch the fruit.

Question—Could you do a large quantity in that way?

Mrs. Ransom—Certainly. My cooker is a home-made one, eighteen by twenty-six inches and sixteen inches deep. I can put ten quart cans in at one time. My apples and sweet pickles I cook in the oven.

Question—Would it not be safer to put warm water instead of hot water around your jars? There would be danger of breaking.

Mrs. Ransom—One must use good judgment in such work. Use hot syrup to drive the air from the fruit; when the can is full, put on rubber and screw cover tight; set them in the receptacle on wet cloth, then pour boiling water in. Do not let the steam touch the cans, but let it strike the side of the receptacle. Then cover tightly and set in cook-box.

Question—You find the jars do not break?

Mrs. Ransom—No. Remember I pour the boiling syrup over them and that has warmed the fruit through. Experiment only will develop expertness.

Question—Can you tell us how long you left any of the fruit in the cook-box?

Mrs. Ransom—You can leave strawberries in too long. Boiling water is 212° F. and when the temperature falls to 100° F., which will be in about two and one-half to three hours, according to your packing. The box is not to be opened until you are ready to take out the cans. The tops should again be tested.

Question—How long is it? Is it two and a half hours after it ceases to be hot?

Mrs. Ransom—After two and a half hours it ceases to cook and I think it is best to remove the cans from the box, still it does not make much difference with black or raspberries, I take them out when convenient. The object in using the cooker is to

retain the heat, and the process will continue until the temperature falls too low.

Mrs. Buxton—I wish all the farmers' wives who have not canned vegetables would try it this summer. I am going to try canning asparagus this year. Asparagus is one of our very nicest vegetables and spinach is very nice.

A Lady—I have canned asparagus for three years. It is not like you get it from the garden, but it is very nice.

Mrs. Buxton—This can of beans was broken on the way here. They have been canned for two years.

Question—What kind of soil do you have where you plant your asparagus? Sandy loam?

Mrs. Buxton—Yes.

Question—Do you think on a heavy clay soil it is hard to get it to grow?

Mrs. Buxton—No, I do not, if the bed is properly prepared.

Question—Do you put any salt in your beans and corn?

Mrs. Buxton—No, I know people put salt in tomatoes, but I never put salt in anything; I think they will keep perfectly without it.

A Lady—I can peas and beans and I have found it was not necessary to cook them so long. I cook them just as though I was preparing them for the table, then boil them for one-half or three-quarters of an hour, and then do them as you do them.

Mrs. Buxton—I think it is better to be on the safe side. I would not advise anybody to do that who is canning vegetables for the first time. It is better to boil them in the boiler for two and one-half hours.

Question—Do you use hot or cold water for boiling?

Mrs. Buxton—I use cold water.

HOME SANITATION AND NURSING.

Mrs. Norah E. R. Perkins, Milwaukee, Wis.

Believing health nursing to be more important than disease nursing, we will spend the time allotted to our subject in discussing some of the agents that are the most helpful in the preservation of health within the home. God, in His goodness, has placed at our doors three of the most important, namely: sun, air and water, and they are absolutely free, without money and without price. therefore, if we fail to appropriate such gifts as Providence has placed at our disposal, we have no one to blame but ourselves.

To make home the abiding place of health, let us first provide the house with plenty of light, pure air, dryness and sunshine. Sunlight from without has an invariable tendency to produce sunshine within and as a germicide there is none better, for sunlight is Nature's own remedy. Pure, fresh air is a very important factor in home sanitation and goes a long way in the everyday disinfection of the house, even helping to dispel sad thoughts, doubts, fears and gloom. Every dwelling ought to be so situated as to insure a free circulation of air and a thorough system of drainage. Dampness coming from beneath or surrounding a house is a source of great danger and gives rise to consumption, malaria, rheumatics and kindred maladies. Every room within the house should have an interior flushing of air daily.

Thorough ventilation is just as essential in winter as summer, despite

the cold and the fact that the thermometer is frequently registered below zero. Wonder if any of you ever visited in a home where the atmosphere was such you could scarcely endure a stay of fifteen minutes or half an hour, and yet the occupants of that same house had become so used to the impure air they were utterly unaware of its disagreeable nature. How often have we been annoyed in church by a neighbor whose clothes were so strongly perfumed with the odor of burnt meat, onions, sauerkraut and sour potatoes that we failed to hear more than one-half of the sermon, secretly wishing in our heart all the while that certain folk could understand that cleanliness is a part of Godliness.

Foul smells and gases arise from many causes. Sewer gas is a most pernicious source of impurity. The decay of vegetable or animal matter, overcrowding in sleeping-rooms, emanations from the surface of the body, unwashed laundry, gas jets, coal stoves, kerosene lamps and flowers, beautiful as they are, throw off carbonic acid gas at night and therefore should never be left in a sleeping-room at night.

The kitchen, living-room and especially the bedchamber ought to be large, airy and well ventilated. No one should sleep in a closed room. Have the windows open from the top all the time, summer and winter, sick or well. If necessary, put hot water bottles or bricks to the feet, a cap on your head, use extra covering on the bed, but if you value your health keep plenty of ogygen and fresh air in the room while you sleep. And never wear at night clothing worn during the day. If the night-robe is not sufficiently warm and you must wear under-garments, be sure to have an extra suit for changing at night. Eight hours out of every twenty-four are given to sleep, thus enabling the body to gain strength and vitality for the duties of the coming day. If this time is spent in a closed room, where we breathe over the same atmosphere, sleep will be stupor, rest will be wear, and the poisonous air inhaled through nostrils (for we ought never to breathe through the mouth) into the lungs will impoverish rather than make good blood and the system will gradually be torn down instead of built up.

But what of the invalid parent of advanced years who refuses to submit to this fresh air treatment at night? For such, we recommend that a bowl or pitcher containing clean, cold water be placed upon a chair or table within their room; the water will absorb much of the impurity, but do not forget the pitcher or bowl must be washed daily and filled with clean, cold water every night.

For health's sake, the sleeping-room must have a very thorough airing every day. All bed-clothing, including pillows and mattresses, should be put out upon the line just as often as time, strength and the weather will permit. But don't you try to lift one of those great, big, cumbersome mattresses alone; ask the good husband, the kind brother or the dutiful son to "lend a hand" and Nature will repay the favor with sweet, refreshing sleep.

For testing the purity of the atmosphere within a room, stand for a moment outside the door, inhale three or more breaths of pure ozone, if, on returning to room the air is heavy and oppresses, ventilation is necessary. Open the door or the window and exchange the impure for wholesome air.

Absolute cleanliness is the great essential to good health. To neglect an efficient use of water is no doubt one of the most potent and prolific causes of disease. The first and sacred duty of every human being is to attend regularly and thoroughly to the cleansing of the entire body and thus far no better way can be suggested

than by the free application of soap with plenty of water. Of course no general rule can be given for the bath; much depends upon the convenience of the house and the state of health of the individual bathing. Some physicians recommend, for the ordinary person, a daily bath. We advise at least a weekly bath for cleansing. A strong, robust man or woman will be greatly benefited by a cold sponge bath before breakfast. Cold hardens the flesh and gives tone to the system; heat expands and softens. Hot baths should be taken only at bedtime and if the bather does not retire immediately every precaution must be taken to avoid drafts and cold.

Perspiration brings to the surface of the body many impurities, consequently a bath after perspiring is necessary to keep the body clean and pure. During the twenty-four hours of our natural day, the body is throwing off three pints of refuse water, almost half of this poisonous waste goes out through the millions of secretory glands in the skin. These glands become clogged up and need to be washed thoroughly to make the blood go through the arteries and veins of the skin the same as it does the other parts of the body. The use of the daily and weekly bath is not only conducive to health, but it prevents disease by aiding digestion, helps to regulate the bowels and is invaluable as a sanitary measure.

Need I say in passing that all underclothing should be changed weekly; socks and stockings every two or three days.

For health's sake, all household furnishings must be kept free from dirt. The corners as well as the center of floor should be scrupulously clean. The sanitation of kitchen, pantry, storeroom, sleeping-room, bath and garret are of far greater importance than the style and beauty of drawing-room, library or parlor.

We believe delicious cookery will fail of its reward unless served in clean dishes on immaculate linen. All dishes, including glasses, silverware, cooking utensils, milk cans and butter crocks, need to be very carefully washed with clean cloth (brush is no doubt best for milk cans), rinsed in clean water and dried on a clean towel. From Miss Clift and Miss Sater we learn that if one would be an artist and excel in cookery, it is necessary to understand the composition of foods. To be a good housewife, we maintain it is necessary to understand the art of careful dishwashing and the complete sanitation of every department of work within the house. Home has been most beautifully termed "Heaven here below;" imagine a heavenly place swept once a month, dusted semi-occasionally, bed linen changed once in three or four weeks to save washing and the house aired as often as we do our annual cleaning. Uncleanliness is without doubt inexcusable at any time in any place, but where illness is concerned it is absolutely criminal and ought to be so declared by a law in every state. Perhaps it would be well to remark in this connection that the speaker has kept house years enough to know that even in a well regulated, sanitary home it is possible for the housewife to go from morn till night with the broom and dustpan in one hand and a dust towel in the other and always find something to do. In every home there are two kinds of dirt, clean dirt and dirty dirt. We refer to the latter and believe every good housewife can distinguish between the two.

In discussing this topic of "Home Sanitation" at the Cooking Schools this winter, we have occasionally been asked this question: "How can we keep the house in this cleanly way, we who have so much to do?" We answer, by systematic endeavor

each day, with "a place for everything and everything in its place," not emphasizing this motto in the extreme sense, for home must always be homelike, in other words, allow disorderly order to prevail, thoroughness in doing all things worth while, for "whatever is worth doing is worth doing well." Let each and every member of the household do his or her part, not leaving all for mother's one pair of hands to do. The home, the work is ours, not mine or thine.

Mothers, tell your daughters that true education and the most splendid accomplishment are best displayed in right home-making and proper housekeeping. Pity not the girl who feels chagrined because she cannot master music, art or the several languages, but rather pity her who cannot make a loaf of bread, keep clean a room or darn a pair of socks. Essentials first, if you please, and then the higher education, in which we most heartily believe.

Fathers, as well as mothers, should teach the boys and girls the value of a happy, useful life, and that the sanitation of mind and heart are essential to good health and right living, for in the old Book we read, "As a man thinketh in his heart so is he." Clean thoughts, pure hearts, honesty of purpose are the three graces that make most for happiness in this life.

We have borrowed from the Massachusetts State Board of Health a few suggestions concerning the teaching of children.

For health's sake, teach the children not to spit, it is seldom necessary; to expectorate on slate, floor, sidewalk or in a handkerchief is an abomination. Not to put fingers in the mouth, or clean the nose without the aid of a handkerchief. Never to wet the fingers with saliva in turning the leaves of a book. Not to put money, pencils, or anything in the mouth except clean food, pure drink and the tooth brush. Never to swap apple cores, candy, chewing gum, half-eaten feed, whistles or bean blowers. To wash hands and face often, especially before breakfast, and not to forget to comb the hair. To turn the face when sneezing or coughing, especially at the table, and when conversing with another. Tell them diseases that kill children and disable others are often taken through the mouth. That disease germs apparently not affecting one person may be transmitted to another, producing terrible suffering and often ending in death.

From the medical world we learn that the majority of all diseases that afflict mankind today are infectious and sanitarians tell us that nearly all of these diseases, including the two most dreaded—consumption and pneumonia—could be prevented if we would judiciously follow sanitary rules. Many of the most terrible diseases (and by the way tuberculosis is not the only plague to be feared) are communicated through the public washroom and toilet, wearing borrowed clothes, occupying unclean beds, using cracked cups, unclean silver, breathing germ-ladened breath by promiscious kissing, and the public drinking cup. A recent examination by a miscroscope of a public drinking cup revealed the startling fact that the cup was literally lined with dead skins from the mouths of those who had used the cup and the cells composing the skin were swarming with disease germs, many of which were more or less dangerous.

Epidemics and the spread of disease are due to carelessness and uncleanliness. All secretions in handkerchiefs of persons afflicted with nasal, bronchial or pulmonary diseases should be carefully watched. Consumption is usually spread by failure to destroy the sputum of tubercular patients. All such sputum contains millions of tubercular bacilli and when dry they cling

to dust atoms, which, when inhaled by persons susceptible, produce disease. Therefore all clothing saturated with tubercular sputum should be burned.

You will pardon the reiteration of a former statement, the emphasis of which is important to adult as well as child. Never expectorate in a handkerchief. If needed, supply little squares of cloth and immediately burn after using.

We have many more things to say, but time forbids. Summing up in a thought, if we would prevent disease and enjoy health (the poor man's best capital), let us insist in having clean food, properly cooked, pure water, clean clothes, a sanitary home, with large, oft-repeated doses of fresh air and sunshine. Thus we shall be happy and by Divine Grace help to make the world a little better as we journey on our way.

DISCUSSION.

Question—Would you advise the one who wishes to take a cold bath in the morning to begin with cold water, or just lukewarm water to begin with?

