Wisconsin Farmers' Institutes : a hand-book of agriculture. A report of the twenty-seventh annual closing Farmers' Institute, held at Clintonville, Wisconsin March 18, 19, 20, 1913. Bulletin No. 27 19...

Wisconsin Farmers' Institutes
Madison, Wisconsin: Democrat Ptg. Co., State Printer, 1913

https://digital.library.wisc.edu/1711.dl/36H74WJQE432G9B

WISCONSIN

Farmers' Institutes

A HAND-BOOK OF AGRICULTURE

BULLETIN No. 27

1913

A Report of the Twenty-Seventh Annual Closing Farmers' Institute, Held at Clintonville, Wisconsin March 18, 19, 20, 1913.

"Agriculture feeds us; to a great degree it clothes us; without it we could not have manufactures, and we should not have commerce. These all stand together, but they stand together like pillars in a cluster, the largest in the middle, and that largest is Agriculture."

—DANIEL WEBSTER.

EDITED BY

GEO. McKERROW

SUPERINTENDENT

FIFTY THOUSAND COPIES ISSUED

Illustrated by
Eau Claire Press Co.,
Eau Claire, Wis.

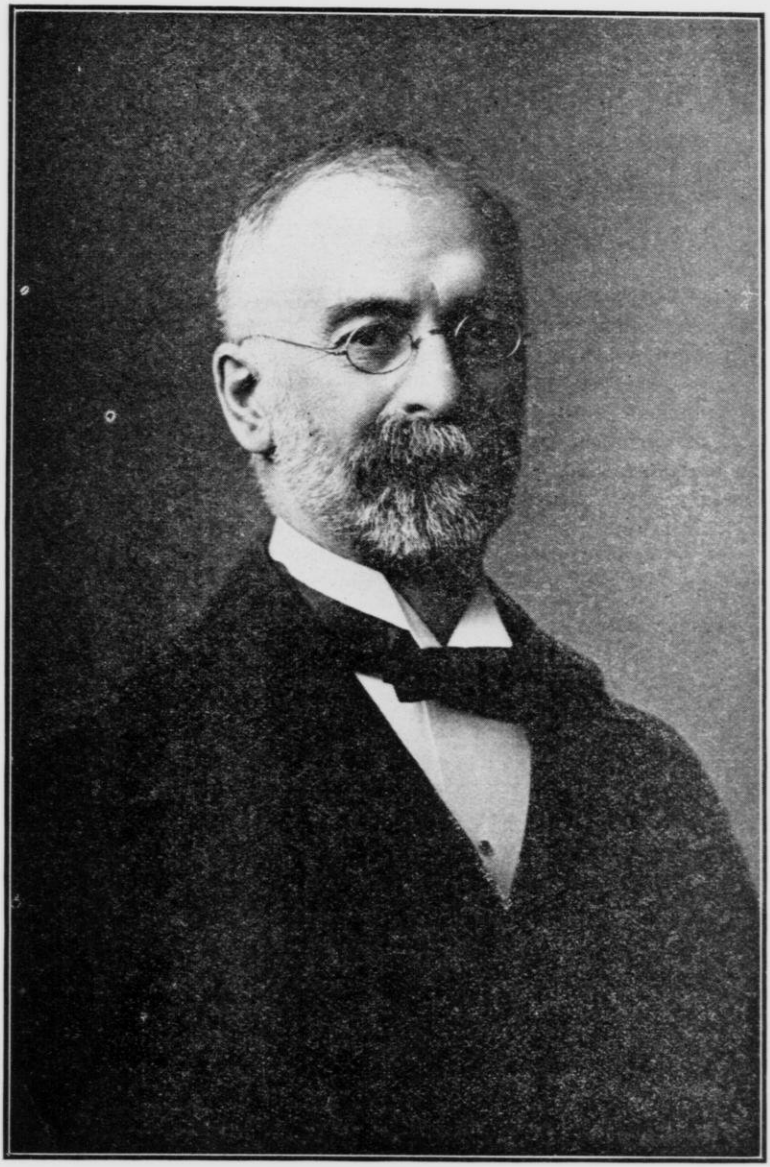
STENOGRAPHIC REPORT BY
MRS. A. L. KELLY
Chicago, Ill.

Printed by
DEMOCRAT PTG CO.
STATE PRINTER,
Madison, Wis.

TABLE OF CONTENTS

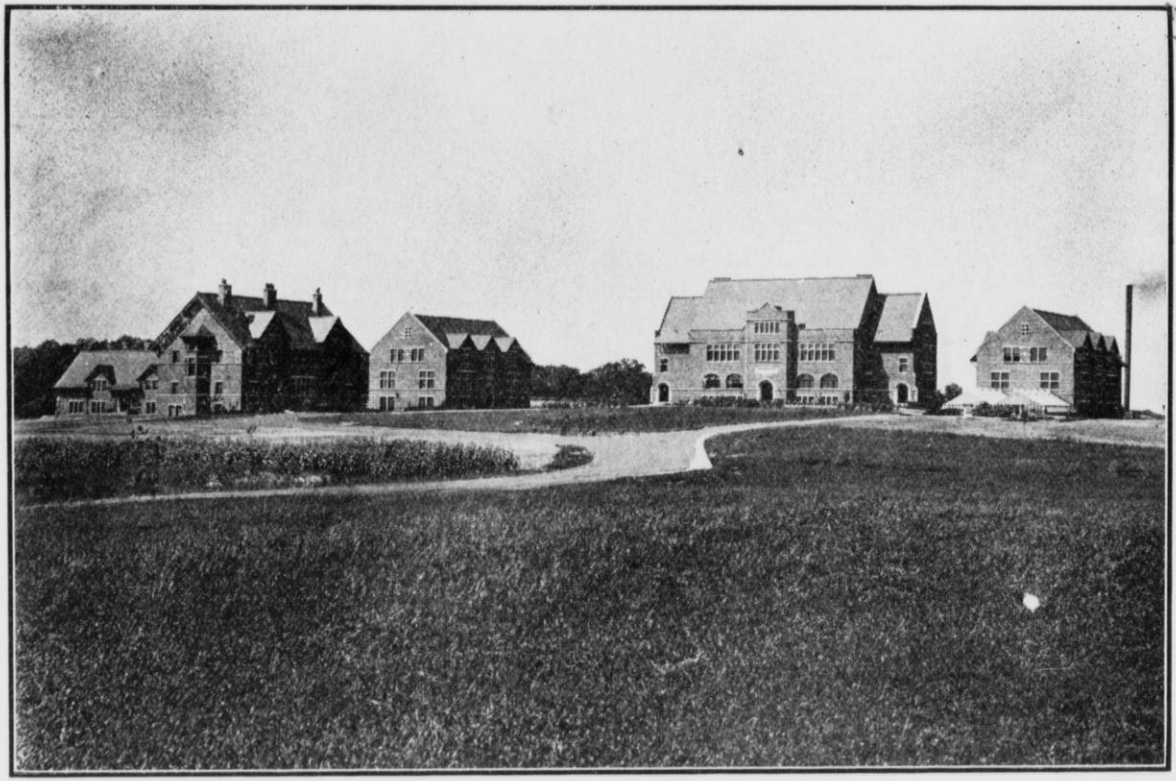
"I warn my countrymen that the great recent progress made in city life is not a full measure of our civilization, for our civilization rests at bottom on the wholesomeness, the attractiveness and the completeness, as well as the prosperity of life in the country. The men and women on the farms stand for what is fundamentally best and most needed in our American life. Upon the development of country life rests ultimately our ability, by methods requiring the highest intelligence, to continue to feed and clothe the hungry nation; to supply the city with fresh blood, clean bodies and clear brains that can endure the terrific strain of modern life; we need the development of men in the open country who will be in the future as in the past the stay and strength of the nation."

—Theodore Roosevelt.



STEPHEN MOULTON BABCOCK.

Professor of Agricultural Chemistry, Wisconsin College of Agriculture, 1888–1913. Inventor of Babcock Test, given to the world without a patent.



Milwaukee County Agricultural School, Wauwatosa, Wis.

LETTER OF TRANSMITTAL

HON. JAMES F. TROTTMAN,

President of the Board of Regents, University of Wisconsin:

SIR:—I have the honor of herewith presenting to you Bulletin No. 27 of Wisconsin Farmers' Institutes.

Most respectfully yours,

GEORGE McKERROW,

Superintendent.

Madison, Wis., November, 1913.

A Corner of the Crop Exhibit at Farmers' Institute, River Falls, Wis., Dec. 12-13, 1912.

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.

State at Large, Gilbert E. Seaman.
State at Large, D. O. Mahoney.
1st District, A. J. Horlick.
2nd District,
3rd District, J. W Martin.
4th District, Theodore M. Hammond.
5th District, James F. Trottman, Pres.
6th District, Miss Elizabeth F. Waters.
7th District, Edward Evans.
8th District, Mrs. Florence G. Buckstaff.
9th District, Orlando E. Clark.
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 Summer Session.
- The College of Letters and Science embraces—
  - General Courses in Liberal Arts.
  - Special Courses which include:
    - Chemistry.
    - Commerce.
    - Journalism.
    - Library Training Courses.
    - Pharmacy.
    - Music.
    - Training of Teachers.

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.

The Summer Session embraces—
- Courses in the various Colleges and Schools of the University.

The College of Engineering embraces—
- The Civil Engineering Course.
- The Mechanical Engineering Course.
- The Electrical Engineering 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 Forest Rangers' Course.

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

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,

Part of the Fruit Exhibit at the Wisconsin State Fair, 1913.

Spanish, Anglo-Saxon and English. In Mathematics there are forty-five 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-nine courses; in Political Economy, sixty-five; in Political Science, fifty; in Mental Sciences there are sixty embracing Philosophy, Psychology Ethics, Aesthetics, Logic and Education. There are twenty-one courses in Music, and forty-four courses in Physical Education.

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 completion of Lathrop Hall, which has been fully equipped and is now ready for occupancy. 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.

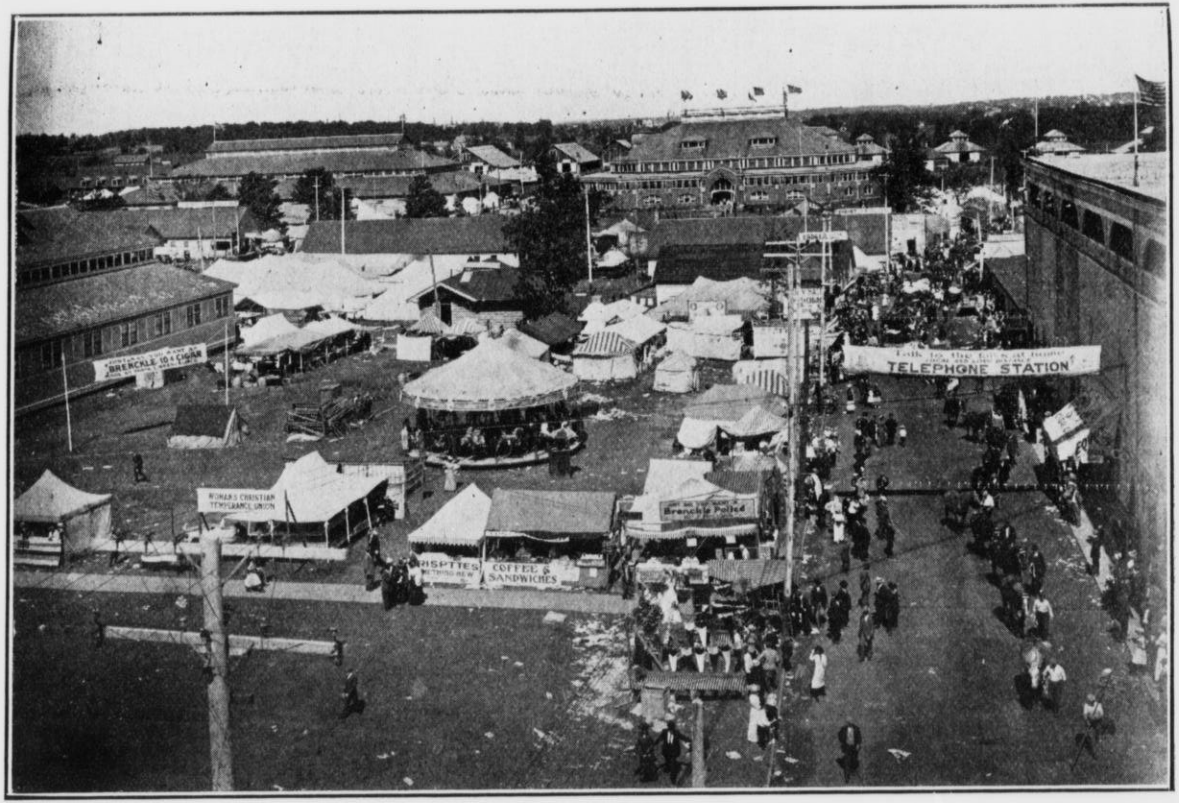
In Pharmacy:—Courses in Practical Pharmacy, Pharmaceutical Chemistry, Materia Medica, Pharmaceutical Botany and Practical Laboratory Work

General Facilities:—The faculty embraces six hundred and twenty-four 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, 185,000 volumes; of the State Historical Society, 450,000 volumes, including pamphlets; of the State Law Department, 51,000 volumes; of the city, 25,000 volumes, besides special professional and technical libraries, making in all more than 711,000 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.



View of Wisconsin State Fair Grounds.
Cattle Barn and Live Stock Judging Pavilion in distance.
Live Stock parade Friday morning, Wisconsin State Fair, 1913.

COURSES IN THE COLLEGE OF AGRICULTURE OF THE UNIVERSITY OF WISCONSIN

MADISON

Long Course. Covering four full college years, offers scientific training in agriculture, as well as training in the underlying sciences. Students may specialize in any line after the second year. In 1913, 579 registered.

Middle Course. Consists of two full college years, modified to include as much practical work as possible in connection with the regular scientific training. In 1913, 107 registered.

Home Economics. A four-year course, leading to the degree of Bachelor of Science, for those who wish to prepare themselves as teachers in Home Economics, as home makers or for other related vocations. In 1913, 165 registered.

Summer Session. Last week in June to second week in August. This session includes 22 courses in agriculture. In 1913, 365 students attended.

Short Course. A term of 14 weeks in each of two years. Registration Saturday, November 29. The course includes lectures, demonstrations, and practice work. In 1912–13, 431 attended.

Young Peoples' Course. This is a one week course of lectures and demonstrations in agriculture for boys and girls who have taken part in the Young People's Grain Growing Contests. It generally begins early in February.

Farmers' Course. This is a ten-days' course of popular lectures, demonstrations and exercises in practical agricultural science, beginning early in February. It is open to farmers over 25 years old. In 1913, 1146 attended.

Winter Dairy Course: A twelve weeks' session, beginning early in November, including lectures, laboratory and practice work in the manufacture of dairy products. It is designed especially for buttermakers and cheesemakers. In 1912–13, 154 attended.

Summer Dairy Course. This is a ten-weeks' training in dairy factory operation for beginners. Students are admitted any time during the spring or summer after March 1.

Special Dairy Course. This is for creamery and cheese factory operators and managers and covers ten days, including addresses and laboratory demonstrations. It is given at the time of the Farmers' Course

Women's Course. This is a one-week course of lectures and demonstrations on various phases of home economics, cooking, nursing, etc., and is given during the first week of the ten days' Farmers' Course, in 1913, 415 attended.

Women's One Week School. This is a laboratory course in cooking, given during the second week of the Farmers' Course. In 1913, 225 attended.

Forest Rangers' Course. This course covers a period of two full years, preparing students for such positions as forest ranger, guard, tree planting expert, or nursery foreman.

For further information concerning any of these courses address the College of Agriculture, Madison, Wis.

Farmers' Institutes.

George McKerrow, Superintendent — Nellie E. Griffiths, Clerk

THE FARMERS' INSTITUTES DEPARTMENT conducts meetings in various sections of the state where practical lectures and conferences on subjects pertaining to farm life and operations are presented. Cooking Schools are also 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; also 10,000 copies of the Farmers' Institute Cookbook. Any community can secure an Institute upon proper application to the Superintendent. For further information address Supt. George McKerrow, Madison, Wis.

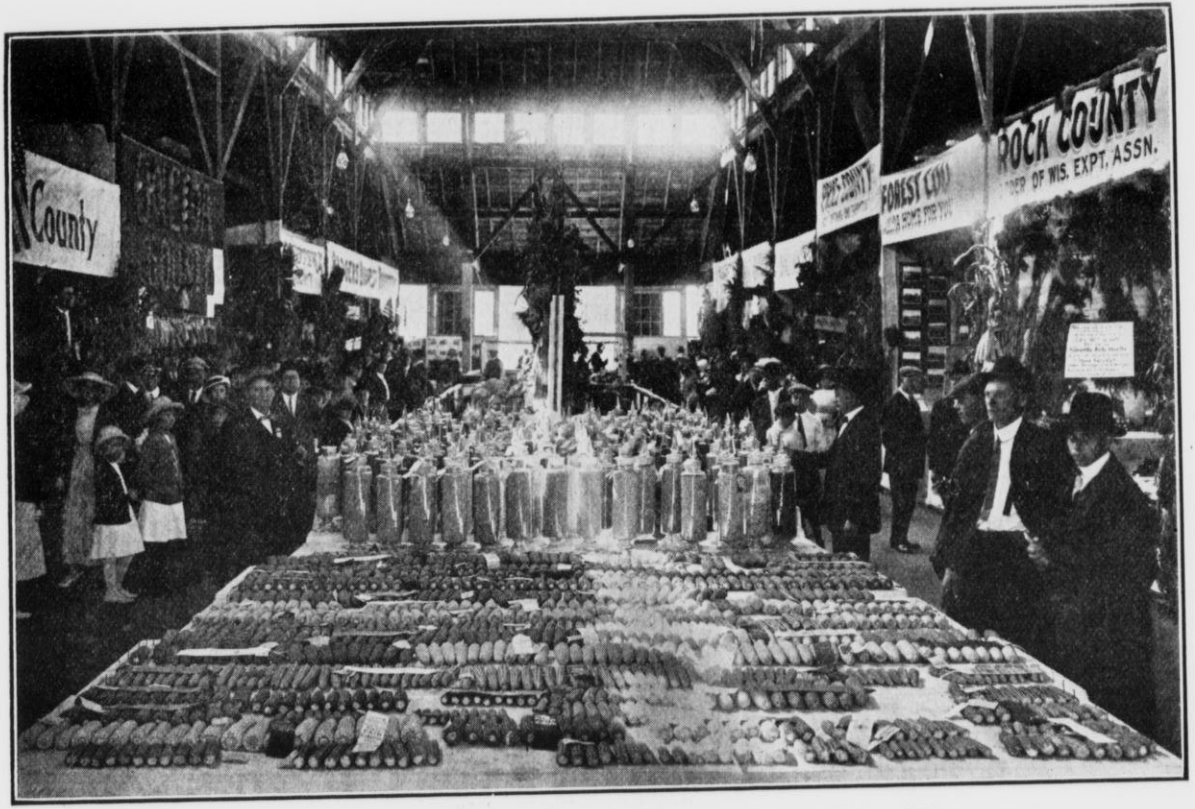


Exhibit in Agricultural Hall at Wisconsin State Fair, 1913.

WISCONSIN FARMERS' INSTITUTES FOR 1913-1914.

ARRANGED BY COUNTIES.

Adams Co.	Arkdale, Grand Marsh
Ashland Co.	Glidden
Barron Co.	Brill, Turtle Lake
Bayfield Co.	Grandview, Washburn
Brown Co.	Denmark, West DePere
Buffalo Co.	Gilmanton
Burnett Co.	Grantsburg, Siren
Calumet Co.	Stockbridge
Chippewa Co.	Cadott, New Auburn
Clark Co.	Granton, Loyal, Thorp
Columbia Co.	Doylestown, Wyocena
Crawford Co.	Ferryville, Gays Mills
Dane Co.	Blue Mounds, Marshall
Dodge Co.	LeRoy, Reeseville
Door Co.	Fish Creek, Sawyer
Douglas Co.	Gordon, Lake Nebagamon, South Superior
Dunn Co.	Fall City, Ridgeland
Eau Claire Co.	Shaw
Florence Co.	Florence
Fond du Lac Co.	New Prospect, St. Cloud
Forest Co.	Wabeno
Grant Co.	Montfort, Potosi
Green Co.	New Glarus
Green Lake Co.	Dalton
Iowa Co.	Edmund
Iron Co.	Hurley
Jackson Co.	Alma Center, Disco
Jefferson Co.	Lake Mills
Juneau Co.	New Lisbon
Kenosha Co.	Kenosha
Kewaunee Co.	Algoma, Kewaunee
La Crosse Co.	Rockland
Lafayette Co.	Benton, Darlington
Langlade Co.	Neva
Manitowoc Co.	Branch, Kiel.
Marathon Co.	Cherokee Hall (Town of Hull)
Marquette Co.	Oxford.
Milwaukee Co.	West Granville.
Monroe Co.	Cataract, Clifton.
Oconto Co.	Abrams, Mountain, Oconto Falls.
Outagamie Co.	Black Creek.
Ozaukee Co.	Belgium, Cedarburg
Pepin Co.	Durand.
Pierce Co.	Ellsworth (Closing Institute), Plum City.
Polk Co.	Dresser Junction, North Valley.
Portage Co.	Amherst. Junction City.
Price Co.	Park Falls, Prentice.
Racine Co.	Burlington, Raymond Center.
Richland Co.	Byrd's Creek, Viola.
Rock Co.	Footville.
Rusk Co.	Ladysmith.
St. Croix Co.	Cylon.
Sauk Co.	Prairie du Sac, Spring Green.
Sawyer Co.	Hayward, Stone Lake.
Shawano Co.	Birnamwood, Caroline, Pulcifer.
Sheboygan Co.	Howard's Grove, Oostburg.
Taylor Co.	Stetsonville, Westboro.
Trempealeau Co.	Arcadia, Blair.
Vernon Co.	Genoa, Ontario.
Walworth Co.	Millard.
Washburn Co.	Minong.
Washington Co.	Hartford.
Waukesha Co.	Genesee Depot, Merton, Prospect.
Waupaca Co.	New London, Waupaca.
Waushara Co.	Coloma, Wild Rose.
Winnebago Co.	Neenah.
Wood Co.	Auburndale.

Dates.	W. C. Bradley, Conductor.	David Imrie, Conductor.	E. Nordman, Conductor.	H. D. Griswold, Conductor.	E. C. Jacobs, Conductor.
1913.					
December.					
9–10	Lake Nebag'mon*	Gordon	Park Falls	Glidden	Hayward.
11–12	South Superior	Minong.	Hurley	Washburn*	Grandview.
16–17	Dresser Junction.	Siren	Brill	Turtle Lake*	Stone Lake.
18–19	North Valley	Grantsburg	Ridgeland	Cylon	Ladysmith.*
1914.					
January.					
6– 7	Abrams†	Wabeno*	Neva	Mountain	Pulcifer.
8– 9	West DePere†	Oconto Falls*	Birnamwood	Caroline	Florence.
13–14	Branch	New London*	Waupaca	Algoma	Sawyer†.
15–16	Denmark	Black Creek	Amherst*	Fish Creek	Kewaunee.†
20–21	Prentice	Junction City	Cadott*	Thorp†	Stetsonville.
22–23	Westboro†	Auburndale	Loyal*	New Auburn	Cherokee.
27–28	Plum City	Fall City	Shaw	Granton†	Blair*.
29–30	Durand	Disco	Gilmanton	Alma Center.†	Arcadia.*
February.					
10–11	Gay's Mills†	Prairie du Sac*	Rockland	Byrd's Creek	Cataract.
12–13	Viola†	Spring Green*	Genoa	Ferryville	Ontario.
17–18	Darlington	Benton	Footville†	Lake Mills*	Montfort.
19–20	Edmund	Potosi	Marshall†	New Glarus*	Blue Mounds.
24–25	Burlington*	Cedarburg	Prospect	Millard	Merton.†
26–27	Kenosha*	West Granville	Raymond Center.	Genesee Depot	Hartford.†
March.					
3– 4	Le Roy	Kiel†	Reeseville*	Oostburg	Howard's Grove.
5– 6	Neenah	Stockbridge†	New Prospect	St. Cloud*	Belgium.
10–11	Coloma	Oxford†	Clifton	Grand Marsh	Wyocena.*
12–13	Wild Rose	Arkdale†	Doylestown	Dalton	New Lisbon.*

Twenty-eighth Annual Closing Institute and Cooking School, Ellsworth, Pierce Co., Wis., March 17, 18, 19, 1914.
All inquiries relative to Farmers' Institutes will be answered promptly.

GEO. McKERROW, Supt.,
Madison, Wis.

*Cooking Schools conducted by Miss Nellie Maxwell.

†Cooking Schools conducted by Miss Susan Brown.

Farmers' Institute Workers at Twenty-seventh Annual Round-up, Clintonville, Wis., March 18, 19 and 20, 1913.

PROCEEDINGS

OF THE

TWENTY-SEVENTH ANNUAL

CLOSING FARMERS' INSTITUTE

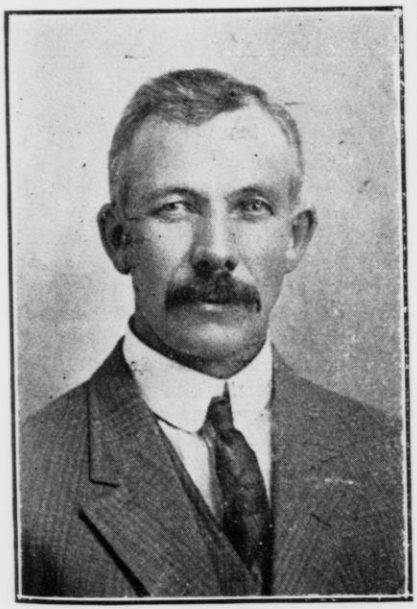
HELD AT

CLINTONVILLE, WIS., MARCH 18, 19, 20, 1913

FIRST DAY, MARCH 18, 1913.

Morning Session, 9:30 o'clock.

The convention was called to order by Supt. George McKerrow. Invocation by Rev. T. W. Cole.



Mayor Felshow.

ADDRESS OF WELCOME.

Mayor Edw. Felshow, Clintonville, Wis.

It gives me a great deal of pleasure to welcome you, for many reasons. One reason is because I have always thought that the farmer is the mainstay and backbone of the country, and perhaps more so with Clintonville than with many other places, because Clintonville is a farmer town. We are surrounded by farmers and, I am proud to say, as good farmers as you can find on the green earth anywhere.

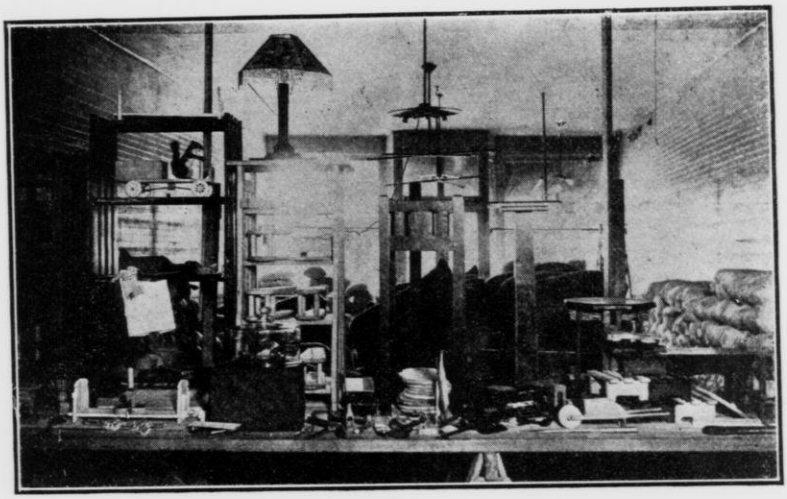
Whenever a man comes into Clintonville and says, "You have a nice little town here," we say, "Yes, but have you been out and seen our farming country? That is what we are particularly proud of, and it is all around us." And I must say, gentlemen, we have some of the most progressive farmers that you can find anywhere. If you will go out in the country, it does not make any difference which

way you go, you will find well kept farms, with nice large barns and houses and out buildings, all kept up in nice shape. I believe we have the best buildings among our farmers of any place in the world. I have traveled to the Pacific coast and I have not seen any place where on the average the farmers look more prosperous than they do right here.

I want to thank you farmers, in the first place for aiding us in getting this Round-up Institute here. It was not the work that we city fellows did that got it here, it was you farmers who came in and took such an interest in the Institute held here last year, that was what convinced Superintendent McKerrow that Clintonville was the place to hold the next Round-up. For the interest that you exhibited a year ago I want to thank you.

To you other gentlemen, all I can say is that I welcome you very heartily to the city. Have a good time while you are here these three days. Enjoy yourselves. Eat, drink and be merry. I sincerely hope that every one of you, after you go back home, will feel that you are so much better qualified to take up the labor you have taken upon yourselves to perform. Consider yourselves welcome at any time to anything our city affords. Our city is wide open, the keys are all thrown in the well. You are heartily welcome, good friends.

Mr. L. P. Martiny was called to preside over the meeting and to give response to the address of welcome.

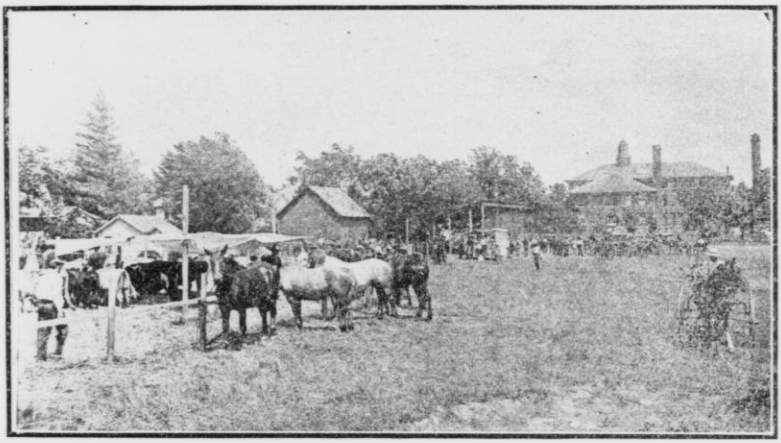


Manual Training Display at Round-up Institute at Clintonville.

REPONSE TO ADDRESS OF WELCOME.

L. P. Martiny, Chippewa Falls, Wis.

It gives me a great deal of pleasure to be here at this time and to reply to this hearty address of welcome that has been given to us. It was my pleasure to attend the Institute held here last year, it was perhaps the largest attended and the best held in the State, and I am proud to say I did what I could to bring the Round-up here.



Keeping up the Farmers' Institute work by a Summer Show, River Falls, June 13, 1913.

As we look back over the Institute work and realize that this is the Twenty-seventh Annual Round-up Institute, we find that great developments have taken place along agricultural lines in this State.

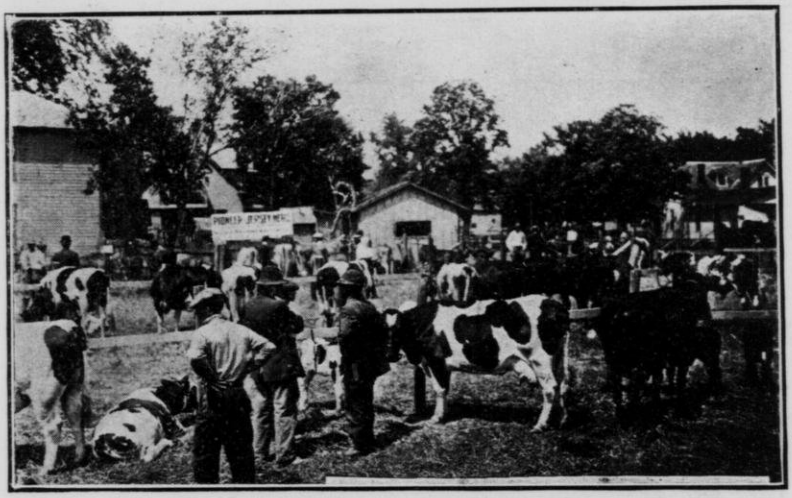
I can remember years ago, when some of the old Institute workers, who have since dropped out, such men as C. P. Goodrich, Ex-Gov. Hoard, John M. True, H. A. Briggs, and a number of others who were pioneers in the Institute work, went about the State talking along lines of what was at that time advanced agriculture; for instance, they were discussing silos. Many times it seemed as though they were making no impression whatever upon their audiences, but it set people to thinking, and today we know that those talks did a great deal of good, because Wisconsin has more silos than any other state in the Union. Not only that, but Wisconsin has more silos than all the other states in the Union put together, and more silos even than all the other states and Canada put together, so we have reason to believe those talks really did set people to thinking.

The earlier Institute men went about this State preaching soil fertility, the importance of conservation of our soils—twenty-seven years ago. Some of our leading political thinkers

are just beginning to discuss this in connection with some of our natural resources, but our Institute workers had this in mind and have been working upon it all these years, and as a result the soils in Wisconsin are better preserved than in many of the other states. We are growing more clover than any other state in in the Union: we are growing more dairy cows than any other state, and these are all the results of efforts made in the early days of the Institute.

among farmers, because they know that if they are to sell farmers machinery it will have to be to the prosperous farm communities. The railroads realize it is a good business. Commercial clubs are organizing in the different cities, but remember to see that the agricultural interests have their chance.

Your Mayor realizes that if this city of Clintonville is going to continue as a prosperous city, it will be because the surrounding country is



At the Stock Exhibit, River Falls, Wis., June 13, 1913.

Today there is a great demand for education along this line. There never was so great a demand for education among the farmers as there is at the present time, and we find constantly that the attendance at our Institutes is larger, the interest greater, there is growing enthusiasm. Not only do our farmers recognize this, but other lines of business recognize that they will be prosperous only as the farmers are prosperous.

The International Harvester Company has set aside $1,000,000 to carry on a line of agricultural education

prosperous. I was glad to see the spirit he manifested here. He thinks it is the most prosperous, the best community anywhere, and I heartily agree with him. But we go into other towns and I am glad to see they all feel the same way. We like to see this optimistic spirit; we like to hear a man say his town is the best, his county is the best, his family and his home are the best in the State. When people feel that way there is going to be progress made.

The attitude of the Farmers' Institutes has been to go out to the people

and discuss practical farm topics from experience rather than from experiment, to talk over the problems that confront the farmers, and so we want this audience to take an active part in this meeting.

WISCONSIN SOILS.

Supt. Geo. McKerrow, Madison, Wis.

For twenty-eight years discussion of the soils of Wisconsin has been going on in our Farmers' Institutes,—the conservation of the soils. I do not expect to tell you anything new about it, all I can do is to repeat what has been said by some of our good soldier boys all this time, at least in part, but, as the soil in every country is the foundation of its agriculture, and, more than that, the foundation of the prosperity of every country, we can well afford to discuss it.

What is Soil?

What is the soil? A little boy in an Institute said, "Dirt," and so it is dirt, but there are different kinds of dirt. What is soil? It is the surface layer of this earth of ours that has been ground up, pulverized and mixed with organic matter by the laws of a wise Creator, so it has the ability to produce things that we need to live upon.

First, we may say the soil is ground rock, the forces of nature have been at work grinding it, the force of the water, the frosts, the sunlight, the roots of plants, earth worms and bacterial life are all working to refine this soil and put it into shape for the production of those things needed by man to feed him, clothe him and keep him warm, therefore the soil is the foundation principle upon which man rests.

Now, many of us come into a new country and take possession of the soil as our own, without any thought of the future, and we crop out of it the elements that are needed for plant growth, sell those crops, put the money into our pockets and spend it, and we keep on at that until that soil is impoverished, and then, in former days, many a farmer moved off, or sold to somebody else to improve or bring up again, or left it as a legacy to his children after he had taken the best out of it and went on into new lands, but we have reached a point where that plan of action must be stopped, because the good lands are fast being taken up; they are becoming very scarce.

I wish I could have the fellows who are not here to talk to, they are the ones who need to be preached to on this subject of soil conservation. We had that pretty well illustrated at one of our northern Institutes. A Swedish farmer came up to me at the intermission and, extending his hand, said: "I know you. I been in Farmers' Institutes a good many times and I see you. I go twenty miles to Farmers' Institute, but all the fellows don't come like that. I got Yankee neighbor, he come from south Wisconsin last summer, and I say to him, 'Come, go with me to the Farmers' Institute,' and he said, 'No, I wouldn't go to that Farmers' Institute to hear them young fellows tell us how to farm.'" (I presume he had not seen Griswold and Bradley; he had just seen Martiny.) "And then he said, 'I know more about farming than those fellows, I farmed forty-five years and wore out three farms before I got up

These are the golden hoofs that keep up soil fertility.
First prize Wisconsin bred flock of Shropshires at Wisconsin State Fair, 1913, bred and owned by Geo. McKerrow & Sons Co., Pewaukee, Wis.

here'." It is those fellows we would like to talk to and talk at, but they are not here.

Wisconsin Soils Varied.

But to get back to the soil. Here in Wisconsin we have more varied agricultural soils than can be found in almost any state in the Union. We have the sand and the sand loams, the clay loams and the clays and the very heavy clay. We have the peat soils that we find in our swamps and our marshes, and these soils all need the same general principles applied to them in care and cultivation. While they all contain the vegetable elements that make plants grow, especially those three most necessary—the nitrogen, the phosphoric acid and the potash—and the other minor elements, yet they contain them in very differing quantities. Most of our Wisconsin soils either have practically nitrogen enough, or it can be supplied with legumes, but we find many of them very short in phosphoric acid and the potash and some short in nitrogen.

Now, the farmer must study and think how to handle each piece of soil that he controls. It is by thinking, and only by studying and thinking, that we can work out the correct principles for our use. You cannot go home from this one Institute and follow the plan in toto of any man that addresses you here. We will very likely have some Jersey crank get up and tell you that the Jersey cattle are the very best on earth, and that is all right, they are the best for him, but unless you are sure they are the best for you, do not go home and sell your Holsteins and buy Jerseys. On the other hand, we will probably have some Holstein crank here who thinks there is no kind of cattle like the Holsteins. He can stand up to milk his Holstein cows and so he likes them best. But you should go home and think these matters over and keep thinking them over and decide on the things that are suited to your conditions gradually. Do not do it in a hurry, or you will probably make a mistake. Grow into it and do it by thinking.

How to Handle the Soil.

It is the same with the handling of our soils. We must think and we must study them. We hear a great deal about shortage of phosphorous in some of these soils and the shortage of potash and the shortage of nitrogen, and when one of these elements is short in its available form, we cannot grow the kind of crops that need that element. So it is for the farmer to study his soil and experiment, even to the extent of buying commercial fertilizers, although I believe that the Wisconsin farmer, if he is a good farmer, a live stock farmer, will not in the future use very much commercial fertilizer for the growing of his crops, because I think when he experiments he will find that in many cases it would be useless upon his land. Of course, whenever there is a lack, then it is his business to supply it, whether he supplies it in the food stuffs that he buys and feeds his cattle, or in the potash and phosphorous that he may buy in the market, that is up to him to decide after studying out the problem.

We hear a good deal about the acidity of our soils; they tell us that bacterial life grows in our soils and that much of this bacteria generates an acid in our soils. The scientist tells us to correct that acid to put on lime, two or two and a half tons to the acre, and the way to find out whether you need lime on your soil is not to buy ten carloads and put all the money you have in the bank and all you can borrow into it, but you just

buy a little litmus paper and by putting that into your soil you can make that little experiment and decide whether you need that lime or not, because, as I said, Wisconsin soils vary.

We are draining a good many of our marshes. A few weeks ago we held an Institute in a locality where marshes are being drained, and a German farmer gave us some of his good experience. He found that potash was the thing needed in the case of his marsh, and indeed that is the case with most of them; the land is deficient in potash in its available form, and so he got potash. Our German friend said, "The first time I bought potash, it was all right, fifty-eight per cent potash, and the next time I bought from the same firm and they sent me only thirty-two per cent potash and I do not get as good results." So you see we have to watch every detail.

I can only touch a few of the high spots on this subject, and I think now that questions, experiences and suggestions would bring out what we want.

DISCUSSION.

Mr. Convey—What is your opinion as to the best way of adding fertility to the soil? Is it better to buy commercial food stuffs, feed them to stock and get the fertilizer in their manure, or is it better to buy potash and phosphoric acid in the market?

Supt. McKerrow—It is better to keep live stock and buy commercial feed stuffs that are rich in those elements. A good class of live stock will always pay for those feeds and then you can get from seventy-five to ninety per cent of those elements back into your soil and it is so much clear gain. Now, nitrogen is something that on most Wisconsin soils we do not need to buy at all, unless we have very sandy soil; but, as a rule, we can get that in the alfalfa and the clover plant.

Mr. Jacobs—In correcting acidity, is the lime refuse from sugar beets actually as good as ground limestone or the marl that is put up?

Supt. McKerrow—I could not tell you. Some people say that it is, it has been slaked by water. I received a bulletin lately from the Rhode Island Station, where they were using that class of lime on alfalfa, and they figured that 3,700 pounds of that class of lime when dry was equal to 5,000 pounds of ground limestone. I do not know whether it was as good as Wisconsin limestone or not.

Mr. John Imrie—Wouldn't it be possible to add to the phosphoric acid and the potash by feeding some certain feeds that we grow on our own farms, especially on a dairy farm?

Supt. McKerrow—Well, that is a question. When you grow such crops as clovers and alfalfa, they are deep rooters, they bring up a good deal of the supply of these elements from a depth greater than the average farm crop, that is deposited in the growth of hay that we take off of the ground and the root that is afterwards turned over, and of course it helps the surface of the soil no doubt, but it is only the available part in these elements that we can get at. The good Lord knew that we were spendthrifts when He made us, and He gave it in trust for us. These elements in the soil only become available as we follow the right methods to develop and refine them and make them fit for the use of our plants, so by having these deep-rooted plants going down deep into the subsoil and bringing up these elements, I think we will get a supply for our surface plants. But you can easily see that under a poor system of working that would not do.

Mr. John Imrie—I mean in feeding

alfalfa and clover and by adding a little more potash.

Supt. McKerrow—Yes, certainly, alfalfa and clovers are richer in all those elements.

Mr. Convey—Which of the commercial food stuffs is richest in phosphoric acid and nitrogen?

Supt. McKerrow—I think bran. Bran has fifty-eight pounds of phosphorous to the ton.

Mr. Stubley—Which is the most practical way of keeping humus in the soil?

Supt. McKerrow—Barnyard manures and the growing of the legumes, the clovers and alfalfa.

Mr. Convey—You better cut out that barnyard manure and say stable manure.

Supt. McKerrow—I accept your amendment. Barnyard manure has had too much washing.

A Member—Consequently it would be best to have the manure taken direct from the stable to the field and spread at once.

Supt. McKerrow—You have been thinking about it, I see; it would.

The Member—Yes, and I am doing it.

Supt. McKerrow—And that is better yet.

A Member—How about when the ground is frozen on hilly land, or even with a little slope?

Supt. McKerrow—Well, I think this man over here will probably put it on the slope; we do. Of course, I would not put it on steep, sloping hillsides. The only time I would object to a gentle slope would be when it was icy.

Mr. John Imrie—I was waiting to hear Supt. McKerrow say that it was all right when it was put on the other side of his neighbor's line fence.

Supt. McKerrow—I do think that grass land, even when the soil is frozen, will hold much more than plowed land.

Mr. Convey—The plowed land isn't porous like grass land. The grass land will take up much more than plowed land.

A Member—Is there any place better on the farm to put manure than on grass land?

Supt. McKerrow—No, sir, I think it is the best for this reason, you not only get the benefit of the liquid part on the soil, but if there happens to be clover or alfalfa roots in the soil, they make holes all through and they draw from below. It adds to the grass crop both root and branch, and the grass uses the fertility as it is available.

Mr. Imrie—What is the best way to apply lime?

Supt. McKerrow—A great many apply it with the manure, from the manure spreader. Of course that would be ground limestone, or the air-slaked lime.

A Member—I secured about fifty bushels of air-slaked lime last fall, I took that to the field and spread it on top of the alfalfa and I could not see much benefit from it, though I hope to see it this spring.

Supt. McKerrow—I hope so, and the next time we come around with an Institute I want you to tell us how it comes out.

Mr. David Imrie—It is hard on the manure spreader, on the machinery. I would rather have one of these regular lime spreaders, a thirty-five dollar machine. We sowed about eight tons of marl last year in the manure spreader, we put on about a ton to the acre; we put it on the manure, then manure again and then lime, and manure again, lots of it. You have to wait until the wind is in the right direction, or it will blow onto your neighbor's land.

The Chairman—If you are going to experiment with lime, what is the best way to apply it and the best time and would you leave it on top or mix it with the soil?

Supt. McKerrow—This gentleman over here says it had better be harrowed, cultivated into the soil. If it is ground lime, it begins to disintegrate better when it gets mixed with the soil; if it is air-slaked lime it will burn some of the vegetable matter in the soil, but in all cases it is better to mix it.

The Chairman—Would you always expect to see results the first year after liming?

Supt. McKerrow—Not with ground limestone, but I would with the air-slaked or water-slaked lime, and marl too.

A Member—Where is marl found in Wisconsin?

Supt. McKerrow—They have small beds in Waukesha county.

Mr. Convey—And they have in this county.

A Member—We have lots of marl in Door county.

Supt. McKerrow—Marl beds are being worked in Waukesha county. These are the only ones I know of being worked in this State.

A Member—They have them in Waupaca county, but they are not working them.

MOISTURE FOR CROP GROWTH.

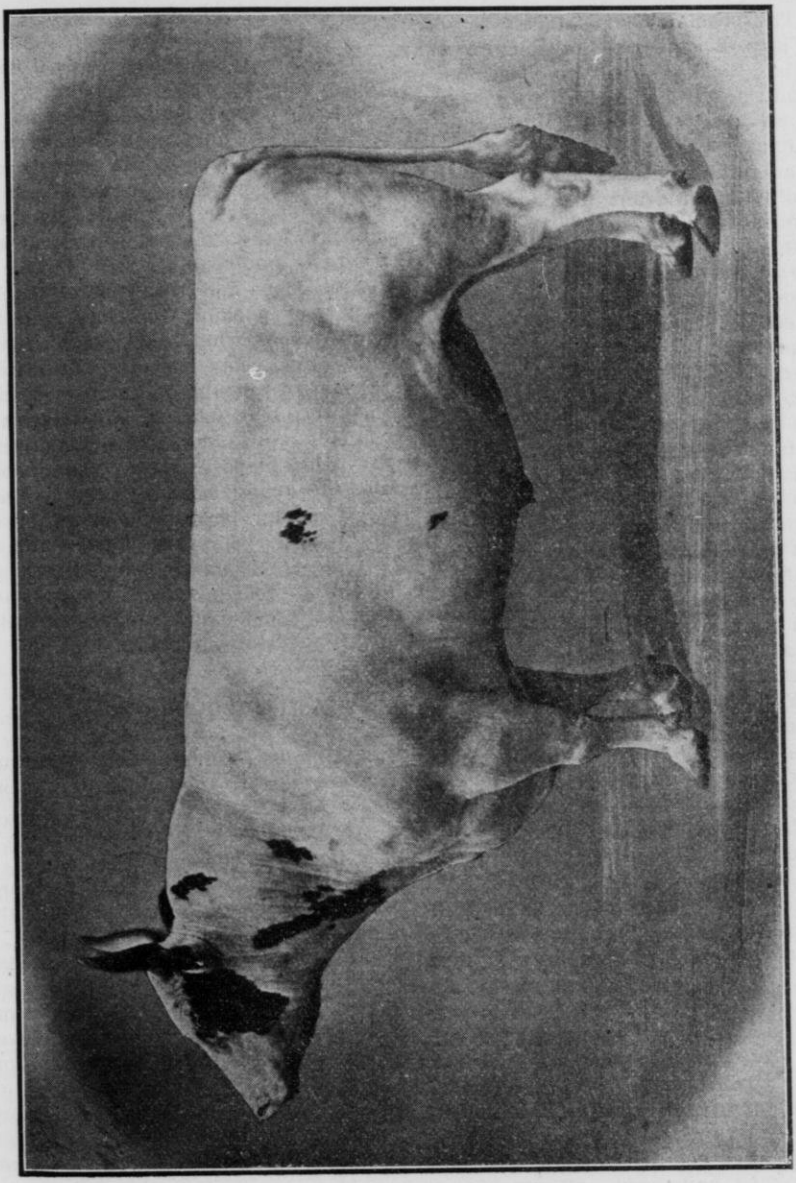
W. C. Bradley, Hudson, Wis.

This is the spring of the year, the time when we are beginning to think about doing things during the coming season, and one of the things we must think about is the condition of our soil, and another thing we must think about is keeping moisture in our soil.

Now, this ought not to be a dry subject, but soils are not all alike, like the Irishman's red flannel shirt. He said no matter how cold and wet it was, it was always warm and dry.

If we could keep our soils warm and wet, the problem of crop growing would be easy, but as it is, the keeping of moisture in the soil is an important question for the Wisconsin farmer, and one of the things that we have got to study more and more.

It makes a good deal of difference where we are in the United States in regard to soils and soil moisture and the amount of moisture that is required to grow crops. If we were in the southern sections of the United States, especially along the Gulf Coast or the Atlantic, we could count on a good deal of rain and the growing of more crops than we can out in the higher lands of Montana, for instance. Evaporation in the colder air goes on slower than in warmer latitudes. We are pretty far north and we can get along with a reasonable amount of rain, but once in a while in Wisconsin it forgets to rain and we are short of moisture. One of the professors from the Agricultural College came up into St. Croix county two years ago and he told us we had moisture enough in the soils of St. Croix county for another year or two. I was pretty sure he did not know what he was talking about, I was sure there was not that much moisture left. I had more confidence in a man from another part of the State who said there was plenty of moisture if we took care of what we had. I believe it is easy to take care of the moisture if it is in the ground, but if it is not there you cannot conserve it, no matter how you twist or turn.



Champion Ayrshire bull, at Wisconsin State Fair, 1913, owned by Adam Seitz, Waukesha, Wis.

How to Conserve Moisture.

The problem for us to try to solve is how to conserve the moisture that falls. We know that land gets out of condition mechanically very easily. If we have clay soil, it may rain on that clay soil and unless it is full of humus, the soil particles run together, and no matter how much rain falls, the moisture in the soil is not available, the particles run together and the plants cannot breathe, though there is plenty of moisture there. Then there are other soils, perhaps sandy soils, where there would be lots of chance for plants to breathe, and yet, unless we keep humus in the soil, the rain falls and if there is nothing to take up that water, the water runs out of the soil, so the plant is left dry and cannot grow. It should be our ambition to try to keep our soil in the mechanical condition necessary, so that whatever moisture comes on the soil the excess might drain out and yet there is enough humus to take up a lot of water and preserve it for plant food.

We know that all plants get their living through moisture, they must have their food in a liquid form, and that must be available. At the same time, there must be air enough mixed with the soil so the plant breathes readily, as well as drinking the water.

In a good many places in the United States the people have come to the conclusion that certain lines of farming are better than some others, and some of them are getting tired of the old lines. I know of several places in the United States where the farmers have got tired of stable manuring, have got tired of keeping cattle, sheep and hogs and hauling out the manure, have got tired of handling clovers; they have said. "There is an easier way to do all this, we will buy commercial fertilizers," and in many places where they have found that while the chemist might analyze those soils and get plenty of fertility, lots of nitrogen and phosphoric acid to grow good crops, yet for some reason they could not grow good crops, and the reason was that there was no humus there to hold water, so in those sections they have had to resort again to the use of stable manure, and to the use of clover, in order to keep the land in the mechanical condition where it would hold water.

This does not apply everywhere. You take in sandy sections, and in some places where they have almost daily rains, they can crop out almost the entire amount of humus, because they get plenty of rain, and there they can add the commercial fertilizers, the dried blood and the ground bone and the guano, because they are easily taken up by the soil and they do not require but very little humus. But in Wisconsin we have got to pay attention to keeping our soil in condition so it will hold moisture in order to get food for our plants.

DISCUSSION.

A Member—Under what conditions can you restore the moisture in our soils?

Mr. Bradley—You cannot restore it if it does not come.

The Member—But if it is there, how can we make it available for the plants?

Mr. Bradley—As a rule, by mulching; by keeping the soil full of vegetable matter, like manure, the roots of clover in the soil, decayed clover roots help a great deal, by cultivation. A few weeks ago we were up north of here a little way and they complained about their soil drying out and their clover being killed, the clover plants would come up, but they would dry out pretty soon. Mr. McKerrow suggested that the ground be covered with a slight covering of straw. We

know that would help keep in some of the moisture; we know also that the growing plant takes out of the soil a great deal of moisture. The roots absorb the moisture and on land where plants are growing, it becomes drier than other land. But in order to make money we must keep something growing, it is our business to conserve the moisture, either by top dressing with manure or any method we can think of that will make available the plant food, the moisture.

Mr. Richardson—Do you cultivate deep or shallow?

Mr. Bradley—I do not believe in very deep cultivation, and again I do not believe in cultivating very much in a dry time, after you have once fixed a mulch over the ground. Some people advocate cultivation in a corn field during a dry time. I believe if we once got a good mulch over it, an inch or two of dirt, that is as much as we can do until the rain comes again. Once we have a perfect dry mulch on top, that is about all we can do to conserve that moisture.

A Member—Will summer fallowing keep moisture in the ground?

Mr. Bradley—It will help, but it is not practical in this State. It is practical in the west and they recommend it.

A Member—I found out two years ago that top dressing is a good idea. I had a field of oats; I sowed it with clover, the oats came up and I took the manure spreader and went over the whole field, about ten acres, and spread it very thinly. There had not much clover come up before, but I secured a very good stand of clover where I had the top dressing put on.

The Chairman—That is my experience also. How did your oats stand up?

The Member—All right for a while. later on it came on so dry that the oats were not very good, but later on the clover recovered and last year I had a fine crop of clover from it.

A Member—How often would a man have to plow in this coarse stuff to keep the humus in the soil?

Mr. Bradley—The oftener we can do that the better. A three-year rotation, on an average level farm, is perhaps an ideal rotation. Get that clover plant in after you have corn and hay and it has done for the soil all it can do. After you turn it under it might stand two or three years more, but after the second year it has done the land all the good it can. Turn it over and use it. That keeps the soil full of humus, full of fertility.

Mr. Convey—Mr. Bradley says if you have a dust mulch during a dry time, that is sufficient. At the Station they have secured better results by cultivating once a week. You speak of the aeration to stimulate the growth of the crop, and you will notice where you cultivate in a very dry time the leaves will freshen up, but they will not freshen up to the same extent on land that is not cultivated, so the presumption is that the moisture in the atmosphere may be taken up by the soil or by plants or by both, and there is better conservation of the soil. The cultivation of the land a whole season has been tried out west. They ran an experiment where they grew corn on land and cultivated the corn crop, and they had a better crop than where they did not cultivate.

Mr. Ivey—Out in western Nebraska they made tests. They had part of the ground with the dust mulch and where they cultivated as high as fifteen times they did better.

Supt. McKerrow—There were experiments made on the St. Croix river. I remember Mr. Bradley wrote me a letter in which he said it was so dry up there that the backs of the

fishes were sunburned in the St. Croix river.

Mr. Convey—I heard him state in the same year that the only moisture they had up there was the farmers' tears.

A Member—Would it be a good plan for any one who does not haul out his manure during the winter, for any reason, but shelters it under a shed, would it be a better plan for him to haul it out and spread it on fall plowed land?

Mr. Bradley—I think it would, anything to keep that manure from washing. If you can put it in a shed and cover it up, it might do. We sometimes make a mistake in plowing under manure that is too coarse. Sometimes that will be a damage to the soil and our crops will suffer. Two years ago, if we had taken our manure that winter and put it in the shed and kept it there until fall, we would have had more good out of it than we did by spreading it in the winter, because that summer it was so dry the manure dried out and we did not get any good from it. I know Convey will object to that, but he does not know, he was not up there.

Mr. Convey—I tried the manure shed and I thought it was the finest thing in the world until I found a better way. The manure shed saves a lot of labor, because you do not haul out in the spring rains and the sun and everything, but the trouble is that if you let it stand long enough it will leach out the fertility and you practically get no value on the hay that season. You will at some time get good out of it, but if you want to get the most good out of it and when it will spread the best, apply it on grass land, and I will guarantee you will not have any loss.

Supt. McKerrow—Mr. Convey wants interest on that manure for five or six months. The man who has raised twelve children wants all the interest he can get.

A Member—I have had experience in hauling manure for three seasons, but I found no advantage. It might be of advantage in the southern part of the State, where you do not have so much snow or heavy frost, but in our country, in the spring now like this, the snow goes off fast and the whole business goes down into the creek. Take it where I keep my manure under shelter, as soon as I get through spreading the manure on the soil, it stays there until late in the fall, when I break it up, and I always find the best results that way. Last year I hauled in the spring and I hauled in the fall and I hauled through the winter onto a good, level piece of soil, and I had one patch where I never manured at all, and I did not see one bit of difference.

Mr. Jacobs—In talking of the conservation of moisture, I think perhaps these doctors have missed a point. We find that manure loses in two ways, by leaching and evaporation. This man who puts it in the manure shed does not lose by leaching, but we can be pretty sure he is going to lose a whole lot by evaporation. The only way manure can be kept with the least loss is by having moisture enough to hold the heat from it and keep fermentation from it.

The Chairman—Your idea is that the shed should be under the manure pile rather than over it?

A Member—It is well packed and well mixed, we mix it during the winter and we find it in a mass, in as nice a shape as you can find anywhere; lots of times I have asked neighbors to look at it. I used to have it high and dried out, but it does not do that way now.

Mr. Convey—We have had thirty years' experience. I am more afraid of applying manure on bare ground than on snow. If it is on grass land

on the snow I do not worry about it; I know I am going to get the value of it. We like to apply every day, except for a time in the summer, and we get better results than we used to get.

Mr. Plowman—Isn't it a fact that at the Experiment Farm at Madison they put their manure into a shed?

Mr. Jacobs—I will say it is also a fact that the Experiment Farm recommends that the least loss occurs by applying it outside.

Mr. Bradley—They tried the shed proposition one year, but only one year. Two years ago they had a shed full and they found out all about it.

A Member—I find where I put it out at this time of the year on top of the ground it goes down in the ditch.

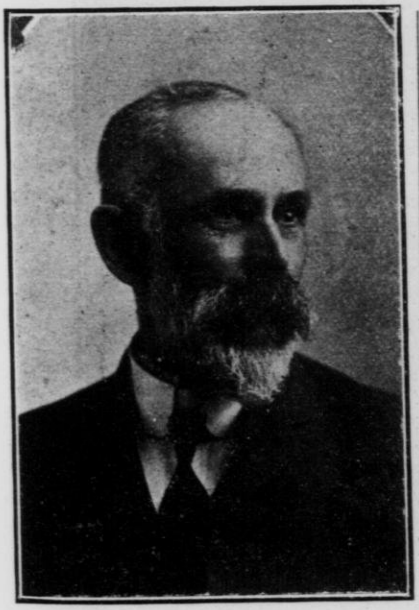
Mr. David Imrie—I believe there is a great difference in the kind of grass land in this matter of applying manure. If you put it on a sheep pasture, eaten down close, you will lose some of it, but if you put it on a new seeding of clover, where you sowed last year and there is stubble eight inches high there it would be all right.

Supt. McKerrow—What does this man Imrie know about sheep pasture? It should not be eaten down close.

Mr. David Imrie—We get it just as far away from the oat crop as we possibly can.

FERTILIZERS ON OUR FARMS.

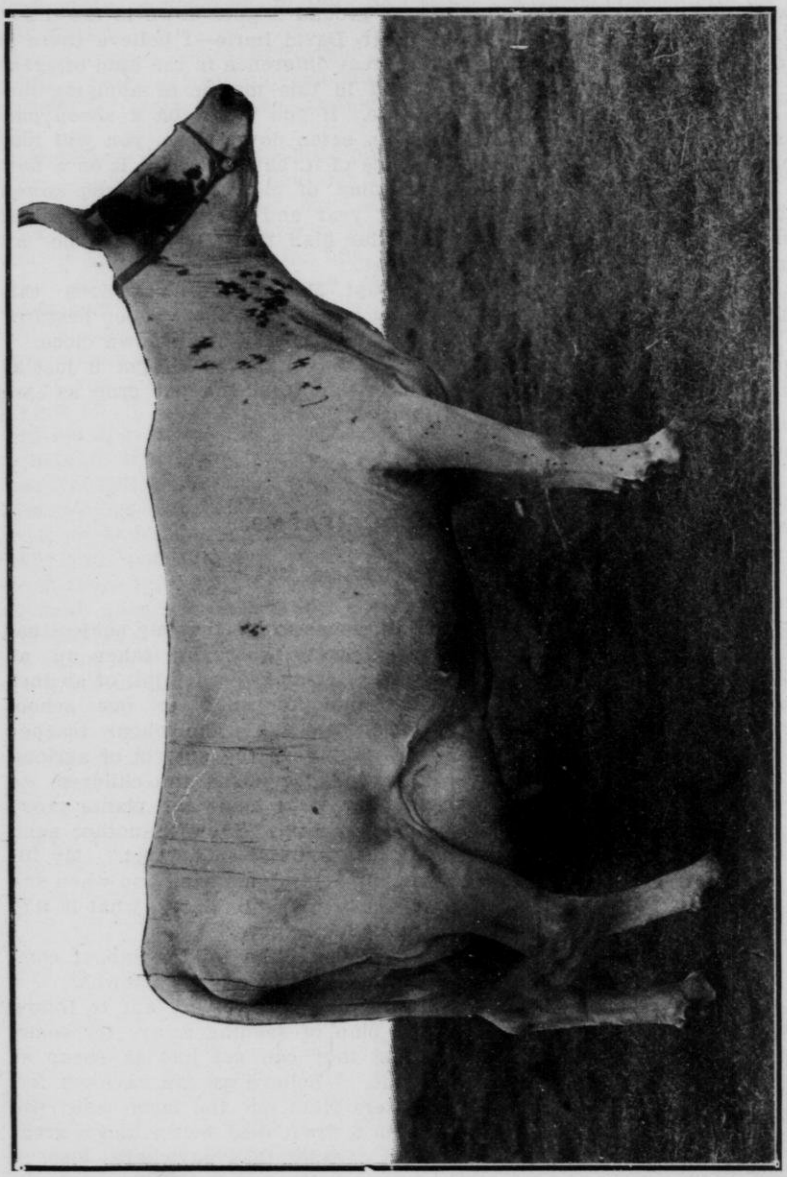
H. D. Griswold, West Salem, Wis.



Mr. Griswold.

It seems to me that my subject has been pretty thoroughly taken up already. It makes me think of an incident that happened in our school some years ago. The school teacher was taking up the subject of agriculture and she asked the children to tell her what made the plants grow. One boy said, "Snow"; another said, "Rain"; another said, "Dirt." My little boy held up his hand and when she asked him, "Well, Harry, what is it?" he said, "Manure."

We have been talking about commercial fertilizers somewhat; I think farmers are very apt to follow the plan of sending away for something they can get just as cheap at home. I believe we can have our fertilizers right on the farm and use them a great deal better and a great deal cheaper than anywhere else. I do not believe that in Wisconsin we need to buy commercial fertilizers, but we do need to keep more stock on our farms and have more of this



Fertility Restorer.

Champion Ayrshire cow, at Wisconsin State Fair, 1913, owned by Adam Seitz, Waukesha, Wis.

barnyard manure—stable manure. I stand corrected.

In a good many cases we have too large farms. Our farmers have paid more attention to the buying of land than they have to the buying of stock, they have too much land for the number of cattle they keep. We want to feed out on our farms all the products of the farm right there; we do not want to be selling off hay and grain, we want to feed them right at home, and if we have the right kind of stock, we can realize a great deal more for our hay and grain fed out at home than we can get on the market.

Handiing the Manure.

I haven't a very big farm, but when you talk about keeping barnyard manure under a shed, I would like to see the shed that would keep our manure. We have got to get it out, and the only way to manage our business is to get it out just as fast as it is made.

Then there is another point to be considered, and that is the liquid part of our barnyard manure; that is where a large part of the waste comes in, in allowing the liquid part to leak out, or even to have drain pipes to the gutter to drain off the liquid. We do not realize the value in that liquid part of our stable manure. We should have tight gutters and tight floors and use enough absorbents to take up the liquid and hold it, so it will be taken out in the field with the solid parts. It is always that liquid part that is first washed out, and that is first available in the soil for our plants to get hold of and grow on.

Another place where we waste our barnyard manure is in letting the cattle run out, going off to some creek to get water, standing in some creek bottom, so all the droppings are practically wasted; we do not get it where we can get the benefit of it. I know of men who keep quite a number of hogs and yet they get nothing from them that they can put out on the land. They let the hogs run in such a way that they get absolutely nothing from them. Now, we can get a large amount of fertilizer from the hog pens if we will give those pigs plenty of bedding, clean out the pens often and take care of them; it is the very best fertilizer we can get, and it will not hurt the hogs either to be taken care of.

We can even get quite a lot of fertility from the hen house by cleaning it often; it will not hurt the hen house any, and the manure is very rich in fertilizing elements.

We know in old countries, where they have raised crops for thousands of years, they are very careful to save all the fertility, to save everything they can use to put on the land to add fertility to it. We spend a lot of money to carry away the sewage of our cities and towns. In the old country they pay money for that for the fertilizing value there is in it.

If we will look out for this fertility that we have right here on the farm, we can keep up the farm. The more stock you keep, the more fertility you have to put back on the land, the better crops you can raise, the more stock you can keep. You will be surprised at the number of cattle you can keep if you follow that up for a term of years.

The Use of Legumes.

The clover plant helps us, the alfalfa plant, all those leguminous plants. The roots of the plants keep the soil loose and in good condition and the plant itself draws nitrogen from the air, so do not forget clover.

I know you say clover kills out and farmers get discouraged because they put some clover seed in the ground and then very often they do

not get any clover. One sowing is nothing. It is like a man I used to know; they said he wasn't very good pay. One man worked for him for several years and he said, "Oh, he is all right, only you have to keep asking him." This clover is all right, only you have got to keep sowing it. We have got good stands of clover by sowing in the last cultivation of the corn. We have got some good stands of clover by sowing it after grain. Right after we got the shocks off, we would go in and sow clover. We do not depend on getting it because we sow it once, we keep on until we finally get it. So get this clover plant; get the alfalfa; you can get it if you keep trying.

Then we are feeding these plants to our animals. Of course the animal takes out of it first its own support and you can lose fertility by selling off the cream or butter from your farm, and you cannot put back what you take off in that way, but if you are buying some bran or cotton seed meal, or some of those things, to balance your ration, you will keep up the fertility, and every year keep putting back on the farm all of that fertility, so the farm will get better year by year, instead of getting poorer. Even back in old New England, where the land is naturally so stony and poor, where they have kept a large number of dairy stock on their farms for years back, the farms are in good condition.

So we do not need to buy these commercial fertilizers to any extent in my opinion. I know that in some of our states they spend a great deal of money in that way, and it is all right to try out those things under certain conditions, but altogether we have tried a good many of the commercial fertilizers on our land, so far we have not seen any results whatever.

DISCUSSION.

Supt. McKerrow—I take it then that you have a two-year rotation, where you sow clover in your corn. That is getting it down finer than Bradley.

Mr. Griswold—Yes, but we have land that is equally good for cultivation and for pasture and the clover sowed in the corn is used many times for pasture, so bringing in the pasture, it makes a longer rotation.

Mr. David Imrie—Hog pastures get so very, very rich, and I would like to ask what would be the best way to get clover in these hog pastures. I will tell you what I am going to try. It is almost impossible to get grain to stand up, it falls down and smothers out the clover. I propose sowing some barley or oats in the clover and using that for pasture for cows. What do you think about that? Will we get a stand of clover that way?

Mr. Griswold—We never tried it in that way, but I think you can get your clover in the corn. Plant the corn in the hog pasture and sow the clover in the corn.

Mr. Imrie—As a rule, we hog off the corn, and I thought we would pasture the clover.

Mr. Baird—Where air-slaked lime is used extensively for a double purpose, as an absorbent in the stable and for the purpose of getting the lime back to the land, would you consider it in any way injurious to the stable manure?

Mr. Griswold—I have never used it. I have used land plaster, but never lime.

Mr. Convey—It is considered to be highly injurious, the air-slaked lime, but whether that is true of ground limestone I could not say. It causes the escape of the ammonia.

Mr. Griswold—It will hasten the

fermentation, whereas land plaster will retard fermentation.

Mr. Convey—Land plaster has the capacity of taking up the fertility, but active lime will dispel it.

Supt. McKerrow—It is the general consensus of opinion from the Experiment stations that caustic lime will do harm and air-slaked lime has a good deal of this caustic property left, and I should say it was very bad to use in your manure.

A Member—How about coal ashes; have they any value as fertilizers?

Supt. McKerrow—Very little value in coal ashes; wood ashes are very good.

A Member—In feeding a ton of bran to cows, how much of the price of that ton do you put back on your farm in manure?

The Chairman—You had better word that question this way: In feeding out a ton of bran, what would the fertilizing ingredients be worth? But, first we must know what we have to pay for commercial fertilizers. At present prices we will pay about fifteen dollars for commercial fertilizers, about fifteen to twenty cents a pound, and about seven cents a pound for potash and phosphates.

Mr. Jacobs—I think your estimate is too high on that basis.

Mr. Convey—Where you can grow clover, you do not need to set so much value on nitrogen. Where your land is in good condition, you can increase the nitrogen content by growing some kind of clover or alfalfa crop. We could not afford to pay the commercial price for fertilizers, hence we could not afford to allow that price in figuring on the bran.

The Chairman—I was figuring on the basis of what you would have to pay for nitrogen in some other form of fertilizers.

A Member—Will ground limestone serve the same purpose as ground phosphate rock in the gutters?

Mr. Griswold—We have never tried it. We have put ground limestone in the soil, but so far we have not seen any results from it whatever.

Supt. McKerrow—Have you tried the phosphate rock?

Mr. Griswold—Yes. Last year we had on our farm an acre carefully measured off and we had fertilizers from the Experiment Station at Madison. One-half had ground limestone put on at the rate of three tons to the acre and then it was divided up in strips of six rows of corn across the acre, making in all ten strips. On the first strip, manure from the hog pen was put in. On another strip we had some nearly pure nitrogen which they sent us, then some phosphate rock and some potash and some phosphorous, so we had different fertilizers and different combinations on those ten strips, and one strip was left without any fertilizer. The corn was cut by itself in the fall from each of these strips, cut by hand, and we husked it out by hand, and the man from Madison came up and weighed it. From the first strip, where the hog manure was put on, we got a yield of fifty pounds more corn than from any other strip, and the strip where there was no fertilizer at all applied yielded just as many pounds of corn as any of those strips where the rock phosphate or the nitrogen or any of those things were applied. There was practically no difference in any strip, except that one.