Mrs. Perkins—That depends on the individual entirely. Some people can stand the cold water; others cannot. One could begin with lukewarm water and gradually decrease it until it becomes cold.

DIET IN TUBERCULOSIS.

Miss I. Adella Sater, Orfordville, Wis.

Osler says: "The cure of tuberculosis is a question of nutrition. Digestion and assimilation control the situation, make the patient grow fat, and the local disease may be left to care for itself. This is the foundation upon which the modern treatment of consumption rests."

Since the treatment of tuberculosis is a question of nutrition, and since it is a recognized fact that no medicine or germicide can take the place of nutritious food as a factor in recovery, is it not essential and of the greatest importance that there should be the same degree of intelligence at work on the food problem (and the proper education required for this branch of the treatment) as for the medical treatment?

While nutritious food is recognized as essential in the treatment, not enough emphasis has been placed upon it, neither has it been prepared and prescribed as scientifically as possible. In this treatment the dietitian, or the person who prepares food, stands in the same relation to the physician as the pharmacist, in other words the dietitian is the pharmacist.

Ellen Richards says: "When the therapeutic value of food is more fully recognized there will be greater willingness to authorize the expense required in providing the best. If the surest means of securing immunity from attacks of disease is well nourished tissue, then the best handmaid of medicine is that nourishment that will be accepted by the tissues, and which thus aids in vanquishing the enemy which has already gained a foothold."

It may be set down as a positive fact, that the predisposing cause of tuberculosis, the condition under which the disease is able to obtain a foothold, is a lessening of the natural resisting powers, due to the fact that the nutritive processes are deficient.

Among the causes of such defective nutrition are under-feeding, defective feeding, improper preparation of the food, over-feeding, and the consequent gastric disturbances resulting therefrom, lack of fresh air. Believing, then, that nutrition plays such an important role in the acquirement of the disease, it follows that it is of still greater consequence in combating and "vanquishing the enemy which has already gained a foothold."

What is Food?

What is food? Anything which when taken into the body serves to build up the tissues, or to supply heat or energy. Definitions might be multiplied, but the one given will answer our purpose. A food, then, serves one or more of four purposes: To build up normal structure; to diminish the waste of tissue; to supply the waste of tissue; through combustion or oxidation to liberate energy. Any substance, therefore, which performs any one or more of these offices is a food. It may do it to a considerable extent and consequently have great food value, or it may do it to but a slight extent, and have but little food value. In order to know that any given article has great food value or not, a scientific knowledge of the composition, digestion, absorption and assimilation of food material is necessary.

The Selection of Food.

Taking up the four different food requirements as above outlined, it may be said with reference to the first, that in the absence of marked fever or other complication, especially of the digestive organs, most patients have sufficient appetite and digestive powers to maintain the general nutrition in a fairly satisfactory state. Under these circumstances, there is no warrant for interfering materially with an ordinary diet of well balanced mixed foods, provided that it be of good quality and well prepared.

When we consider the second and third propositions, presenting undue waste and supplying excessive tissue waste, we are confronted by a more serious problem as a rule; if a patient without much fever continues to waste, such a fact can oftenest be explained by diminished assimilation. The fatty tissues are consumed first, after which the muscles are attacked. With rest and open air, the diet in these cases becomes one of the greatest problems. We may have to build up muscle tissue as well as to simply add fat to the body. To this end all classes of food must be represented, and, as Harris says, the proteids should preponderate. That meat diet is important is easily seen from the fact that the pendulum has swung to the extreme of an almost exclusive meat diet. Certain others have seen in the egg the symbol of Life, and have established an almost equally exclusive egg diet. Milk has found equally enthusiastic adherents, and again it has been suggested that the salvation consisted in frequent ingestion, five or six meals a day. Frequency in meals and regularity in administration are undoubtedly of great consequence.

While it is well to cater to the patient's desires, and may be necessary to do so by giving them what their appetites suggest to a certain degree, still we must not lose sight of the fact that the food must contain the elements of nutrition in proper proportion.

The Preparation of Food.

Since the careful preparation of food is recognized to be of vital importance to the invalid, and especially to the tuberculous patient where so much depends upon the amount and quality of the food which can be as-

similated, the food should be prepared in such a manner that patients derive the greatest amount of nutrition from its consumption, and also in such a way as to make the least possible tax upon the digestive system.

The appetite must be encouraged in every way possible. It is not only essential that the food served be nutritious, wholesome and palatable, but also the service be dainty and aesthetic. Neatness and attractiveness go a long way toward making food palatable; therefore this should be taken advantage of. The appetite should be encouraged in every way possible. Sometimes an appeal through the senses brings about desired results; the sense of sight by having a well furnished dining room and tables artistically arranged, when possible decorated with flowers; to the sense of hearing by music; let the music be of such nature as to appeal to the patients, making them forget self and putting all into a happy frame of mind; to the sense of taste by having the food well prepared and daintily served; to the sense of smell by having well savored food.

In selecting a menu, monotony must be avoided. My experience has been that a higher standard of efficiency is attained and maintained by a variety of food, a change being made from one kind of meat to another, from one kind of vegetable to another, always, however, giving the body the food stuffs in proper proportions to supply its demands. Every meal, therefore, must be the result of the concurrence of all kinds of practical and scientific considerations.

It is not enough that the different classes of foods are represented, but the proportion of the ingredients must be proper. It is quite possible that any given food may have all the required constituents, but there may be too much of one and too little of another. Lack of one nutritive constituent is probably commoner that a deficiency of all, or, in other words, an ill-balanced diet is more frequently met than one which is deficient all around.

The conclusion must be that a mixed and well balanced diet is the proper basis for feeding. For the nitrogenus supply we must rely upon meat, eggs, milk and leguminous plants. Carbohydrates furnish heat and energy, vegetables and fruits are served in sufficient amount to keep the diet well balanced.

Fat seems to be of special value in the diet of phthisis, but frequently we find that fats are very obnoxious and repulsive to tubercular patients, but by giving them the more easily digested forms, such as cream, butter, bacon and nuts, and combining them with other foods in such a manner that they do not realize that they are getting fats, we have no difficulty in persuading them to take a sufficient amount. Cakes and pies are omitted from the dietary.

The appetite is no reliable criterion as to the amount of food that may be taken and digested by the patient. If the digestive organs are not impaired, there is as a rule no difficulty in getting the patient to gain in weight. The tuberculous individual who has a poor appetite or a disgust for food, can usually digest much more food than he is willing to eat. His digestive powers are much better than his appetite would indicate, and it is especially surprising how much food can be taken and digested by one who spends the greater portion of his time in the open air, even though not exercising.

At the Ottawa Tent Colony, each patient is expected to take daily from one to three quarts of milk and from six to twelve raw eggs in addition to three regular meals.

Some Samples of a Balanced Ration.

The following sample menus will illustrate the composition and balance of ration composing the meals:

Breakfast, 7:30—Oranges, oatmeal and cream, beefsteak and potatoes, bread and butter, graham gems, milk, coffee.

Lunch, 10:00—Milk, raw eggs, nuts.

Dinner, 12:00—Roast beef, potatoes, cream corn, buttered peas, olives, rice and dates with whipped cream, milk.

Lunch, 3:00—Same as above.

Supper, 5:30—Oyster stew, baked potato, egg souffle, fruit, tea, milk.

Lunch, 8:00—Milk, raw eggs, nuts, fruit.

Some Results of Proper Feeding.

The following are some of the gains in weight, which may be accepted as one of the most marked evidences of improvement. One far advanced case, whose weight on admission was eighty-four pounds, gained thirty pounds in 140 days. Another of the same class, whose weight on admission was 103 pounds, gained twenty-four pounds in eighty-five days; another incipient case, thirteen pounds in twenty-one days; a second stage case, ten pounds in ten days; another, sixteen pounds in twenty-eight days. It is nothing unusual for patients who are doing well to gain from three to six pounds a week during earlier part of the treatment.

The principles of food reform are basic and fundamental to all physical, mental and moral progress. This statement may seem an exaggeration, but it is based upon the physiologic fact that our bodies are made up of what we eat. Both structure and function are dependent upon nutrition. It is gratifying to know that not only physicians and intelligent laymen, but even military and governmental authorities are giving increasing attention to questions of nutrition as related to various phases of human welfare.

It has been said that hygiene and diet are the foundation stones upon which may be constructed successful therapeutics in the cure of tuberculosis. These are not the only factors in the restoration, but they are so much and embrace so much that without them our best efforts avail nothing. This assertion has been made that "without special care in hygiene and diet there is no cure for the tubercular, but with this care all things are possible."

DISCUSSION.

Question—Do you not have to take the individual patient into consideration in diet for tuberculosis?

Miss Sater—Yes, to a great extent. The physician prescribes and the nurse sees that the patient takes the food that is prescribed. In complications, diet must become more of a study.

Question—Should the dishes used by a tubercular patient be washed separate from those used by the other members of the family?

Miss Sater—Yes; the patient's dishes should be sterilized.

Question—How do you prepare the raw egg for different patients?

Miss Sater—They may be given in form of an egg nog, but better still taking the whole egg, perhaps with a sprinkle of salt and covered with milk, or in grape juice, but better plain, and can be done quite easily after a little practice and is not disagreeable.

Question—Is there any danger in a patient coughing?

Miss Sater—Yes, and that is why they are cautioned so in regard to coughing, and to cover the mouth so as to prevent the escape of any particles of saliva.

Question—Another thing, were the

patients supposed to sleep outside all the time?

Miss Sater—In our sanitorium, patients slept in tents summer and winter.

Question—Should the patient use the same towel and soap that other people do?

Miss Sater—No; I do not think that a wise practice for well people.

Mrs. Buxton—I have a towel for every member of the family. I find the little people wash cleaner when they have their own towel, because they do not want to have any one say that their towel is dirtier than the rest, and it is economical in washing.

Question—Do you think after the disease has become thoroughly established that it can be cured? It has been very hopeless in our family.

Miss Sater—An early diagnosis means much to the patient in this respect.

The Lady—My brother-in-law took a three months' treatment at a sanitorium, but finally ended his days in Colorado. Another case went through with the same treatment and went to New Mexico finally, so it seems as though there was no help anywhere.

Miss Sater—I know that is the case in a great many instances, but some are benefited. It was at one time considered that there was absolutely no hope, but now it has been demonstrated that even the third stage patients have been cured, although there is not the hope for a third stage patient that there is for an incipient case.

Supt. McKerrow—I do not know but the breeders of cattle are leading the human family in finding out the disease. I read just the other day that a very prominent London physician stated that a chicken could get tuberculosis from running around in a field and tuberculosis germs were found in the eggs. He found that the disease germs were carried in the eggs. Why could it not be so if the germs can be carried from a tubercular cow through the milk?

Mrs. Buxton—I have read so many times that if the Women's Clubs would take up this subject of tuberculosis and talk fresh air to the members of their clubs and everywhere wherever they could that there would not only be less danger of the disease, but the death rate would be lessened so much and the danger of tuberculosis would be lessened so much. If every one would sleep with open windows there would be less tuberculosis.

Question—If not to stamp out tuberculosis, if the people would open their windows they would be more immune from tuberculosis, would they not?

Miss Sater—It would be a great help in that line. Keep the body strong so as to resist these germs, and to keep up to standard we must have plenty of fresh air, good, nutritious food and exercise.

Question—I heard you answer a question in regard to the cure of the disease. Now, do you not think, from the last remarks you made, that the disease is not cured in these cases, it is not cured, it is only held back?

Miss Sater—I think there are cases that have been cured.

Supt. McKerrow—You see in the human family they do not kill the people to find out whether it has worked well or not. At Ottawa they have been experimenting with a family of cattle and they have made several post-mortems, and while the disease has been held back they respond to the tuberculin test, but they have the fresh air treatment, they are getting better as a family, because the young ones are growing up healthy without the germs getting into the system, and applying that to the

human family it would lead me to the view that they are simply holding back the disease for a length of time.

Mrs. Perkins—In discussing fresh air as a remedy and a preventive for tuberculosis, do they not advise it as a preventive for other contagious diseases?

Miss Sater—Yes.

Mrs. Gilman—I would like to speak for the ladies of Mondovi. I am sure we have all been greatly benefited by what we have heard during the past three days and I want to ask the ladies of Mondovi to express their thanks to these ladies by a rising vote.

A rising vote of thanks was unanimously given and the session adjourned.

APPENDIX.

ABSTRACT OF LAWS OF INTEREST TO FARMERS, 1909.

Compiled by Hon. Charles E. Estabrook.

Fences, Removal of.—No person shall be required to move a fence between the fifteenth day of May and the first day of October in any year. This is an amendment of Section 1284 of the Statutes, changing the time from April first to May fifteenth, and from November first to October first.—Chap. 57, 1909.

Highway, Obstructions.—Any person who shall obstruct any public highway by a ditch, humps, earth, logs, stones, nails, glass or other material, etc., or who shall obstruct any ditch for draining water from the highway, shall be guilty of a misdemeanor. The superintendent of highways must remove any such obstruction after written notice.—Chap. 143, 1909

Highways, Nuisance on.—It shall be the duty of the town board to make rules prohibiting the throwing on or along any public highway any dead animals, carrion, meat, fish, rubbish, ashes, paper, brick, tin cans, old iron, junk, boxes, barrels, and machinery, and to require the removal therefrom.—Chap. 149, 1909.

Highways, Bonds for Roads.—The electors at a town meeting may authorize the town board to issue and negotiate bonds of the town, not exceeding five thousand dollars in the aggregate, for the purpose of building roads. This law amends subdivision 7 of Section 776 of the Statutes.—Chap. 243, 1909.

Highways, Road Drag.—The town board is authorized to have earth roads dragged with a split log-drag or other similar drag, whenever deemed beneficial to have such work done; may contract to have a given piece of road dragged at a rate not exceeding seventy-five cents per mile for each time dragged, the width not to be less than twenty feet, if width of roadway will permit. It shall be unlawful to place loose earth, weeds, sods or other matter on the portion of the road which has been dragged so as to interfere with the free flow of water from the dragged portion of the road.—Chap. 284, 1909.

Highways, Collection of Taxes.—The following is added to Section 1521 of the Statutes, relating to the collection of highway taxes.

"When any person or persons shall be liable to pay his or their highway taxes in money as provided in this section the town board may direct the superintendent of the highway district to employ some other competent person or persons to do the work under the direction of the superintendent. The superintendent shall furnish each of the persons so employed with a certificate showing the amount due him for services which shall be audited and paid the same as other claims against the town are audited and paid. The amount of money which may be so expended upon the highways in any one year shall not exceed the amount of

highway taxes liable to be paid in money in that year."—Chap. 389, 1909.

Seeds: Impurities, etc.—Sixteen sections are added to the Statutes on this general subject. Section one provides that no seed in packages exceeding one pound in weight shall be offered for sale or distribution unless the same have plainly written or printed thereon in the English language the following:

1. Name and kind of seed.
2. Full name and address of seedsman, importer, agent or dealer.
3. Statement of purity of seed.
4. Germinating power of seed.
5. Locality where seed was grown, if known.

Agricultural Seeds.—Under this act includes red, white and alsike clover, alfalfa, timothy, orchard grass, Kentucky blue grass, red top, bromis inermis, oat grass, rye grass, the fescues, the millets, other grass and forage plant seeds, flax, rape and cereals.

Then follow several sections fixing the standard of purity too lengthy to be included here. Enforcement of this act is placed with the experiment station under supervision of the director.

Tests: "The results of all tests of seed made by the experiment station shall be published in bulletins of the station, together with the names and post office address of the persons, firms or corporations from whom all samples tested were obtained."

A fee of twenty-five cents shall be collected for each sample of seed tested.—Chap. 173, 1909.

For further information on this subject apply to the Experiment Station, Madison, Wis.

Schools, Sites on Highways.—Section 477 of the statutes, relating to the location and purchase of school house sites, is amended by adding thereto the following:

"* * * Provided that every such school house site obtained by purchase or grant shall be located and established abutting on a public highway or street, and that no school house hereafter to be erected shall be erected on any site unless such site abuts on a public highway or street."—Chap. 171, 1909.

Weeds, Noxious.—Quitch grass, known also as quack grass, is added to the list of noxious weeds enumerated in Section 1480 of the Statutes.—Chap. 146, 1909.

See as to place of filing the oath of office of weed commissioner.—Chap 100, 1909.

Wood-Lot.—Subdivision 12m is added to Section 776 of the Statutes, and provides that the electors at town meeting may vote:

"To authorize the town board to acquire by purchase or otherwise a sufficient tract of land to use and maintain as a wood-lot and to preserve and re-forest the same under regulations approved by the state board of forestry."—Chap. 77, 1909.

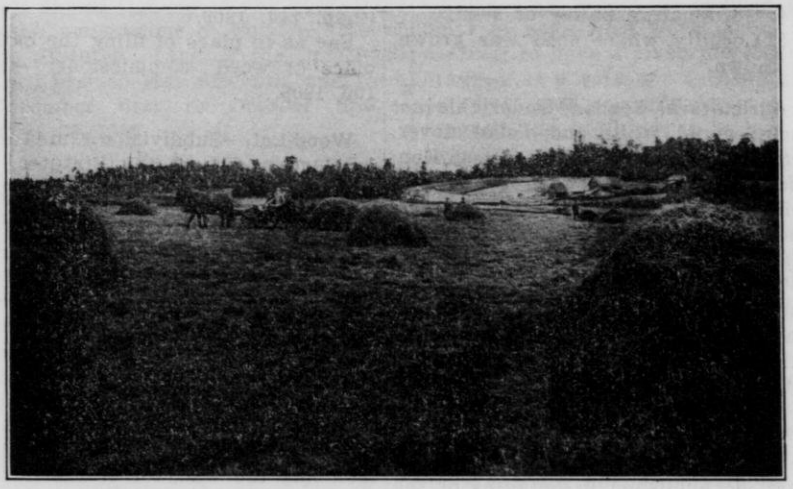
The compiler of this synopsis is the author of this statute. He well remembers the wood-lot of the farmers of years gone by. This law was suggested from the knowledge of the communal forests of France and Germany and the belief that many pieces of waste land in many of the towns of southwestern Wisconsin and the central part of the state could be utilized for the purposes herein authorized should the people in the town meeting exercise the power granted to re-forest the waste land in such towns. For information on the subject of forestry address State Forester, Madison, Wis.

WISCONSIN'S HOMEMAKING OPPORTUNITIES.

A. D. Campbell, Commissioner of Immigration.

Millions of Acres of Fertile Lands yet Undeveloped—Wisconsin Opportunities for Wisconsin People.

That there still remains unsettled at least 10,000,000 of acres of fertile land in the northern part of Wisconsin is a fact that has been demonstrated at the scores of settlements prevailing at the villages on the many lines of railway that traverse the upper counties. The present unoccupied condition of nearly all of the counties of the northern half of the state is owing principally to three causes: 1. So much of the land has been held by lumber companies until such time as the saw logs could be removed that no effective effort has until recently been made to secure settlers; 2. Because until recently the fertility of the soil had not been sufficiently demonstrated at enough points to convince homeseekers that this area is suited to farming; 3. Because the immense advertising campaigns by Canadian and western people have so engrossed the attention of homeseekers as to cause them to pass Wisconsin without knowledge of our opportunities. However, during the last couple of years large numbers of people have purchased land in the northern counties upon which to make homes. It is apparent that the number of settlers will increase from year to year.



Hay on a reclaimed north Wisconsin swamp.

In preparing this article I have no desire either to persuade or dissuade—to overpaint Wisconsin's opportunities, nor to minimize opportunities prevailing elsewhere. I chose northern Wisconsin after long and patient study of the present and probable future of all

areas of cheap or undeveloped lands and several years of study and observation in private and official capacity have convinced me more firmly that Wisconsin's undeveloped opportunities are unsurpassed if not unequalled anywhere.

The Wisconsin man desirous of securing a new home has a choice of several propositions:

Crop of north Wisconsin hay.

1. He may buy a high priced farm and go heavily into debt, which he will hesitate to do.

2. He may go to distant points on the western plains and undertake the methods known as "dry farming," which the Government Yearbook advises him not to do unless he can buy, stock and equip a section or more of land and have a reserve fund.

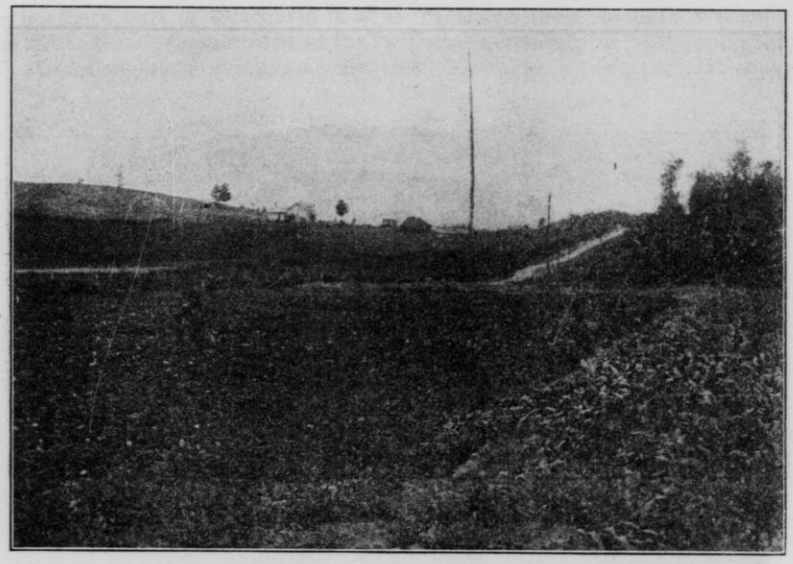
3. He may renounce his home country and go to foreign lands.

4. He may go into the hardwood timber belt that extends across northern Wisconsin, lapping over into Michigan on one side and Minnesota on the other.

And what will he find there? He will first be impressed with the splendid ozone-laden atmosphere that is such a relief to people with bronchial troubles and hay fever as to have attracted great attention. He will enjoy the clear, pure, soft water and note the pride taken in good roads and schools. If he is away from settlements he will wonder how clover and timothy came to grow where no man appears ever to have been. If in the berry season, he will be astounded with the abundance of raspberries and blackberries in the openings and blueberries and cranberries in the marshes that go to waste every year. He will see deer and other game in the woods and will be sure that rivers and lakes of such water as he finds must be filled with fish.

Upon inspection of farms in the settlements he will be impressed with the wonderfully green and productive pastures, the well filled haymows and the fine dairy cows, and will be impressed with their healthful appear-

ance. He will be surprised to find cornfields and no less surprised at the quality as well as quantity of the potatoes and root crops. In some sections he will see immense crops of sugar beets, tobacco, clover seed, and he will be told that truck gardening can be carried on with handsome returns and that small fruit does wonderfully

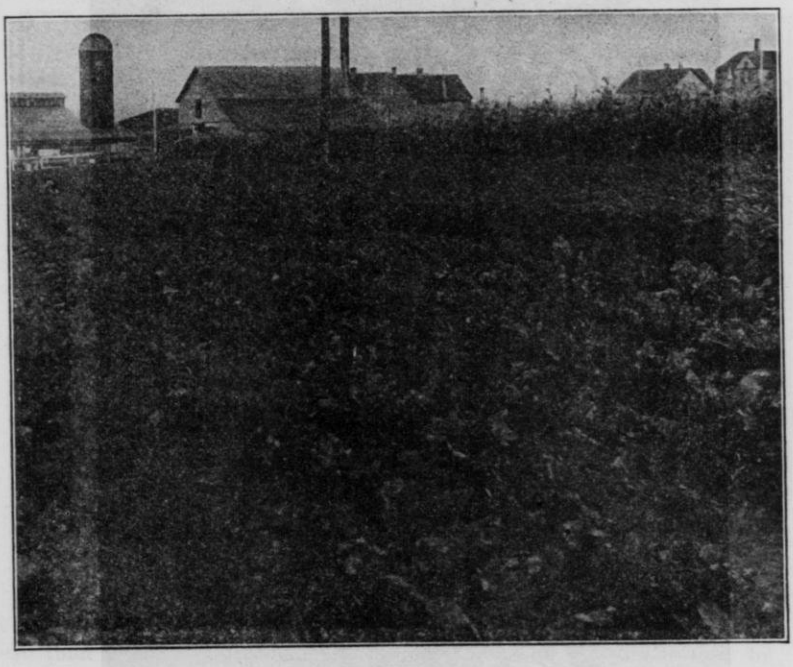


Farm view in north Wisconsin.

well—and he notes the great frequency of manufacturing towns that need these things. The fact that fuel and building material are at hand will not escape him. He sees settlers clearing more land while their crops are growing and learns that every piece of timber large enough for fuel has a value, and that while clearing the settlers are obtaining an income discounting that of the factory worker. He inquires of the settlers as to their experiences. They had but a few hundred dollars when they came. They have lived well and haven't overworked. Their clearings have grown, their herds have increased, and their lands have advanced in value. They have had no crop failures, no droughts, no hot winds, no cyclones and no floods. They have encountered none of the problems of the arts of dry farming or the science of irrigation agriculture—they have been confronted by neither the hazardous transportation of perishable products nor a fickle market beyond personal contact. Their market takes their produce at the highest price and supplies their wants at the lowest cost.

These cut-over hardwood lands may be purchased at a low price—generally at from $8 to $15 per acre on reasonable terms. The initial payment usually depends upon whether improvement is to be made at once—in such case a very small payment

will suffice. The cost of clearing varies greatly—but in any case is well repaid in the increased value of the land. Whether the settler clears his farm rapidly or slowly, he has an assured living—he can "work out" if he likes at any time—and has a home of which he can be an independent lord and master.



Experimental crops at Iron River.