Mr. David Imrie—I believe that those people who want to try these things should try in small quantities, experiment on a small piece of land. Two years ago last spring, I bought a ton of acid phosphate, which is supposed to be more valuable than rock phosphate. I sowed it as an experiment, on cats, clover, barley and alfalfa, just taking a strip through the field and marking it so I would know it. Some I put in about one hundred and

fifty pounds to the acre, mixing it in; some I sowed on top and some I drilled in. It was so dry that year that I saw no results as I thought. The next year I had to plow one of those fields, because the clover did not grow. In the alfalfa field I could not see any difference, but I had to plow the clover field the next year, and I turned it down four inches under the ground. I saw no results the next year, it was seeded with clover again. Then the next year it was in clover and I could see no results. This year we will put corn on it, and if it is to show at all, it will show in the corn.

Mr. Convey—I do not think we ought to be unfair about commercial fertilizers. These men here have kept up their farms, and in their cases it was not necessary, but it might be possible that another man, having different conditions, would find fertilizers a great advantage.

Mr. Griswold—I can always tell on a farm where I put barnyard manure.

Mr. Jacobs—I have heard it stated that fertility may be purchased with money, but it takes brains to put humidity in the soil.

Mr. Convey—Give us some idea about how many cattle we should carry on a farm per acre.

Mr. Griswold—That depends on the soil, but as I said before, all you can carry with the feeds you can raise, and the more stock you carry, the more feed you can raise, and after you have practiced that a while, you can keep more and more as the years go by. I keep about sixty head on eighty acres, and then we have four or five horses and forty or fifty hogs, but I could not have done that twenty years ago. I have brought my land to that point by keeping stock and putting on all the manure.

Mr. Imrie—You spoke about conserving the liquid manure. How can you do that if you haven't a lot of straw?

Mr. Griswold—Our crop is largely corn; we fill our silos and that takes about half the corn crop. The other half is shredded and we use a large part of that for bedding. It will take up the manure in the gutter better than straw or most anything else.

A Member—In case you do not have corn stalks or straw, would you consider it profitable to buy planer shavings?

Mr. Griswold—Yes, I would.

A Member—How about a septic tank?

Mr. Griswold—Those systems do not work very well with us.

A Member—How many silos have you on your farm, and how large are they?

Mr. Griswold—We have three; one is eighteen feet in diameter and thirty-two feet deep; and each of the others is twelve feet in diameter and one is twenty-four and the other twenty-eight feet deep.

Mr. Convey—Have you silos enough?

Mr. Griswold—No, I am going to build another one next year.

A Member—Do you consider those planer shavings a detriment to the soil, any kind, such as you would get from the planing mill?

Mr. Griswold—I do not consider that the pine shavings are, but I do not like hardwood. I notice where they have had the hardwood saw-mills it does not seem to do the soil any good.

Supt. McKerrow—Mrs. Kelly says that according to the ginseng people, who want acid in their soil, they get it by putting on hardwood mulch, because there is acid in the hardwood leaves and sawdust.

The Chairman—You said that a great deal of the fertilizing elements

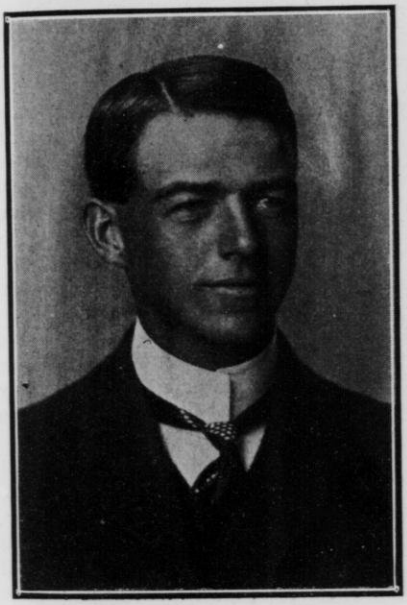
were in the liquid manure. About what proportion would you say?

Mr. Griswold—About one-half.

Mr. Convey—There is considerable more from a money standpoint.

SMALL FRUITS.

C. L. Richardson, Chippewa Falls, Wis.



Mr. Richardson.

Under the constantly increasing price of food stuffs, particularly those for making pies, cakes, desserts, etc., any crop that enables us to live better and saves work or time or expense without costing more than it comes to, is a wise and economical crop to raise. And such a one is the fruit crop upon the farm.

A great deal of sympathy is due to the woman on the farm, who is obliged to prepare one thousand and ninety-five meals each year, and who, while seeking variety and originality, is limited to the flour bin and the pork barrel. "What shall we have for dinner?" becomes in very truth to her the 'eternal question,' and small wonder if the answering of it through the years deepens the lines of care in her face and adds a note of sharpness to her voice.

There is a saving of a lot of worry to the woman, there is better food for all concerned, there is increased variety, there is better health and fewer doctor bills, there is a more wholesome 'balanced ration,' there is a decreased expense on the farm which has, in their respective seasons, an abundance of strawberries, raspberries, currants, perhaps gooseberries and blackberries, to be followed in their turn by cherries, plums and apples, fresh and delicious, or canned, preserved, jellied or jammed, any day in the year.

It is with no misgivings that the planting and care of fruit enough to furnish the family with all they can eat and can is recommended on every farm, for they are wholesome, easy to prepare, require but small first expense and not a great deal of time or care thereafter. It is not good judgment to rely on buying fruit, for that is much more expensive, and there is not a sufficient chance to get it: so that in most instances "buying it" really spells going without. But these facts are too well known to require further statement or defense.

The Strawberry.

The first fruit to ripen in Wisconsin, and the one most widely disseminated over the State, is the strawberry. It has the widest range of soil and location and is the most generally grown of all our fruits. The average family will require from two hundred to four hundred plants.

Avoid, if possible, very heavy, stiff clay, or light, drifting sand. Any good land, well enriched, will do. Land which is in condition to produce a first-class crop of corn or potatoes is in fair shape.

If a choice of locations is available, a site should be selected which is not upon light sand, as this will dry out too badly when maturing the crop, while heavy clay is too cold and wet and freezes and heaves in winter, breaking the small rootlets. Select a site that is sloping enough to drain well and high enough so cold air does not drain down onto it cold nights. A deep covering of snow is a distinct advantage, while fields where the snow blows off are subject to winter killing. Sandy southern slopes produce small but early fruit; north clay exposures produce large late fruit and endure drought.

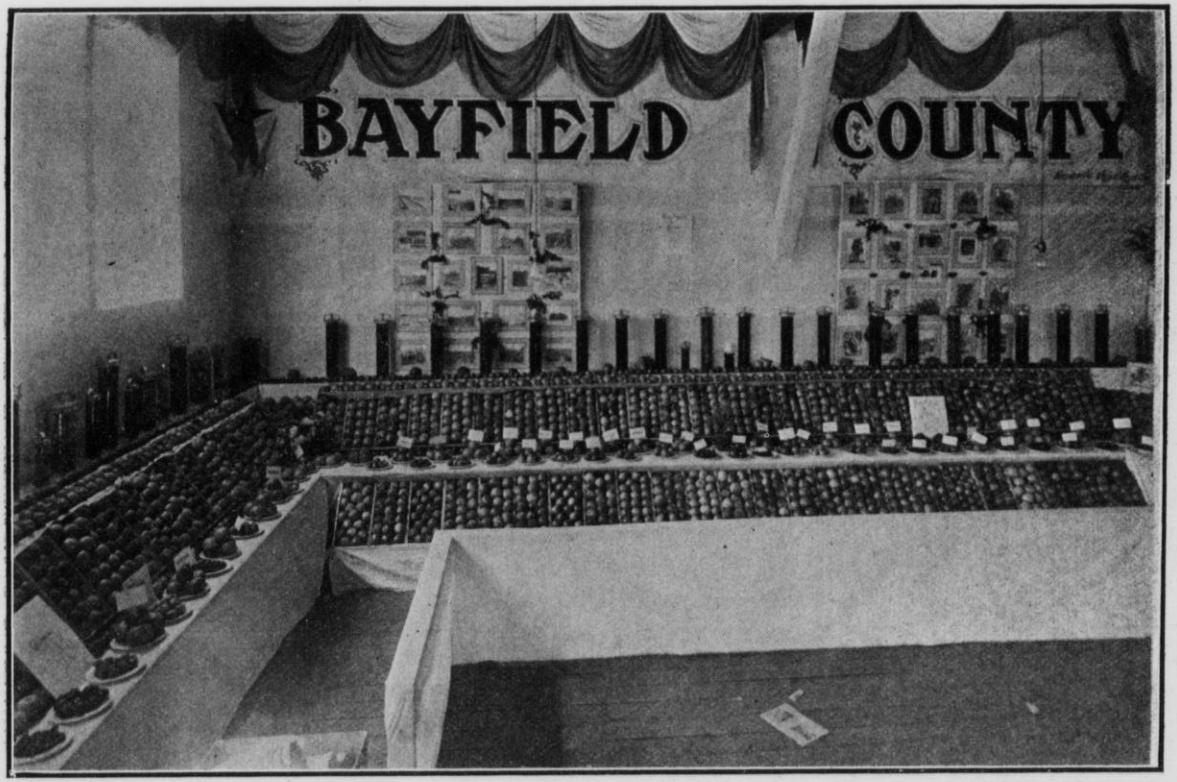
The ground should be as free as possible from cut worms and white grubs—the larvae of the May Beetle, or "June Bug", as it is commonly called—as either is destructive to newly set plants. A young clover sod, where oats have grown the year previous, is as good as anything.

We prefer to spread twenty to thirty tons per acre of barnyard manure on the ground and plow it under five or six inches, as the roots of any of the fruits go deep enough to reach it, while grass and weeds are avoided. Only old, well rotted manure, in which all seed has been sprouted or killed, should be used for top-dressing.

Plow either in spring or fall, the former leaving the ground in a little softer condition. Cultivate and pulverize the ground thoroughly before planting, that is the cheapest time to prepare it. When ready for planting it should be fine, firm and free from lumps, holes and grass or straw. Mark off the land in rows the long way of the field.

Plants can be obtained either from any nearby nursery which has been inspected according to law, or by sending direct to any reliable nurseryman or small fruit grower. Such plants are cheaper and will arrive in better condition than those sent to local canvassers and by them peddled out. As soon as fruit stock arrives, it should be unpacked and "heeled in" in moist earth until ready for planting. Standard varieties ought not to cost more than fifty to seventy-five cents per hundred or $3.50 to $5.00 per thousand. Dozen lots can be sent by United States mail, larger quantities by express or the new parcel post.

Set the plants in rows four feet apart, with the plants twenty-two to twenty-six inches apart in the row, depending on the kind and fertility of soil and the running capabilities of the variety. Large quantities can be set with a strawberry transplanter, smaller quantities with a sharp spade, garden trowel or mason's trowel. The best times to set are on a cloudy day, before a rain or towards evening. Plants should never be exposed to hot sunshine and drying winds; even a few minutes may dry them so badly that twenty-five to forty per cent will die. We trim the roots to about four and one-half inches in length, place a hundred in a pail containing half an inch of water, cover them with a wet sack and take out only one at a time as planted, being careful to get the



Some North Wisconsin Apples grown in Bayfield county.

roots down deep into the ground, packing the earth firmly about the roots and leaving a little loose earth on top to act as a mulch and prevent evaporation.

Tame strawberries, unlike wild ones, are either staminate, that is, perfect flowering, or pistillate, that is, imperfect flowering, and requiring a staminate to be planted beside them. The latter are perhaps a little more productive, so it is as well to plant some of each.

Perhaps the Senator Dunlap is the best variety to plant in Wisconsin, as it succeeds on all soils. The old Warfield is very good, but is too short of root for dry soils. Clay and sand require different varieties. A dark berry, such as the Warfield, Dunlap, or Lyon, is best for canning. The Beiderwood and Haverland are light and soft, but are productive and stand drought well. The old Crescent is small and soft, but endures neglect as well as any. The New York, Glen Mary, Sample, Challenge, Parsons Beauty and Uncle Jim are large and rather late, the Michels Early, Camerons Early, Fairfield, August Luther, Excelsior and St. Louis are among the earliest and smaller, while the Good Luck, Gandy, Nettie and Latest are very late.

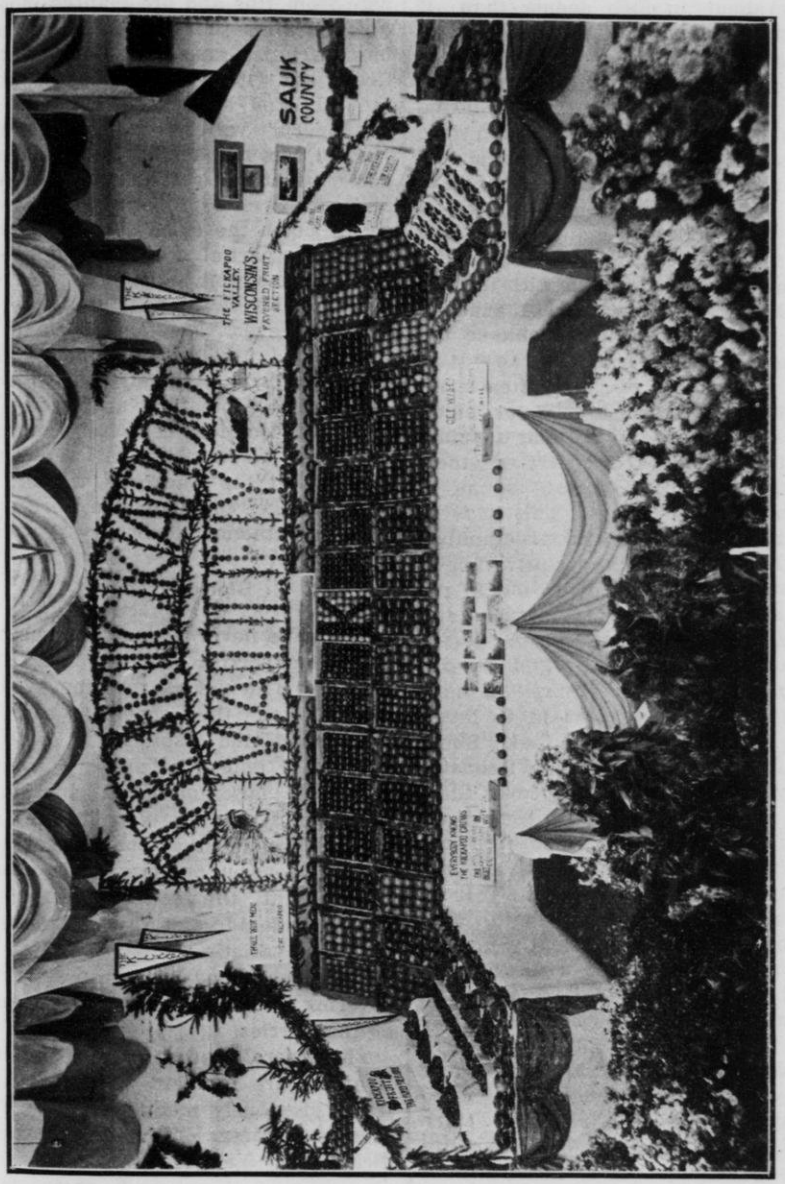
As soon as set, cultivate with a fine-toothed cultivator, and hoe shallow, to "surface" the plants and prevent evaporation. Cultivate every ten days or two weeks during the summer, and especially after rains. Hoe from four to seven times during the summer. It is necessary to keep all blossoms off the first year, to throw all the plants' strength into the runners. Swing the runners around lengthwise of the row, and hold in place with a small stone or a hoe-full of earth. Space the plants some as the row widens, so the plants do not crowd. A larger and fancier quality of fruit can be produced by spacing the plants five inches apart and restricting the row to eighteen or twenty inches in width. This is a lot more work and will not produce any more quarts per acre. The hoeing is far easier, if you do not let the grass and weeds get the start.

Mulch the plants in the fall as soon as the ground freezes with straw, marsh hay or shredded cornstalks, thinly and evenly spread on at about three tons to the acre. Coarse manure is a good mulch and forces a fine crop, but induces such a growth of grass and weeds it is not generally to be recommended. This mulch prevents heaving in the winter, protects from winter-killing in case the ground be bare of snow, retards spring growth until most of the frosts have occurred, prevents grass and weeds next summer, keeps the berries clean when picked, and, most useful of all, conserves the moisture during bearing season when the plants require an enormous amount of water to mature their crop. On sandy soil it is well to use flat cultivation; on moist clay, ridge the row slightly.

Then the following spring, take up some plants from these new rows and set out for the next year, for once you have had them you will not want to be without them.

The Raspberry.

The next fruit, in point of season, is the raspberry, the most perishable and perhaps the most intensive as well as delicious of all the fruits. A hundred canes will suffice for the ordinary family. The general type of soil, its preparation, care and cultivation, time of setting, etc., are decidedly similar to that already laid down, except that a more sheltered location is desirable. The red varieties do well at seven feet by five, the blackcaps at six feet by four. Plant the



Kickapoo Valley Apple Exhibit at Wisconsin State Fair, 1913.

stock about an inch deeper than it originally stood, make the hole large enough to receive the roots without crowding, and pack the earth firmly about the roots. Cultivation should be frequent enough to keep down the grass and weeds, form a dust mulch and conserve moisture. Each plant will send up additional canes, as well as "suckers," similar to a lilac bush. A cultivator with horizontal knives plus a little work with the hoe will keep them down. In August of each year the old canes should be cut out and destroyed and at the same time the number of canes in each hill should be reduced to six or eight. Canes which are too tall and ungainly can be headed back a part of their length, before full grown, so as to produce lateral shoots. This adds to the size of the fruit, without diminishing the quantity. Stop cultivation in time to let the ground dry out in the fall, so the canes will mature and harden their wood for winter.

Shortly before the ground freezes in the fall, it is necessary in most parts of Wisconsin (except in favorable locations along the Lake Shore and in extreme southern Wisconsin) to lay down the canes and cover them with a little earth for winter protection. A shovel or six-tined fork and a pair of heavy mittens are all the implements required. Shake loose and stand the canes up again next spring, and if not sufficiently upright they may be supported with a line of small posts or stakes carrying wires, like a wire fence, on each side of the row.

There are newer varieties, more highly advertised, and costing more money, but the old, reliable, Marlboro, Cuthbert, Miller and Loudon are as good as any. The Eaton is a newer one, it is well liked also. Plants will cost from thirty-five to seventy-five cents per dozen, or $1.25 to $2.00 per hundred. The blackcaps propagate from tips and are planted closer together than the reds. Among the best varieties are the Cumberland, Gregg and Older. The Kansas, too, is well liked by many. There is a good purple variety—the Columbian.

After our raspberries had been under cultivation perhaps five years and were well established, we ceased to lay down the canes in winter, and after two partial crop failures they produced as well as before, and we dodged a lot of work. If this is to be done, however, the plants need to be established first and should be allowed to form a thickly matted row for mutual protection, and need a sheltered location, especially on the north and west, where the snow lies deeply, but the blackcaps are not as hardy as the reds and seem to require winter protection almost everywhere.

Blackberries.

We have never had much success with blackberries on our farm and this is by no means an unusual experience, as they seem to succeed only in isolated instances in Wisconsin. They appear to prefer a loamy soil, rich, dark and moist, and some of the most successful fields are on north slopes, just at the base where the hill opens out on marsh or meadow land at the foot. The Ancient Briton, Eldorado and Snyder are good standard varieties.

They need good winter protection, covering with earth, as in the case of raspberries.

The general method of care and cultivation are similar to the cane fruits previously mentioned, but the thorny character of the canes makes picking, cutting out of old canes and all other work around them less agreeable in character than the care of the other cane fruits, but on the other hand, their comparative late-

ness makes them valuable about the home.

The Currant.

The last and least troublesome to produce of the home fruits is the currant. In its preference for deep, rich soils, it more nearly approaches the garden vegetables than any of the others.

Set the rows six or seven feet apart, with the bushes four feet apart in the row, put on plenty of manure and cultivate. We have always preferred to mulch about the plants with some sawdust and the coarse chip dirt from the bottom of the woodpile. Once in three or four years cut out the old wood, but it is not necessary to set out new plants oftener than once in ten or twelve years. Indeed currants and raspberries are the least trouble of all the fruits to raise, once they are well started. We have grown the Red Dutch, Fay's Prolific, Cherry and Perfection. From all points of view, the latter seems to be as good as any.

In conclusion, remember that we all dislike to cultivate and that no man likes to work cramped in by fences on four sides, so put the fruit in long, straight rows, far enough apart to practice horse cultivation. The currants can well go between the fruit trees, the raspberries in two or three rows to the east of them, then cultivate them, pick them, eat them and enjoy them. They are delicious. Please pass the fruit.

DISCUSSION.

Mr. Griswold—Is it necessary to spray strawberries?

Mr. Richardson—It is not necessary, and yet it is advocated in many places where the rust is bad or some other peculiar conditions exist. It is not being generally done throughout the State today. Where we do spray, we can use the Bordeaux mixture at the rate of 3-4-40.

Mr. Griswold—Do you spray at blossoming time?

Mr. Richardson—No, spray just before and after the blossoming stage.

A Member—Will strawberries planted early in the spring produce a crop that year?

Mr. Richardson—You could get a few berries that year, but not enough to be worth while, you want to throw all the strength into the runners. The only way you could do anything this year would be to set out your plants very close together indeed, twelve or fifteen inches.

The Chairman—The object is to grow plants one year and berries the next.

Mr. Richardson—Yes, it is a two years' crop.

The Chairman—Would you leave all the runners on?

Mr. Richardson—That depends on the soil and cultivation. On a very heavy soil you might get too many plants, and there is likely to be a lack of pollenization in that case. It is better to space the plants and get better results by restricting the number of plants.

A Lady—When is the best time to set out strawberries—spring or fall?

Mr. Richardson—There is only one good time and that is in the spring. We plant after we have finished our oat seeding and before corn planting begins. By trying to plant in the fall, the plant is liable not to be fully matured and it cannot take care of itself. We have to care for it all fall, there is a considerable percentage of winter loss, and next spring it is but little ahead of the spring-set plants and a lot more trouble.

A Member—I have tried raspberries two or three years and have had no success. They grow fine, twenty feet long on the ground, we clip them off

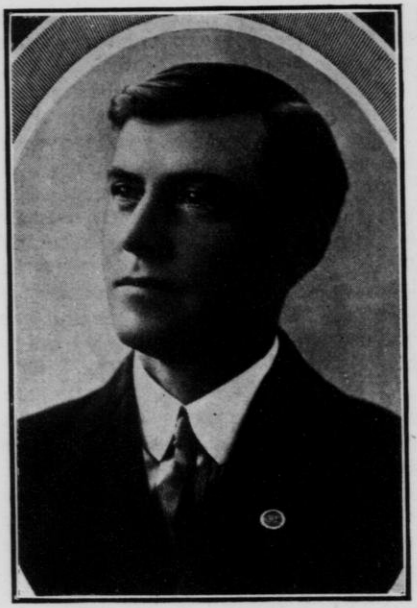
to keep them three feet high, then they grow a heavy, solid, stiff stalk and they winter-kill. Mine is heavy clay ground and if we have much storm during the summer the root will grow so solid it will not give and they break very easily.

Mr. Richardson—You could make that plant smaller by impoverishing the soil so your cane would not get so big. I think you could prune it down during the summer and head it back to probably four feet, or pinch off some of the ends.

Mr. Bingham—I would suggest that you let them grow more canes, which would naturally be smaller, and then in the fall, after they have grown a lot of canes, trim them out to the right number.

TREE FRUITS.

D. E. Bingham, Sturgeon Bay, Wis.



Mr. Bingham.

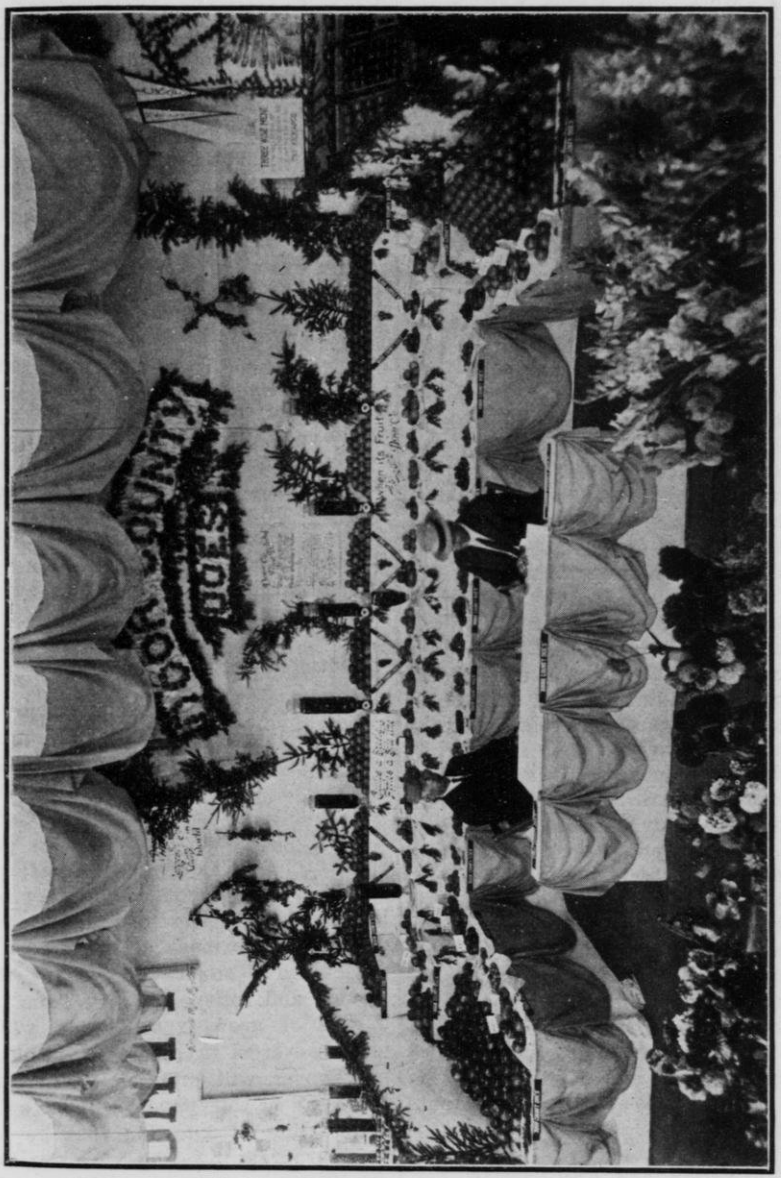
I wish to limit what I have to say on fruit culture wholly to the home orchard, or the fruit trees generally found in the garden or near the dwelling of a majority of our people; also to point out the best way to manage under the conditions usually existing.

As a rule, there is too much crowding of trees and shrubs into small spaces and fruit trees suffer for room, especially where they are too close to shade trees. Often too many fruit trees occupy the ground, including crab apples that are more or less worthless, especially if they fire blight. Under such circumstances it is best to remove the worthless, the dead or dying and give the best more room and sunshine.

One of the best things that can be done to renovate old trees is to prune properly. The aim should be to increase the vigor of the whole tree to bring the weak growing limbs into more growth, and to make the branches grow with equal strength. This can be done by removing the weak, under-vigorous limbs and either removing the over-vigorous or shortening them by cutting back.

If the tree lost its foliage last year from fungus diseases or from slugs or other insect foes, there is a condition of weakness requiring special attention in pruning, especially if the trees are young and in reasonable vigor.

Last season there was a good growth of new branches early in the season throughout the State where



Door County Horticultural Exhibit at the Wisconsin State Fair, 1913.

orchards were reasonably well cultivated. Where the leaves fell off in midsummer, the wood and buds of this new growth could not ripen or mature properly. Such growth may be cut out quite considerably to secure the growth of the strongest buds near the base of the branch, rather than allow the weaker buds of the ends of the twigs to grow as they would if left on.

Spraying for Insect Pests.

Very often the trees are badly infested with scale of the oyster shell bark louse. For this trouble, lime and sulphur is a remedy if applied right. The right strength to use of the commercial solution is one gallon to about ten gallons of water, to be sprayed all over the tree when it is dormant, that is before there is any growth of buds or leaves.

For protection from worms and fungus troubles such as scab of the apple and shot hole fungus of the plum and cherry, the best and safest spray is Bordeaux mixture and arsenate of lead. Lime sulphur solution is for part of the spraying, thought to be preferable by some fruit growers, but it is not always as successful in some seasons as we would wish, notably as rainy a season as that of 1912. The advent of powdered arsenate of lead, instead of the paste heretofore used, promises to make it easier and more accurate to use.

Nicotine for plant lice, vine hoppers, and other sucking insects that we cannot destroy with paris green or arsenate of lead, will supersede kerosene emulsion as being much more easily prepared and probably can be used with lime-sulphur advantageously.

Cultivation and Fertilization.

Perhaps one general condition prevailing in our little home orchard or garden is lack of cultivation. Where it is not practical to break up the sod and stir the soil, a mulching of strawy barnyard manure would help give the desired growth. Often, however, the soil is exceedingly fertile, especially where refuse and slops from the house are thrown upon the ground about the trees. The fertility may, however, stimulate to a growth that is soft and succulent and does not ripen well. This may form an excess of nitrogen and it is desirable to correct this by giving a better balanced ration. While theoretically unleached wood ashes would supply the needed elements, they have also a dissolving effect upon the humus and nitrogen of the soil and by making them more available to the tree would stimulate the succulent growth and aggravate the trouble. Lime might often be more safely used, especially where the soil is sour, and if the lime is ground carbonate or marl, rather than actively caustic.

Treatment for Over-Bearing Trees.

In the orchard, or the garden or the back yard it is often the case that the trees will some seasons bear excessively. It is better to thin the fruit than to allow this condition. Plums and early apples are very prone to over-bear some seasons. Such trees seldom prove long-lived or satisfactory. A removal of one-half or more of the plums or apples when small will remedy this trouble and relieve the tree from the burden of growing the seeds, which is the severest tax upon its vitality.

Whoever will practice the things set forth in this paper, will have the satisfaction of knowing that he has made progress toward having the best conditions prevail in his home orchard and is reasonably sure of his reward.

DISCUSSION.

A Member—What is the best time to trim apple trees?

Mr. Bingham—I would say the latter part of March or April.

A Member—I have been trimming and trimming and trimming. I read quite a lot about it and I find where I trim trees in the orchard there will be a branch come right out three or four feet long, and so I have got to keep right after them. What is the matter?

Mr. Bingham—Too rich land again. Those water sprouts ought to be removed; you should take them off when they first come.

The Member—But a man is busy, he cannot go around every week.

Mr. Bingham—It does not take a man long to go around once a week. That is about the only remedy, anyway.

The Member—Another thing, I sent to a firm once for a certain number of cherry trees, ten of them, and four proved to be plum trees. They blossom clean and nice every spring, but they do not have a plum on them.

Mr. Bingham—The plum is subject to a fungus disease and if you spray when they are in full bloom you sometimes check the disease, but of course they must be pollenized to bear fruit. Use regular Bordeaux mixture, either 3-4-50 or 4-5-50 formula, and then use plenty of lime, say five pounds, put it into blue vitrol so it is neutralized, and spray right onto the full bloom.

A Lady—Some one told me we would never get any plums because they are planted near the apples. Is there anything in that?

Mr. Bingham—No. There may be another reason why you do not get plums. There are some native plums that are not self-pollenizing and they will bear only a few scattered fruit.

I have a list of apples for the home orchard. I would say that the farmer's orchard should comprise about two dozen trees and I would suggest something like this: Red Astrakan, one; Duchess, one; Whitney, two; Hyslop, two; Liveland, one; Snow, two; McIntosh, two; McMahon, two; Wealthy, two; Tolman, two; Gem City, two; Windsor Chief, two, and two Northwestern Greenings. That gives you a variety that will carry you from the first of the season right on through, and there are two of each variety, with the exception of the Red Astrachan and the Duchess.

A Member—I have ten plum trees, last year I sprayed five of them and the others I did not. Those I sprayed were well loaded with plums and the others had no plums on.

Recess until 1:30 p. m.

AFTERNOON SESSION.

The convention met at 1:30 p. m., Mr. W. C. Bradley in the chair.

THE NEW FARM.

A. J. Plowman, Elderon, Wis.

Mr. Plowman.

My remarks this afternoon will not be confined to the new farms of the far-off and bleak plains of western Canada, nor will they be of the new farms in the Great American Desert, which thousands have been rushing to in the past few years, but they will be of the new farms located in our own beloved State of Wisconsin.

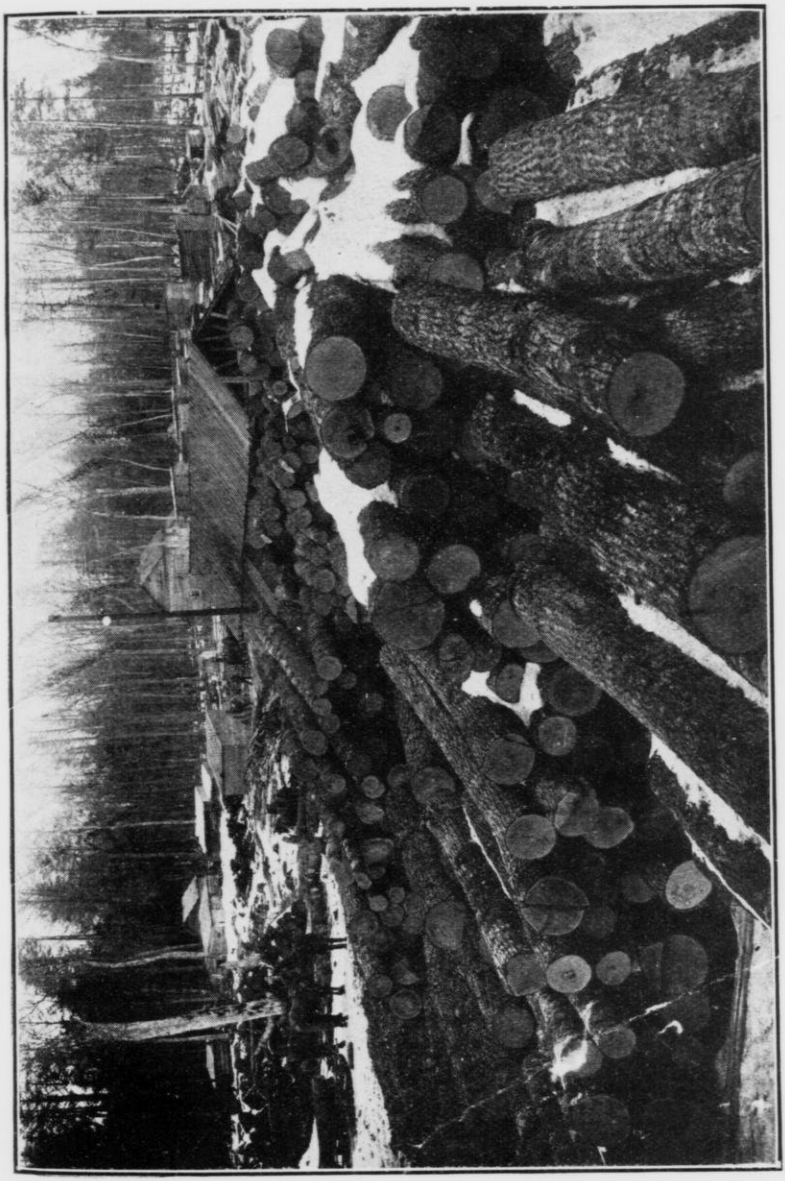
A Great Dairy State.

Few people realize the great agricultural possibilities of Wisconsin today. We are already boasting of our great dairy State of Wisconsin, because we already have as many silos as all the rest of the United States put together because we already own one-fourth of all the dairy cattle in the United States, or a grand total of over five million; we are already producing forty-four per cent of all the cheese manufactured in the United States, and about one-twelfth of all the butter.

Wisconsin's Unimproved and Unoccupied Acreage.