What of the future? This area is specially suited to dairying and stock-raising. The clovers, alfalfa and peas thrive wonderfully and assure that these lands need never be lacking in nitrogen which is so essential in land. Clover plowed under adds humus. Barnyard manures furnish phosphorus and other essential ingredients. This assures continual fertility without heavy outlay for commercial fertilizers common to most sections. Settlers should construct silos as soon as possible, as northern Wisconsin corn makes wonderfully valuable silage, the form in which corn should be fed.

Throughout this great area are almost numberless magnificent water powers, the early development of which will be forced by the increasing cost of coal. Many are now developed and at each a prosperous manufacturing town is springing up. The process of harnessing these powers is continually going on. The effect of these industries, and the cities they are building, on the increased future value of farms in this section should be a matter of intense interest to homeseekers. The fact that improved farms in this partially settled area are held around $80 to $100 per acre is a suggestion of their

future worth when the country is fully developed industrially as well as agriculturally.

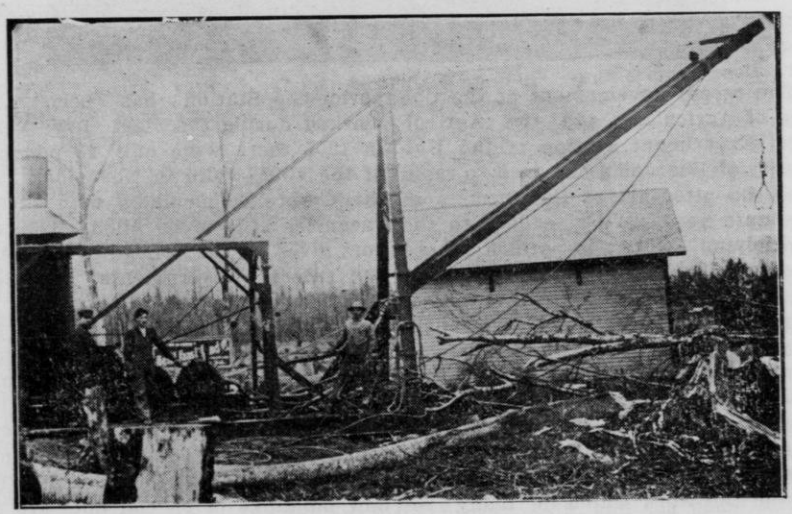
The writer of this article has no desire to minimize irrigation and dry farming as features in our agricultural activity—far from it, for both must be looked upon as finally necessary. But I believe them to be movements that should be prosecuted by men of experience, wide adaptability and, especially, of ample means. In this view I am supported by the experts of the federal agricultural department and, I believe, by all the essential elements of the situation. The men of means and experience and speculative instinct who go to those

A north Wisconsin cornfield.

distant points to win or lose in their efforts deserve the plaudits of all. Let them do it while people without expert ability or means to hazard are developing our fertile Wisconsin areas into fine farms, with beautiful homes.

The question which presents itself is simply this: Can Wisconsin people do better in the distant west or southwest than here at home in Wisconsin? While clearing our timber lands is not without its labor, its productiveness is a known quantity. It is not necessary to adopt new methods of agriculture nor to raise crops with which the Wisconsin farmer is unacquainted. Our markets are also known to be abundant and active. The question of future supply and demand does not enter into the equation here in the sense that it does in distant and isolated localities where a supply exceeding local demand means long distances to market.

The fact that our northern pastures outlast the hardwood stumps and modern machinery removes them speedily are material facts affecting the situation. When wild lands, costing $10 to $15 per acre, become worth $80 or more when improved it means that the labor of clearing is not by any means "Love's labor lost." Land that will grow abundant crops of clover, timothy, small grains, potatoes, root crops, sugar beets, corn that makes the finest of silage, peas in perfection, with pure water, cheap building material and fuel that costs only the labor of preparing it, with the best of schools and markets, certainly deserves the serious consideration of homeseekers.



One of the helps in rapidly clearing the new lands in northern Wisconsin. Machine built by the Faast Land Co., Eau Claire, Wis.

GROWTH OF THE COLLEGE OF AGRICULTURE AND EXPERIMENT STATION.

The recent development of the College of Agriculture and the Agricultural Experiment Station of the University of Wisconsin has been so rapid that the attention of the farmers of the state needs to be called to the multiplying ways in which these closely related institutions may be of aid to those engaged in practical farming. The state of Wisconsin may justly pride herself on having what is now one of the largest and best equipped institutions for agricultural education and research to be found anywhere in the country and this, in addition to the splendid history of the work which in many respects was pioneer effort, is a matter upon which the state may well be congratulated.

No such institution as this would have been built up had not the people of the state and particularly the farmers earnestly supported the institution in the legislature when funds were needed for development. The larger proportion of the credit for the building up of one of the leading state universities in the country is due to the farmer members of the state legislature who have always considered all investments in education for agriculture as profitable to the state.

Growth in Staff and Equipment.

The growth of the staff of workers of the College of Agriculture and Experiment Station has been quite marked during the last few years. In 1905 there were only 23 members of the staff, while in November, 1909, there were 60 members with several vacancies still to be filled. The support given to the college by the state and federal governments has been increased along with the growth in the working force. The state has been generous in its appropriations for buildings, four new structures being provided for during the last three years, in addition to extensive repairs, additions to the farm lands, live stock and other equipment. The new buildings of special note are the Animal Husbandry Pavilion, costing $75,000, completed this year, the Agricultural Engineering building costing $45,000 completed in 1908, the Agronomy building costing $30,000, completed in 1908, and the Horticultural building and green-houses still to be erected, which will cost about $60,000.

Growth of Instructional Work.

Courses of instruction have been extended to include the important phases of agriculture in which there is a demand for instruction by Wisconsin students. Several new departments of instruction have been inaugurated during the past year, viz.: Agricultural Economics, Agricultural Education, Poultry Husbandry, Plant Pathology and Agricultural Journal-

ism. The Department of Home Economics was transferred from the College of Letters and Science to the College of Agriculture and has been fully reorganized with a new staff.

The attendance on various courses in the College of Agriculture has shown a most remarkable growth during the last two years when the total increase has been over 100 per cent.

Previous to 1900 the enrollment in the four years course in agriculture did not exceed ten, except in one year and for 12 years ranged about ten students. A slow growth began in 1900 as follows:

1900–1901, students enrolled 24
1901–1902, students enrolled 21
1902–1903, students enrolled 36
1903–1904, students enrolled 60
1904–1905, students enrolled 87
1905–1906, students enrolled 143
1906–1907, students enrolled 150
1907–1908, students enrolled 160
1908–1909, students enrolled 250
1909–1910, students enrolled 324

The Middle Course, which was offered for the first time last year, started with an enrollment of 35, which has increased to over 60 this year. This makes the total enrollment for 1908–1909, 250, and for 1909–1910, 324.

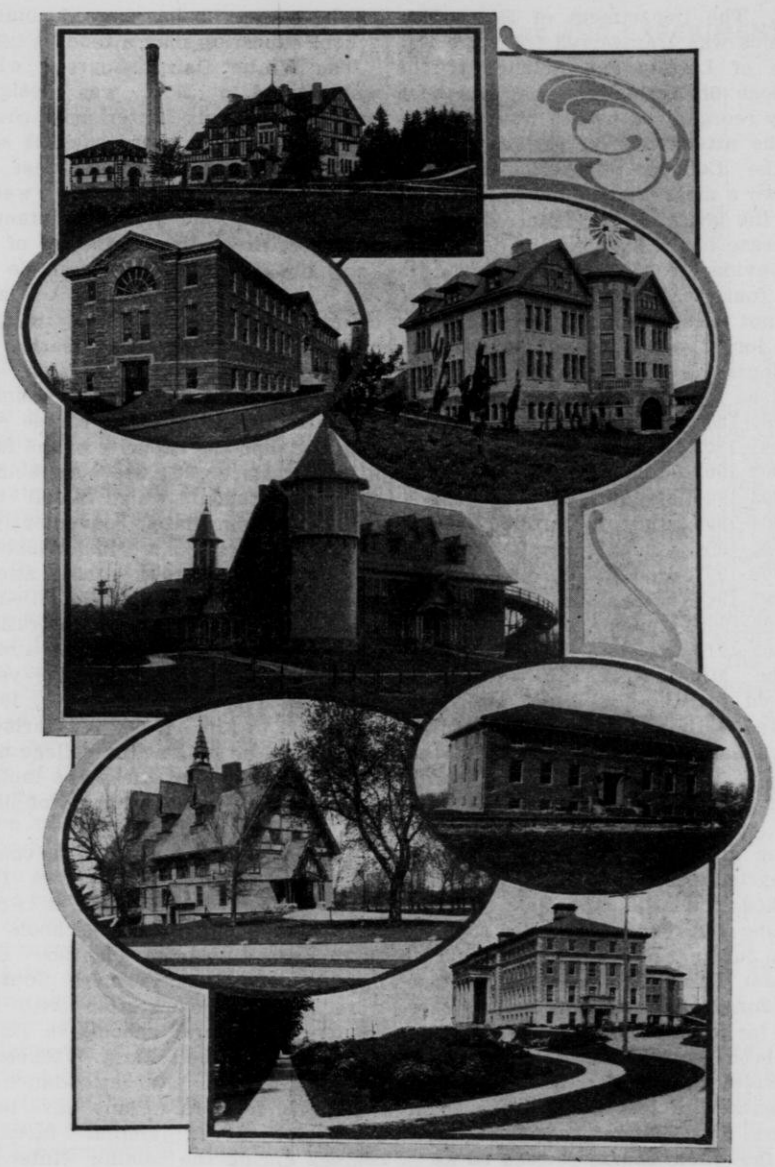
The growth in the Short Course in Agriculture has been especially marked, the attendance last year exceeding 460, which was over 60 more than during the previous year. This popular 14 weeks' course of instruction for young men who expect to return for practical work upon the farms has been reorganized so that more effective training can be given the students with less strain upon them. Several new subjects have been added and the whole course revised so as to turn out men with as wide a practical knowledge of scientific principles used in farming as may be given in two winter terms. This course opens early in December and any young man of the state who has a good common school education may attend.

The Winter Dairy Course, which was started in 1889, was designed primarily to train butter and cheese makers to render more efficient service in the creameries and cheese factories in the state. The 12 weeks' study during one term is intensely practical, the entire equipment of the dairy department being available to this class of students. A large creamery and cheese factory is operated upon a commercial basis the year round in order to furnish students adequate practical training. The attendance in this course has long equalled the capacity of the facilities and since 1903 has been held at about 150 students which is all that can be accommodated conveniently.

The Farmers' Course in Agriculture was first given in 1904 with an attendance of 175 farmers. The 10-days practical lectures and demonstrations proved so attractive that the attendance grew during the next five years from 227, 1905; 410, 1906; 601, 1907; 701, 1908, to 810, 1909. A Farmers' Course will be held at the college next February, 8–18, and the plans include an unusually strong program of practical topics.

The idea involved in this course proved so successful that in 1908 Farmers' Courses were held at two of the county agricultural schools in Dunn and Winnebago counties. During 1909 one week Farmers' Courses were held in co-operation with the county agricultural schools in Dunn, Marathon, Marinette and Winnebago counties with a total attendance of over 2,500 farmers. Plans have been made for seven similar farmers' courses during the coming winter.

The Women's Course in Home-Making held in connection with the Farmers' Course at Madison in 1909 attracted over 400 women who came to hear lectures and witness demon-



College of Agriculture Buildings.

Hiram Smith Hall (top); Agricultural Engineering and Soils-Horticulture; Dairy Barn (center); Horse Barn and Agronomy; Agricultural Hall (bottom).

strations on such subjects as cooking, home decoration, home nursing, textiles, etc. The Home Economics department will hold several such Women's Courses at farmers' courses in various parts of the state during the ensuing winter in addition to the course which will be held at Madison in February.

The Special Dairy Course for creamery and cheese factory operators and managers was offered for the first time in February, 1909, and some 50 students were enrolled. Experts on various phases of dairy manufacturing discussed the more important problems in connection with this business. This course will be held in February, 1910.

The Summer Dairy Course has given many students a chance to secure a practical knowledge of dairy manufac turing by ten weeks' study during the summer months.

Through all of the various courses the Wisconsin College of Agriculture has reached over 4,500 students during the past year with some kind of agricultural instruction. The dissemination of a better knowledge of the methods to be followed in agriculture on such scale as this cannot fail to be reflected in the agriculture of the state in increased returns combined with the conservation of present farm resources.

The Agricultural Extension Service.

The development of better methods in agriculture and the discovery of new facts as a result of experiments by the Experiment Station has awakened farmers to the need of applying this new information to secure the most profitable returns on their farms. This awakening of the farmers has expressed itself in a large number of calls upon the Agricultural College and Experiment Station to give aid in solving specific farm problems. While the primary function of an agricultural experiment station consists in conducting investigations to secure new knowledge it has come to be believed that it is equally important that such an institution should distribute the information gained so that it may be put to immediate beneficial use.

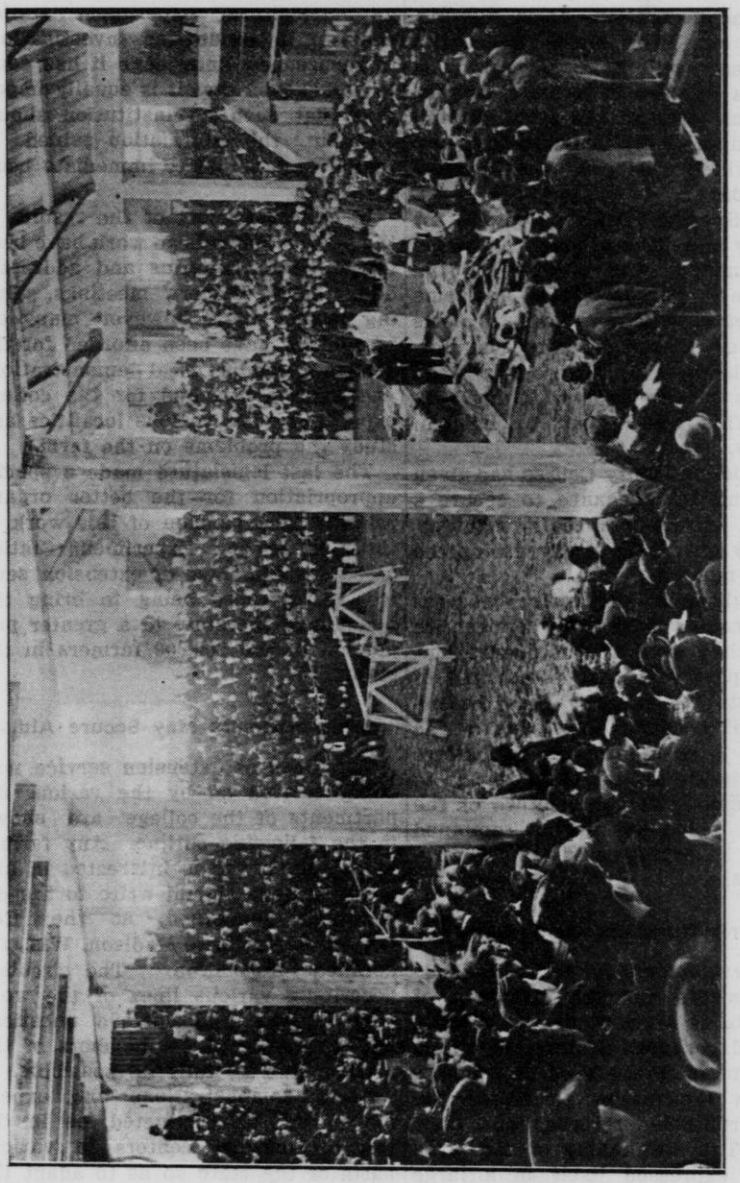
In the past, most of the results of the station and college work have been presented in bulletins and addresses delivered at farmers' meetings. During recent years, however, many opportunities have been afforded for the college to conduct local demonstrations and experiments and for the college experts to visit various localities and study the problems on the farm.

The last legislature made a special appropriation for the better organization and expansion of this work of the College and Experiment Station along various lines of extension service, the purpose being to bring the benefits of the state to a greater proportion of the 200,000 farmers in the state.

How Farmers May Secure Aid.

The lines of extension service now being carried on by the various departments of the college are shown in the following outline. Any farmer in the state who is interested in any of these lines should write to the department concerned, at the College of Agriculture, Madison, Wis., for detailed information. The circulars describing various lines of the work may be had and specific questions will be answered by members of the station staff as fully as possibble.

Local demonstrations and experiments will be conducted, as in the past, in certain centers in various parts of the state so as to adapt the work of the station to local conditions. Meetings will be held at points where such experiments are conducted to



Over 2000 farmers witnessing a tuberculosis **post-mortem** demonstration in the Livestock Pavilion at the College of Agriculture, during the Farmers' Course, 1909.

which farmers of the neighborhood may come for specific information.

Where local problems arise station experts will be sent to outline and conduct co-operative experiments in cases where such work seems justifiable. Advice on any topic connected with Wisconsin farming may be had by writing to the department of the station in charge of that subject.

Lines of Extension Service.

Agricultural Engineering:
- Farm building and construction.

Chemistry:
- Feed inspection,
- Fertilizer inspection,
- Dairy cow tests.

Dairying:
- Butter and cheese scoring exhibitions,
- Milk and cream testing,
- Starter distribution.

Horse Breeding:
- Stallion licensing.

Horticulture:
- Potato spraying demonstrations,
- Orchard spraying demonstrations,

Inspecting an alfalfa field at a Farmers' Demonstration Meeting on a county farm.

Agricultural Economics:
- Cost of producing farm products,
- Student employment bureau.

Agronomy:
- Pure seed dissemination,
- County and state farm tests,
- Young people's corn contests,
- Seed inspection,
- Weed control,
- Sub-station work with farm crops.

Animal Husbandry:
- Dairy cattle breeders' associations,
- Sheep and swine breeders' associations,
- Horse breeders' associations,
- Live stock judging.

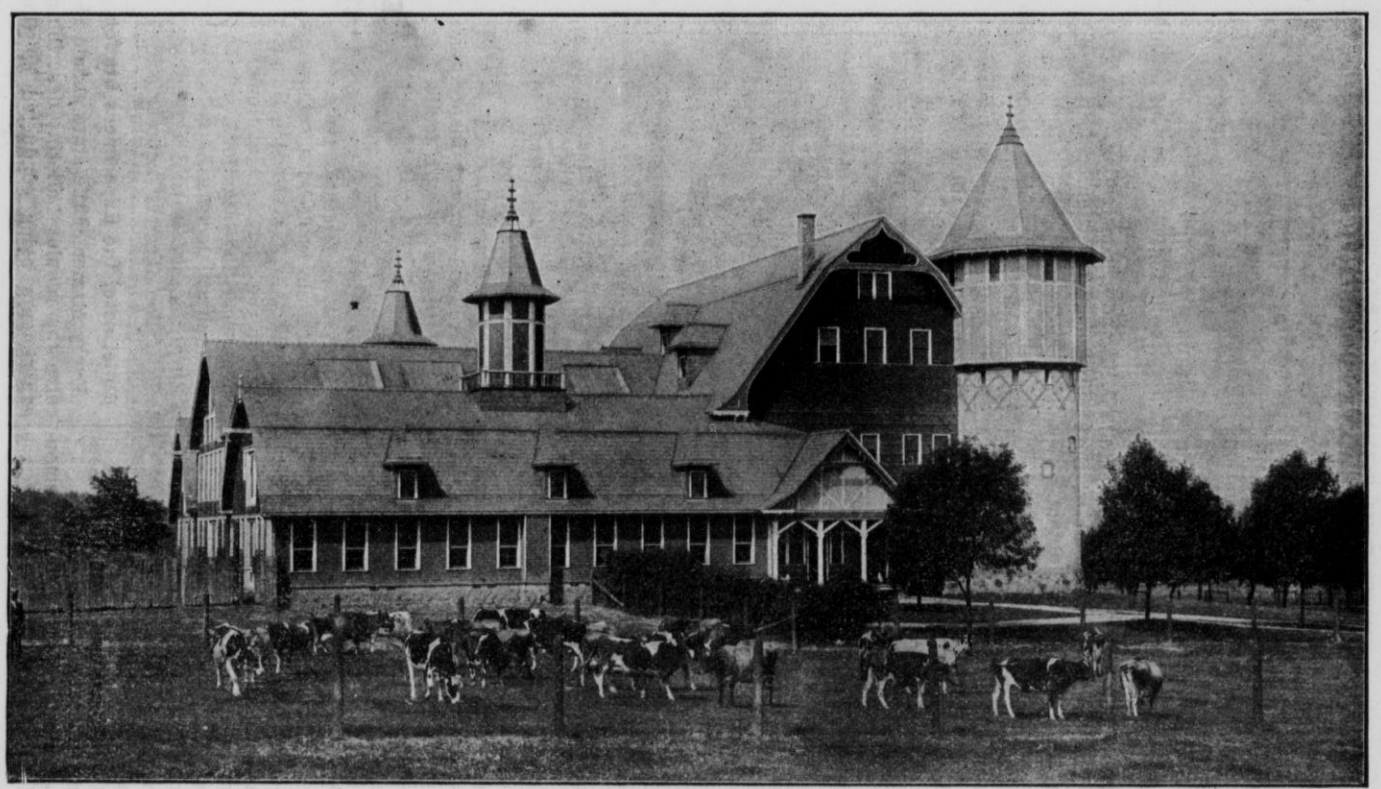
Bacteriology:
- Animal disease control,
- Tuberculosis post-mortem demonstrations,
- Tobacco seed distribution,
- Landscape gardening,
- Orchard and nursery inspection,
- Sub-station work with fruits.

Soils:
- Soil examinations,
- Drainage service,
- Co-operative fertilizer tests,
- Sub-station work with soils.

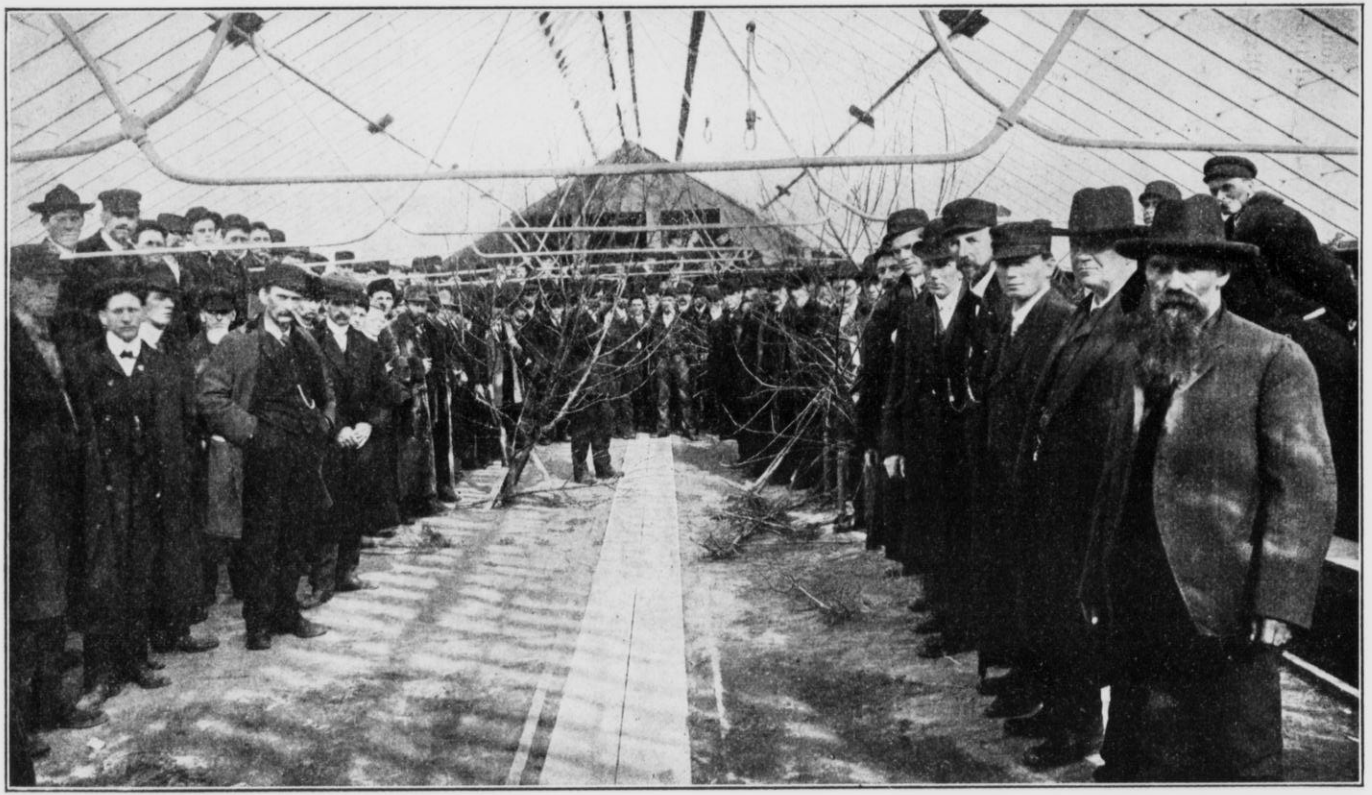
General Lines of Extension Service:
- Stump removal investigations,
- Cranberry investigations,
- Agricultural lectures,
- Rural and high school agriculture,
- Extension farmers' courses.

Bulletins of the Experiment Station.