According to the last United States census, Wisconsin contains about thirty-six million acres of land, out of which at the present time only twelve million, or one-third, are improved and occupied. According to reports of our State Department, there are in the State thirteen million acres of unimproved and unoccupied land. Out of those thirteen million acres, it has been estimated that we have ten million acres of number one farm lands.

We have today in Wisconsin about 177,000 farms, and these farms have made this wonderful record in cheese and butter which we now have and of which we feel so proud. What will Wisconsin be when this great empire in the northern half of the State has been developed into farms? It means that the number of farms can and will be doubled; it means that we have room for another million of peo-



A. J. Plowman harvesting the first crop in Marathon county from the new home at Elderon.

ple in the twenty-two northern counties of Wisconsin.

We sometimes wonder why this vast empire of northern Wisconsin, with all its natural resources, healthy climate, rich soils and sparkling waters, should remain for so many years unoccupied and unimproved, but has this country, up to the present time, had its just share of advertising, in the way of encouraging settlers to locate on its rich lands?

Pernicious Advertising.

Today we can scarcely go into any depot or public place without seeing large posters, telling of the wonderful possibilities of some far-off country. Take up almost any of the time-tables of the great railroads and you will find on the backs of them advertisements of cheap rates:— "Only $36.00 to far-off Texas"; "Only $33.00 to Oregon"; or, "Cheap rates into western Canada." All of these same great railroads pass through many of the counties of northern Wisconsin, but it has not been for their advantage to advertise rates into northern Wisconsin, because the haul is altogether too short and the rates instead of being thirty-six dollars would only be three dollars. They much prefer to haul the people into western Canada, because they know, as a rule, they have a chance to haul them back again.

Through all these wonderful forms of advertising, they took, during the year 1912, 143,251 American citizens up into the district of western Canada, and, according to the Canadian reports, those citizens took with them an average of one thousand dollars each.

Need For Legislative Enactment.

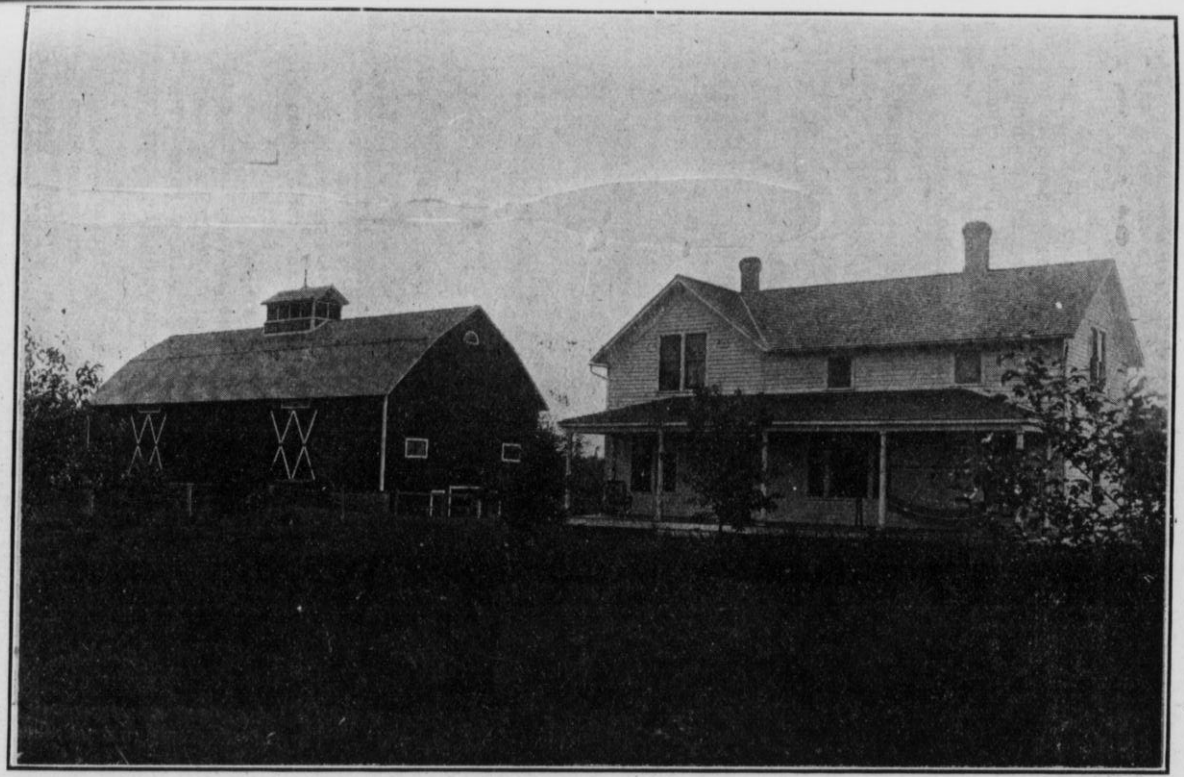
We have begun to realize today that we cannot afford to lose those citizens, nor can we afford to spare the money they take with them. Our Legislature is now waking up to the fact that something should be done to substantially encourage and help the new settlers in our own State.

The Governor, in his last message to the Legislature, recommended many things that will be of help to the development of northern Wisconsin. He said he should not only invite the settlers to Wisconsin, but should encourage and protect them in every possible way after they come here, in order that they may become successful farmers and independent, self-reliant citizens.

Our last Legislature appropriated $450,000 to help the farmers in the southern part of the State get cheaper binder twine; thousands of dollars have been appropriated to aid the different lines of agriculture and now the people begin to think it is no more than fair that steps should be taken to help get the land of the northern part of the State in shape to use binder twine.

The primeval forest of northern Wisconsin has been practically cleared away and a great deal of the money gotten from it has been taken down to build up the cities and business industries of the southern part of the State. In other words, our cream has been taken away from us and we are left to work out our future with the skim milk. We need a little of the cream to help us get started with, and the Legislature of 1911 passed a law which intended to give us a chance to reach down into those southern money centers and bring back some of the cream, so we could use it, at a cheap rate of interest.

The law, which is Chapter 656, Laws of 1911, provided that when twenty-five or more settlers of any county shall petition the county board, setting forth that they are the owners of cut-over lands and that they wish to reclaim said lands by



The Farm Home of A. J. Plowman five years later.

clearing the same, the county board may, upon receipt of these petitions, issue county bonds and the money from these bonds can be loaned to the the settlers, the settlers to pay the money back to the county, so much each year, with interest.

It is intended to be worked out similar to the way school districts borrow money from the trust funds of the State. This law when worked out will be one way of getting money from the richer communities at a reasonable rate of interest to help the settler get started on his unimproved farm.

The present Legislature is considering several bills of vast importance to the northern part of the State, and it is a very good indication that they have the right spirit and we are about to enter upon a new era when the northern part of the State, with its ten million acres of good lands, will be covered with fine homes and prosperous farms.

The Climate of Northern Wisconsin.

Our climate in northern Wisconsin is clear and dry. It is modified by the high altitude of that part of the State. Hay fever and similar troubles are nearly unknown. The winter snow begins about the first of December and lasts until the middle of March. The winters are cold, but dry, and the season is so continuous and snow falls so ample that there is seldom a day after the first snow that the roads are not in excellent condition. The ample snow fall protects the ground from freezing, except to a very slight depth, which speedily disappears when the snow melts in the spring.

The springs are enjoyable seasons and the change from winter seems very sudden, because of the quickness with which the growth of grass and foliage follows the departure of winter's snow.

The summers are warm and pleasant, with plenty of rain fall, which generally comes in showers followed by clear weather. The fog and dismal weather so common in lower altitudes are no part of northern Wisconsin weather. The climate of northern Wisconsin should be an attraction to all who desire good health.

Marketing Facilities.

The markets of northern Wisconsin cannot be beat by any locality, because we are located in the center of a great manufacturing district. On the north we have Duluth, Superior and Ashland, Hurley and Bayfield; on the west, the cities of St. Paul and Minneapolis; on the south, the cities of the State of Wisconsin and the city of Chicago, and the many enterprising and active manufacturing cities scattered all around over our own northern counties.

The settler who locates on the far-off bleak plains of the northwest must pay heavy freight to the central markets on all he produces. He must also pay the freight on all he consumes. This item alone will in a few years amount to more than the first cost of land in either section.

Possibilities for the Young in This Section.

Much as I love to discuss conditions in general of northern Wisconsin, my subject, "The New Farm," must have consideration in the short time given to me.

As a rule, the greater part of the people who come to northern Wisconsin are men of limited means. Some land companies are trying to encourage the settlement of northern Wisconsin by people from the foreign lands, but we think the cities can take the foreigners and let us have

the farmer boys from the southern part of the State.

Today in almost all localities we find men who are dissatisfied with their occupation and location and many of them are continually moving to the cities, only to be shuffled and lost and never heard of again. We think it much better for many of those people, if they are bound to have a change, to come up and try a new farm in northern Wisconsin. They will find life much happier than that of the city, where they will be whistled in and whistled out all the rest of their natural lives.

In the first place, the young man who wants a farm in northern Wisconsin has ten million acres of land from which to select his farm. It is not necessary to locate far from town or any great distance from railroad points.

The hardships of the early settlers such as were experienced in southern Wisconsin, are not to be found in northern Wisconsin, because the lumbermen have gone before us. The railroads are to be found in almost every locality. Little towns have been built up by the mill men, and the new settler will have no trouble finding a locality close to schools and markets.

Timber harvested, brush burnt and ready to seed down to pasture on Plowman's farm.

For a man of limited means, it would be best to make as small payment as possible on his land. All of the lumber companies are willing to sell their lands to good, energetic young men, with a very small payment down, and right here I want to say that most all of the large companies are on the square and will use any man who cares to deal with them fair and right.

After selecting a farm, the young man should make up his mind right from the start to make his living on

it. He should not depend on working for others, as it is more profitable to give his entire time and attention to the new farm first. He should be very careful in selecting his building site.

Locate Buildings Carefully.

As we travel about the older localities today, we find so many farms with the buildings in the worst places they could possibly find. In some of the rich farming districts of Wisconsin today, you will find a farmer travelling through a dirty barnyard in going from the house to the barn. You will find some houses facing the barn or hog pen, and the whole business with its back to the road. We sometimes find the orchard shutting off the most pleasant views, and the whole thing in general out of shape and harmony.

This new settler will have the satisfaction of being his own architect, and he should be careful to start right. After selecting the site, he should have money enough to make a small clearing before putting up any of his buildings. He should build his house and barns in such a way that they can be added to in later years.

Northern Wisconsin a Natural Dairy Section.

His first harvest will be the "skim milk" left by the lumberman, and we are very thankful today that this skim milk or by-product has become a very valuable crop. The price has almost doubled in the last ten years on all lines of forest product, such as railway ties, pulp-wood, bolts, and the different lines of cordwood.

His first winter, harvesting this crop on the land he intends to clear, will be a very profitable one, and when spring opens a good deal of this money should be put into the machines that will give him his future prosperity—the dairy cow.

No expert in dairying has ever been known to come to any other conclusion but that northern Wisconsin is naturally adapted to the dairy business, and the new settler will have no trouble in finding good pasture land for his herd right from the start.

The first summer can be spent in growing various kinds of crops among the stumps where he took off the timber during the winter. Root crops of all kinds do well in almost any locality, and with a few acres dragged into rutabagas and a small piece into millet, oats and clover, he will have no trouble in taking his small herd through the first winter. If he can spare the money, he can begin to remove the stumps and get his land in condition for machinery right from the start. If he has not the money, it is well to let nature take its course with the stumps.

He can very easily keep one cow, or the equivalent thereof, for every acre of land cleared, because it will not be necessary to use the cleared land for pasture purposes.

The silo should follow as soon as the clearing is large enough to begin raising corn.

While his main attention should be given to the dairy cow, he should not forget the planting of a good orchard and see that all his fields are properly arranged.

He will find all this work very fascinating and encouraging, because there is no nobler work of man than building up a new country. There is something in it that makes one feel he has made the world better for the fact of his being in it. He will gradually grow to love his work and farm; and as he goes on improving year by year and sees his farm change from a wild wilderness to a good, profitable, paying proposition, he will become a patriotic northern Wisconsin farmer

and will feel like the old man who went and visited in the old country, and on returning home was asked how he liked the countries of Europe. He replied that the old country was good, but there was no country like the United States, and there was no State in the United States as good as Wisconsin and there was no county in Wisconsin as good as Marathon county, and there was no town in the county as good as our town, and he was sure his farm was the best farm in the town.

In five years 40 acres of timber have changed to potatoes and corn on Plowman's farm.

DISCUSSION.

Mr. David Imrie—How long a growing season do you have in the northern part of the State?

Mr. Plowman—The season is perhaps two weeks shorter than in the southern part of the State, but we have more actual hours of sunshine in northern Wisconsin than you have down in central Illinois or the southern part of Wisconsin; I think it is about seventy hours or five days more of sunshine during the growing season. The fact that tomatoes, corn, Hubbard squash and crops of that kind are successfully grown in almost all of our northern counties is better proof than anthing else that the growing season is long enough to make farming profitable. The old fallacy that we cannot grow corn in northern Wisconsin is dying away. We are growing reasonably good corn for the reason that at least three-quarters of the land is quick soil and with this extra sunshine, it grows its crops that much quicker. In many places our soil is light, sandy loam, and corn will do quite as well as in southern Wisconsin.

The Chairman—I think there is more sunshine in the souls of the men in northern Wisconsin, and that helps a lot.

Mr. Plowman—I have heard it said they can raise better corn in the western part of the State than in the southern or eastern part because they have so much hot air circulating around in the western part, on account of all those Institute workers over there.

Mr. David Imrie—About what does it cost to clear an acre of land in northern Wisconsin?

Mr. Plowman—The cost varies in different localities and under different conditions. In the hardwood regions, the clearing is considerably cheaper than in the pine regions. About three-quarters of that northern territory is composed of hardwood lands. Of course it depends on how long the stumps have stood, but I think an average price would be from twenty to thirty dollars an acre. That would mean removing the stumps. But if you have a reasonable amount of by-product left, the cost of clearing will not be noticed, because you can get enough out of your timber to almost clear the land.

A Member—What is the best way to get rid of stumps?

Mr. Plowman—The ordinary settler will find that dynamite is his only tool but now we are beginning to have land clearing companies formed for the purpose of clearing with machines, and there are machines being put on the market, powerful pulling machines, so that land clearing can be made a good deal cheaper than the ordinary way of dynamiting that the settler takes.

A Member—Have you ever seen any pulling of stumps with a traction engine, such as they are using in Polk county?

Mr. Plowman—They could pull easy stumps that way, but with the ordinary stumps of northern Wisconsin, you would have to have a better rig than that.

Mr. Richardson—What will that good land cost, in a general way?

Mr. Plowman—The average price of that land in northern Wisconsin I would say is about fifteen dollars an acre. Of course, you can buy very good stuff for that and well located, close to town, and on some good turnpike road, on very easy terms. You can buy from most timber companies by paying one-quarter down and get most any time you want.

A Member—What about the hay-making situation up there?

Mr. Plowman—In many of the regions, the settler can get out on lake shores and in open marshes where he can get some hay to start with, but it is a natural grass country; the woods are full of grass. We even sometimes find tame grass; that was seeded by the loggers.

Mr. Imrie—How about quack grass?

Mr. Plowman—Sometimes it is shipped in to our part of the State in baled hay, but it is not found, excepting in places where it has been seeded.

Mr. Richardson—May I say just a word in regard to the experience of a friend of mine who bought eighty acres up there? He paid eighteen dollars an acre. The first year he was there he cleared nineteen acres, getting 153 cords of bolts from it, or eight cords to the acre, which he sold on the ground at $2.35, making $18.80 per acre; in other words, eighty cents more than the land cost him, and he had cleared nineteen acres. I do not claim that is a typical instance, for he was a good, big, strong man, but it is a thing that can be done by any one who wanted to get in and work as hard as he did. That was 1911 and 1912. He was out six or seven miles from the track.

Mr. Plowman—That perhaps was a good price, unless he had to haul it. The price of pulp wood today is $4.25, loaded on the cars.

Mr. Clark—Isn't it better to sow grass on this land that is cut over and let the stumps rot out?

Mr. Plowman—If you are not in a hurry to get your farm started, it is well to let nature take her course with the stumps, and you can do it very cheaply that way, but it would be well for the settler to take the stumps off on some land, then let the stumps rot on part of his clearing. Even among the stumps, he can raise various kinds of crops to a profit; very good hay, anyway.

Mr. Convey—Tell us the best way to start hay.

Mr. Plowman—I would drag it in with oats or millet and seed down with clover or timothy, or any kind you want to get started. You can get out in the spring and seed right down on the snow and get a good catch. We clear off a piece of land during the winter and the first dry weather we go out and burn it, then wait until just before a good rain comes and throw out grass seed, and we get a good catch that way.

Mr. Convey—How does alfalfa thrive there?

Mr. Plowman—It does well in most northern localities. I know one neighbor who sowed two acres of alfalfa, right on raw, new land, the first crop that was ever put on to it, and the alfalfa grew and did fairly well.

Mr. David Imrie—I think I would have to be considered a northern Wisconsin man. I am a good way north, anyway, up in St. Croix county. At the grain show in South Carolina this winter, our county took the prize, competing with all the other states in the Union, so we can grow alfalfa in northern Wisconsin all right. It is evident that Mr. Plowman loves Wisconsin, and if every one else did, there would be less immigration to Canada and Texas and other countries.

The Chairman—I see in the audience a lady whom most of you know as one who has traveled over this State from one end of it to the other, year after year, preaching the gospel of good reading. I do not know whether she wants to make a little talk or not, but I think she does, and if she does, she will give us a good talk.

Miss Lutie E. Stearns (representing the Wisconsin Traveling Library)—I am very grateful to Mr. Bradley for giving me this opportunity. I did not like to hear from the preceding speaker the expression of feeling between the northern and the southern part of the State. I have never recognized any line, never found any line. We are all Wisconsin, all interested in Wisconsin, whether we live on Lake Superior or in Madison or in Milwaukee, or any other place in the State.

One of the speakers this afternoon held up a big card before you and I could just see the words, "Wisconsin stands first," but I couldn't see the rest of it, so I do not know to what it referred. It may have referred to our dairy products, but there is one way in which we do not stand first. We have all had a great shock recently, we who love Wisconsin, in being told that Wisconsin, as far as education goes, does not stand first, but it stands away down the line, away down twenty-eighth.

The Chairman—Yes, but we do not believe that.

Miss Stearns—I hope it isn't true; but that is what we are told by investigators sent out by the Russell Sage Foundation. They tell us that twenty-seven States are better in their educational resources than is Wisconsin. I confess that came to me as a great shock. I have lived in Wisconsin all but three years of my life, and hate to hear that kind of thing said of Wisconsin, whether it is true or not.

One thing, however, it did not dis-

courage me in the work that I have been trying to do in Wisconsin in the past eighteen years among the farmers of Wisconsin. It simply made me feel that I had got to go out and hustle all the more and bring to the people of Wisconsin a certain educational instrument, we may call it. We are talking public libraries all over this State, but there are thousands upon thousands of communities that are not large enough to have public libraries, and when a boy belonging in one of those communities leaves school, where does he go to get good books so that he may go on with his education. Then again, there are any number of people who cannot read or write English in the State of Wisconsin. From Madison and through fourteen county systems we send out about fourteen hundred boxes of fine books a year to help all these people in self-education; to inspire people and to refresh people. Now, it is to get the boxes of books into the hands and the homes of the class of people I have mentioned that I go all over the State, and that I welcome such an opportunity as this to talk to you farmers, so large a number of you at one time. We will send to any community that applies, fifty-five or sixty-five or seventy-five or one hundred books, good English books, books of history, books of travel, books on agriculture, on the soil, on any subject you are interested in, and then we put in some good stories for the children and for the tired man or woman to read at night. Then again, if your community is a foreign community, composed largely of Germans or French or Italians or Hollanders, people who speak the Yiddish language, Croatian, Polish, Russian, no matter what nationality they may be, we will send books printed in whatever tongue you wish, any tongue that you have represented in your community.

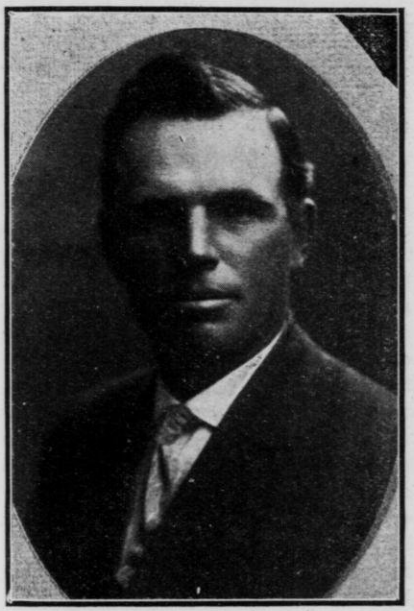
You can keep these books that we send for four or five or six months; then send them back to Madison and we will send an entirely different set of books, and you can keep them six months, and so on. There are many of the Institute conductors who have these traveling libraries in their own communities. You farmers are paying for them, you are putting money into this system every year, and your particular community ought to get something out of it.

I have some application blanks here and if you will sign them and get your neighbors to sign them and send them to Madison, the only thing you have to pay is the freight on the boxes, which no where is more than one dollar. You can pay the freight when you get the box and when you send it back, and if your community is too poor to pay the freight, the State is very glad to pay it, rather than have the community go without books. I thank you.

The Chairman—It may be that many of you have been ashamed, as Miss Stearns was, as to the finding of this committee. I hope you got mad, too, as I did, and will resent such a slur, as I believe it is, on our State. If we are deficient in our common school system, we ought to get a better system, but I do not thank the Sage Foundation for putting us twenty-eighth in that list, and I hope you do not like it either.

IMPROVING A RUN-DOWN FARM.

L. P. Martiny, Chippewa Falls, Wis.



Mr. Martiny.

In discussing the subject of improving a run-down farm, I think it might be well to pause for a moment and define what I mean by a "run-down" farm, because I think there are a good many of us who do not know exactly what a run-down farm is.

You all listened to Mr. Plowman's paper, telling of the advantages of northern Wisconsin, and I want to say that the aim of the first men who went into northern Wisconsin, the lumberman, was not to utilize all the timber or lumber that was produced there. They went in there with the idea of getting rich just as quick as they possibly could and in that process of getting rich very often destroyed as much timber as they used. Perhaps there are some of the older men in this audience who can remember years ago, when the forests of northern Wisconsin were first entered for the purpose of cutting down, that the statement was made that the forests of Wisconsin would last forever, that it would be thousands of years before the timber of northern Wisconsin would be harvested, but here, within a single generation, we have seen the forests cut over, and many of us who have seen it have noted the way that timber has been wasted, the loggers' contracts having been drawn up in such a way that very often they felled the trees and let them lie there, making no use whatever of them.

Robbing the Soil.

Now, I might say that in northern Wisconsin, that new country, farming has started out in something the same way. The first settler who goes on the land goes on it with the same idea that logger had, that the land which yields a good crop to start with will grow good crops forever. There are a great many people who have gone into our new sections and have raised crops which they sold from their farms, and after a time, having depended simply on the natural conditions of those soils the crops have commenced to go down in their yields and then the farmers begin to cast about for some reason. Sometimes we hear it said that we do not have the deep snows we had years ago; others say we do not have

the rainfalls like we used to have, the seasons are changing. Perhaps some will say the sun does not shine quite the same as it used to, when, as a matter of fact, they have been reducing the elements of fertility in these soils, taking them out year after year, until they are run-down. There are a good many farmers in Wisconsin, and all over the United States, who complain that their farms do not yield as well as they did formerly. Then again, we hear some farmer swell up with pride in talking about his splendid yields. He has been a good farmer, he has grown clover, he has been in the live stock business, and sometimes he will even say, "My farm is so rich I cannot grow crops any more," and of course we feel very sorry for him.

The kind of farm I am going to discuss is one of those farms whose fertility was cut down by continuous cropping, a farm which has been depleted through farming for many years and the fields are declining every year.

Now, the reason farms are run-down is because one or more of the elements contained in the soil are cropped out of that soil. It may be the element of humus, we find very often the vegetable matter is cropped out of the soil, so that soil will not hold moisture, it dries out and the farmers complain that the seasons are drier, when as a matter of fact they haven't the water-holding power in their soils. Science tells us that after farms have been cropped for a number of years the soils become acid. Where no fertility is added, no green crop plowed under, I believe those soils do become acid, and they will not yield up even what is in them. I believe that was what was the matter with my farm that had been overcropped for years, the soil had become acid.

Regaining Fertility.

Now, in order to improve a worn-out farm, I will tell you a little bit of experience on this farm of which I speak. I went up to Chippewa county to look at this farm. I looked it over, noted the crops that were growing there. I knew that down in the southern part of the State we used to grow corn that went one hundred and one hundred and twenty five baskets to the acre. They had a piece of corn on this farm that I estimated would grow about one hundred or one hundred and twenty-five baskets to the acre; that is, if fed, stalks and all. This farm had been used by a man who was formerly a logger, then finally it had been rented and the crops which were grown were oats and timothy hay, which were marketed and carried up into the woods to logging camps. I bought this farm, nice, level prairie soil, for fifty dollars an acre. Coming from the southern part of the State, that sounded very cheap to me, but when I went up there some of my neighbors said I had paid altogether too much for that land, and in one way I had. If I was to go on farming in the same way that man farmed, today the farm would not be worth fifty dollars an acre, for it was nearly cropped to death to hay and oats.

But we have put in a different system, we have been growing a different class of crops, crops that we intended to feed to live stock, growing a rotation of crops, making clover one of the important crops in that rotation; growing corn to put in the silo to feed to dairy cows; growing crops that would produce the most feed for live stock, feeding everything on the farm and then buying some commer-

cial feeds that any dairyman finds it profitable to feed cows, which contain a large quantity of fertilizing ingredients.

The man who does not recognize today that the keeping of live stock is essential in the improvement of his farm is going to wake up some day and find himself on a run-down farm, because I do not know of any other way in this day and age that you can maintain in a practical way the raising of the ordinary farm crops without keeping live stock on that farm and feeding the crops to the live stock.

The Fertilizer Question.

Then the next question comes up, how to save fertility produced from that live stock? We try to draw our manure out every day in the winter. We are in the winter dairy business we have to have our farm help, and it is easier to get it out at that time on this run-down farm, and we think we have improved our farm by applying this manure to new seeding where we expect to mow next year, and we find that in putting the manure on the seeding we get from one-third to one-half larger crops than where we did not put it on, we get a bigger crop of hay to feed to our colts, calves and cows. The scientist tells us that the bigger the growth of clover that is grown on the land the more the clover enriches the land, and so we killed two birds with one stone, we got more hay and we got more nitrogen into our soil.

In this following of rotation of crops in northern Wisconsin, in most sections there is enough creek bottom land, or wild land for pasture, so our land is all farmed; we do not pasture any of it, except in the fall. We just grow clover one year, then it is plowed, and we practice fall plowing, because we think we can get better crops in that way, and we can do our plowing better than in the cold days of the spring. It is reasonably free from weeds and we can grow a good crop of corn under those conditions. Then the next year we sow to peas, plowing it a little deeper in the fall again, and sowing to peas. Then the next year, sow to oats, seed down, so we really have a four-year rotation. By careful saving of the manure and applying it to the new seeding and feeding all crops that we produce to our live stock, we find it works well. We are careful to save all the manure. Mr. Griswold said this morning that one-half the value of the manure is in the liquid part. Experiments have shown that nearly two-thirds of the fertilizing elements of the manure are in the liquid part. I want to say that on our place it is practical to haul out the manure, starting in the fall, until about this time of year, when the land gets so soft we cannot get onto it until after oat sowing time, so we have to keep that manure in the yard.

I believe with our high-priced land and the high cost of living, everything going up higher in price, and at the price we can buy cement today, that on every farm it will be practical to have a cement tank in which we can store our manure and pump it out, so that every drop would be saved to put onto the land, and that would not cost very much.

DISCUSSION

Question—Do you spread your manure when you haul it out?

Mr. Martiny—Yes, as long as we can use the manure spreader. Then we take it on a sled and haul it by hand. In that case we go over it

with a fine-tooth harrow in the spring, dragging it crossways.

Mr. John Imrie—If you had no permanent pasture, would you make your rotation the same as you do?

Mr. Martiny—I think I would leave the hay down two years.

Mr. Imrie—Do you feed your peas to the hogs?

Mr. Martiny—Yes, we feed them in several different ways. In the summer we turn the hogs into part of them and let the hogs eat them. Then we thresh quite a lot for the hogs and we sell quite a lot for seed. Peas are one of the best paying cash crops we can grow. If you were always sure of growing winter wheat successfully and getting a dollar a bushel for it, every farmer would go into it. With peas we have got thirty bushels to the acre and you can figure at a price of a dollar and a half to two dollars a bushel in the northern half of the State.

Mr. Imrie—What kind of soil is this?

Mr. Martiny—Black, sandy loam; ordinarily quite productive soil. The loam is from one to two feet deep, and it runs down to clay and gravel.

Supt. McKerrow—Have you ever tried seeding to clover with peas?

Mr. Martiny—Yes, but it does not seem to work; the peas make such a growth, but where you are in a canning district, or you grow a dwarf variety, I do not know of anything better for seeding with clover, better even than oats. We do not mix oats with our peas. We prepare the ground very deep and set them as deep as we can set the drill.

A Member—And how much seed do you sow to the acre?

Mr. Martiny—Two and a half bushels in our locality. In some places it only takes one bushel.

A Member—Have you ever found any benefits from liming on this run-down land?

Mr. Martiny—We have been experimenting with lime, and sometimes I think I have seen benefits from it and sometimes I think we have not. We have tried lime from the sugar beet factory, and I do not think we put it on heavy enough. I would not say one way or the other. We put it on at the rate of about a ton to the acre.

Mr. Jacobs—Your neighbor in charge of the insane asylum reports very favorable returns, but that was put on by crazy people and they put it on very thickly.

A Member—How do you harvest your peas?

Mr. Martiny—We take an ordinary mower and there are special guards manufactured—long guards, that sort of oscillate, they come over so the peas are lifted up and come up over together, and the team will drive right through between the swath and the peas that are not cut.

A Member—Have you used ground phospate rock?

Mr. Martiny—Yes, I tried some acid phospate I got from the Experiment Station and put some of it on some oats. I set up stakes in the middle of the field to show where it was put. I put some on some corn and some on potatoes and set up stakes, and if it had not been for the stakes I never could have told where I put it. But I have tried muriate of potash and I think our soil will respond to that. We got nearly twice as much as where we did not put it on. But where we put on manure we got better results every time. Manure is the best fertilizer, manure and clover. I believe that the basis for maintaining fertility in our soils is and will be stable manure and clover, but I believe the time is coming,

when our lands get a little higher priced, that the good farmer will do just about as the good dairyman does today; he puts his corn in the silo, makes silage, and he says that is good feed for his dairy cow. He raises some oats. But anyway, he sits down and figures, he finds he is getting perhaps a little too much carbohydrates and not enough fat, so he goes out to get some bran or a little oil meal and his cow gets a perfectly balanced ration. I believe the farmer of the future will have to study and learn about his soils just about in the same way that the dairyman has learned his cow, and while we depend upon stable manure and clover, it may be profitable to buy some lime or rock phosphate or nitrogen or sulphur.

A Member—Wouldn't that method be to rob Peter to pay Paul? Somebody else has raised those crops that you buy.

Mr. Martiny—I feel, sir, for them, but as long as they do not know any better I will take advantage of their ignorance.

Mr. Plowman—I have heard men on run-out soils speak about bringing it back by deep plowing. Is there anything in that?

Mr. Martiny—It would depend. If that soil was an alluvial soil, had been washed in there with all its available fertility in it, the deeper plowing would turn that up, but if it is prairie soil, turning it up would bring up a lot of material that had no available fertility in it, and so it would take some years to make it available. The better way is to gradually fill your soil with humus, digging it up a little at a time. This year we have more than enough manure to cover our clover and we are spreading it on top of our fall plowing, where it is going to raise corn this year.

Supt. McKerrow—Is there any one in this audience who has used the Spaulding deep plow and knows how it works?

A Member—I did last fall where I planned to plant some sugar beets. I plowed about four acres of it with the subsoil plow, but last summer it was so awful wet the difference was hardly to be noticed. It was pretty much all alike, on account of there being so much water. That deep plowing where we subsoiled was too wet, it seemed to be kind of spongy. I have not seen any benefit from it. I first plowed about eight inches deep and then I plowed six inches of the subsoil, just broke it.

Supt. McKerrow—The Spaulding, I understand, shoves the upper part over and keeps it over, breaks it down, twelve or fourteen inches.

A Member—Do you practice subsoiling?

Mr. Martiny—Only by growing clover and letting the roots grow down.

A Member—Don't you lose the liquid in the manure by putting it on the ground when it is frozen?

Mr. Martiny—No, because our farm is comparatively level. I am not sure but on some farms where the land is quite hilly there is quite a little loss, and the man there would be wise to build a basin, but the way it is ordinarily taken care of, just dumped out in the yard, with the loss of leaching and fermentation, it would be greater in the yard than it would be on the side hill—quite a steep side hill at that.

A Member—If land is plowed in the fall, I do not think there is much danger in putting it on.

Mr. Martiny—I think the best place to put manure is on new seeding; there is not nearly as much

washing as if it was bare land. We haul manure all winter.

Now, some of you are going to have trouble in getting a catch of clover. We had a little difficulty with that on our farm and we have found that a light top-dressing on new seeding in the spring is very beneficial. We usually seed with oats, though I realize it is the poorest crop to seed with. As soon as we get through seeding with the oats, we take our manure spreader and the manure that has accumulated in the spring and put it all out on the oats, and that gives almost an assurance of good seeding. Put it on after you get the seeding all done, even after the oats come up, go on and put it on.

A Member—Don't you find by hauling manure on plowed ground that it produces more weeds than you want?

Mr. Martiny— That sometimes bothers a little, but in the spring we drag it crossways of the furrows with a fine-tooth harrow and that destroys the crop of weeds because they are usually started. In a week or two we go on and disk and that stops new sproutings.

A Member—Do you plant your corn as early as you can?

Mr. Martiny—Up there we like to put it in early.

A Member—Have any of you had any experience with this new nitrogen inoculating seed that is advertised by the Galloway Company of Milwaukee?

Mr. Martiny—I saw some of it on our county farm last summer where they had inoculated some seed with that nitrogen culture and some they had not and where they had not inoculated it was a good deal better than where they had.

The Chairman—At the University of Wisconsin last year they tried fourteen or fifteen different cultures for the inoculation of alfalfa seed and only one out of the whole bunch was any good, and they were not sure about that even. I do not know what particular kind it was, but they got no results.