Every farmer of the state should receive the regular bulletins describing experiments being conducted by the

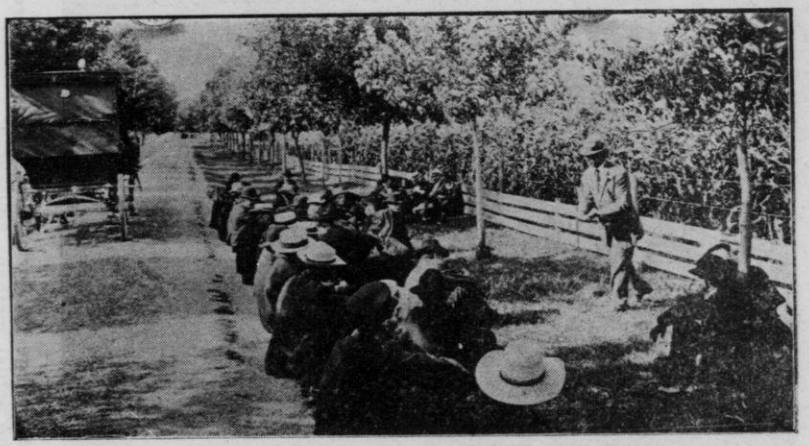


The dairy barn with its well lighted and equipped stables, silo and storage facilities furnishes adequate quarters for the dairy herd which includes representatives of the leading dairy breeds, kept for demonstration and breeding.



A lecture on pruning fruit trees at the Farmers' Course at the College of Agriculture. These lectures are presented with demonstrations which show the actual methods advocated.

station and giving the results of the same. These bulletins are sent free to residents of the state who are interested in agriculture, and names are placed upon the regular mailing list upon receipt of a request stating the line of farming followed. Such requests should be addressed to the Director, Wisconsin Agricultural Experiment Station, Madison, Wis.



A talk on corn culture at a Farmers' Demonstration Meeting on a country farm.

Recent Bulletins on Wisconsin Agriculture.

No. Title.

153, Portable Hog Houses.
158, Grade Stallion Situation in Wisconsin.
164, The King System of Ventilation.
166, Disinfection and Commercial Disinfectants.
168, Spraying Potatoes against Blight and the Potato Beetle.
173, Milking Machine Experiments.
174, Conservation of Phosphates on Wisconsin Farms.
175, Three Years' Campaign against Bovine Tuberculosis.
176, The Improvement of Wisconsin Tobacco through Seed Selection.
177, The Field Pea in Wisconsin.
179, Eradication of Farm Weeds with Iron Sulphate.
180, Fertilizers for Wisconsin Farms.

WISCONSIN FARMERS' INSTITUTES.

ORIGIN AND HISTORY.

Supt. George McKerrow, Madison, Wis.

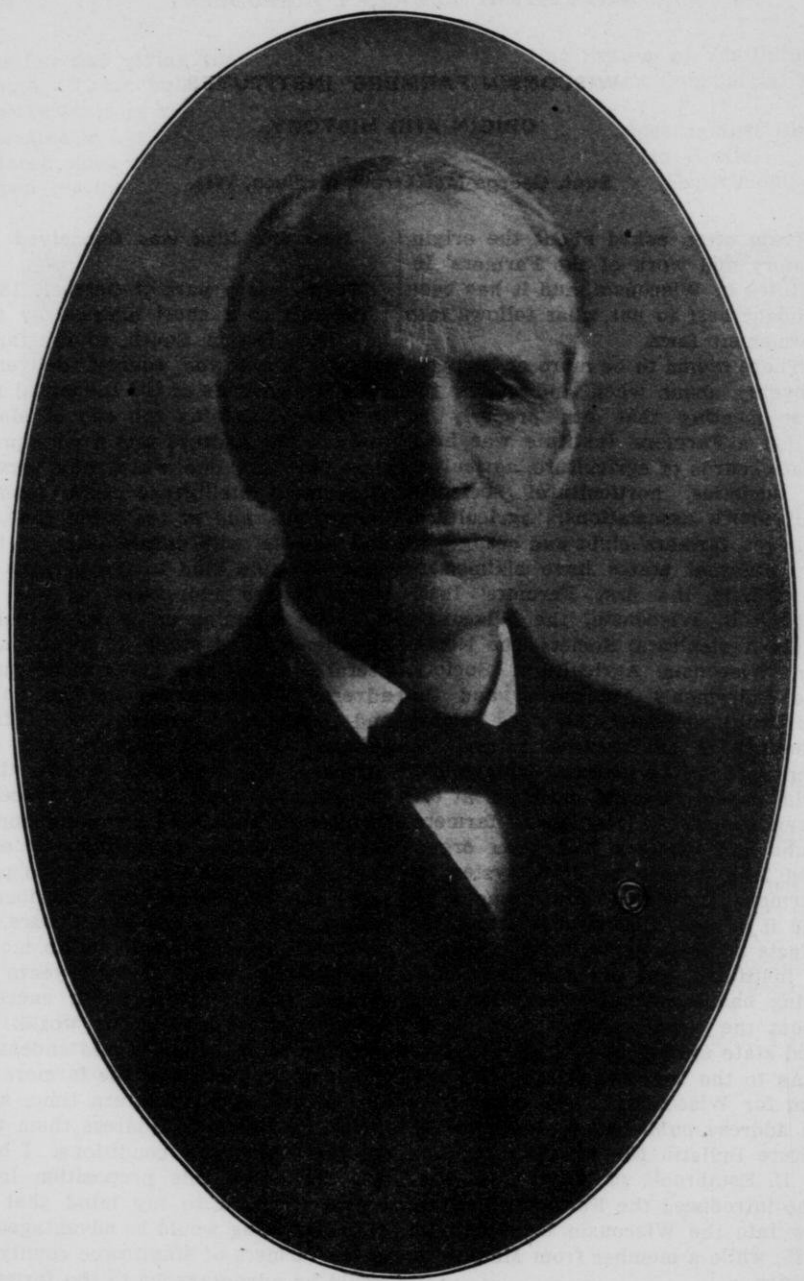
I am often asked about the origin, history and work of the Farmers' Institutes in Wisconsin, and it has been thought best to put what follows into permanent form.

There seems to be more or less controversy about when and where the first meeting that can properly be called a Farmers' Institute was held. State boards of agriculture, agricultural societies, horticultural societies, dairymen's associations, agricultural colleges, farmers' clubs and granges in the different states have claimed to have held the first Farmers' Institutes. In Wisconsin, the Wisconsin State Agricultural Society, the Northern Wisconsin Agricultural Society, the Dairymen's Association and the Horticultural Society all were holding meetings of an institute nature, Dr. Henry, of the Agricultural College, had held several farmers' meetings at different points in the state, farmers' clubs and granges had been organized long before the state system of Farmers' Institutes was thought of, and it is more than probable that the effects of these agricultural meetings, or institutes, and the good they were doing, had something to do in bringing about the establishment of an organized state system in this state.

As to the law establishing this system for Wisconsin, I will quote from an address published in Farmers' Institute Bulletin No. 10, 1896, by Hon. C. E. Estabrook, of Milwaukee, Wis., who introduced the Farmers' Institute law into the Wisconsin legislature of 1885, while a member from Manitowoc county.

How the Idea was Conceived.

"In the early part of October, 1884, I listened to a short address by the late Hon. Hiram Smith, to the farmers of Manitowoc county, delivered upon the grounds of the Industrial Association, adjoining the city of Manitowoc. The address was a very practical one, and one which any person of common intelligence could readily understand, and at the same time, it was replete with information of the most valuable kind to the persons to whom it was addressed. It was, in fact, the summing up of the valuable experiences and study of a long and useful life, and was given under such adverse circumstances as the noise and confusion incident to a fair ground. The first thought that occurred to me was what a pity that the valuable experience of a successful lifetime should be given out under such unfavorable circumstances, and that no effort should be made to preserve the knowledge thus laboriously gained. That in a few short years, at most, the speaker would be no more, and that the result of forty years of earnest labor crowned with success would then be lost to the world. It occurred to me that I would endeavor to get up a meeting of the farmers of our county at some future time, and invite Mr. Smith to address them under more favorable conditions. I had not considered this proposition long before it came to my mind that if such a meeting would be advantageous to the farmers of Manitowoc county it would be advantageous to the farmers



Hon. C. E. Estabrook,
Author of Farmers' Institute Law.

of other counties in the state as well, and that if such a work was to be undertaken it should be extended throughout the state. To do this required organization. Thus one idea led to another until the whole scheme, as it was subsequently enacted into a law, was definitely outlined."

The Origin of the Work in Wisconsin.

The bill introduced by Mr. Estabrook for the organization of a state system of Farmers' Institutes passed the Wisconsin legislature of 1885 and became a law, and I believe this to be the first considerable, separate appropriation ever made by state, province or country for the maintenance of a state system of Farmers' Institutes. It is true that, in a few states, agricultural societies, or other agricultural organizations had intermittently set aside small sums to be used in holding farmers' meetings, but no state or country, so far as I can find, started out with a definite, annual appropriation to build up a state-wide system of genuine Farmers' Institutes, belonging to the farmers themselves, and for the purpose of the spread of practical, agricultural education.

This law carried with it an annual appropriation of $5,000. The law was amended in two years and the appropriation made $12,000 per annum, and in 1907 was increased to $20,000.

The Early Days of the Work.

The control of the institutes was placed with the regents of the university, as Mr. Estabrook was well acquainted with the regents who at that time composed the farm committee, Messrs. Hiram Smith, H. D. Hitt and C. H. Williams, all being farmers.

Speaking in reference to this subject before a Farmers' Institute held in Green Bay March 28–30, 1887, Hon. Hiran Smith, at that time a member of the board of regents of the university, said:

"Ladies and Gents:—On behalf of the regents of the Wisconsin University, I will give you a short history of the origin and inauguration of the system of agricultural education, through the instrumentality of the Farmers' Institutes.

"Not a single member of the board of regents had any knowledge or expectation of the fund that finally was appropriated by the liberality of the legislature of our state, and placed in the hands of the farm committee. The notice in the paper of a bill introduced by Hon. Mr. Estabrook, of Manitowoc, was the first notice that the members of the board had that the money was intended to be placed in their hands."

This committee selected the late W. H. Morrison as the first superintendent, with office in the capitol, and gave him almost absolute power in organizing and perfecting the work of this new venture. Since 1894, the present superintendent has carried on the work, making some gradual changes.

Mr. Morrison had had experience as a farmer, county superintendent of schools, and secretary of the well-known Walworth County Agricultural Society, whose annual fairs have become known throughout the state and country as one of the best organized working county agricultural fairs in the world. His good judgment and remarkable organizing ability rapidly brought the Wisconsin system into such good working order that other states and provinces that began to formulate systems for themselves, drew upon Mr. Morrison very largely for plans for the establishing of their work.

The first two years, under the $5,000 appropriation, an average of forty-four meetings was held; during the next seven years, with a $12,000

Group of Farmers Institute Workers, 1889.

Thos. Convey, T. J. Fleming, Geo. Wylie, C. R. Beach, Dr. Atkinson, Geo. McKerrow, S. B. Morrison. H. J. Wilkinson, H. C. Thom, Supt. Morrison, J. M. True, Hiram Smith, Theo. Louis.

appropriation, an average of seventy, and the past twelve years an average of one hundred and twelve have been held, with eleven cooking schools each season during the past eight years up to 1907. During the ten years preceding 1907, the aggregate attendance was about 50,000 per year. The past two years, under a $20,000 appropriation, an average of one hundred and thirty-five institutes and thirty-four cooking schools has been held, with an aggregate attendance of about 85,000 per year.

Wisconsin Institutes True to Their Name.

The Wisconsin institutes are what the name indicates, genuine Farmers' Institutes, being actually held by farmers themselves; the superintendents of the work both having been practical farmers and the workers chosen from the best farmers in the state, those whose live stock and farm products have won prizes at the greatest shows in the country and have topped the best markets for farm products; men who had a reputation, not only in their own localities but throughout the state as its best stock breeders and farmers, before they were called to the institute platform. The farmers ask for these meetings and feel that they are their own.

Wisconsin Farmers' Institute Bulletin.

During the meetings of 1886–1887, Superintendent Morrison conceived the idea that the best matter brought out in the different discussions should be preserved and put into book form, and commenced the publication of the Wisconsin Farmers' Institute Bulletin. This has been continued annually and this year No. 23 of the series will be given to the Wisconsin farmers.

The matter for this bulletin is secured by holding a Round-up Institute at some central point in the state, where the different corps of institute workers are brought together, with some of the best workers from other states and some of the professors from the Agricultural College. A competent stenographer is secured and a full report of all the discussions of this meeting is edited into the annual bulletin.

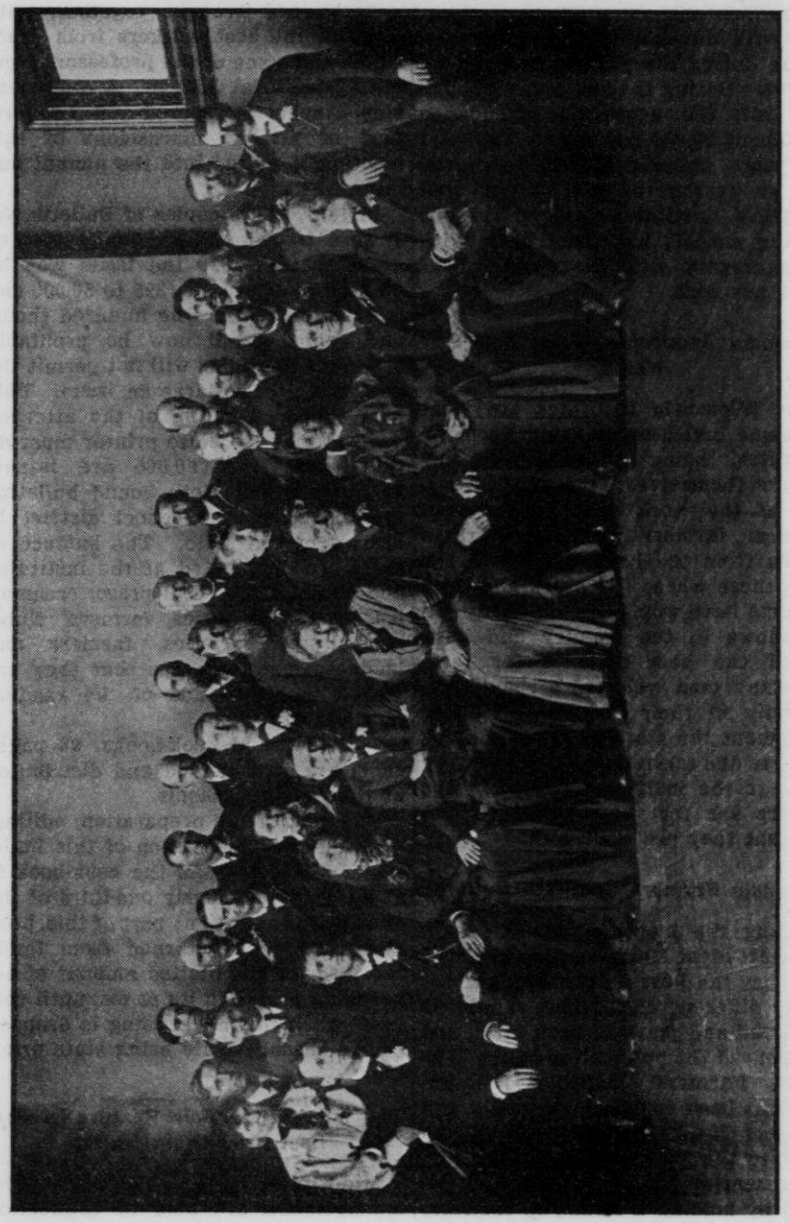
In 1887, 31,000 copies of Bulletin No. 1 were issued. The demand was so great that in 1890 the issue was increased to 40,000, in 1895 to 50,000 and in 1896 to 60,000. One hundred thousand copies could now be profitably used, but the funds will not permit the publication of so large an issue. This year, under a ruling of the attorney general that the state printer must do this work, only 50,000 are issued. Eight thousand cloth bound bulletins are placed in the school district libraries of the state. The balance of them are distributed at the institutes and through the local press, creameries, cheese factories, farmers' clubs, agricultural societies, farmers and business men, who see that they are placed in the hands of the reading farmers.

Ten thousand cook-books, 96 pages each, are also printed and distributed at the cooking schools.

The cost of the preparation, editing, printing and distribution of this bulletin of 320 pages and the cook-book is about $6,000, or nearly one-third of the annual appropriation; part of this, however, has been returned from funds received for the limited amount of advertising placed in its pages, until this year, when this advertising is dropped out on account of its being state printing.

The Mid-Winter Fair Feature in Connection with Institutes.

Mid-winter fairs, under the local management, are held in connection



Farmers' Institute Workers, 1905.

with many of the two-day winter institutes, where prize lists for products of the farm and home, varying in amounts of premiums from $10.00 up to $2,500.00 have been offered. Where properly managed, this fair feature adds a great deal to the interest, but when the amount offered is more than two or three hundred dollars, the interest centers too much in the exhibition and not enough in the institute proper.

Methods Followed in Wisconsin Institutes.

The methods followed in conducting Wisconsin institutes partake of both the features of a school and conference.

The farmers of each district first call the attention of the management to their need of an institute by sending in a petition, signed by farmers and business men, in which they proffer a free hall and the local organization to look after the local details without any expense to the state fund. The institutes are placed by the superintendent, by selecting from the places making application in such a manner as to best cover the entire state. These meetings are advertised thoroughly by sending out posters and programs and notices through the local press.

The winter meetings are two days each. Upon the first day, three sessions are held, and but two upon the second day. The evening session, which is held the evening of the first day, is devoted to educational topics, in which the school officers of state and county usually take part with the institute workers.

In opening each meeting, the conductor of the corps of workers who are to hold the meeting, impresses upon the farmers the fact that it is their meeting and that they are expected to take an active part in all the discussions.

The speakers give an opening lecture, usually of from fifteen to twenty minutes in length, which is followed by a twenty to thirty-minute discussion, the greater part of which is devoted to asking questions by the farmers, and brief, pointed answers to the same by the institute workers, with an occasional short statement of experience and experiments by those present.

The conductor at each meeting promptly shuts off all partisan political discussions, or statements based on ignorance, prejudice or superstitions.

Charts are used extensively in all discussions. Models and animals are also sometimes used.

Some years ago a stock judging institute was held under the direction of the superintendent of Farmers' Institutes at the Waukesha County Fair, since which time several counties have adopted the plan of having the judges briefly state the reasons for their awards.

All meetings are reported to the superintendent by the conductors in charge. The reports are made upon uniform blanks furnished to each conductor for the purpose. One object of these reports is to aid the superintendent in planning future work in the same district. The main features of these reports are:

1. Report of attendance at each session.
2. Interest shown in the meeting.
3. Have local arrangements been properly attended to?
4. Were prizes offered? If so, how much?
5. Best place for next meeting.
6. Name and address of local workers.

Summer Institutes in Northern Wisconsin.

Since 1895, from ten to thirty one-day institutes have been held in the

Mrs. Helen Armstrong, of Chicago, conducting a Cooking School during the Round-up Institute at Eau Claire, March 7, 8, 9, 1905.

timber districts of central and northern Wisconsin, where farmers are making homes by clearing up the timber land that has been logged over. These meetings have been very successful and in great demand and we believe have done much towards developing better methods of farming, better bred live stock, a better system of crop rotation and the dairy industry in particular in this new section. Many cheese and butter factories have also been established as the result of the institutes.

Attitude of the Farmers Towards Institutes.

The farmers of Wisconsin at first were suspicious of the Farmers' Institutes, looking upon them as a political move, or an advertising medium for breeders or the Agricultural College and the State University, and quite often spoke of the institute workers and speakers as theorists. This spirit has been entirely overcome by the employment of practical farmers as the institute instructors, until now the farmers of Wisconsin bank on the institutes and their teachings as reliable and practical.

To illustrate, let me quote from a chart prepared locally and placed upon the walls of the institute hall at Beaver Dam, Wis., in 1893. This chart showed a district within a radius of ten miles of the city of Beaver Dam, giving the location of thirty-eight butter and cheese factories within that district. The statement accompanying this chart read as follows: "The Farm Institutes enccuraged the farmers to build 38 butter and cheese factories within 10 miles of Beaver Dam, Wis., paying in cash annually over one-half million dollars to the farmers for milk and adding over a million dollars to the wealth of Dodge county in the past 7 years since the first institute was held in this county, in 1886."

In Hoard's "Dairyman" of April 15, 1904, a writer from Kewaunee county says that the farmers of that district all follow the teachings of the institutes.

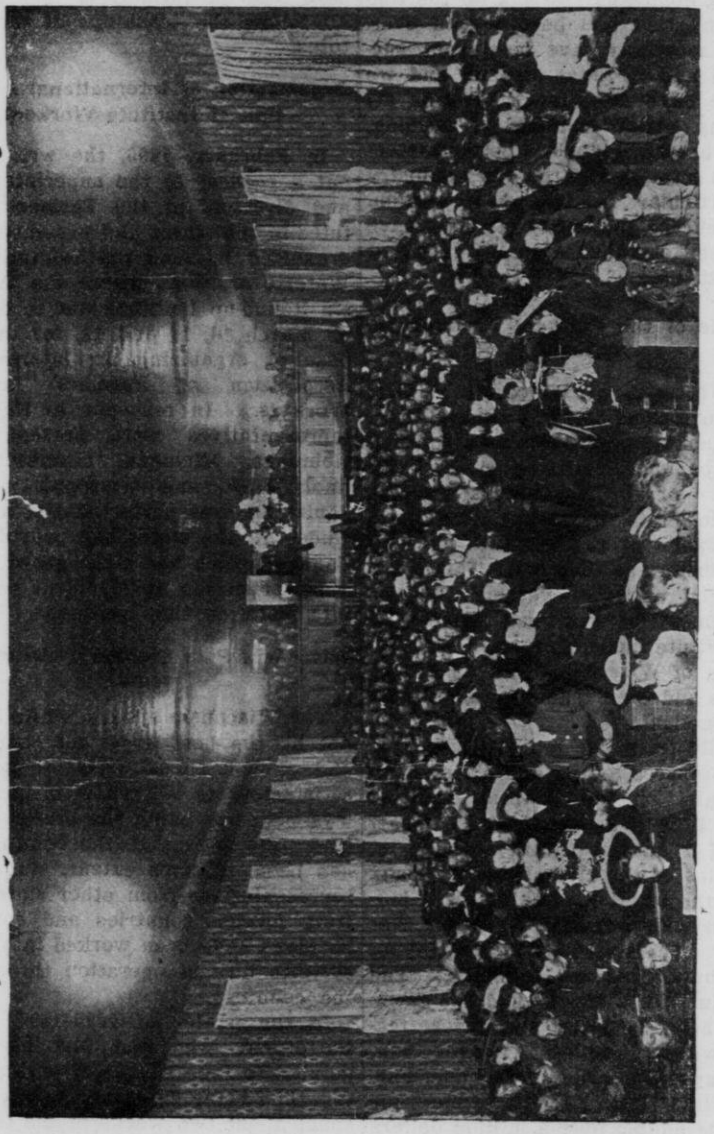
Organization of International Association of Institute Workers.

In February, 1896, the writer sent out a request to the superintendents and directors of the Farmers' Institutes in the states and provinces then organized to send representatives to Watertown, Wis., where the Wisconsin Round-up Institute was to be held on March 10, 11 and 12, for the purpose of organizing an International Association of Farmers' Institute Workers. In response to this call, representatives were present from Nebraska, Michigan, Minnesota, Illinois, Ohio and Wisconsin, an organization was perfected and now includes all the states and provinces of Canada, which has since grown to be a power in the development of institute work on this continent.

Wisconsin Plan Studied by Other Systems.

The Wisconsin system, while it may not be the best under all conditions and circumstances, seems to be very satisfactory to Wisconsin farmers. It lays claim to being the oldest organized state system in the country and has been, to some extent, studied by representatives from other states and from foreign countries and some of its plans have been worked into many systems now in operation throughout the country.

In the winter of 1895–1896, K. L. Butterfield, who had just been appointed to take charge of a state system then being developed in Michigan, spent about two weeks of his time in studying Wisconsin institutes and gave a very favorable report of our work in a Michigan Agricultural College publi-



An Evening Audience at a Wisconsin Farmers' Institute, Mayville, Dodge Co., March 1, 1905.

cation. Supt. Fred W. Taylor, in charge of the Nebraska institutes at their inception, also spent considerable time in studying the Wisconsin system. In June, 1897, a commissioner of the Russian government, who was in the United States for the purpose of studying agricultural education, visited Wisconsin institutes and in his report to the Russian government on his return home advised the holding of agricultural institutes after the plan followed in the United States, and as Wisconsin institutes were the only ones that he visited, we feel highly honored in this part of his report.

Some of the Things Farmers' Institutes Have Helped to Do.

The 2,211 Farmers' Institutes, 181 cooking schools, with the distribution of over 1,122,000 annual bulletins of 320 pages each, each one of which is truly a practical hand-book of agriculture, covering, as they do, every form of Wisconsin farming, as well as giving much attention to the great questions of home-making and practical education, must have had much to do in placing Wisconsin in the front rank in many respects among the sisterhood of great agricultural states.

We claim for our state one of the best agricultural colleges and one of the best systems of agricultural education in our rural, high and county schools so far evolved on this continent. Wisconsin farmers have more good silos than can be found in any other state. They have more high-class dairy cows, both grades and pure bred; more high-class, pure bred sheep; they are well forward in pure bred swine, beef cattle and horses. More clover is grown in proportion to the cultivated area and thus a better system of crop rotation, which causes a higher general average of all of her crops. She has made greater advance in dealing in an intelligent way with animal diseases, particularly bovine tuberculosis; has more good, well ventilated, well lighted stock barns, as well as a high average by comparison of good farm homes that are well kept. She has a position as a dairy state second to none; her agricultural fair system is one of the strongest and best.