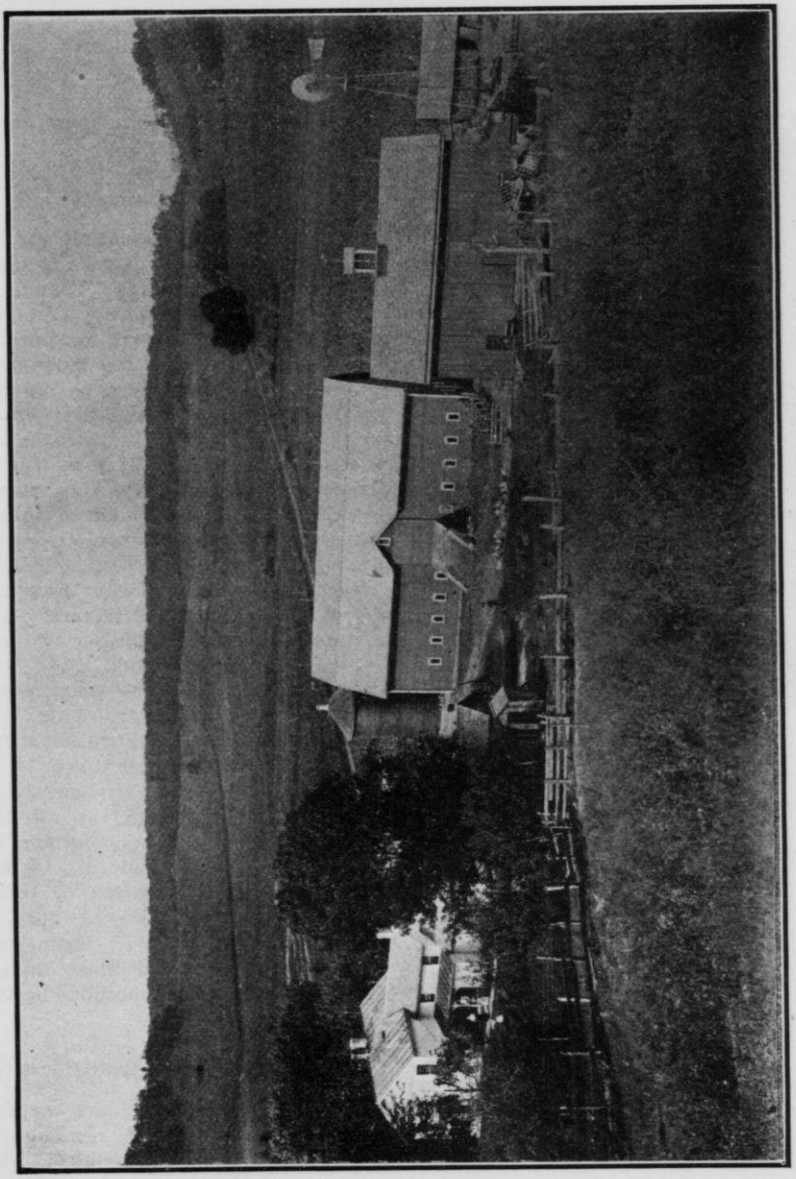
Mr. Martiny—If you want to inoculate anything, go to the field and get some dirt, that does not cost anything.

Mr. Imrie—How deep do you plow your clover land for corn?

Mr. Martiny—Where we turn under this clover sod that has been previously dressed, we do not plow very deep, about four or five inches only, but the next year when we come to plow that up for the peas we plow deeper. We aim to turn up all the soil, but very little clay. We do most all our plowing in the fall.

A Member—Did you ever plow twice?

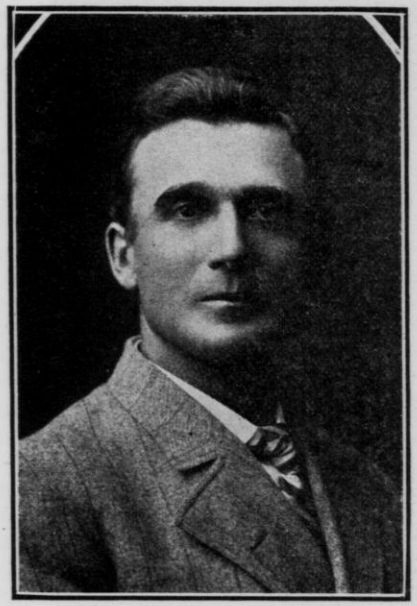
Mr. Martiny—No, but we use the disk harrow and that has about the same effect.



Valley Farm, Mr. Stubley's Farm Home.

CO-OPERATIVE CREAMERIES.

Fred Stubley, Black Earth, Wis.



Mr. Stubley.

Co-operation is to straighten out some kinks in the road between the producer and consumer. One way we can begin along this line is by co-operation in the manufacturing of our milk into butter by organizing what is called the co-operative creamery, for the purpose of cheapening the manufacture, as a number working together can manufacture more cheaply than single individuals and can cut out the middleman, give the producer all there is in the product, minus the cost of manufacture, and at the same time enable the consumer to buy the butter, instead of building up large fortunes for the private manufacturers and centralizers, who have accumulated millions by handling the milk and cream for the producer at an enormous profit.

Forming a Company.

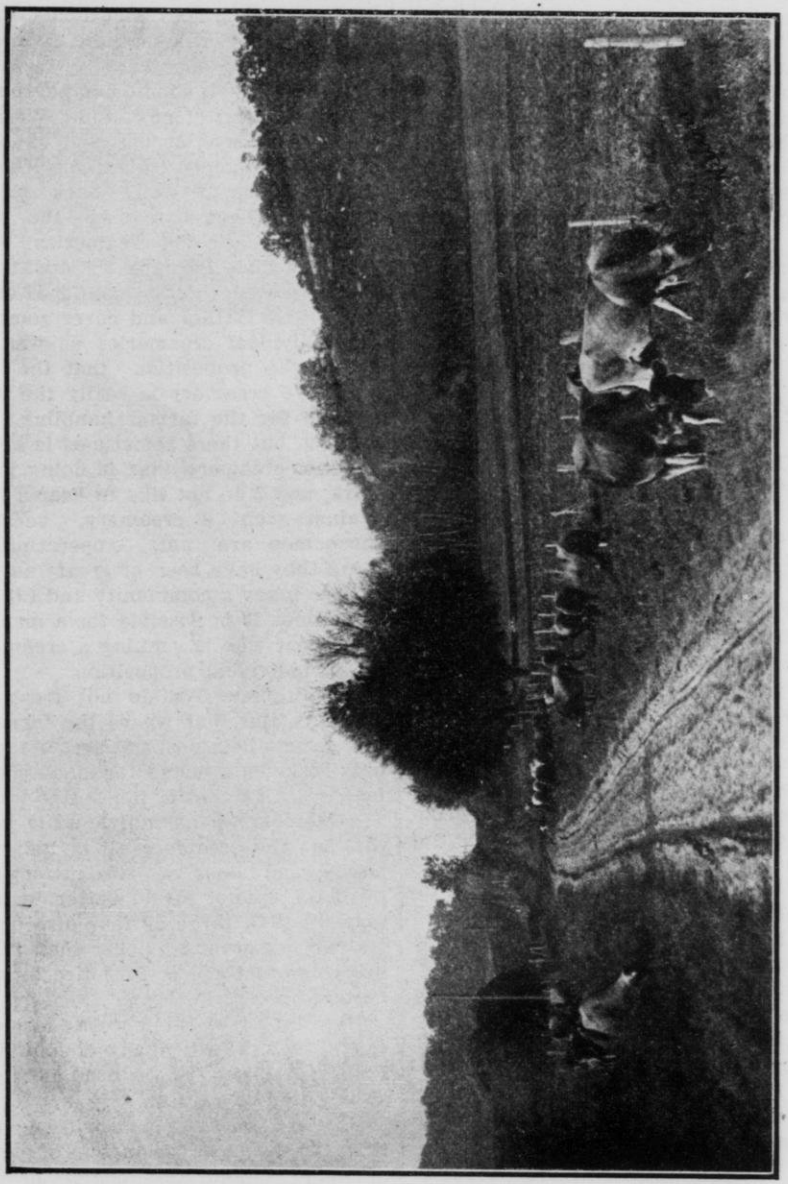
One of the first essentials is patrons. In organizing, be sure to make your capital stock large enough to build and equip a creamery complete and have a small surplus for working capital, and be sure to make the shares five dollars, not over ten dollars apiece, because the first essential, as stated above, is patrons, and if the shares are small more will be apt to buy than if they were placed at twenty-five or one hundred dollars apiece. I know from experience that this is true.

Next, select three of your best producers for a board of directors, electing one for one year, one for two and one for three years, then after the first year elect for three years, electing one every year after. This will enable you to have some trained members on the board at all times.

Change often, so the producers may become acquainted with the running of the creamery and may become familiar with the method of testing over-run and the variation of tests, something that creates a good deal of trouble in our farmers' creameries, caused by ignorance of these things, and a lack of business methods on the farm.

Ignorance Cause of Dissatisfaction.

In my twenty-three years' experience with a co-operative creamery, I have never found a producer who weighs his milk, tests his milk or cream and keeps a record of the production of the individuals in his herd, who gave any trouble in being



Stubley's Jersey herd on the way to the pasture.

dissatisfied with the tests, etc. The dissatisfaction comes from the ignorant man, who, for the want of business methods, does not know anything about these things and becomes jealous of his neighbor because of his success, thinks partiality or dishonesty is the cause of his success. Nine cases out of ten, these fellows who are everlastingly kicking or picking their fellow farmers to pieces are the ones who are in a measure failures and out with themselves and the world in general.

Co-operation Brings Success.

We find in no place in the State the success and advancement along dairy lines that we do in the locality where a successful co-operative creamery is in operation, giving the farmers all there is in their product minus cost of manufacturing.

Where we find shippers, as a rule they are paying transportation of cream and trusting to the individuals who are in the business for the money there is in it. A close investigation of some of the centralizers and private creamery men shows large fortunes, up in the millions, which they have made out of the producer, either in weights or tests, or from the consumer in unreasonable prices for the manufactured product.

What we must do is to stand together and if each of us will plant in his heart Abraham Lincoln's words, "With malice towards none, with charity for all," we will lay the foundation upon which to build a structure which will be a lighthouse of hope, a tower of strength, and a shelter from the storms of adversity to many thousands of good people in our great State of Wisconsin.

DISCUSSION.

Mr. Plowman—Should a creamery be run in such a way that large dividends should be paid to the stockholders each year? Or should it be run in such a way that the dividends should be very small?

Mr. Stubley—It should not be run to pay a dividend of any kind. We aim to pay a reasonable per cent of interest on the money invested, leaving the dividends to revert back to the producer. That has been the one weak point in many creameries.

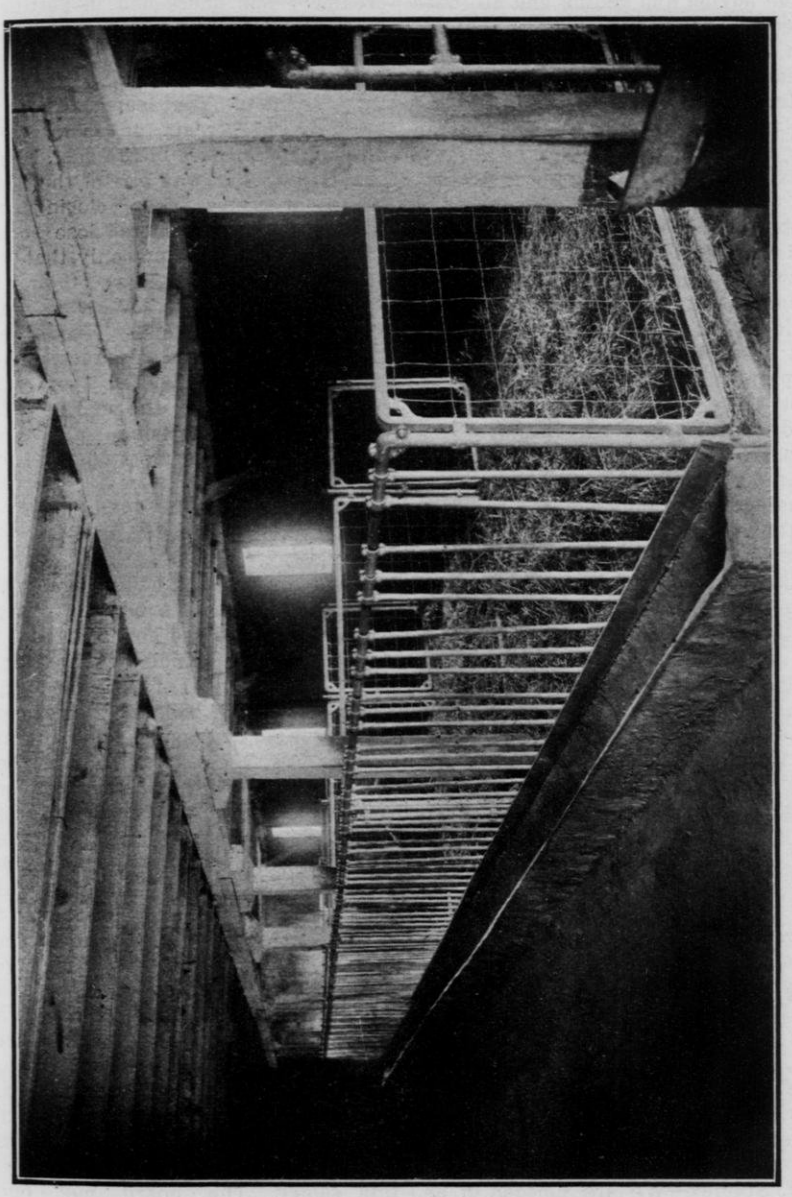
Mr. Jacobs—Perhaps we might get Stubley to spread his mantle of charity a little farther and cover some of the individual creameries as well. I accept the proposition that the co-operative creamery is really the best method for the farmer handling his product, but there sometimes is an individual creamery that is doing good work, and I do not like to hear a slur against such a creamery, because those men are not co-operating. I think they have been of great advantage to many a community and I think sometimes it is possible for a man to be honest who is running a creamery on an individual proposition.

Mr. Stubley—We do not mean to cast any slur, but where the farmers can select their own officers and pay only so much a pound for manufacturing, we think that is the better way.

A Member—If an individual is honest, has the creamery all in his own hands and does a straightforward business, cannot he do better by the farmers than three or four directors? He can get around quicker than if he has to go to three or four directors to agree to a certain thing.

Mr. Stubley—I think we as farmers can elect a board in any community, by being careful, who can do as much as any individual man.

Mr. John Imrie—You would suggest that the business manager of that creamery should have charge of the business? I find in a good many years' experience that there must be some head, and he must have charge



Interior view of Mr. Stubley's Dairy Barn.

of the buying and selling and all these other things, or else so many opinions will creep in that you are bound to have trouble sometimes.

Mr. Stubley—We have never had any trouble in regard to handling the board in doing the business.

Mr. Jacobs—I do not want to raise any question as to the advisability of co-operation and the co-operative way of doing business, but under our conditions of marketing, our cities are demanding a great variety of dairy products, and in very few instances that I know anything about has the co-operative creamery been able to meet those demands. On the other hand, the private owner may be able to make changes and meet those conditions as they arise. Now, in the manufacture of butter and putting it on the market, in the great majority of cases there is no question about the co-operative creamery, but I believe that if the farmers are going to get the very best market and the very best price, in many cases it has got to be put up in other ways than butter and cheese, and I think it is sometimes necessary for an individual to run those operations. I believe Mr. Stubley will agree with me that in the great majority of cases those men are just as honest and just as worthy of the confidence of the farmers as if they chose them from among their own number.

Mr. Stubley—I must disagree with you. For many years we have been shipping cream for ice cream. Why shouldn't the co-operative creamery send their cream out for that purpose, just as well as a private enterprise?

Mr. Jacobs—Are you doing that yourself privately, or is your creamery doing it for you?

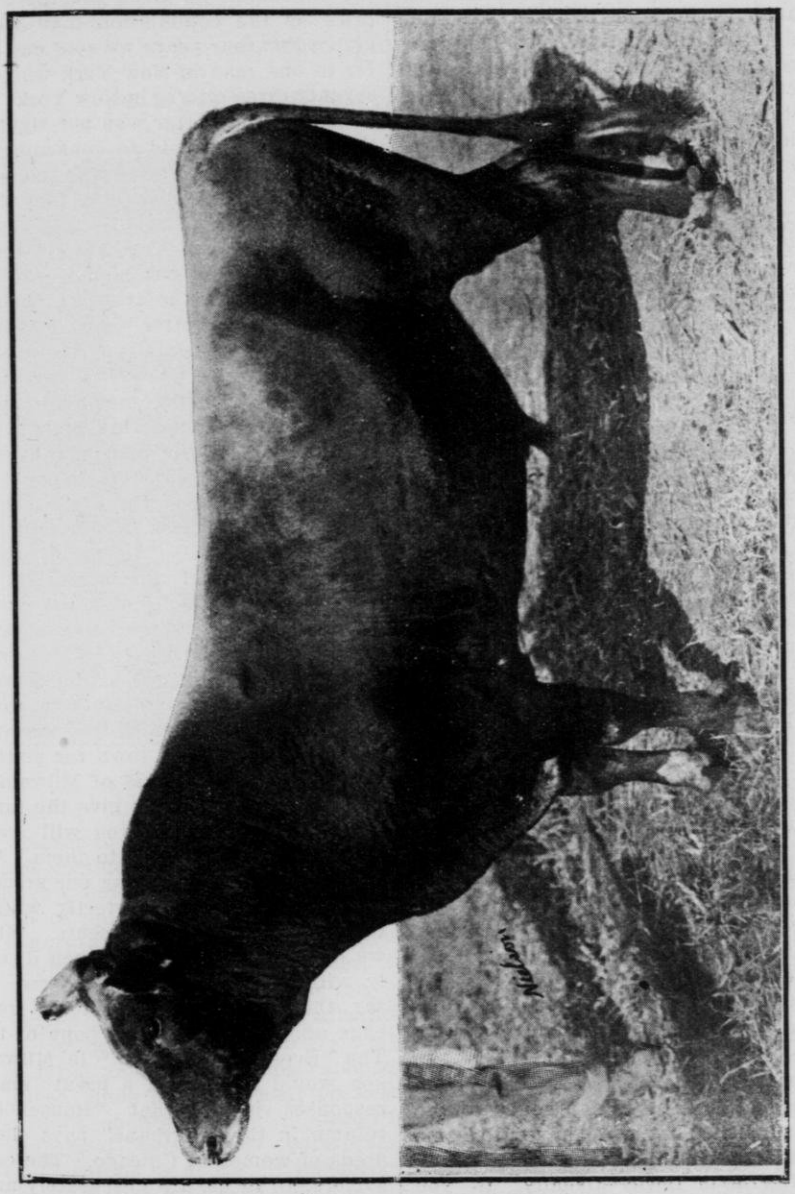
Mr. Stubley—We are neither of us doing it at present. I am going to do it privately before a great while.

A Member—Where a co-operative creamery has succeeded in getting a real good board of managers, would you advise a change?

Mr. Stubley—I advise changing from time to time. You leave officers in too long, five or six, or, as has been done in some cases in the past, seventeen years, that was one of the great causes of pretty near closing our creamery, the farmers lose confidence in them, and not only that, the officers themselves lose their interest in the concern. What we want to do is to change every year or two and give each one a chance. Then they become acquainted with the working conditions, the markets, the selling, the advertising, all those things that most farmers do not know anything about.

The Chairman—It is a sort of school where you educate the producer.

Mr. John Imrie—I believe we must have the system of a board of directors, but I do not see how the board of directors could handle the business without a good deal of work for all the directors. In organizing a creamery at one time, and as manager of that creamery, I thought it would work better to elect a board of directors, one from each section of the territory that furnished milk to the creamery; then this board of managers elected a manager. He was really the man that did the business. You wouldn't have to call the board together for small matters of business, and this manager was supposed to do that. He made out statements, he was secretary as well as manager. Then the treasurer made out the checks for the company, and so in that way it relieved the board of managers from the necessity of meeting so often. They got no pay and the manager was paid a certain salary. The board met once every three months, or at the call of the president. If anything especial came up out of common, the board of



Head of herd at Valley Farm.

directors was called together and the manager would get their advice. But still he is the manager, he has done the business and it has worked satisfactorily.

Mr. Stubley—In our method one was selected as salesman to manage the sales, either in the form of butter or cheese, and another had charge of the buying. We hired a secretary and paid him a salary, and we have yet to have any trouble.

Supt. McKerrow—Do you aim to sell your products to the consumer, or to have them go through a lot of middle hands, taking out their commissions?

Mr. Stubley—We are trying to sell as near home as possible. We are selling seven or eight hundred dollars' worth a month right in our village. The other is f. o. b. cars right at the depot, taking our factory weights, sold to the commission men.

Supt. McKerrow—I noticed some figures the other day in regard to some Wisconsin cheese sold in Denver for twenty-five cents. The farmer in Wisconsin got thirteen cents. The maker got one and one-half cents a pound, the buyer here in Wisconsin on the Board of Trade got his cent and a half a pound; the railroads got two cents a pound to carry it to Denver; the commission man in Denver that sold to the retailer got his two cents a pound, and the retailer got five. That made up the twenty-five cents. There were a good many pieces taken off before it got there.

Mr. Stubley—After the farmers get co-operative creameries and co-operative stores, the next step will be the co-operative warehouse or commission house to deliver this product to the consumer. That will have to come later.

Mr. David Imrie—Usually, if you find a man who is dealing direct with the consumer, he gives you the same price as the commission man would give. For four years we sold our butter to one man in New York who had seventy-three stores in New York and Brooklyn, the butter was put right on the market and sold to consumers in small lots, but the price was the same as the market price, and they look after that.

The Chairman—Our co-operative creamery is selling to a man who has seven stores and he is going about a cent a pound better than if it was put on the market.

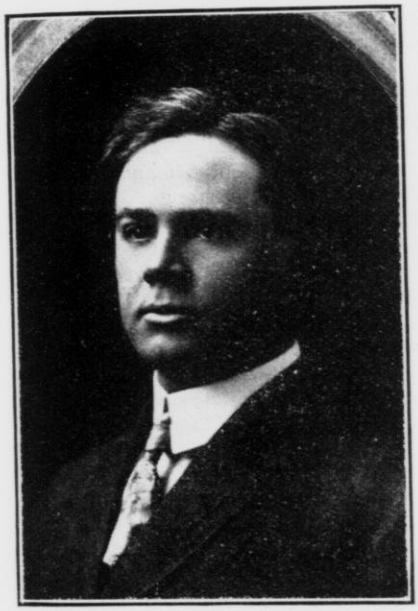
Mr. Plowman—Have you any idea how many traveling men are paid for traveling around this State? It all comes out of the man who buys.

Mr. Stubley—It amounts to one hundred dollars apiece for every family in the United States to support the traveling men.

Miss Stearns—I am interested in this subject as a consumer, not as a farmer. I have been cutting out the middleman. In the city of Milwaukee, where I live, eggs at the present moment are forty-four cents a dozen at the grocer's. I bought some the other day at a little town for sixteen cents. Now, the people of Milwaukee are perfectly willing to give the farmers a good margin if you will send your products directly to them. We consumers that are paying our grocers forty-four cents are perfectly willing to pay the twenty-six cents. What we do want is to get in touch directly with you farmers. I am free to say that an advertisement of fresh eggs and butter put in a copy of the The "Evening Wisconsin" in Milwaukee would meet with a great many responses, just as that "Household" column in the "Tribune" pays hundreds of women in Chicago. The consumers, all of us, are desparately anxious to cut out that middleman.

MAKING GOOD ON NEW SOIL.

B. G. Packer, Commissioner of Immigration, Madison.



Mr. Packer.

Never in the agricultural, industrial and commercial history of Wisconsin have conditions been so good and so full of promise as at present. Farm, factory and bank alike bear witness. Aside from continued good crops, this can largely be attributed to the effective co-operative organizations promoting agriculture. No state with so large an acreage of desirable low-priced lands for settlement possesses a more energetic host of state-wide and local agricultural partnerships than are to be found in Badgerdom. These movements are specific in aim, and today are more numerous, more effective and more generously supported from private purse and public fund than ever before. Several hundred thousands of dollars are contributed every year by the State in sustaining its agricultural activities, and all of this splendid work is furthered by much private contribution of time, effort and money.

To illustrate: Wisconsin was the first State to use a portion of its public funds to foster Farmers' Institutes. Here was established the first Dairy School. This is the first to give financial support for the hire of county agricultural experts. There are a number of these in the new districts, trained specialists who give their entire time to the study of local conditions and the improvement of products from field, yard and orchard. Provision is made by law for ten in 1914 and sixteen in 1915. These farming evangelists supplement the efforts of seventy instructors in the College of Agriculture. All are endowed with preceptive agricultural optic nerves.

In fact, through a multitude of agencies the State has assumed a most important rank in creating and developing result-producing agricultural expansion work, and an eastern magazine recently well said: "In Wisconsin the Agricultural College is as close to him who tills the ground as his common school."

But listen; back of all these enterprises is a productive soil and positive rainfall.

In yield per acre of flax, oats, and spring wheat, Wisconsin leads all the large producing non-irrigated states for the period 1900-1910.

In combined yield and value per acre of oats, wheat, barley, corn and potatoes, a number of the counties in the less developed part of the State equalled the united yield and worth

of the same crops brought forth in the high priced counties of Illinois and Iowa for the year 1900, as shown by the 1910 Census.

Today we are considering the interests of the new settler and farmer with greater attention than ever, especially those matters which vitally concern the unfolding of the State's agricultural possibilities.

Space forbids mention in detail of these measures now on the anvil, but it is sufficient to say that the soil is having its inning in the Badger State.

Types of Soil.

In this partly developed region, the price of land ranges from $8.00 to $25.00 per acre. Usually it can be purchased upon easy terms and long-time payments. Considering the investment and worth of crops when developed, values are low. As in any similar large area, there is in addition to this great amount of good land, some which is not suited for farming under present methods. These are largely narrow strips of light sand reaching into a number of productive districts.

The types of soil include clayey loam, loamy clay, sandy loam, sandy, red clay and peat or muck soils.

The clayey loam soils cover a much larger portion of upper Wisconsin than those of any other type. This loam soil is fine in texture, contains a considerable amount of clay, and has large moisture holding capacity.

The loamy clay soil is closely similar to the clayey loam, but is even still finer, being composed of smaller soil particles.

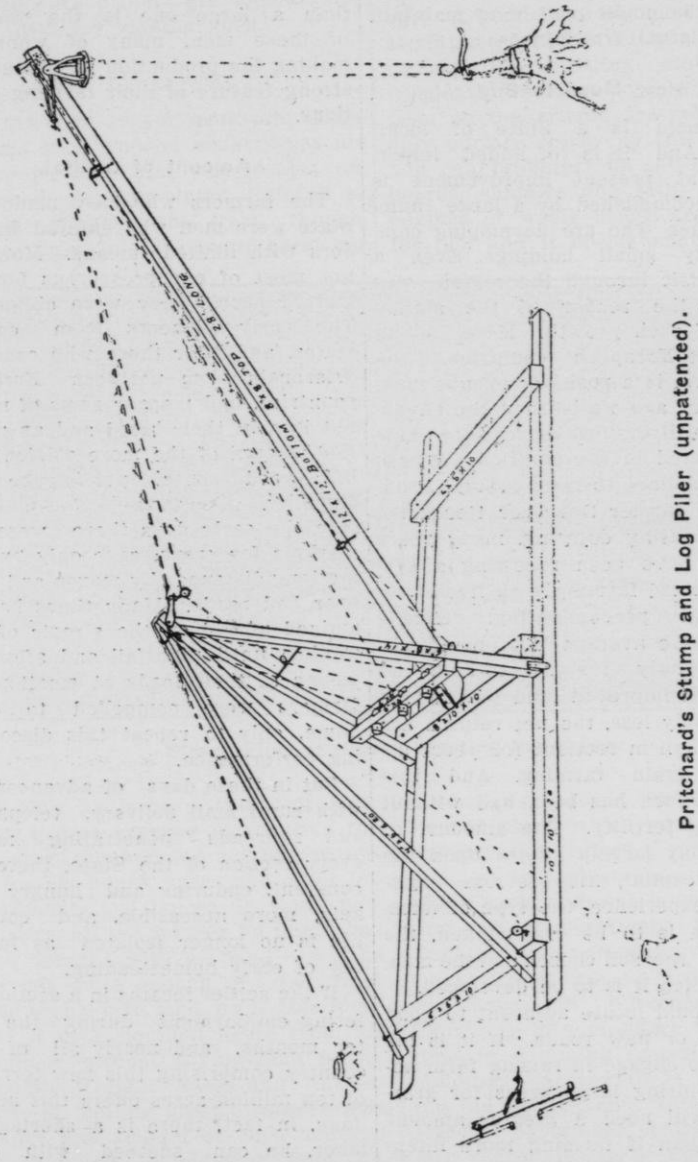
The sandy loam soil is warm, responsive, easily worked and well adapted to live stock production and general farming and the growth of special cash crops, corn, rye and potatoes.

The red clay soil is found principally in belts bordering Lake Superior. The soil is of exceeding fine texture, and under proper management is one of the most productive.

Very frequently, the sandy loam soil gradually shades into sandy soils, but all these sandy soils are not equally light. The lightest, however, should be shunned by the home-seeker.

Under the classification known as peat or muck soils is included the soils of all marsh lands. Some districts, formerly marsh land, have partially dried out as the surrounding timber has been removed. When drained and rightly handled, this soil is suited to the production of cultivated crops and truck farming.

It would be difficult to find soils better adapted to diversified farming, special crops and live stock raising than these. They are largely of glacial origin, practically the whole of the detrital matter which composed them ages ago being rent from the bed rock by action of ice sheets, and since part of the matter was often transported to sections distant from its point of origin, there is found a variety in composition and depth of soil. Throughout northern Wisconsin, vegetable decay has been going on long enough to greatly enrich the land. A distinct advantage arising from the structure of these soils is that they rarely wash away in the manner observed in those of other types. This characteristic largely is due to the fact that the ground water sinks freely into their depths and gradually escapes by springs to the drainage system of the country; thus, on land in a given area, there is sometimes found a greater variety in the character of fields than occurs where the soil originates by decay of underlying rock. For this reason the farms of Wisconsin are commonly more self-supporting than in those sections characterized by soils of less



Pritchard's Stump and Log Piler (unpatented).

desirable formation. These soils have in them a constant source of renewal and refreshment which has only to be made avail of to maintain their original fruitfulness.

How Much to Buy.

Wisconsin is a State of small farms. And it is of added importance that present improvement is being accomplished by a large number of men who are developing comparatively small holdings. Even a casual visit through the region will convince the reader of the significance of such growth. Here, as in the best European countries, the small farm is a positive revenue maker. Years ago we learned the advantage of a diversified agriculture. This has resulted in the addition of millions of dollars to farm profits. From the time farmer Governor Hoard began advocating dairying, many years ago, we have been following a system of mixed farming with live stock production predominating. Hence, although the average Wisconsin farm contains only 119 acres and the amount of improved land per farm is considerably less, the net returns are greater than in sections for years devoted to grain farming. And this greater return has been had without sacrificing fertility. The amount of land to buy largely hinges upon the settler's capital, his previous agricultural experience, the type of farming which is to be undertaken, the nature of the soil chosen and the manner in which it is to be developed.

One should locate adjacent to good highways or new roads. If it is his purpose to engage in raising farm animals requiring large areas for grazing, he will need a greater amount of land than if farming more intensively. Numerous settlers are making good on new soil with farms of eighty acres and often only a portion of this is under cultivation.

To own a profitable farm rather than a large one is the ambition of these men, many of whom are making the production of live stock a strong feature of their farming operations.

Amount of Capital.

The farmers who have made this State were men who entered its borders with limited means. Many, if not most of our prosperous farmers, started poor. They were obliged to. The early pioneers from eastern states, and later those who came to Wisconsin from northern European countries, had meager sums of money but iron in their blood and an unlimited amount of the more efficient capital,—good sense, persistence and frugality.

In the early days there were few markets for crops, save only by hauling long distances by wagon and often over bad roads. Many times hay remained unsold on the streets of Milwaukee until nightfall and after disposing of their loads at small prices farmers were compelled to drive home, only to repeat this discouraging performance.

But in these days of advancement, with rural mail delivery, telephones and railroads penetrating nearly every section of the State, there are constant, enduring and hungry markets, more accessible, and country life is no longer isolated as in the day of early homesteading.

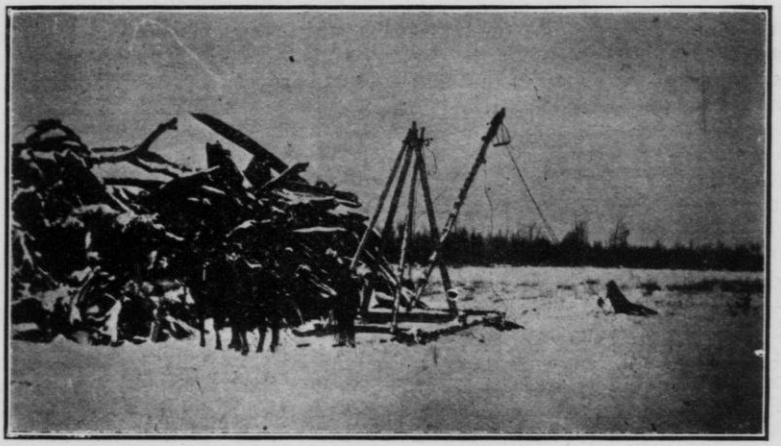
If the settler locates in a section offering employment during the winter months, and nearly all of the country comprising this new territory of ten million acres offers this advantage, in fact, there is a shortage of labor, he can succeed with only small capital.

How much?

This depends upon the man, and upon his wife, and how they use it. For the worker there are splendid opportunities for making good.

The First Year.

In the long run, a man who takes up land in a wooded country has an advantage over him who locates on the broad, unbroken plains. Rainfall is certain. Right at the start, though he may be unable at once to break up and plow as large a tract of land, there is less expense in securing the necessary lumber and building material for his house, barns and other improvements and fences. In many new districts, all the lumber he needs has been donated with his land—or if he has not quite enough of the right kind on his own land, he is able to secure it at a nominal figure from his neighbor without paying high prices, excessive freight rates and the expense of hauling great distances. The quality and amount of such material to be found on cut-over land depends, of course, upon its former growth, how severely it was cut and whether it has recently been logged off, there being more timber on land which was logged a number of years ago. A portion of the "down" timber sometimes found on such land can be utilized for building material and frequently certain logs which have been on the ground for years show only surface injury by this exposure and can profitably be sawed up into boards, shingles and lath; even the edgings or waste pieces are valuable for fuel and it is customary to use sawdust as bedding for stock. The big red barns which strike the visitors' attention afford a good illustration of the advantage in locating where such material is readily available and comparatively inexpensive. Such indicate permanency of development. There are no sod houses or sod barns in Wisconsin. Nor is there any loss of effort or waste of time in obtaining material for such buildings. Access to it is had over the old logging and "tote" roads constructed by lumber companies in former years. It can be gotten out and hauled to the sawmill in the winter and only a small charge per thousand



Stump Piler at work. Starting the stump.

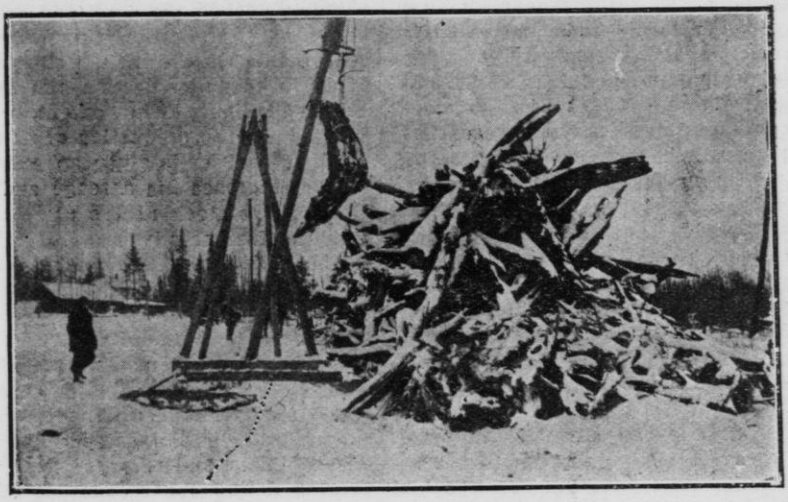
feet is made for sawing. This work need not interfere with the clearing of land or cultivation of farm crops. Farm development work may be engaged in every week in the year. Very frequently the new settler can secure the use of a portable sawmill. A fair grade of shingles is manufactured from young hemlock. Siding for his house made from basswood works up easily and readily takes paint. It is durable if immediately coated and affords good wainscoating for interior work. He can construct his barn basement of concrete, or his entire house for that matter, as the small rivers and creeks traversing this section are valuable to the homemaker, both for water supply and the fine gravel and sand found in their beds. Labor for construction purposes will cost less than in cities, in fact, by exchange of work he can have the assistance of neighbors. Thousands of successful settlers throughout this region are eager to assist the newcomer. Their suggestions are as valuable to him as money in the bank. He will find them a sympathetic and responsive people and profiting by their experience can make rapid headway. He probably will find equally as successful methods of crop production in his new location as those prevailing in the district from whence he came. Perhaps better.

Usually there is rubbish and small brush, "slashing" and stumps on cut-over land. The time when the brush should be cut is largely a matter of convenience. Some claim it clips off better and that more can be accomplished when the ground is frozen; others perform this work in July or August. In clearing, it is well to cut the brush closely and pile it in heaps, laying it straight with tops in the same direction. Upon this should be placed such rubbish as can readily be handled. There may be bolt or cordwood timber on the land which can be worked up and marketed profitably. Dynamite is the 20th century persuader and the cheap low grades, supplemented with block and line, are economical clearing agencies in this region.

Brushing should proceed rapidly and ordinarily when a number of acres have been cut and the loose material consumed, he is ready for a sowed crop or seeding down to grass. In this soil is much rich vegetable mold. It should be stirred up with a spring tooth, or disk harrow, so as to assist in releasing the fertility which has long been accumulating. Grass seed, especially clover, or clover and timothy, should then be sowed and but little further effort at clearing need be made the first year, save only to wholly clear a small acreage upon which to grow winter feed and garden vegetables. The new soil is fertile. It produces. There is much error in the belief that it is "raw" and incapable of producing good crops until "subdued," and the evidence of this is found in the splendid gardens and yields of farm crops secured by new settlers on practically all the well drained clay and light loam lands. Much of the display made by the Board of Immigration at State Fairs and expositions has been had from this soil.

If the settler has limited capital, his house, though built on a foundation of blocks, can be banked and kept comfortably warm. Air-tight heaters are inexpensive and good fireholders. He has his fuel for the cutting and but few in that region have learned to economize on wood. The average cost of clearing the burned-over, cut-over hardwood lands of northern Wisconsin is probably between $20 and $30 per acre. To clear the land of green timber costs more, but from this expense should be subtracted the amount received from the sale

of wood products. Regions in the west, notably in Washington and Oregon, also cost more to develop agriculturally than northern Wisconsin. There a different kind of timber flourished. The fir and cedar stumps offer greater resistance to removal than the hardwood and white pine of Wisconsin. The root system of the fir and cedar go straight into the earth, while in the cut-over districts of Wisconsin, the roots are found close to the surface, save in sandy sections and on knolls. Further, the development of northern Wisconsin is not so much a matter of clearing the land from stumps. Splendid forage crops are being secured from land brushed off and not stumped. Substantial profits in the form of milk and meat, are most economically to be had by clearing only sufficient land to grow corn silage (ten acres will furnish a hundred tons or more) and leaving considerable in clover meadow and pasture uncleared. The man who follows this practice and increases his clearing with the size of his herd is certain of success. And corn silage and clover may be had in abundance in all the northern counties. For the man with limited resources, here is a key to certain farm development—at the start clear and cultivate only a a small acreage, brush off and seed down to clover a big acreage.



Ready to unload.

Why the Settler Should Consider Live Stock.

The provision of meat for the house is a problem, and the present high price and apparent constant advance of the same are becoming matters of grave concern. Repeated drouth in the districts formerly devoted to beef production not only lessen the present supply to famine proportions, but indicate a small domestic crop for the future. So acute has the condition become at this writing, that resort is being had to imports from Australia. It is estimated that two-fifths of the expenditure of families having ordinary incomes is devoted to the purchase of food necessary for their existence, and it is further com-

puted that one-third of the national diet is composed of meat. It is plain to see what an over-powering influence meat prices have on the nineteen million families of the nation.

A recent federal investigation made in fifty cities shows a marked decline in the average individual consumption of beef, mutton and pork, and this doubtless because of the present high prices. In 1840 it was possible to furnish an average of .88 of a beef animal to each inhabitant. This has dropped to .69. With sheep it was possible to furnish one and one-third to each inhabitant and now only .52. The decline in pork is about the same. There is a dearth of live stock for food purposes, and the present situation rather than becoming better has been made more serious by the increased foreign immigration of recent years, because only a small proportion of these become food producers and their wants add to the consumption and help elevate prices.

During the last ten years bacon has increased in price 41%; fresh beef, 14%; mess beef, 22%; mutton, 16%; pork, 51%; lard, 40% and tallow, 42%. Cheese has advanced in price 43%; eggs, 41%; dairy butter, 32% and milk, 31%.

Because of the extraordinary development of the manufacturing interests of the country, the number of food producers is constantly growing less. Such being the case, homeseekers are more and more turning towards districts renowned for their live stock producing advantages. There is no substitute for breakfast bacon, mutton and roast beef, and no better place can be found for the economical production of these meats than in Wisconsin. An average of twenty-nine head of live stock, cattle, horses and swine, is kept per farm. For this reason, without rotation of crops, the need of commercial fertilizer has not been felt in Wisconsin; in fact, the use of such decreased 56 per cent from 1900 to 1910.

For the production of beef there are thousands of acres of well watered, cut-over land upon which clover is growing wild, self-sown and unused. For the production of pork this clover, in connection with dairy by-products, is equally valuable, and a greater variety of feed for swine production can be grown in northern Wisconsin than in southern and western states. Field peas yield twenty to thirty bushels per acre, and are superior to corn in the production of good pork. On the high, well-drained lands in this new section, are acres, almost unlimited in extent, well adapted to the production of mutton. Thus, the settler is given an opportunity to increase his acreage and his herd of live stock at the same time, with the further advantage of growing his own meat and other food products independent of the butcher and baker.

There are community live stock breeders' associations in the State with large memberships; societies promoting Holstein, Guernsey, Jersey and other breeds of dairy cattle and farm animals, and many of these are located in the upper counties. Herds of well bred and well fed cattle are being developed throughout this territory.

Special Crops.

Similar co-operative effort is being had in the community production of potatoes and fruits. In order to secure car shipments of uniform type many potato growing localities are now concentrating upon a few standard varieties, paying careful attention to selection of seed, sorting in the field and grading at the car. Bearing these requirements in mind, the potato is desirable as a cash crop for the new settler.

The upper counties are peculiarly

adapted to the production of all leguminous crops, including peas of field and canning varieties. Peas for canning ordinarily will bring from forty to sixty dollars per acre. Wisconsin leads all states in the pea canning industry, the production in 1912 totalling 2,658,000 cases, or more than the combined product of Minnesota, Ohio, Indiana and Michigan.

Clover seed is another important special crop to be considered by the northern Wisconsin settler. These include the medium red and alsike varieties on the heavier soils and mammoth on the lighter types. Alsike clover will yield from two to six bushels of seed per acre, and the price is such as to make its marketing profitable. Ordinarily it is easy to secure a good "catch" of clover. The ample snowfall which remains undisturbed throughout the winter affords protection not enjoyed in a country subject to wind sweep. So indigenous to this section is clover that the biennial varieties largely have become perennial in many sections.

Tobacco growing has spread northward and much of this crop is now harvested in some of the upper counties. Its culture has not yet become general. Sugar beets, with more than the average sugar content, are cultivated.

Northern Wisconsin grows an abundance of small fruits, strawberries, raspberries, blackberries, currants, etc. Apples sufficient for home needs may be grown anywhere in the State on good soil, such varieties as the Duchess, Wealthy, Patten's Greening, and similar hardy varieties are well adapted to all the northern counties. In more favored sections, limited acres bordering Lake Superior and Michigan, and certain interior districts, many excellent varieties of orchard fruits, apples, cherries and plums are being grown commercially and with good profit.

Cherries planted by the early mission fathers in certain portions of the Lake Superior region, furnish proof of climate and soil conditions adapted to the production of this high priced fruit.

What of the Future?

There has been much recent development throughout upper Wisconsin. The ample snowfall which remains ready apparent in every county, and it has but just begun. Better yields, higher market values and improved quality of product are the rule in every section where modern methods of farm management have been given a trial and this applies as well to orcharding and stock raising as to the production of corn, wheat, alfalfa, and other field crops and garden vegetables.

Such development finds expression in many social and economic advantages. It is significant that more Wisconsin farmers (88.3%) own the farms they are operating than do hose in any other state in the Mississippi or Ohio river valleys, or in the Gulf states or central west. And yet there is room for many thousand free-holders in the fertile upper Wisconsin counties.

The fruitfulness of these lands is such that over 50,000 acres are being cleared and brought under cultivation annually. This is based upon the average annual increase during the period 1900-1910, which totalled 580,000 acres. During the same time the value of all farm property, stock, machinery, buildings and land, increased two hundred per cent. But the addition of improved farm land during the three seasons since has been relatively greater than during the above term. More farmers are at work, better clearing methods are followed, and a recent crop report issued by our State Board of Agriculture shows an increase of twelve per cent in amount of land cleared in

1912 in this region over that of 1911.

A very great many new farms are being started, the land brushed off and improved, new roads and bridges constructed and school houses erected in every northern county. Development could not have advanced in this gratifying manner were it not for the fact that thousands of new farmers have learned the fruitfulness of this section of Wisconsin and today are making good on the new soil.

Recess until 7:30 in the evening.

EVENING SESSION.

The convention met at 7:30 p. m., same day. Superintendent McKerrow in the chair. Vocal solo, Mr. R. Gibson.

The Chairman—The very best stock on the farm are the boys and girls, and while some people think that farmers think more of their calves and colts than they do of the boys and girls, yet we are going to show you tonight that this is not the fact, because one of the farm women of Wisconsin is going to discuss this great question, "Our Boys and Girls", and I take pleasure in introducing to you Mrs. Jennie Brackett Jacobs, of Elk Mound, Wis.

MORE FOR OUR BOYS AND GIRLS.

Mrs. Jennie Brackett Jacobs, Elk Mound, Wis.

Mrs. Jennie Brackett Jacobs.

Superintendent McKerrow, in a moment of recklessness, asked me to appear on this program. I had had some acquaintance with some of his Institute workers, whom I considered no younger, no better looking, no smarter than myself, and I as recklessly promised I would. I did not realize how grossly I had misjudged his force until I began to prepare this paper. I know it is not fair that you should suffer as well as I for my indiscretion, but if you will accept my explanation I will make your term of punishment as short as possible.

The choice of subject was left to me. After selecting various topics and casually, discreetly and incidentally trying one after the other on various members of my family without any effect, or else an effect which it is better not to mention, I have fallen back upon a subject familiar to every person in this audience—the home and what it can do for our boys and girls.

I shall probably be able to say no-

thing but what has been said many times before; I shall not be able to clothe my few thoughts in the language which I desire, but if I can interest one person in this audience in some child, if I can help some one to be a better father or mother, if something said may influence some young person to grow into more useful manhood or womanhood, I shall be glad the opportunity was given me to appear before you.

The Stamp of the Home Indelible.

I have during my work in the past come in contact with many children. I have been in many homes, differing as much in character and individuality as in number. It is no idle fancy, it is no theory that given certain home conditions and surroundings, certain types of children are developed.

Your home puts an indelible stamp, a coat of arms, upon your child, which time, distance, nor conditions cannot efface. Many a grey-haired father and mother are thanking God today that this is so—that the gentle, earnest lessons taught their children in the old home have gone with them through life. Many a parent's head is bowed in shame today over some son or daughter whose failure in life they must admit be attributed to the lessons they learned or failed to learn in the early home. There cannot be a more bitter memory than that of knowing that the young life which was intrusted to you for guidance has been shipwrecked because of your ignorance or indifference in the home. If your child fails to accomplish his work in life, if worse than failure is recorded after his name, will you be able to say, "I did my best for him"?

Many parents have not considered this matter seriously. They have not yet learned that they themselves are drafting in their children today the clear-cut, definite pattern of the men of tomorrow.

Do not blame the schools and local conditions entirely when your boy goes wrong. Put the blame where it belongs. If we have been more interested in the shop, visiting our neighbors, attending the club, reading trashy literature, than we have in our home and family, let us take our medicine and not try to rub it on or into some one else. I hope the time will never come when I shall have to admit that some institution or person has more influence in my family than I have.

Fathers and mothers, many of you will never be able to leave your children wealth, many will not be able to give them the education they desire, most will not be able to leave them an honorable name as the world counts honor, but all can leave with them that which is worth more than all these—lessons learned in childhood which will go with them long after you have passed into a beautiful memory.

Not long ago I heard a man of middle age say, "I have been in close association with my father all my life and I cannot remember the time when I doubted his word or motive." I need not tell you that this son will leave with his children this same inheritance of honesty which came to him from his father.

When I was a child I knew intimately a woman with five daughters. When the world did not move according to her pleasure, her manner of addressing her family may be best expressed by the term "yelled." Today no one will dispute me when I say that four of these daughters are loud-voiced, scolding, untidy women.

These are not isolated examples of the effect of early home training and conditions on children. There is not a person in this audience but what

can cite me to hundreds of similar cases.

Some editor has said that if he wished to find a woman who counted in the world, he would not turn to the lists of famous writers, actors, musicians and reformers, but would go into some school room. There he would single out some clean, well groomed, pleasant, respectful, considerate child; he would go with that child to his home and there he would find a woman who counted.

Mother, your name may never be inscribed in the world's book of fame, but you may if you so will, leave with your children that strength of character, that loyalty to principle, that charity to mankind that will be a perpetual monument to the life you have lived.

The Home the First Consideration.

I would urge you to make your home your first consideration—place it before everything else. Learn to know your children as you know yourself. Teach them to feel that nothing can come into their lives but what they can take to you. It is more than pitiful, it is really alarming, when one realizes how little most parents know of the real lives of their children.

Something is wrong in the home, somewhere a mistake has been made, if a child does not turn instinctively to father and mother in his hour of perplexity and trouble. Shame on the parent whose boy has learned through experience that some one else can be of greater service, of more comfort than father or mother.

You cannot expect reverence, confidence, love from your children if you have not proven yourself worthy of them.

"For life is a mirror of king and slave;
'Tis just what you are and do;
Then give to the world the best you have,
And the best will come back to you."

Give your children the best you have in thought, word and deed. Can you afford to do otherwise? Do you dare to do less, when you think of the long journey which stretches out before them, and the strength and courage necessary to face the problems which will confront them?

Give of your time freely, joyfully, intelligently. May I ask the mothers here tonight what books you have read on the development of children; what mothers' magazine do you take; when, where and how often do you hold your mothers' clubs and meetings? How much time do you devote during the week to an earnest endeavor to train yourself to be a better mother? What are the fathers reading along the same line? I ask you in all sincerity to what extent are the needs of your children systematically studied? Are you giving them what they have a right to expect from you?

Is our business, is our stock, are our silos of more importance than our children? I do not see farmers leaving their work and driving ten miles into town to learn how to be a better father. I have seldom been in an audience such as is here tonight, called for the purpose of considering the best methods of training the young in the home. Have you?

I hope the time is not far distant when the Farmers' Institute will add to its valuable work a course for parents. We need this intelligent training surely as much as we need to know how to feed ourselves and our stock properly. There are fathers and mothers before me tonight who are doing their best for their children, yet who have made mistake after mistake which might have been avoided had they had the opportunity

which might have trained them to better parenthood.

A few weeks ago I attended an evening program in a small town. In the back of the room sat a group of young people who complacently chewed gum and tittered through the entire evening. Several girls in their early teens were earless, because of their fashionable coiffure. Two little children added to the evening's program a popular song whose sentiment they had no right to know. I am not a crank on the little things of life, but these examples I have mentioned are only an index to the larger things which will follow. I could not but wish as I sat there that the mothers of that town would seriously consider the traits of character which were being developed in those young people, that every mature person in that town would feel his responsibility in doing his part to start those young people in the right direction.

"May every soul that touches mine—
Be it the slightest contact—get
therefrom some good,
Some little grace, one kindly thought,
One inspiration yet unfelt, one bit of
courage,
For the darkening sky, one gleam of
faith
To brave the thickening ills of life.
One glimpse of brighter skies be-
yond the gathering mists,
To make this life worth while and
Heaven a surer heritage.

I am not pleading tonight for better schools, for more of the material things of life for our children, but I am asking you to give them more of yourself, sit down in your home with your children about you in the evening. Take the time to let them know that your love is first, last and most. Take time for the story, the song, the talk which will develop them in the right direction. Keep in touch with them, enjoy their games, talk over their prospects, keep their confidence. Teach them that we want more kindness in the world, not less, more sincerity and less show, more interest in humanity and less in the artificial things of life. Nothing we can do for them will be half as valuable as a right preparation for life, and we will never have but one chance to give it. Only a little while and they will wander from us. The company they will choose and the habits they will form will depend upon what we are doing for them now in the home. Let us not try to escape our responsibility or shirk it. Above all, let us not fail to see it.

Strength of Character Comes From Within.

Mother Nature will soon teach us one of the most beautiful lessons in parenthood to be learned. In a few weeks the flowers will dot every hill, fringe every forest and bedeck every prairie; the earth will be carpeted with green; the trees which have stood naked and drear through the long winter months will put forth their signs of life and add their part to the beauty of the landscape. This old world will become an art palace, because of the quiet, steady work which has been going on unseen. The tiny bud, the bursting flower, the grateful shade of the oak could not give us the pleasure and comfort which they will were it not for the nourishment and strength and life that comes to them from within.

The result of the training we give our children, like these signs of beauty in nature, must come as an indication of strength and life and nourishment within. Mother Nature does not hang a leaf on here, tack a flower on there. Oh, no! Then let us not begin from the outside to hang a pleasing personality and polite manners upon our children. Let us train

them so that these will be the natural result of a kindly heart, a charitable spirit, a generous disposition. When this is done, nothing but happiness can be ours and theirs, here and in the hereafter.

I cannot close without pointing to one more lesson from nature, which to me is a beautiful one.

Some flowers bloom at the dawn of day, some at noon one at four o'clock, some in the evening shadows, some at the hour of midnight darkness, some flowers bloom every month, some once a year, some once in two years, and one labors on a century, but every plant that is faithful unto the end, receives its crown of glory.

Parents, with this thought in mind, let us go on with renewed faith, confident that the lessons taught our boys and girls today cannot be forgotten, that some time, somewhere, the world must reap their benefit. True parenthood can never impoverish the world, narrow our outlook or dwarf the work we were intended to do. The home must be the hot-house in which the seeds of kindness, charity and virtue are planted and nourished and cared for, which finally develop and make this life worth while and this world a place in which to live.

"There are hermit souls that live withdrawn
In the place of their self content;
There are souls like stars, that dwell apart
In a fellowless firmament;
There are pioneer souls that blaze the paths
Where highways never ran;
But let me live by the side of the road
And be a friend to man.

Let me live in a house by the side of the road,
Where the race of men go by—
The men who are good and the men who are bad,
As good and as bad as I.
I would not sit in the scorner's seat,
Or hurl the cynic's ban,
Let me live in a house by the side of the road
And be a friend to man.

I see from my house by the side of the road,
By the side of the highway of life,
The men who press with the ardor of hope,
The men who are faint with the strife.
But I turn not away from their smiles or their tears,
Both parts of their infinite plan;
Let me live in a house by the side of the road
And be a friend to man.

I know there are brook-gladdened meadows ahead,
And mountains of wearisome height,
That the road passes on through the long afternoon,
And stretches away to the night;
But still I rejoice when the travelers rejoice,
And weep with the strangers that moan,
Nor live in my house by the side of the road
Like a man who dwells alone.

Let me live in my house by the side of the road,
Where the race of men go by;
They are good, they are bad, they are weak, they are strong,
Wise, foolish—so am I.
Then why should I sit in the scorner's seat,
Or hurl the cynic's ban?
Let me live in my house by the side of the road
And be a friend to man."

—Sam Walter Foss.

Reading, "Love Among the Blackbirds," Miss Pearl Berg.

Scotch Songs, Mr. John Imrie.

ADDRESS.

W. C. Bradley, Hudson, Wis.

Superintendent McKerrow uses me a good deal like some boys and girls use the old slot machine, he pushes in a nickel and gets out chewing gum, candy and most anything else to fill in.

In the session this afternoon Miss Stearns said something about the condition of the country schools of Wisconsin and tonight I am going to give you a few of my ideas on that subject.

We have had quite a jolt in the report of the investigation that has been made lately with reference to our country schools. We all know they are not as good as they ought to be, and yet very many of us admit—we have to—that they are as good as we want them to be. If the school in your district is not a good school, it is not Superintendent Cary's fault, it is not the fault of the University, it is not the fault of some one in Illinois or California, it is your fault. It is your business, and it ought to be as good as you can make it. I know there are a good many places in Wisconsin where it is hard to have a good school; there are many places where the settlers are miles apart and where the conditions for having a good school are not as good as they will be in a few years. We also know that there are places in southern Wisconsin, in the old settled districts of the State, where the schools are not nearly as good as they ought to be, because where there used to be thirty, forty or sixty scholars, there are now only three or four; but in most places, whether the school is good or bad depends entirely upon the way the people in that district feel. If they want a good teacher, they will have one. If they want a well-equipped school, they will have it. If, on the contrary, they want to run that school as economically as possible, they will have a poor school no doubt. We have in the past, in a good many of our rural schools, hired as teachers the graduates of the city schools, mostly young men and women who have grown up in the city without much knowledge of country life or country conditions. About all we have asked of them has been to teach from books, and in many cases they knew nothing about the conditions that prevail on the farm; they had little in common with the boy or girl on the farm. We have been obliged to do this, because it was almost impossible to get well-equipped teachers, but within the last few years there have been established in this State a good many training schools, where our own boys and girls may get the training to fit themselves as teachers in the country schools, and it seems to me this is a long step forward in the educational work of Wisconsin.

I perhaps have some ideas about school teaching that are not taught even in these training schools, and I am going to touch upon some of them briefly tonight.

Nature a Good Teacher.

I believe we look too much to the text book for the education of our children; they need many things the books and most of the teachers do not teach. I would have the teacher fit herself as well as may be to instill in the minds of those school children right living, right thinking and right development of the body, and I would have the teacher talk to the boys and

girls about things that are in common with the lives they expect to live, the things that will touch them daily in their farm homes.

I would take a week perhaps for one subject and, for instance, I would talk to those school children as a whole about trees; the planting of trees on the schoolhouse yards, along the roadside and around the farm home. I would teach them the names of the different trees, tell them why certain ones are better than others for certain purposes; about lumber of different kinds; about the habits of the trees, when they bloom and how they live; their habits and favorite place to live. When they know these things they will take a practical interest in forestry, the replanting of the barren portions of the United States, and know more of the practical part of it than a good many of the men trained in the schools of forestry.

Flowers and Birds.

Then I would take another week and talk to the boys and girls about the flowers. I would tell them something about the roses of Portland, the orchids of Pasadena and the bluebells of Scotland. Let us give them a taste of the beautiful things, the flowers and shrubs and trees.

Then I would take a week perhaps and talk to them about the different kinds of birds in Wisconsin; interest them in things of this kind and they will soon learn to study for themselves. Read to them such books as have been written by Gene Stratton Porter, "The Girl of the Limberlost," and "The Harvester." Get them to reading such books in schools and they will soon form a love for the birds of the country.

Peace the Ideal Condition.

Then, for another week, I would teach these children something of history from a different standpoint than we find it in the books. I would tell them of the make-up of the army and navy, the millions of dollars the United States are spending year after year to build great battle ships that to many of us seem to be worthless, useless. We can teach them many things about peace and war and the effects of war that are not in the books. We ought to tell them of the soldiers in the Regular Army who must serve three years and how three-fourths of them come back to their homes poisoned, mentally, physically and morally, ruined as citizens. Teach them that war is wrong and too costly and that peace is a better proposition.

Successful Men.

I would take a week and talk to the boys and girls about the men who are making history in this world of ours and who have made history in the past. I would have them know something of the lives of Washington and Lincoln and Grant and LaFollette and Cummings and Platte and Bryan and Wilson. Try to have them get something of their personality, their character, what kind of men they were morally as well as mentally, and in that way I think we can set up in the boy and girl a better standard of manhood and womanhood and perhaps we will not be hero worshippers simply because of the love of fighting.

Then I believe I would talk to the boys and girls once in a while about what success in life means. Too many feel in these days that only the man who is making money is a real success. Let us teach our boys and girl something better. We can find in any of our communities men who have perhaps made a financial success but we can also find men and women who have reared families of children who have grown up to be useful in

the community, and that is really the foundation of success.

I would take an occasional day or two and talk to the boys and girls about the poets of this country, tell them something of their personality, Bryant, Longfellow and Whittier, Shakespeare and the other great poets of the world. Read to them some of the best selections and get them to learn, so they can quote by heart, some good selections from these poets, so they will form the habit of getting acquainted with some of the best minds in the world, and they will enjoy in after life many, many hours that otherwise perhaps would be spent foolishly.

The Social Center Idea.

I would try to have this teacher visit the farm home; to encourage little social gatherings, picnics and evening gatherings, where they may have a song service, recitations and music, and discuss the things that pertain to country life. We have heard a good deal of talk lately about the social center, the using of the schoolhouse as a gathering place to discuss problems, and I think it is a good thing to get people together in meetings of this kind. Have a committee on entertainment, a few men and women selected to furnish different topics for the evening, so the whole countryside may come together and sing and talk and enjoy life more than we have been doing in most of the rural communities.

This is the age of co-operation and we ought to entertain any project that may get the people together in a social way, a brotherly way, either in our farm homes or our village homes, or the country church or the country schoolhouse, in order that we may rub up against each other, we may exchange ideas. In this way we not only better ourselves, but we better the condition of our neighbors and every one in the community. Some of us get into the habit of taking life too seriously.

Let us talk to these children about the men who have made life worth living, about the things they have said and written. Tell them something about James Whitcomb Riley and the funny things he has said that make people smile. Tell them about Will Carlton, and hundreds of others that you will think of who have made the literature of the United States as permanent as that of any country in the world.

I would like to see every schoolhouse yard surrounded with trees and flowers and I would like to have the teacher take an interest in the planting of flowers in the farm home, visiting these farm homes, and suggesting some things of beauty.

Then let us teach the boys and girls to be honest; let us teach them that whatever they do they should earn the wages they get.

Piano duet, Miss Mildred Goodrich and Mr. Wade Townsend.

Adjourned to 9 o'clock a. m., next day.

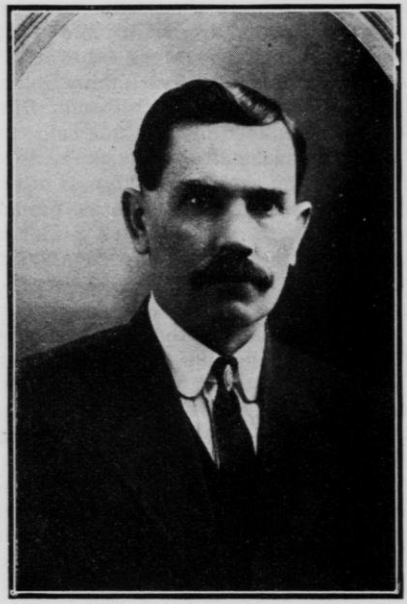
SECOND DAY, MARCH 19, 1913.

Morning Session, 9 o'clock.

The convention met at 9 o'clock a. m., Mr. H. D. Griswold in the chair.

TOWN MANAGEMENT OF DIRT ROADS.

J. T. Donaghey, North Freedom, Wis.



Mr. Donaghey.

The town management of dirt roads has become one of the most difficult problems confronting the taxpayers of Wisconsin. We have 61,000 miles of road in the State and spend upon them annually, under the supervision of the 1,195 towns, $2,000,000, aside from the amount expended under the State aid law.

Of this 61,000 miles of road, about 13,000 miles are upon the prospective State aid system and will be improved in the near future under the provision of the State aid law. A considerable portion of these 13,000 miles, and the other 48,00 miles will of necessity have to be maintained by the towns for many years to come. Each year a few miles will be added to the prospective State aid system, but enough new roads will be laid out in the northern counties to keep the percentages of each about the same as they are now.

When we stop to consider that fully seventy-five per cent of the farm produce that goes to market must be hauled over this 48,000 miles of dirt road, at least for a short distance before reaching the improved roads, and that fifty per cent of our children attending the rural schools must travel these same roads, we can see the necessity of some well defined system of improvement for this class of road.

The $2,000,000 spent annually on these dirt roads, if applied in a systematic manner by men trained in this kind of work, would show a marked improvement instead of keeping them just about as good as they were last year. A few years ago we were holding a good roads meeting in a little inland town in my home county, trying to create interest enough in the movement to induce the town to make an appropriation for the improvement of a certain road. An old German was talking in favor

Road Building in the Winter Time.

Under the supervision of Andrew Elklund, County Highway Commissioner of Marinette County.

The gravel is hauled on sleighs, and deposited along the shoulder of a twenty-foot grade, previously made. The following season it is placed in the subgrade or trench by the use of a four-horse grader, and then rolled with a ten ton roller. Many miles of good gravel road are built in this manner in Marinette County.

On one six-mile haul the gravel was delivered for 60 cts. per cubic yard and a two-horse team hauled from four to six cubic yards.

of the appropriation. He went on to tell of the good roads he had traveled in Germany when a boy, finally making this statement: "It will be thirty years next month since I first drove over that eight miles of road, and our town has expended hundreds of dollars upon it each year, and honestly, gentlemen, it is not in much worse condition now than it was then."

This statement is true of nearly all our dirt roads. They are no worse than they were thirty years ago, neither are they any better. We need legislation that will compel town authorities to expend the ordinary highway taxes with more economy, and with some well defined system of improvement in view.

The Cash System.

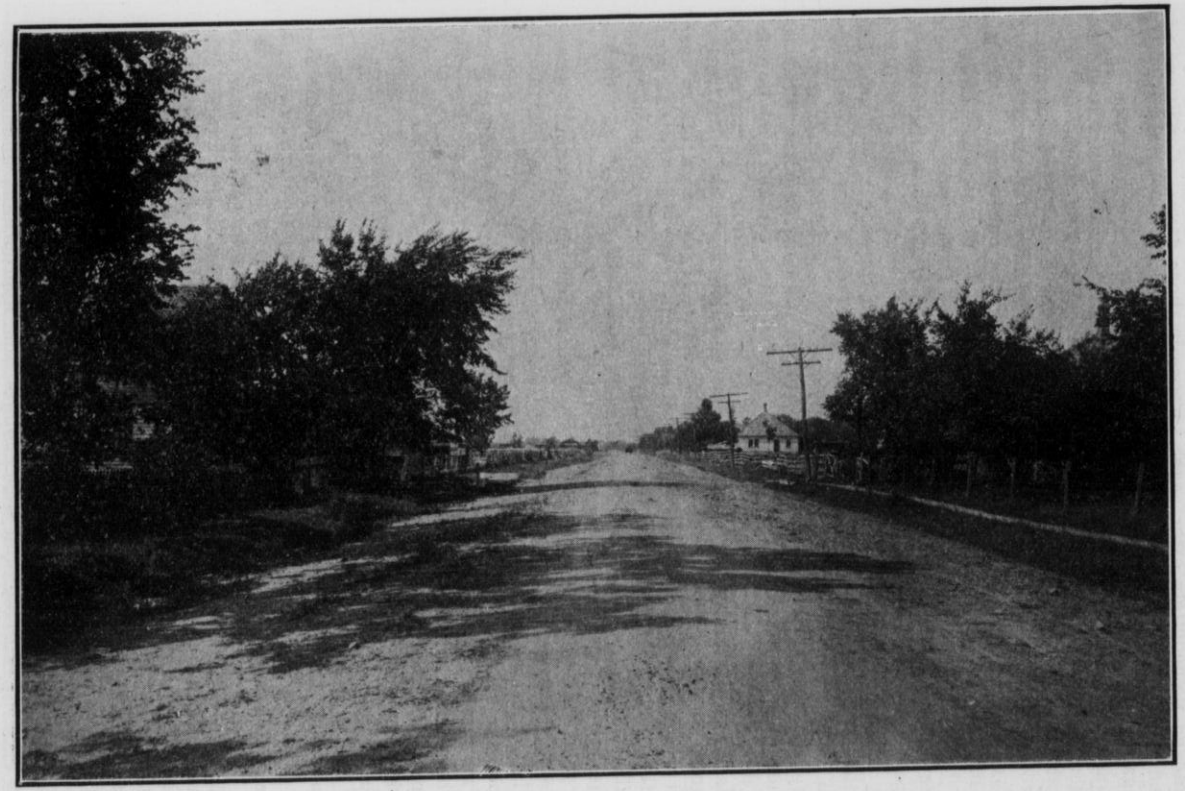
The Legislature of 1911 passed a law that is a move in the right direction. Chapter 599, Laws of 1911, provides that the county board by a majority vote may pass a resolution compelling all towns in the county to collect their highway taxes in cash. Forty-two counties out of the seventy-one in the State have taken advantage of this law, and the road work in those counties will be done on a cash basis in 1913. The success or failure of the "cash system" in these forty-two counties will depend almost entirely upon the town board in each town. If the board is made up of live men, who are working for the best interests of the town, and if they use good judgment in directing the road work, the results will be satisfactory. To properly carry out the intent of the law, the town board should first look over all the roads in their town and decide how many districts the town should be divided into, and in no case should they exceed four, and if possible, a less number.

After deciding the number of districts and their boundaries, appoint a superintendent for each district for a term of three years. He should be a "live wire"—a man who possesses the faculty of getting work out of men and teams, and one who has had some experience in road building if possible. Pay this man a good salary, for if he is not capable of earning a good wage he is not the man who should expend your good money.

Go over each district with the superintendent and map out a good system of improvement covering the three years for which he is appointed. Plan for cutting down certain hills, grading up some of the low swampy stretches, providing culverts, drainage, etc., besides the ordinary maintenance, which consists of light grading and dragging. If you have any heavy cuts or fills to make, or a serious drainage proposition to overcome, call on the State Highway Commission and they will give you all the assistance within their power.

Divide your total highway appropriation among the districts according to the needs of each district, and not on a basis of valuation, as it is quite improbable that any two districts in a town would require the same percentage of the total appropriation in the same year. One district might require twice the amount each year to keep its roads in the same condition as the others, and if so is entitled to it. This is one of the very best features of the cash tax law. It places the town board in a position to have the money expended where most needed, and if there are certain roads in the town that need no improvement at present, the tax from the land abutting on those roads may be expended in the farthest corner of the town if the town board deem it necessary.

Set aside a certain amount of the money allotted to each district for permanent improvements, the balance to be used for general maintenance. Provide a plan whereby the superin-



Wausau road, Town of Hull, Portage county, built by Thomas E. Cauley, County Highway Commissioner, in 1913, under the State Aid highway law.

tendent can have all clay roads properly dragged immediately after each rain, and reserve a small amount of the maintenance fund for the removal of snow during the winter months. Give the superintendents authority to hire men and teams wherever they can be best procured, and to get men who will stay on the job a reasonable length of time, as it is very expensive to break in new men and teams every few days, as was the practice in the past when the taxpayer worked out his road tax. Pay them the wages that are being paid for similar work in your community, and they will give you service accordingly, for they know full well that if they do not do this you will get someone in their place the next day.

The town should also provide the necessary machinery to properly handle the work in each district, and should insist that the superintendent does this work at the proper season of the year. A dollar spent on a clay road in the months of May, June or July is worth two or three dollars spent upon the same road in the same manner in October or November.