The Farmers' Institutes lay claim to a fair share of this advancement and are still working for better conditions all along the line in educating and moulding public sentiment and state pride for better and happier farm homes, better live stock, better dairying, better and cleaner agricultural fairs, a stronger and more practical educational school system; in fact, better things in every way.

The late Hon. H. C. Adams, in his annual address as president of the Wisconsin Dairymen's Association, at Augusta, February 20, 1889, said: "The most common precepts of good dairy practice cannot be repeated too often. The a, b, c's of the dairy business have yet to be learned by the great majority of Wisconsin farmers.

The Farmers' Institutes have gone closer to the people in this respect than any other educational influence. In every county the short, practical papers and breezy discussions have brought about immediate and evident results. One prominent breeder of dairy cattle told me that he could tell where the institutes were last winter by the letters of inquiry he received about breeding stock. Not only this, but purchasers of butter in towns where these meetings have been held, nearly all testify to the marked improvement of the article they buy. The Institutes have been the means of making Wisconsin farmers intimately acquainted with the business methods of successful dairymen."

The First Institute as Seen by an Eye Witness.

"The first meeting was held at Hudson Nov. 24–25, 1885. Among those from

abroad who were present were W. H. Morrison, superintendent, Hon. Hiram Smith, Major Williams, W. D. Hoard, Stephen Faville, J. M. Smith, Capt. A. A. Arnold, Hon. J. C. Bartholf, C. A. Smith, A. G. Tuttle, Professors Henry and Armsby, President W. B. Parker, Prof. King, Hon. C. V. Guy and Prof. Lombard, the noted singer, of Chicago.

The meeting was called to order by Supt. Morrison at 9:30; Hon. Hiram Smith elected presiding officer. This was followed by a rousing song by the Hudson Glee Club. The literary portion of the program was as follows: "Shall the Young Man Leave the Farm," by J. C. Bartholf, of Milton; "Farm Machinery and Its Care," by W. C. Bradley, Hudson; "How Can I Keep Bees," by Ed. Connor, of Baldwin. These paper brought good discussions, in which nearly all the visitors took a part and a number of local men as well.

The afternoon session opened with music, which was followed by a paper by George M. Strett, of Hammond, on "Farm Raising vs. Stock Raising;" President W. B. Parker, of the River Falls Normal School, read a paper which was very instructive along the lines of education.

In the evening Mrs. Horace Barlow read one of the most interesting papers of the institute on "Farming as a Business." At this time the address of welcome on behalf of the city of Hudson was rendered by Hon. John C. Spooner, who talked in favor of establishing an agricultural college in Wisconsin. This was responded to by Hon. W. D. Hoard. This was followed by a discussion on the value of education for farmers' sons, which was participated in by Prof. Henry, Major Williams and J. C. Bartholf. Music and singing were interspersed during the evening program. Mrs. C. D. Parker then gave an excellent paper on "Our Homes."

Wednesday morning Capt. Arnold was called to the chair. Major Williams opened the meeting with a carefully prepared paper on the desirability of developing better men and women, which opened up one of the most interesting discussions of the session, holding the attention of the audience for nearly two hours.

Wednesday afternoon session: Hon. Hiram Smith presiding. A throng was assembled. Prof. Armsby devoted an hour to discussing the practical side of farming; C. B. Guy, of River Falls, talked on "Farm Improvements" and gave a paper which was well received. The most profitable side of farming was ably handled by John C. Searles, of Warren. The concluding paper of the session was given by Prof. King, of River Falls, on "Why Do the Young Men Leave the Farm?" Hiram Smith closed the session with a heartfelt appeal to farmers to dignify their calling, as it lies at the foundation of all wealth and progress.

In the evening a musical program was rendered, W. D. Hoard presiding as class leader, and sang in his favorite style the old song, "Finnegan's Wake." The whole program was very entertaining and many were the witty speeches in reply to the toasts.

This closed the first Farm Institute ever held in Wisconsin or the United States under a state system, backed by an annual appropriation, and proved one of the best ever held. The meeting opened up a line of thought and work which has been progressing ever since. It also brought to the minds of the south Wisconsin people the many opportunities offered in northwest Wisconsin and brought home to St. Croix county farmers how the work was being done in other sections of the state.

J. A. Chinnock."

FARMERS' CLUBS.

Geo. McKerrow, Superintendent Farmers' Institutes.

In holding Farmers' Institutes in the different sections of Wisconsin we have found that in those localities where farmers' clubs have been maintained for some time there the most intelligent and best meetings are conducted and the thrift, intelligence and morality of the people are above the average. Therefore I take pleasure in recommending that such clubs be formed to work in harmony with the Farmers' Institutes, and any information that will help these clubs to organize or to do successful work after organization will be gladly given from this office and Bulletins will be supplied them for free distribution. To help such parties as may wish to organize we publish the following Constitution and By-Laws which have been compiled from those of some of the best working clubs in the state, and can be changed to suit other conditions that may exist where other clubs are being formed. I would suggest that all clubs formed send in the name of club and names and post-office address of president and secretary, that we may keep a list and be able to forward the work as opportunity offers.

Constitution and By-Laws of the Agricultural Club, Together With Rules of Order and Order of Business.

Constitution.

Preamble.

We, the undersigned, interested in Agriculture and Horticulture, and desirous to secure the benefits to be derived from organization, for the purpose of practical discussion and the promotion of the common interests of our pursuits, do subscribe the following constitution:

Article 1—Name.

This Association shall be styled and known as the ..... Agricultural Club.

Article 2—Objects.

The objects of this Club are to advance the knowledge and promote the general interests of Agriculture and Horticulture in this community.

Article 3—Officers.

The officers shall consist of a president, vice-president, recording secretary, corresponding secretary, treasurer and librarian.

Article 4—Duties of Officers.

Section 1. It shall be the duty of the president to preside at all meetings of the Club; to enforce a due observance of the constitution, by-laws and rules of order; to assign topics of discussion, at the suggestion of members. He shall neither make nor second any motion, but shall have the privilege of taking part in debate; and, while he has the floor, the meeting, for the time being, shall be in charge of the vice-president; but the president shall have no vote unless the club shall be equally divided.

Section 2. It shall be the duty of the vice-president to preside at all times when the president is absent, and while he shall have temporarily vacated the chair.

Section 3. The recording secretary shall keep a record of the proceedings

of the club, also the name of each member, and shall, on the regular last meeting of each year, prepare and read the names of all members, and he shall have charge of the archives of the club.

Section 4. The corresponding secretary shall conduct the correspondence of the club and act as recording secretary in the absence of that officer. He shall render such assistance to the recording secretary as that officer may require in the performance of his duties.

Section 5. The treasurer shall keep all money belonging to the club, and disburse the same under the direction of the club, according to its laws. He shall collect all fees and dues of members, and shall, at some time during the month of December of each year, notify such as are in arrears and request their dues. He shall keep a correct account of all moneys received and expended.

Section 6. The librarian shall have charge of the library and its appurtenances, regulating the use of the same by the members, according to the rules and regulations prescribed. He shall make a written report of the condition of the library at the annual meeting, and at such other times as the club may direct. He shall, within one week, deliver to his successor in office the library and its appurtenances and all books, papers and documents in his possession belonging to the club.

Article 5—Elections.

All elections for officers shall be by ballot, and shall be held at the first regular meeting in January of each year; and their terms shall commence immediately after their election, to continue for one year, or until others are elected to fill their places. In the case of a vacancy occurring in any office, the club shall go immediately into an election to fill the same. A majority of all the votes cast shall be necessary to a choice.

Article 6—Membership.

Section 1. Any person interested in agriculture or horticulture, and of good moral standing, may become a member of this club by signing this constitution, agreeing to support all laws and regulations made in pursuance thereof, and paying fifty cents annually into the treasury.

Section 2. Honorary membership may be conferred in consideration of eminent character and services in honor of agriculture or horticulture, and shall be conferred without fee or dues. The recipient shall not be entitled to hold office, and may take part in all discussions and vote on all questions.

Article 7—Amendments.

No alteration, amendment or addition can be made to this constitution, neither can a part of it be repealed, without a vote of two-thirds of the members present. Any proposed alteration, amendment, addition or repeal must be submitted in writing, filed with the recording secretary, and read at the two regular meetings next preceding that on which the vote is taken.

By-Laws.

Article 1.

This club shall assemble weekly on ..... evenings from November 1 to April 1, and at such intervals thereafter as may be agreed upon by the club, or appointed by the president. The time and place of meeting may be altered at any regular meeting of the club by a vote of two-thirds of all of the members present.

Article 2.

Section 1. Seven members shall constitute a quorum for the transaction of business of the club. A less number may meet, maintain a discussion on any topic, and adjourn to any given time.

Section 2. Persons present, not members of the club, may be invited to take part in all discussions of agricultural topics; but they shall take no part in the business of the club.

Article 3.

Section 1. If funds of the club should at any time be exhausted, or inadequate to meet the demands contemplated by the constitution, there shall be an equal assessment upon each member to make up the deficiency.

Section 2. No appropriation of money from the funds of the club shall be lawful, except in furtherance of the objects contemplated by the constitution, as stated in Article 2, or as especially provided by these by-laws.

Article 4.

Section 1. There shall be a library established for the use of the club in furtherance of the objects contemplated in Article 2 of the constitution.

Section 2. The library shall be open to the free use of the members of the club, who shall not be more than three months indebted to the treasury, subject to the prescribed rules and regulations.

Section 3. The library shall be maintained by the surplus fund, after defraying the expenses of the club, and by voluntary contributions and donations of the members, to be duly accredited to such contributor and donor.

Section 4. The library shall be in charge of the librarian, as provided in Article 4, Section 6, of the constitution. There shall be a standing library committee of three members appointed at each annual meeting, of whom the librarian shall be one, and ex-officio chairman, who shall have charge of the purchase and collection of books, papers and pamphlets for the library, and perform such other duties as may be ordained.

Section 5. Rules—Rule 1. No member shall have from the library more than one book at a time.

Rule 2. No volume shall be retained longer than two weeks, under penalty of a fine of ten cents for the first week of detention and five cents for each week thereafter.

Rule 3. There shall be assessed for injuries as follows: First, for an injury beyond ordinary wear, an amount appropriate to the injury, ascertained by the librarian. Second, for the loss of the volume, the cost of the book; and if one of a set, an amount sufficient to replace it or purchase a new set.

Rule 4. No person having incurred a fine shall be permitted to take books from the library until the fine is paid.

Article 5.

A vote of two-thirds of all the members present shall be required to pass any appropriation of money by the club other than for its necessary contingent expenses.

Article 6.

Section 1. Any member who shall suffer his account with the treasurer to go unsettled for more than one year shall cease to be considered as belonging to the club, and his name shall be stricken from the roll accordingly.

Section 2. Any member who shall be guilty of any gross violation of the rules of order or of profane or indecent language or conduct at any of the

meetings of the club, shall be fined, reprimanded or expelled, as the club may, by a two-thirds vote, decide.

Section 3. Any member who shall become guilty of any heinous offense or disgraceful practice, such as to render him unfit as an associate, shall, on conviction thereof, be expelled by the club.

Article 7.

These by-laws may be amended in the same manner as the constitution.

Standing Resolutions.

Resolved, That, after this date, the weekly meetings of this club shall be held on ....., at ...., or at the residence of the members of the club, at ..... o'clock.

Resolved, That there shall be an executive committee, consisting of the president, recording secretary and treasurer, having power to transact the necessary business of the club during the term when meetings are not held.

Rules of Order.

1. No question shall be stated unless moved by two members, nor open for discussion unless stated by the president.

2. When a member intends to speak on a question he shall rise in his place and respectfully address his remarks to the chair, confine his remarks to the question, and avoid personalities. Should more than one person rise at a time, the president shall determine who is entitled to the floor.

3. When a member is called to order by the president, or any other member, he shall at once take his seat, and every point of order shall be decided by the president without debate, subject to an appeal to the club.

4. In case of an appeal from the decision of the chair the question shall be put to the club, thus: "Shall the decision of the chair be sustained?" which shall be decided without debate.

5. No member shall interrupt another while he is speaking, except to call to order.

6. Any member may call for a division of the question, when the sense will admit of it.

7. When any three members call for the ayes and nays, they shall be taken and recorded on the minutes.

8. All resolutions shall, when required by the President or any member, be submitted in writing and signed by the member offering the same.

9. Roberts' Rules of Order shall be adopted as authority in all matters pertaining to parliamentary order in the Club.

10. These rules may be amended in the same manner as the Constitution and By-Laws.

Order of Business.

1. Calling the roll of officers and necessary filling of vacancies.
2. Reading of minutes of last meeting.
3. Reports of committees.
4. Unfinished business.
5. New business.
6. Reception of new members.
7. Has any member any question to ask for information in regard to his farm, stock, etc.?
8. Reading of communications and essays.
9. Discussion of regular topic.
10. Assignment of subject for next discussion.