Here is where the greatest trouble has been in the past. The taxpayer was working out his road tax, and as the majority of the taxpayers were farmers, the work was done when most convenient for the farmer.

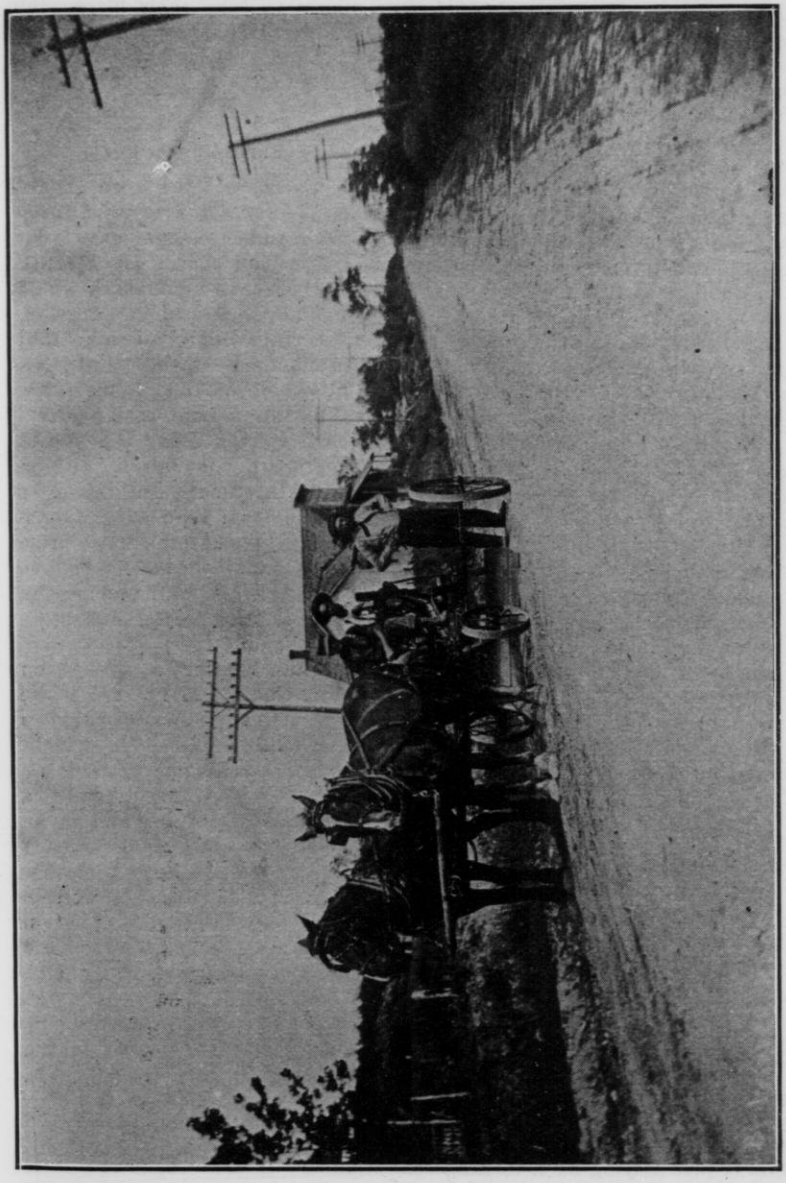
Changed Agricultural Conditions.

Twenty-five years ago the average farmer had only a few acres to plant and cultivate, he had ample time to work out his road tax at the proper season of the year. He did not have from ten to twenty cows to milk morning and night, as is the case now. He could do his few chores—or let the women do them—and then get to the road job in good season, even if it were one or two miles away. He was glad to get the chance to work out his road tax, as money was scarce in those days. Conditions are different now in every agricultural district of the State. As soon as he has sowed his small grain, it is time to plant corn. Then come the potatoes or sugar beets or tobacco, and by this time the first planting of corn is waiting for the cultivator. Now the clover is ready to cut, and before he is aware of it harvest is on. He does not get that two or three weeks of slack time that he had twenty-five years ago in the month of June. The up-to-date farmer who knows the value of a day with his team and cultivator in his corn or potato field at the proper time will tell you he cannot afford to work on the road at any price, and that he would much rather pay his share of the road tax in cash and let some other men do that work who make a study of the best methods of road work as he does with his farming.

Go into a farming community where the farmers are not progressive, but are just where they were twenty-five years ago, and they will want to work out their road tax just as they did then.

A Pernicious System.

I attended a Farmers' Institute a few days ago in a town where the majority of the farmers were of this class and their views on the road question and farming in general bear me out. This town is within thirty-five miles of Milwaukee and dairying is their chief occupation. The Institute Conductor inquired how many present had silos and I think only two raised their hands. That shows you how progessive they were. This town had an assessed valuation of two million dollars and appropriates annually a two mill road tax entitling them to raise four thousand dollars for their ordinary highway taxes. The town is



Trimming up the shoulders with a light grader.
Town of Milladore, Wood County. Louis Amundsen, County Highway Commissioner.

divided into forty-two road districts and has forty-two pathmasters. The machinery with which to expend this four thousand dollars under forty-two different bosses consists of two graders, two wheel scrapers and one road plow and the pathmaster from whom I received my information said they had been unable to find the road plow during the season of 1912 and that he knew he was wasting fully fifty per cent of the money in his district.

Now if this town was on a cash system and divided into four districts with each superintendent having one thousand dollars to expend, what would be the result if we went into that district with a crew of men (not taxpayers) and got no more for the money than they now get? Each taxpayer in the town would be up in arms and this superintendent's work so severely criticised that the town board would be compelled to make a change. As matters now stand in this town the very men who would criticize the work if done on a cash basis are the men who are doing the work as well as bossing the job. They surely will not criticise their own work, no matter how poor it may be.

The Labor Plan.

Some towns in certain counties that have voted for the payment of the taxes in cash have adopted a plan which they think is in compliance with the law. The town clerk makes out the road warrants just as he did under the old labor law, and any taxpayer who wishes to may work out the amount of his tax, taking a receipt from the pathmaster for the amount and turning this in as part payment of his total taxes.

Now, this is just getting back to the old labor plan. You are not any better off than before. The same condition exists in changing men and teams every day and having to chase after others to take their place the following day. This is not the intention of the law and should not be tolerated in counties that have voted a cash tax.

County Road Conventions.

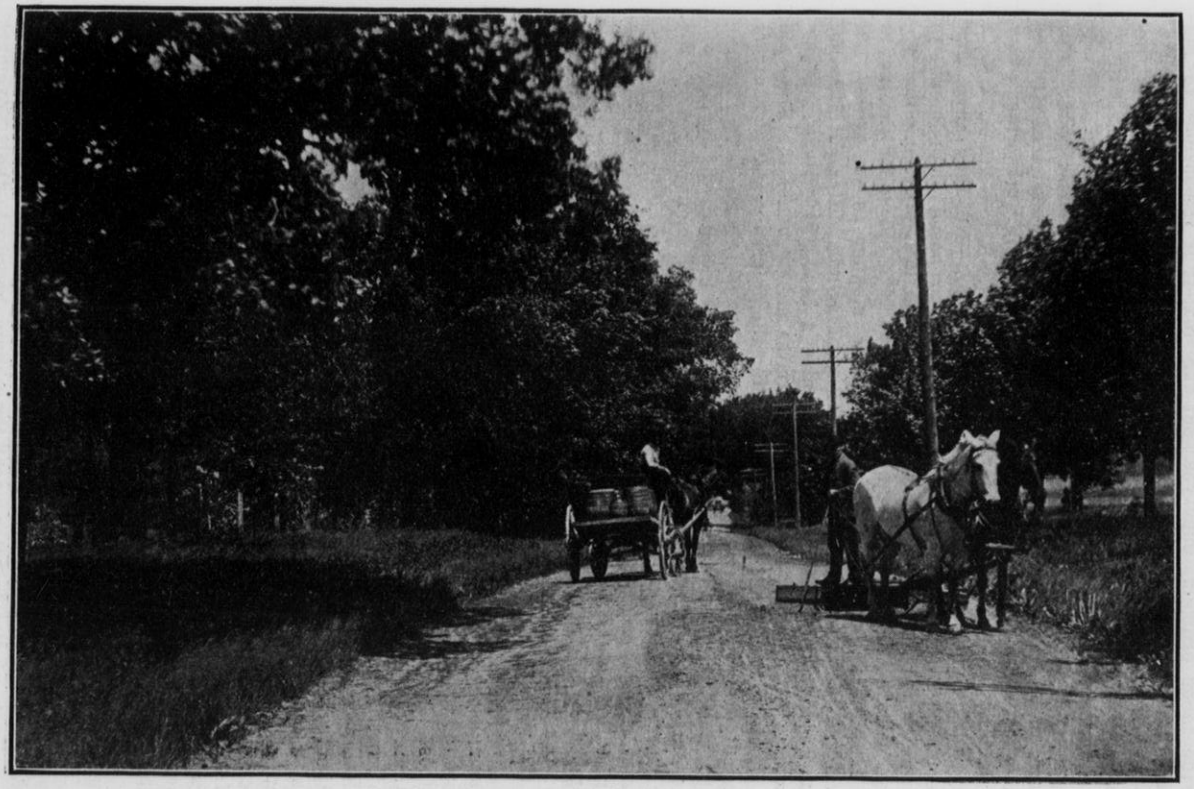
The members of the town board should be elected for a term of three years, one member elected each year just as our school boards are elected. Under this plan, two members would always hold over and could carry into effect certain improvements that had been planned ahead. Bill No. 373 S., now before the Legislature, provides for an annual road convention in each county, along the line of our school board convention. It provides for the attendance of the town chairman and local road superintendents, who will discuss the local problems and exchange ideas. I believe this would work out well and be the means of promoting better and more uniform work.

The Institute workers in talking on good feeding have told us that if we feed an animal only enough to keep it alive, it will decrease in weight rather than increase. They tell us also that we must feed the animal a properly balanced ration, and in an amount sufficient to make steady daily gains, or we are losing money. This advice applies equally well to the road problem. Feed the road a properly balanced ration of labor and brains, upon a feeding floor consisting of a "well planned system of improvement," and we will surely see a steady gain each year, both in the quality and quantity of our dirt roads.

DISCUSSION.

A Member—In our country it is pretty hard to get help to do that work.

Mr. Donaghey—Yes, that is the handicap in all classes of work. In



Showing the Earth Road Drag at work near Oconomowoc.
The good roads enthusiast deserves great credit for his fine work.

all road or street work, you are up against the labor problem, but you can secure labor probably better under the cash tax system than in any other manner. The few towns in the State that have worked under the cash system for several years have proven this to be true. You will also find that you are getting a better class of labor when you pay cash for it. They will do more work in a day than the man who comes on the job for but one or two days to work out his taxes, because they understand what is expected of them, and know that if they do not satisfy the superintendent he will get another man in their place.

They should give the taxpayer the first chance to work, providing he is willing to work the season through, but if he only wishes to work a few days, or just long enough to work out the amount of his road tax, you cannot afford to let him on the work.

A Member—Wouldn't it be a good plan to work a road drag about this time of the year on the dirt roads, as soon as the frost is out?

Mr. Donaghey—It is a very good plan to use the road drag just as soon as the frost is out of the ground. I do not think it will do much good before the frost is out, excepting in certain soils that dry out on the surface before the frost is entirely out. Get busy just as soon as the frost is out and keep at it after every heavy rain until the ground is frozen again. This is one of the most important features of the cash tax law. The town board can provide for dragging the roads at the proper time. Where a town is divided, as it should be, into not more than four road districts, the superintendent of each district can make arrangements to have men at different points where the clay roads are, who must get out immediately after each rain and drag a certain number of miles of road.

Under the old system of working out the tax, it is impossible to get the road dragged at the proper time. What is everybody's business is nobody's business.

Mr. Baird—Has the State Highway Commission any jurisdiction over highways on the outskirts of city limits, but within the prescribed city limits?

Mr. Donaghey—No, they have not. There is a proposed amendment to the State aid law, providing for villages to receive aid under the law in the same manner as the towns, but it does not include cities. If this bill becomes a law, any village that appropriates money under the State aid law for the improvement of a street or road that is a part of the prospective State aid system, will receive aid in just the same manner and in the same proportions as the towns. The cities as a rule have road building machines of their own, and are in a position to handle their street improvement economically where the small village is not.

Mr. John Imrie—Then there is no way of making the city fix a road running into the city right up to the city limits?

Mr. Donaghey—No way under the law, but there are very few cities in the State of Wisconsin but are anxious to meet any improvements the adjoining towns may make, with a street as good if not better than the town is building, besides in many cases giving the town a liberal donation to induce them to make their improvement.

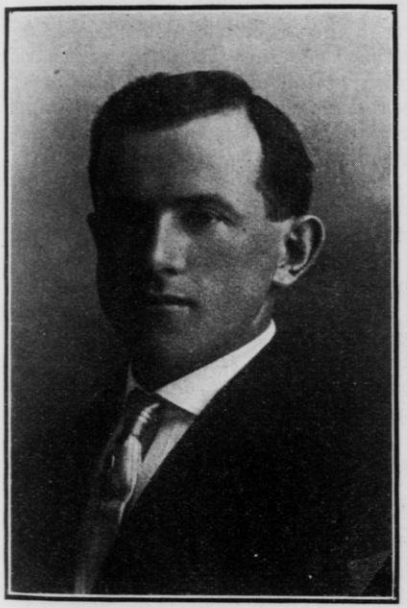
Mr. Convey—In some of the counties of the State they voted to have the road tax paid in cash, but in some cases they failed to make the appropriation for that purpose.

Mr. Donaghey—In counties where the county board at the November session, 1912 or later, has passed a resolution compelling the payment of

highway taxes in cash, the town boards of the several towns should have levied a tax sufficient to carry on the road work in their town for the coming year. The Attorney General decided that this could be done legally. If they have not done this, they should at the next annual meeting make provisions to borrow enough money for that year, in addition to making an appropriation for the following year. This will mean a double tax in some one year, but cannot be avoided, and is the only way you can ever catch up.

CONCRETE ROADS.

H. J. Kuelling, Milwaukee, Wis.



Mr. Kuelling.

While individual cases of concrete pavements are not new, yet the fairly extensive use of concrete as a wearing surface for streets has been inaugurated within quite recent years.

Its more extensive use was brought about by a demand for a pavement to withstand the auto traffic, and one that would not cost as much as brick or block pavement.

While concrete as a surface is still far free from disadvantages, I believe it to be a step in the proper direction. I do not believe it is the proper pavement for heavy traffic in our cities, but I do believe it is an economical pavement for heavy country traffic, for residential streets in any city and for the main streets in the smaller cities. I believe that the larger the percentage of motor traffic becomes, the more economical the concrete street will become, because the horse and the iron tires are more destructive to it than are automobiles, a situation just opposite to that of macadam.

The selection of concrete as a paving material in Milwaukee county was made for several reasons, among them being the following:

1. Durability.
2. Low maintenance cost.
3. Cheapness and availability of materials.
4. Simplicity of construction.
5. Low initial cost.

These all resolve into a question of economy, which when combined with the ease of traction, smoothness, non-slipperiness, cleanliness and sanitary qualities, make concrete as nearly an ideal pavement for rural high-

ways as could be devised for Milwaukee county.

This type of road has some disadvantages, as have all other kinds of pavements, some of which are noisiness, non-resiliency, glare in sunlight, difficulty of repair and likelihood of development of cracks. However the noise of a concrete pavement is not particularly objectionable in rural districts, owing to the fact that dwellings are more or less widely separated and furthermore are usually set back some distance from the highway.

The question of non-resiliency can be taken care of by treating the surface with a bitumen if desired, but we have yet to hear a complaint that the pavement injures horses' feet. In the same manner the glare of the the pavement can be reduced or even eliminated by adding a dark material, such as lamp black, to the concrete while mixing.

The difficulty of repair of concrete is not so serious as formerly, since improved methods are being introduced, creating the possibility of repairs which are practically as good as the original pavement. The matter of development of cracks is really only an apparent disadvantage and unless the two parts of the pavement which have become separated tend to shear past each other, making a sudden rise in the road, the crack will be harmless, except possibly to the looks of the pavement. Cracks can be easily remedied by pouring in a little bitumen and afterward sprinkling with sand and will wear for years.

Construction.

In the construction of a concrete road or pavement, practically the same principles enter into consideration as in any other pavement.

The manner of construction of concrete roads as carried on by the various contractors was essentially uniform, although different details were handled in different ways. The grading was done in accordance with plans furnished by the Highway Department, the grades being given by the inspector in charge of the work. Standard cross-sections were adopted and the sub-grade was prepared for the concrete to conform with these. The grading in some cases was completed ahead of the concrete crew for the whole length of the road being improved, and in others only a short distance, depending to a large extent upon the amount of earth to be moved. In our work a large proportion of the grading consists merely in cutting off the usually excessive crown of the old road and placing it on the sides to widen the sub-grade and form shoulders at the sides of the pavement.

After the subgrade is brought to shape, the forms are set up at the sides, separated at a distance equal to the width of the finished pavement. These are made from 2" x 6" or 2" x 7" planks and set up on edge, supported by stakes driven at frequent intervals. The 1912 work was done using the 7" depth in some cases and 6" in others, the former in the event of a crowned sub-grade, and the latter where a flat sub-grade is employed. In this connection it might be stated that the practice of using a flat sub-grade is considered better by this department and will be used in next season's work, owing partly to the fact that the crown is obtained by thickening the central portion, thus strengthening the part where the greatest strain is encountered, and partly for drainage and construction reasons.

Drainage.

A concrete road or pavement requires good drainage as well as any other form of road construction. As a

rule, more attention is given to this point in cities than in rural districts, due, perhaps, to the fact that a larger share of the work is planned and supervised by engineers. In some respects, for several reasons, it is a more important point on country highways than on city streets. Streets generally have some form of gutter which permits the water to flow off quickly, while country roads must depend entirely upon the side ditches. Streets, as a rule, are wider than country roads, thus being in less danger of the foundation becoming saturated, a condition which will surely cause heaving by frost.

Besides attention to surface water, the engineer must be on the watch for underground water, and tile where necessary. Such conditions exist not only in low, flat districts, but very often in a rolling country or where a road runs along the side of a hill.

Foundation.

If the drainage is thus properly looked after, the matter of a correct sub-grade is quite simple. Where considerable grading is done and a tractor of some kind is used, sufficient compacting of the foundation may be done during the grading to make it firm. This condition is more likely to arise in country road construction than in city work, as in the latter case the grading is more likely to be nearer grade. Where a concrete pavement is to be constructed on a street that was formerly covered with macadam or gravel, I believe that where possible the old street material should be used as a foundation for the concrete, as it adds firmness as well as assisting very materially in the drainage.

Materials.

The materials that enter into the concrete should be well considered, because the work to be done by a concrete pavement is entirely different from that done by a concrete foundation.

First of all, a good quality of portland cement should be used, of which there are numerous brands now upon the market. Next the aggregate should comply with a good standard of cleanliness, size and hardness; the better the standard the better the concrete that will result. One practice especially I would like to guard against, and that is the use of bank run gravel, even where attempts are made to determine the proportion of sand and stone in it, and also the percentage of voids. Even though careful efforts are made to bring the gravel to a proper grading by the addition of stone, one will meet with failures, because practically no pit is uniform in character, and thus necessitates a continual change in mixture. Such changing is well known to be a bad thing for a crew, as well as for the resulting concrete. The only alternative is to screen all the gravel and remix the sand and stone in the mixer. In nearly every case the gravel will be found to contain an excess of sand, of which some disposal must be made or stone purchased to add to it.

Where gravel is purchased without screening, it must be remembered that a cubic yard contains considerable more material than is the case where the same has been screened. This is almost as important a point to consider in arriving at the proper change in price as the added cost of screening. In a general way, I believe that a clean screened gravel is better than a mixture of sand and crushed limestone. The harder the stone contained in the concrete, the better will be the wearing qualities, as the stone must carry the wear rather than the mortar, thus making

crushed granite or hard gravel a more valuable aggregate than crushed limestone, especially the softer varieties.

1:2:4 Mixture.

A proper mixture I believe to be about 1:2:4. However, we should not adopt the mixture blindly, but make a careful study of the voids in the sand and stone that are available for each "job", as some materials require more cement than others, to obtain an equally good concrete. Because of this fact, it is sometimes economy to pay more for sand with a low percentage of voids than to use what seems cheaper at first thought.

Water.

It is needless to say that plenty of fresh, clean water should be available at all times. This is generally a simple enough problem in cities, but an entirely different one in the country road work. During the past season, we used twelve miles of 2-inch pipe. In some cases we had pressure enough from city hydrants, while in others we were compelled to put a booster pump in the line.

Mixing and Laying.

Even if proper drainage, foundation and materials are obtained, failure may result unless care is taken in construction of the street.

First of all some good form of batch mixer should be used, as a failure to properly proportion in a continuous machine means a hole in your pavement. Personally, in my country road work, I prefer a machine with a spout discharge rather than either the boom bucket or carts, because I believe the material to be more evenly placed upon the street; because there is not the tendency to disturb your foundation and mix dirt with your concrete that there is with carts, especially on narrow roads; and because the spout causes less trouble in the placing of the expansion joints. Some will argue that more material can be placed with carts, because of the larger and easier source of supply in the piles, but I believe by a little careful placing of the sand and stone that an equal amount can be placed, especially with the large tractor mixers now on the market.

A good practice in mixing concrete, as well as any other work, is to keep the same man doing the same class of work around the mixer, so that it becomes almost second nature for him to do the right thing at the right time.

The following, I believe, is a fair arrangement for a crew, especially on road work.

1 Foreman

2 Men to attend to preparing joints

3 Men to attend to sub-grade, so that material can be dumped and concrete placed.

2 Form setters.

6 Men who load wheelbarrows

4 Men who handle the wheelbarrows

2 Men for handling cement, one who delivers it and one who dumps it into the hopper

1 Engineman on the mixer

1 Man at the hoist

1 Man who handles the spout for placing the concrete on the road

2 Men for striking off the concrete with a strike board cut to the crown of the road

1 Man for finishing the concrete and trimming the edges

1 General utility man.

This gives a total of 26 men, whose pay would aggregate about $63.00. Such a crew should average about 600 square yards of 7-inch concrete per ten-hour day.

As to the relative merits of one and two course types of pavements, I prefer the one course type, mainly for construction reasons, although there are many arguments for both sides.

Where it is necessary to place reinforcement, which I believe is not often, it is more difficult to get it placed near the surface in the single coat work than it is in the two coat work. A cheap and satisfactory form of reinforcement is common woven wire fence.

After the concrete is properly placed, it should be well cured. In our work we cover the road with earth or gravel as soon as it is hard enough to carry it. For the first five days it is kept well sprinkled, especially in warm weather. The roads were kept free from traffic for twenty days, in order to give the concrete sufficient time for complete setting, and the contractors were required to maintain strict observance of this clause of the specifications. In spite of the fact that it is common knowledge that concrete required a number of days hardening before being fit for travel, it was found necessary to employ members of the sheriff's force in several instances to emphasize the fact. It is to be hoped that some time in the near future it will be realized that in order to gain any improvement, some temporary sacrifices must be made. Notwithstanding the carefulness of the watchmen, barriers were deliberately removed by travelers and some damage was done, the most glaring example being on the Janesville Plank Road, where a team and wagon drove over the green concrete, leaving a shallow rut about 600 feet in length. While this may not appear serious, other than on the surface, the whole pavement is injured in the vicinity of the depression, due to the disturbance of the particles during the final setting and the consequent destruction of the bond between the component particles.

Joints.

One of the most important problems in the construction of a concrete road or pavement is the matter of proper joints to provide for expansion or contraction. Many types are in use, such as a plain filler joint, wood joints, felt joints and steel combined with some of the others, the steel acting as a protection to the joint, and sometimes as a reinforcement across the end of the slab. In Milwaukee county we have used a rather high-priced joint, consisting of two pieces of asphaltic felt between two pieces of steel. The felt reaches entirely through the slab, while the steel is only 2½" deep and is anchored into the slabs by 6" wings punched into the steel. After a little practice, this joint is easily erected, costing in place about five to six cents per square yard of pavement. These joints are placed at twenty-five feet intervals. Engineers differ as to the proper distance apart for joints to be placed, varying from twenty to fifty feet and even one hundred feet, while a few are trying out roads without any provision for expansion. This latter I believe to be a very bad practice. I believe that the farther apart the joints are placed, the wider should be the joint, and the wider the joint is, the more danger there is of a defect developing in your road. The common practice is to place these joints at right angles with the line of travel, but I believe that a slightly better practice that is being introduced is to place them at an angle so that two wheels cannot come to the joint at the same time.

Surfacing.

As to whether or not a bituminous treatment on a concrete road is economical in all cases I am unable to say. For certain conditions, however, I believe it is well worthy of consideration for several reasons. It acts as a cushion to traffic, thus making it easier for horses' feet, as well as protecting the concrete itself from grinding away. It tends to relieve the glare of the street and deaden the noise of traffic, thus making the pavement more desirable for residential streets. A fair treatment is about one-half gallon of bituminous compound per square yard. After pouring, the treatment is covered with a sprinkling of coarse sand, as is done in oiling an old macadam street.

Such a treatment under a fair traffic would last one or two seasons; the center of the street for one, and the sides for two seasons. Such a treatment would cost about one cent per square yard for application, and not over five cents for the material. There are several treatments of this kind with patents pending, but I do not believe it necessary to use any of them, because bitumen of the proper mixture can be purchased that will be satisfactory.

While being treated, the street should be thoroughly clean and thoroughly dry, or the material will peel off from under traffic.

Cost.

As regards the cost of concrete roads or pavements, the conditions vary so greatly in different parts of our State that what would be proper for our Milwaukee county work would be entirely wrong in some other sections. Because of the varying cost of sand, stone, men and teams, I can make no definite estimate of a square yard price, but in a general way will state that the pavements have cost us on an average in the neighborhood of one dollar per square yard, exclusive of grading. This is divided into about the following proportions:

Cement	.30
Gravel and stone	.13
Labor and hauling	.47
Joints	.06
Inspection and water	.04
Total	$1.00

These figures are based upon team hauling at six dollars per day per team, and common labor at $2.25 per day.

This cost is about one and one-half times what plain waterbound macadam costs under similar conditions in Milwaukee county and about ten to fifteen per cent more than asphalt or tar macadam would cost.

The question which immediately arises is whether the concrete road is worth the difference. In answer I would say that we believe it is, or we would not have given up all forms of road construction in favor of concrete for our main highways in the county. With the heavy maintenance cost that we would meet with on any form of macadam roads, in order to keep them in a decent condition under the heavy traffic of our county, I figure that in a comparatively short period of years we would be justified, from an economic standpoint, in tearing up our concrete road and placing an entirely new one. However, I do not believe such an extreme method will be necessary for many years on a well constructed concrete road.

Even under medium country traffic, I think there are many places in Wisconsin with a plentiful supply of good gravel that would be more than justified in placing concrete upon

their highways. It should be remembered in this connection that the initial cost in road construction is by no means the only cost to be considered, and what may at first sight appear to be the costliest road, may be and often is the cheapest road when the question of maintenance is properly considered.

In conclusion I would add that I believe concrete road construction to be only in its infancy and that another decade will see its use extending over a wide territory. I also believe that many people will make mistakes by not profiting by the experience of those who have had experience, for it seems that almost every community feels it their duty to carry on some kind of experiments.

DISCUSSION.

Supt. McKerrow—In your observation, have you seen any concrete road that has been used for a sufficient length of time to determine in your judgment its wearing qualities?

Mr. Kuelling—Yes. The oldest on a large scale are around the city of Detroit, where they have some that are now entering on their sixth year, and up to date they have not been required to repair them. Indeed, I cannot see but what they are as good as when laid. They have given up everything there in place of concrete, they have almost one hundred miles of concrete pavement, and they claim that during 1912 they spent only three hundred dollars on maintenance of sixty some odd miles, and that was all spent in taking the dirt off the shoulders of the road where the dirt had encroached on the concrete.

Supt. McKerrow—Is the main traffic on that road from the metropolis?

Mr. Kuelling—Everything; it is one of the oldest of the Detroit roads, the main street extended into the country.

Mr. David Imrie—Would not a 1:3 mixture be good enough, with good, sharp sand?

Mr. Kuelling—No, sir, it would not be hard enough.

Mr. Baird—That would not include a cement gutter?

Mr. Kuelling—No, sir.

Mr. Baird—Don't you think those concrete roads are awfully slippery?

Mr. Kuelling—They are nowhere near as slippery as the soft pavements are, especially asphalt.

A Member—Don't they wear the corks on the horses' shoes?

Mr. Kuelling—Corks on horses' shoes are a good deal cheaper than horses.

A Member—What kind of finish do you put on?

Mr. Kuelling—We put on a wood float finish, not finishing with steel. We put it all on in one layer.

A Member—Slush work?

Mr. Kuelling—Pretty slushy.

A Member—Any tamping?

Mr. Kuelling—It does not need any tamping.

A Member—Don't you think there are a great many localities in the State where a concrete road can be built a good deal cheaper than you have given?

Mr. Kuelling—I do think so. We are paying six dollars a day for teams, and at least $2.25 for men. For a nine-foot road, at one dollar a yard, which is what it costs, that will be $5280.00 for a mile of road. There are places where it ought to be built for eighty-five cents a yard, or even eighty.

Mr. Baird—Wouldn't you think that a concrete gutter would add to the permanency of the road?

Mr. Kuelling—You would not want

to put a gutter on a nine-foot road. I would not want to go to the expense of putting a gutter on a road that was eighteen feet wide even, and I do not think any good highway demands anything wider than eighteen feet.

Mr. Baird—The difficulty of many of our country roads is that the gutters are not taken care of, they clog up from the washing from the fields, and the permanency of the center is lost.

Mr. Kuelling—Oh, you mean to build a concrete gutter out on the ditch line. Of course that would add to your road and take care of the water better, but I do not know whether that is justifiable in many cases.

Mr. Martiny—We have many towns in the State and probably one-third of them have appropriated an amount giving them $1,200.00 to expend in that town. In that case, would you advise them to build a concrete road where they could build a gravel road at $1,500.00, or a macadam road at $2,500.00?

Mr. Kuelling—There are so many things entering into the local conditions that it is pretty hard to answer that question. I would consider first the trouble that I had to contend with, the type of road, then I would consider a comparison of the roads, then I would consider my sum of money. If I only had $1,200.00, I do not believe I would attempt to organize and start the construction of a concrete road, because you would use too much of your money in starting and stopping as you would do in a gravel or macadam road. In making this road, we grade down to grade and throw out our trench the same as we do in the macadam road. We do not use any cushion at all between the concrete and the pavement. Some people think it advisable, but we do not. Six inches thick at the sides and eight in the center is the standard. Of course the most travel comes in the center. There is a funny thing about these cracks that come in concrete, and that is that they always come longitudinally, not across the road. That is something we do not understand yet. In our estimate, our gravel costs us about thirteen cents per square yard of pavement. That makes about sixty-five cents per cubic yard. This year I will have to pay varying from ten cents in the pit to sixty cents on cars, depending on where I have to get it. Some places we have to haul three miles. It is better to figure the cost of the gravel at its origin and then add the cost of hauling.

A Member—How did you haul that gravel, say a two mile haul?

Mr. Kuelling—We hauled last year with teams, this year I am putting in two heavy wagon trains with an engine, and in one case I am going to haul with a little locomotive on tracks. I think hauling is a great expense and that I shall save monep on the job by my new plan.

A Member—Did I understand you could buy gravel at ten cents per cubic yard in Milwaukee county?

Mr. Kuelling—Yes, I am going to buy 30,000 yards this summer.

Mr. Monroe—With gravel at one dollar delivered on the road, and cement around a dollar and a half, what would be the cost per cubic yard?

Mr. Kuelling—It would be considerable under a dollar, between eighty and ninety cents.

Mr. Monroe—In other words, about $4,492.00 for a mile of nine-foot road?

Mr. Kuelling—Something like that. In some localities, a crushed stone road would probably cost you pretty well around $2,500.00.

A Member—What is the size of screen used for screening your gravel?

Mr. Kuelling—Anything under a quarter of an inch I call sand, and I do not like stone over two inches in size to get in as stone.

Mr. Monroe—Will gravel wear any better than crushed stone?

Mr. Kuelling—It will wear a little better, and for that reason I advise gravel instead of crushed stone.

A Member—Why had those roads that you spoke of in Detroit given out?

Mr. Kuelling—They had not given out. The mortar was broken up in the cracks. All they need is to take care of the cracks. You could not put concrete on top of them by any means we know of. We have methods of digging out the dirt with oxalic acid and applying the same type of concrete that the original road is built of. The trouble was the dirt was carried onto the concrete by wheels and it had to be taken off.

Mr. Monroe—In a road where it had a good basis and the top simply wears out, what could you do with the road?

Mr. Kuelling—I think if you had good gravel, you could put on five inches. I would not use anything less than that. Some people have put on a 1-2-4 mixture but I would not advise it. The Wayne county people put on a 1-1½-3 mixture; others have used 1-2-3½. The mortar then is about sixty per cent of the total aggregate, but we believe that a 1-2-4 is doing the work.

Mr. Baird—What kind of soils have these roads that you refer to been built on?

Mr. Kuelling—We have all types of soils, from light sandy soil to heavy clay soil.

Mr. Baird—What would you do if you had quick sand bottom?

Mr. Kuelling—I would attempt to get some kind of a trench to take it away, the same as you would any road.

Mr. Imrie—Do you suppose these cracks in these roads were caused by freezing, heaving?

Mr. Kuelling—That is one of the many causes.

Mr. Imrie—It looks as though the center had raised.

A Member—Do you make the surface level, or simply rolling?

Mr. Kuelling—It is six inches on the side and eight in the center. That is two inches rise. We crown about one-quarter of an inch to the foot. That is important, because it makes your travel distributive over the road. On a crowned road, the travel will drive on the crown all the time and wear it out.

Mr. Martiny—At this time of the year, does not the ice and frost make it slippery?

Mr. Kuelling—We had not noticed that any more than any other pavement. If sleet comes and freezes, it will make any road slippery.

Mr. Imrie—Is there any kind of rule about teams meeting?

Mr. Kuelling—I believe that while these shoulders will harden and make it safe for the team to turn out on, of course it will be a little objectionable the first year. After that I do not think you will have any trouble.

POTATO CULTURE.

C. E. Brown, Elk River, Minn.

I deem it a pleasure to meet with the farmers of Wisconsin. This is the first time I have had the opportunity, but the subject that has been given me is not very popular this year. Last year the man who talked potatoes was in demand, because potatoes were bringing from $1.00 to $1.80, but this year I have got to get out of the business when they are low and in when they are high. It was easy to see last year that there was going to be a large acreage of potatoes because we received letters from places where they have not been raising potatoes, where the farmers contemplated putting in forty or eighty acres, and of course

Home of C. E. Brown, Elk River, Minn.

out of my State to get an opportunity to talk. One fellow said to me, "Brown, do not talk potatoes, because I have got enough to last me for five years, I cannot sell them."

Now, those are the conditions that we find, always have found and always will find in the potato business; some years they are high and other years they are low, and many farmers make a great mistake by trying to that would mean that potatoes would be low, because that was the first step toward cheap potatoes. We find we need about so many potatoes in the United States in a year. In 1911 we raised 286,000,000 bushels. We use 30,000,000 bushels a year for seed and consume about three and a half bushels per capita, with 90,000,000 people, which makes about 345,000,000 bushels necessary for seed and

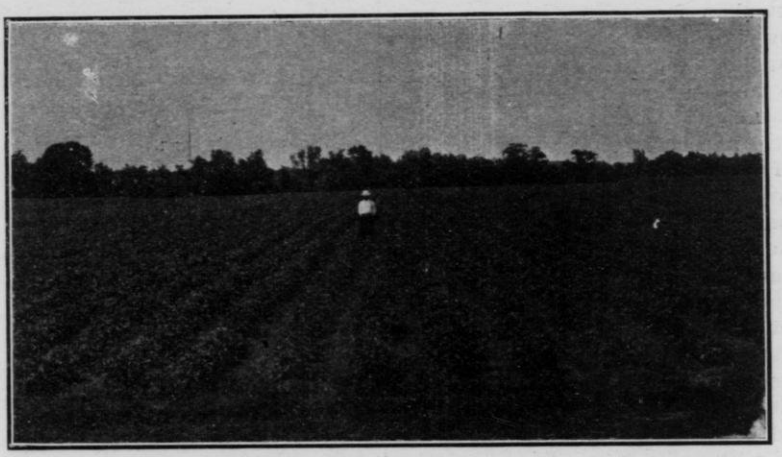
consumption, so that in 1911 we lacked about half a bushel for everybody in the United States.

This last year we raised about 400,000,000 bushels and we had about a half bushel to spare, and as it is a perishable crop, they necessarily were cheap. A great many of them would be ground up for starch and a great many of them will not be used at all.

I have been advising the farmers in my State to plant potatoes this year; I believe this is a good year in which to plant potatoes, simply because they were low last year. There are some farmers who are going to quit the business; there are some who are going to double their acreage, because it costs nothing for seed, so I expect to see the same acreage planted in our State and other states.

But when we stop to consider the potato question, we find that potato culture is scattered all over the United States. Now, it is hardly possible for so large an area to go through two years running without a drought or something to destroy the potato crop in some locality; then in the other places it would mean a better potato market. This last year we had a fair crop everywhere. All the places we had to ship were the southern seed market and the large cities, and of course we soon supplied the demand and prices went down, so I am advising the farmers in our State to plant the regular number of acres. I do not believe it is a good plan for farmers to put the whole farm into potatoes, even though they are in a good potato country, because we never know what the price is going to be, but I do not think there is any crop we raise on the farm in Minnesota that for a series of ten years will make the farmer any more money, for those years, but the only way to succeed, like in the hog business or any other business, is to take a certain number of acres that works into your rotation on your farm and keep at it, one year after another.

I think I have sold potatoes cheaper, perhaps, than any man in this audience. I have sold them for fifteen



Mr. Brown's potato field June 20, 1913. Note the straight rows.

cents a hundred pounds after wintering all winter, and the reason was I had them in the cellar under the house and it just paid for hauling off after I had them in the wagon. Had I quit at that time I would have been a loser, because the next year I got a dollar a bushel from the field, and it made a good average between the two years.

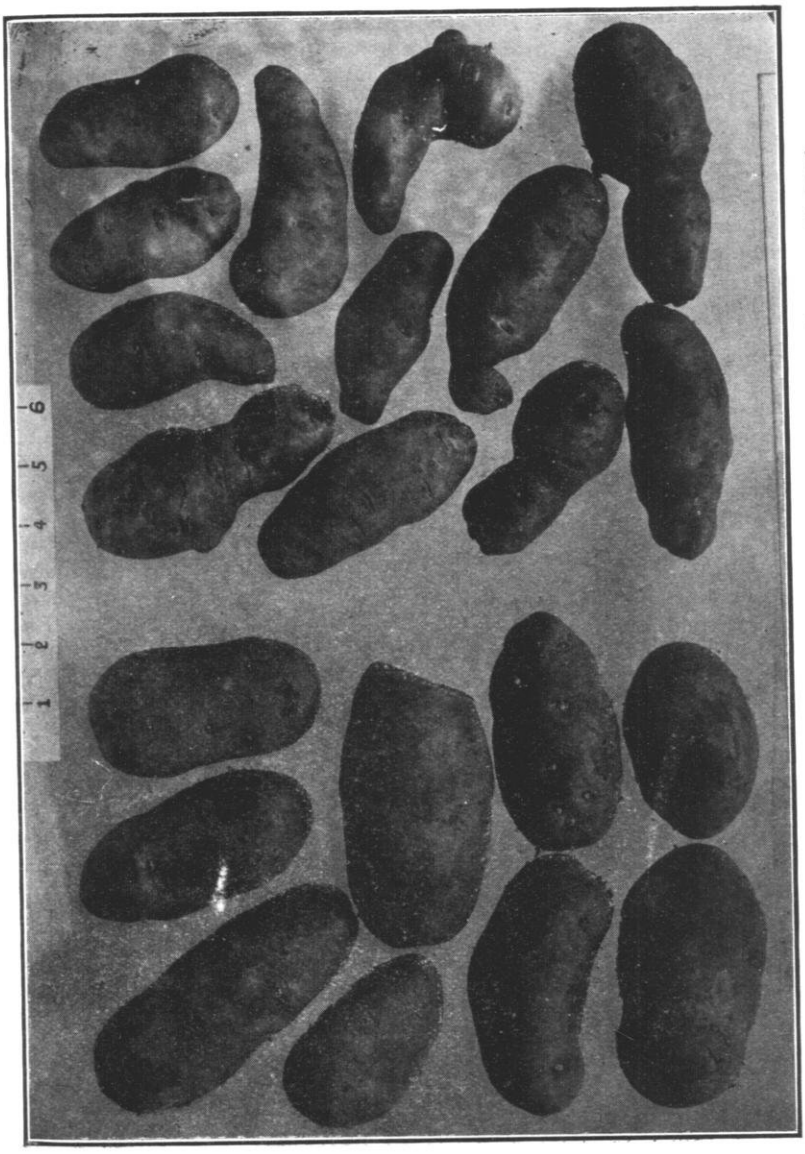
The Selection of Seed.

The short time that I have will not allow me to go into a long talk covering the whole cultivation and handling of potatoes, but I am going to take up the selection of seed this morning, because I think it is of great importance.

I am safe to say that there is no crop which we raise on the farm where the seed has been neglected like the potato crop. The last few years we have made great strides with our corn; we have got up to famous yields, and when we come to figure out just how we did that we find that much depended upon the selection of seed. Then the good soil and the good cultivation comes in, but without good seed to start with, we never could expect to get the yields of corn that we have got. Any farmer who is in the corn business knows that if he raises a thousand bushels of grain in a year and he uses a hundred bushels for seed that it will pay him to go out in his granary and winnow the entire thousand bushels to get his seed. But when it comes to the potato business, we have never done that. I have bought and sold carloads of seed stock, called selected seed, but there was no selection about it, it was scabby and rotten, and perhaps the little ones taken out. Now, if we selected our seed corn along those same lines, we would hardly keep it up to the standard. But many of the farmers, unless they make potato raising a business, do not even give the potato that chance, they do not even use the field run. They put a hundred bushels in the cellar, feed the family out of them all winter, and if they take any to town, of course they take the good ones, and whatever is left will do for seed, and in a few years they will say their potatoes are running out. Any other crop would run out the same way if we used it the same way. The trouble is we have not made any selection.

Now, we have done some experimenting in our State along that line, and I am going to give you the result. We find that out of one hundred so-called varieties, though many of them are really old varieties sold under another name, but we put them in groups, as the Long White and the Round White, the Long Red and the Round Red, and we find that each group of potatoes has a type or formation of its own, just like the types of dairy or beef cattle. Any one who has studied the question can tell the Early Ohio by its type. We can tell the Burbank by its type, and so with others; while they are in the same family and resemble each other very much, there is a difference in the type, and we find that when the potato begins to lose that type, that it is beginning to run out. It can hold its power to yield about two years after it begins to lose its type, and after that it begins to lose its power to yield, and then you will find in a hill of potatoes perhaps twenty or thirty little potatoes and none of them salable. Then it is completely run out.

The Early Ohio I have followed perhaps a little closer than any others, and we find the first sign of



Degenerate seed.

Long Red.

True to type.

deterioration is that the seed end will begin to get pointed. We follow that potato along and we find that the next year the other end will lengthen out and you have a long potato where you ought to have an oval potato. I have samples here showing this. So what we look for first in the selection of our seed is type. If any of you farmers are going out to buy Holstein cows and you go to the place of a man of whose black and white animals you had heard, but when you arrive there you see they have very wide backs, not the angular appearance you look for in the dairy type, he could not make you believe that was a dairy cow. You would say, "She is not of the type I want."

Now, we apply that same principle to potatoes. All of you breeders of stock know you do not care how much you pay for your stock if you raise everything that is born on your farm without grading up at all, you begin to go down and keep going down. You know you have to grade up and keep grading up.

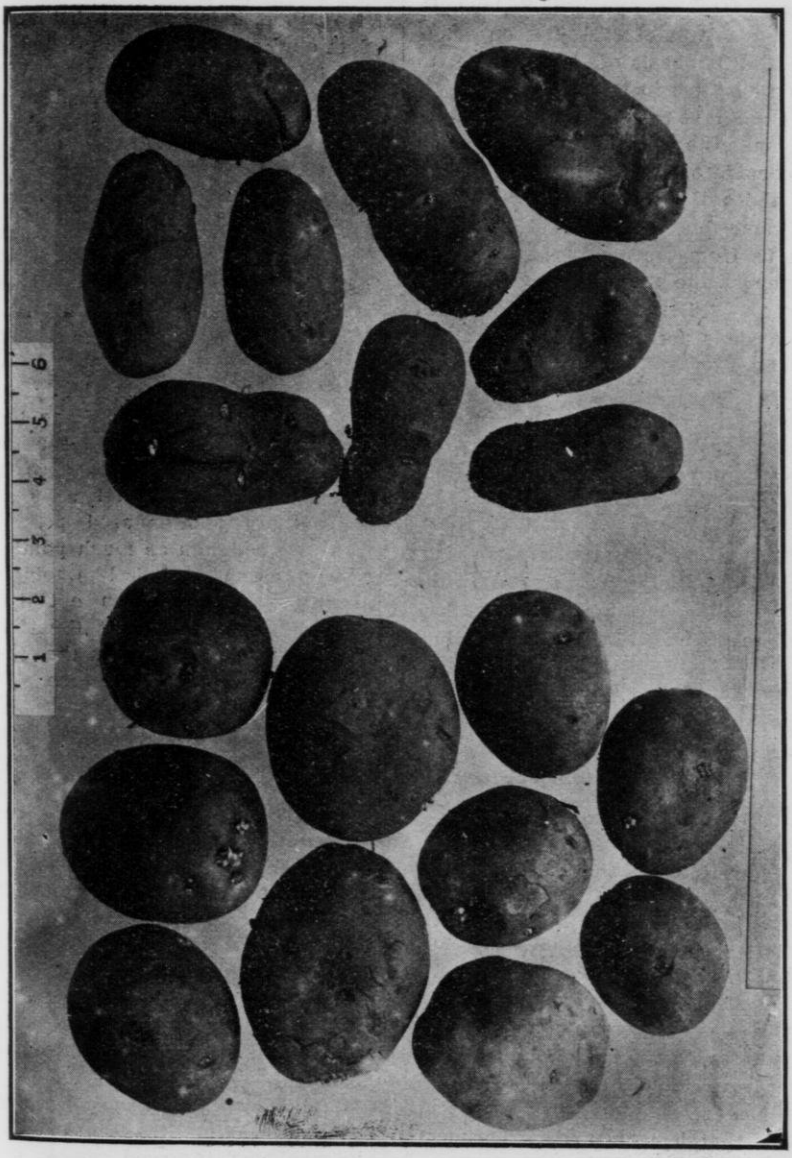
It is not enough to pick and select your seed carefully one year, but you must keep doing that. The first year perhaps will not show so much as it will the years following. The farmer, as a general thing, is a poor one to pick seed. He ought to take lessons from his wife. Here is where you can work in co-operation with your wife on the farm and let her show you how to pick seed. Lots of us fellows will say, "I would like to see my wife pick potatoes for me," but I can tell you the women are the best ones to pick seed after picking them three hundred and sixty-five days out of the year, only they let you eat them instead of keeping them for seed. You want to get the very best potatoes, not necessarily the largest ones, you want to get the choicest potatoes for your seed. You let your wife pick the potatoes. You let her invite her favorite preacher to dinner some day and when she goes down to get the potatoes you hold the light for her and watch the potatoes she will pick out for the preacher to eat; they will fit nicely in the hand, they are not scabby, they are smooth and nice. After she has all those potatoes picked out, you take them away from her and those you will find are good seed potatoes.

Some Experiments in Seed Selection.

I want to call your attention to the chart I have hung up here. Up at the College, they took up this subject that I have been preaching for about six years, and that chart is the result.

We tried out fifty varieties of potatoes, and there was not a single exception to the rule; they all worked out this way, some not quite so strong as the others.

First on the list you will notice the Early Ohio potatoes. These potatoes were raised on the Experiment Farm and in the same bin we found potatoes true to type and untrue to type when we went there for seed. We selected them as carefully as possible, and then we took photographs of those potatoes the day they were planted, and here you see them. These others are what we call the "degenerate" seed. Our good ones were none too good, but they are a better type a great deal than these. In these yo will notice the ends are most all pointed and the eye is very small on the seed end. I am very sorry to say I found most of this type up here in the exhibit room. We took those out and planted them side by side on the farm. When we came to harvest, the good type of seed gave



True to type. Round Red. Degenerate seed.

us a yield of 121.6 bushels, while the "degenerate" seed gave us 84 bushels, making a gain of 37.6 just on selection on the basis of being true to type or untrue to type.

Then I have the Carmen potato here. We made the selection of those which we considered the true-to-type Carmen and those that were not, all out of the same bin. This Carmen No. 3 gave us from the good type seed 15.5 bushels, while the "degenerate" seed gave us 53.4, making a difference of 98.1 bushels per acre.

Then we have the Rurals, the selection was made just the same, the type ran just about the same and the result was very similar, good type 167.8, while from "degenerate" seed 70.6, making a gain of 97.2 bushels per acre.

Then we have the Burbanks. Our best were none too good to start with, and we could only get a few true-to-type, what I call really good Burbanks. But these others were miserable looking potatoes, and you will always find that among Burbank potatoes, when you get a poor crop they will carry the meanest shape of any potato we grow. The good Burbanks only yielded 76.9, but the "degenerate" seed only gave us nine bushels per acre. All this is based on marketable potatoes. So you see we proved that there was no exception to the rule I have stated.

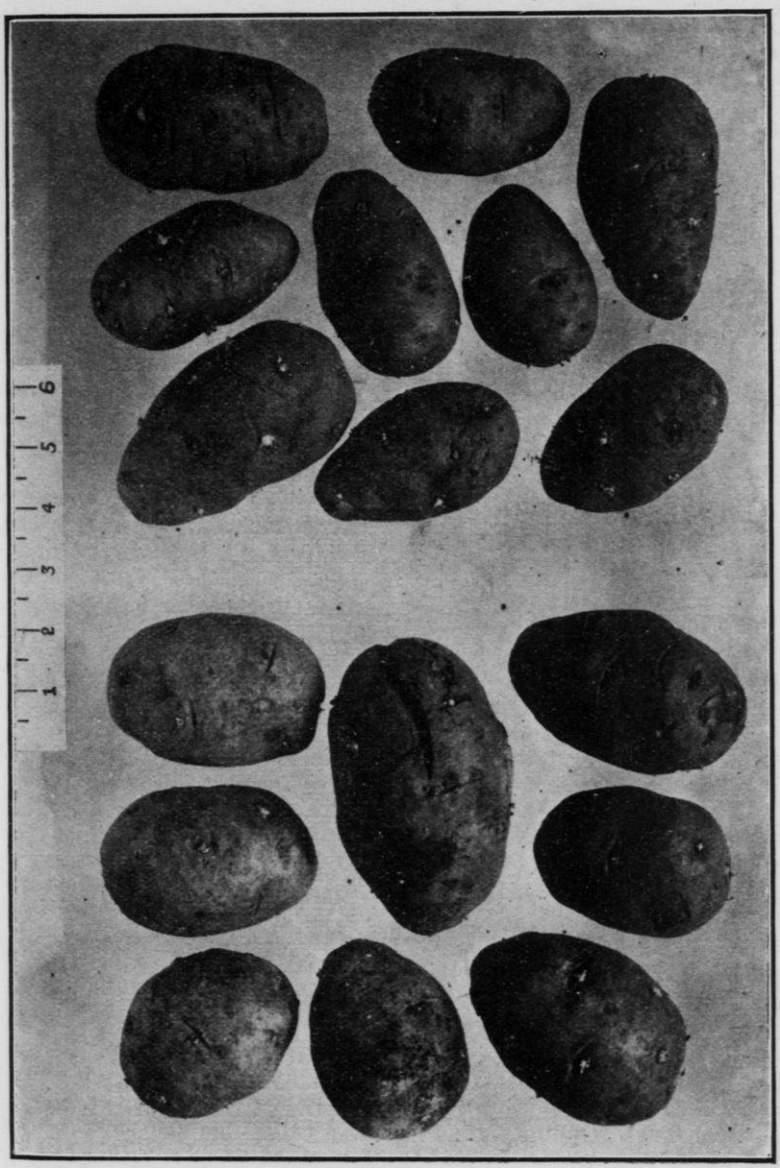
The results this year were very much the same, except we found that the potatoes we selected and got the best yields from this year were a little bigger.

Now, that has been my experience twenty years in raising potatoes, that we have fallen down every time in our yields where we have fallen down in our seed selection.

Caring for the Seed.

Now then, it is not enough that we select our seed in good shape, but we must take care of it properly. With seed corn, we are compelled to do that, but we do not always take care of our potatoes. Why is it that the southern planter comes up into Wisconsin and into our State to buy potato seed and pays a big price for it? Two years ago I knew a man who was buying carloads of potatoes, costing sixty and seventy cents a bushel, besides the freight, to take to the southern states to plant. The answer to that question is simply that they got there in better shape than their own would be. The southern planter has not the climate so he can keep his potatoes. When we sell the southern planter seed potatoes we do not sell him as much potatoes as we do climate. It is like going to California; the land men out there never say anything about the land for sale, they will give you the land if you will only buy the climate. We have climate up here in Wisconsin and Minnesota so we can keep potatoes from sprouting and they haven't got it down south. One planter told me he can plant northern grown seed and get thirty per cent more yield, and he can get potatoes at least two weeks earlier by planting northern grown seed rather than to plant his own. Now, if the southern planter has found that out, why is it that so many of our farmers will take the potatoes out of their cellars with sprouts on six, seven and eight inches long and go out and plant them? It is simply because we have never been educated to the fact that those sprouts have weakened the seed.

This chart shows the results of a little experiment. Here our potatoes were barely sprouted when planted


True to type.
Long White.
Degenerate seed.

and we got 121.2 bushels per acre, while potatoes that were sprouted, that came out of the same bin, with sprouts from one to four inches, only gave us 100.2 bushels, and they were not sprouted very badly either.

The same kind of plant food that is in the soil is in that potato and it is put there to give the potato a chance to get started. If it is wasted by the sprout starting, it weakens the potato. We should endeavor to get the first sprout to start in the field and it will be on the road for a better crop.

So much for good seed; but that is not enough. I would divide successful potato growing into three parts, namely, good seed, good soil and good cultivation.

Good Soil a Necessity.

We hear much about good potato soil, and about all the information we get from the books on the potato is that the potato needs a sandy, mellow soil. Now, I would say it needs a mellow soil, but I do not care whether it is sandy or not. It does not have to be sandy soil; in fact, the largest crops of potatoes I ever raised were on the heaviest land, but you have to have that mellow soil, whether it is sand or clay, and you have to make that mellow soil by the amount of vegetable matter, the humus, you work in with the soil.

Of course the potato crop needs good deep seeding. It should be planted deep, so it has plenty of room to grow underneath and not grow up. If it grows up out of the ground, it is the man's fault, because the potato was intended to grow underneath the ground if the conditions are favorable, but if they are not favorable, they will grow above the ground, and you will find where your ground is lacking in humus, where you have not prepared a good seed bed and the ground packs, the potato comes up, because that is the question of least resistance.

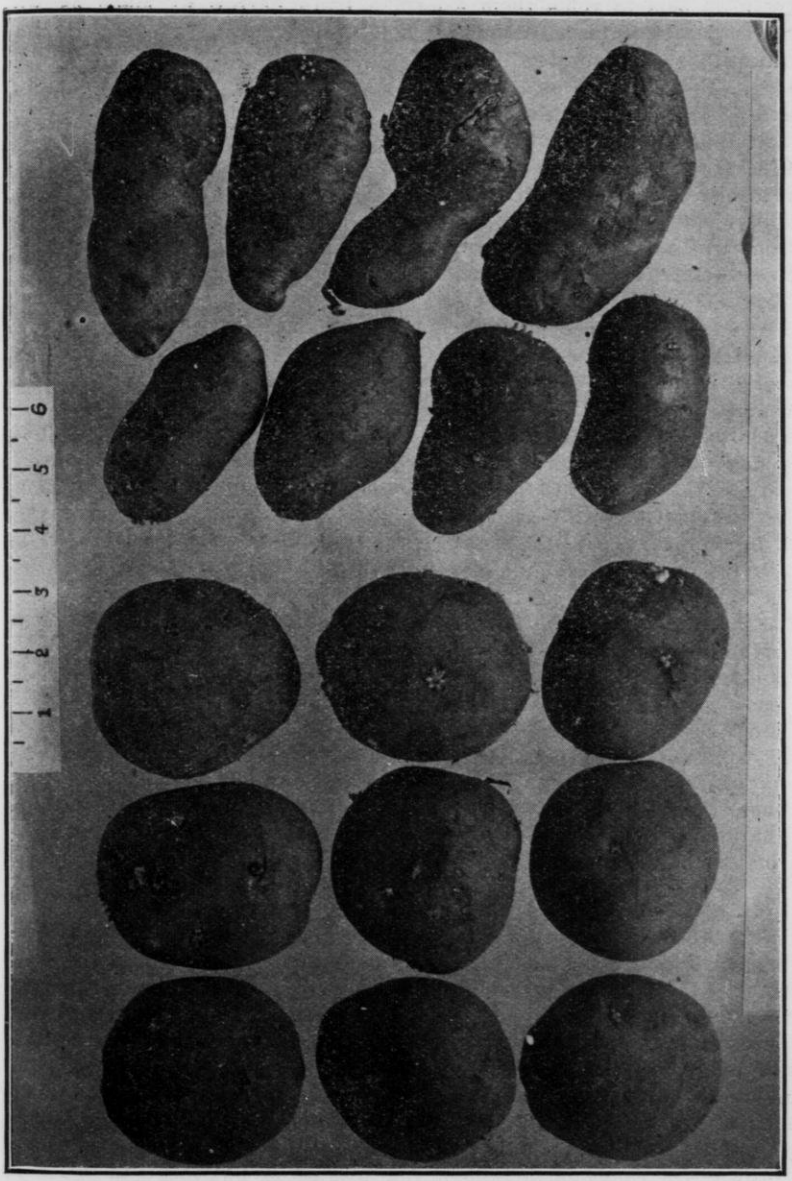
The seed bed should be deep, and about one-half of the cultivation of the potato should be done on the preparation of the land, and that I find is the best and cheapest way to do it. If I had an ideal condition, I would take clover sod, plowed in the fall and top-dressed in the winter; I like to put manure on top of fall plowing and do the work in the spring with a disk. On sandy land I prefer the work done with the disk, then by the time you have that material worked in there you have a good seed bed. Do not be afraid to do lots of this work before planting, because you are cultivating your potatoes at the same time, and there is no time when you can cultivate so cheaply as you can when you can do it with four horses and a big disk, because you can cultivate just where the hill of potatoes is going to be.

Cultivation After Planting.

The cultivation of the land after the potatoes are planted varies according to the soil. If you have a soil that will not pack, harrowing is all right, but if the soil is heavy with a tendency to pack, I would advise you to adopt the blind cultivation.

The first cultivation should be deep; do not be afraid to put your cultivator down; we want the ground mellow. The first two cultivations should be deep. After that, as the potatoes begin to grow and the roots begin to extend out, we must drop the deep cultivation and practice shallow cultivation.

There are times when it is advisable to hill the potatoes. If you have a very low and very level piece of



True to type. Round White. Degenerate seed.

ground, where it has not very good drainage, it is best to ridge them a little as a matter of drainage, because the potato will scald very readily if water stands there, but if you have a field that is well drained, the level cultivation is by far the best. There is no advantage, as far as the potato goes, in hilling. That is an old custom, which, as near as I can trace it, came from Ireland, where they had to throw two furrows together and grow them on a ridge, and we supposed we had to do it too, but there is no advantage whatever, while there is a great disadvantage, because the time that the farmer thinks he should hill his potatoes is just the time he ought not to cultivate deep, and of course to get the dirt to hill the potatoes he has to cultivate deep, and he goes in there and cuts the roots at the wrong time. If he has not cultivated deep, he will find his ground is getting hard, he attempts to go in there with a great, big cultivator and root the ground over and throw great furrows up, and he will say to himself, "I will fix that," and he usually fixes it so he gets about half a crop. The throwing of the dirt around the potatoes would not do any harm if it was not for the cutting of the roots.

DISCUSSION.

A Member—Which do you prefer, the drills or the hills?

Mr. Brown—The drills. I think I can raise more potatoes to the acre and raise them cheaper.

A Member—You say you plow them deep. How deep?

Mr. Brown—On sandy land, I like to have them five inches deep; on heavy land, about four; then that gives us a chance to do a great deal of harrowing. We do not use the spike tooth harrow as much as we should. We must leave the ground mellow.

A Member—Do you cultivate before the potatoes are up?

Mr. Brown—I do on heavy land.

A Member—I have a little place, it is awfully heavy ground, kind of a heavy clay, and I find if it is worked too fine it is harder than it was before, it packs easier, it puddles.

Mr. Brown—Of course you must be careful on heavy soil, or it will puddle. Perhaps the land is lacking in vegetable matter.

The Member—It is pretty rich.

Mr. Brown—It may be rich, but if you have a soil that will puddle I would not say that was the best kind of potato soil.

The Member—It is a good deal of work to dig them out of my ground, but I haven't a neighbor that can beat me on a few rows of potatoes, just the same.

A Member—I would like to tell this old gentleman that if he hauls his manure all out and also hauls a little sawdust onto his land, I think he will be pretty well off.

Mr. Martiny—You showed the difference between the seed when it is sprouted and those not sprouted. Now, tell us how to keep them from sprouting until we plant in June.

Mr. Brown—When we store our potatoes in the fall, we handle them pretty carefully, keep them pretty cool nights by taking out the windows, opening the doors and letting the air in, then shutting those windows up in the heat of the day, but it is the time from now on that is the dangerous time. You usually sell a few bushels of potatoes and you will have to open up the root cellar, and you say, "It isn't going to freeze and I won't shut it up very tight." You

are allowing the warm air to get in there where you should keep it tightly closed. Potatoes will not sprout unless they get warmer than forty degrees, and the weather is so with us that we can keep potatoes until we get ready to plant by opening the windows in the cellar during the night and getting the temperature down to thirty-five or forty, then closing it up in the morning. You know if the thermometer should drop to fifty below tonight our potatoes would be in no danger, our cellars would not freeze tonight, but look out tomorrow night, or the next night. We do not need to look out for the cold all the time. The thing is to look out for the warm weather and keep out the warm air just the same as we did the cold. We must not let our cellars warm up.

A Member—Would you advise planting as late as the first of June?

Mr. Brown—If I was raising the Triumph potato I would plant as late as that. If you plant late you escape the blight. The Rural and the Carmen need the longer seasons.

Mr. Convey—Is it your experience that the Rural is the heaviest yielder?

Mr. Brown—No, sir; the Carmen No. 3 is the heaviest yielder in our State.

A Member—Which is the older, the Early Ohio or the Carmen, which has run the longest as a potato?

Mr. Brown—The Early Ohio.

Mr. Convey—Do you believe that the quality of seed can be kept up indefinitely?

Mr. Brown—Yes, sir.

Mr. Convey—Isn't it a fact that the older varieties of potatoes have practically disappeared?

Mr. Brown—Because people have taken up with the new varieties and let the old ones go.

I believe I have forgotten to mention a very important part of this subject, and that is the marketing part. We should stop raising so many varieties of potatoes. You can take any potato district in the United States, from Maine to Colorado, and you will find where they are getting a good price for their potatoes and where they have a name for raising potatoes they are raising just one variety, are making a specialty of that, they are not raising a lot of different varieties, they never do so well. The old varieties have run out because the new varieties have come in, You can come in with a new variety of potatoes, your seedsman has something that is going to yield enormously and sometimes you happen to get something that is fine.

A Member—The old Peach Blow seems to be all gone.

Mr. Brown—I saw Peach Blows last year. The best Early Ohio man in our State has had them twenty-five years and he has always beaten me at the State Fair. He has a type of Early Ohios so well set I can tell them the minute I see them.

A Member—Would you advise the farmers to organize farmers' clubs to encourage the raising of one kind of potatoes in a neighborhood?

Mr. Brown—I would by all means. We have done that all over the State and have been benefited thereby. Hill selection is the best. When a man is planting a hundred bushels he cannot do that, but if he is planting in a small way you will find there are some potatoes that resist drought and the bugs and the blight a great deal better than others and that selection should be exercised along this line.

A Member—Do you let them stand long after cutting?

Mr. Brown—No, I take them right out and plant them.

A Member—How do you cut seed?

Mr. Brown—I always want to split it endways once and then cut this other way the next time, making a square chunk or cube. It will not dry up so readily as a long, narrow piece. I do not care how many eyes there are, so long as there is one. If you planted a whole potato instead of that piece, you would not get any more potatoes.

A Member—Do you treat the seed before you plant it?

Mr. Brown—Yes, for scab. I use formaldehyde, one pint to 25 gallons of water, and leave them in an hour and a half, not to exceed two hours. The time is coming when we all will have to do that in the potato belt, because if we do not the scab is going to get away with us. We have a cure that is just as sure as Paris green or poison.

A Member—What kind of potatoes are called for the most in the market?

Mr. Brown—We have different markets. The Early Ohio is one of the best early potatoes we have. The southern raises the Triumph, but they are better when they are immature. The Ohio is much better for us up here. They want a red early potato and a white late potato. We have many varieties of late red potatoes, but in a year like this, when the price is low, you cannot sell them. What we want is a red early potato and a white late potato.

A Member—Do you use any commercial fertilizers?

Mr. Brown—No, sir; stable manure on clover sod.

A Member— I have noticed in going through a potato field that there will be just one big root going down into the hill and just as sure as you dig that hill you will find from one to four or five excellent potatoes. What part of the seed potato do you think grew those?

Mr. Brown—I do not know that I could answer that satisfactorily, but when you go through your field and notice that some potatoes are up further than the others, more advanced, and you dig in there, you will always find those are the seed end pieces that have got the start of the others.

A Member—Often where there is a whole lot of roots you will dig out from one to a thousand and none of them are any good.

Mr. Brown—You will find those come from the potatoes that have run too long, have run out. You take a long-stemmed potato and you will find it has more than twice as many eyes as this planting end.

A Member— I am only a scrub farmer myself, but I always dig those hills that have a certain sized potato and put them aside for seed.

Mr. Brown—That is right—and keep your wife away from them.

Mr. Martiny—What is your most practical way of bugging potatoes?

Mr. Brown—As yet we use the horse sprayer and the Paris green spray. The ideal way is to use the Paris green dry, but it is a pretty nasty job.

A Member—What do you think of these hand power machines for dusting on the Paris green?

Mr. Brown—It seems to me rather slow when you have a large acreage.

The Member—You can take two rows at once and go along as fast as you can walk.

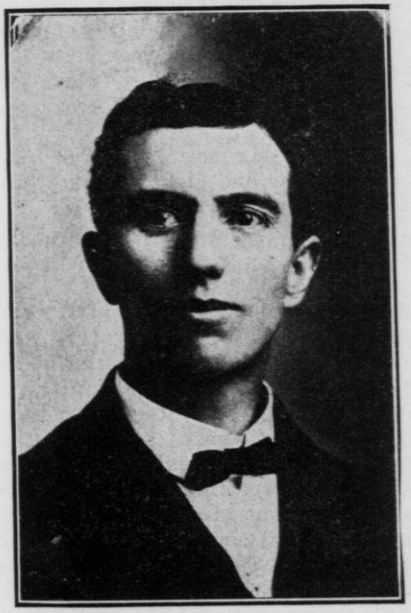
Mr. Brown—The other way you can take four and five—and ride.

Supt. McKerrow—In regard to this selection of seed I am one of those cranks who believe in that old adage "Like begets like." Maybe it is not exactly true in all these things, but when I saw this chart, my mind turn-

ed to what they have been doing at the Ontario Agricultural College in the matter of improving grains. They selected the heaviest seed of various kinds of grains, then the medium and then the light seed and planted them separately, and they found quite a difference in the first crop. They kept it up and the difference grew wider and wider, until that which came from the heaviest was twenty-five, thirty, thirty-three and a third percent greater yield than that in the second class, all starting from the same seed originally. I suppose the same thing is true of the human family, and it seems to be in the potato.

THE FARMER'S POULTRY.

Geo. W. Hackett, North Freedom, Wis.



Mr. Hackett.

The time is long since past when any reliable authority on good live stock breeding would advocate or approve of using any but pure bred stock, or, at least, pure bred males must be used to grade up herds and flocks for a definite purpose. The results attained through this method of breeding are proof positive that the doctrine is correct. With the most progressive farmer, this has applied to all of the live stock on the farm, yet too many have not considered their poultry as part of their live stock. On this account, the poultry have not had a fair chance, and yet, in spite of all the disadvantages, the American hen has been doing a great business and is fast forging her way to the front as a mighty factor in supplying the world's food products.

While some men have been carefully studying and developing the dairy cow for greater performance and more attractive appearance, other men have been applying the same careful work in developing the better types of poultry for better production and better carcasses. Much has been accomplished.

Investigations have proven that there is as much difference in the production of hens as there is in cows, and even greater differences are found to exist. We therefore arrive at the conclusion at once that the farmer's poultry should be just as carefully selected as any of his other stock.

Standard Bred Poultry Desirable.

If there was no other reason for the farmer keeping standard bred poultry than that of having his flock of fowls uniform in size, conformation and color, that, to us, would seem a sufficient reason to appeal to the ordinary person. These desirable features are of less importance, however, than the advantages of the better production obtainable from fowls that have been bred for that purpose. A more uniform size and color of eggs should also be thus secured, and a better carcass of earlier development and even color of skin and shank should be obtained. All these features will help to find a ready market at better prices. Then in the care of the flock there is a decided advantage in having their requirements as nearly uniform as possible, for different classes of fowls cannot be given the same feed and care with equally good results.

The large number of varieties recognized by the American Standard of perfection as having been bred to a definite type and color and for a definite purpose, offer diversity enough in size, shape and color to suit any fancy without the necessity of mixing varieties. While the Standard divides poultry into fourteen classes, in a more general way it is divided into three classes: The light weights, or egg breeds, consisting of the Mediterranean varieties mostly; the medium weights, or general purpose fowls, which include all American breeds, such as the Rocks, Reds, Wyandottes, etc., and are generally termed "general purpose" class, and the third class, which includes all the heavy weight breeds, such as the Cochins, Brahmas, Langshans, Orpingtons, etc., and are termed the meat breeds.

Good Breeding the First Essential.

Select the breed best suited to your needs and a variety that appeals to your fancy, and once having made your choice, stay by it.

The farmer keeps poultry for the benefits derived from it in supplying his table with some of the convenient, healthful and substantial articles of food, and for the profits he expects to derive from it. He has the advantage of being able to produce it cheaper and with less trouble than it can be produced for elsewhere but whether there be a profit or not will depend upon the ability of his flock to produce and the management he gives it. This involves good methods of housing, right feeding and cleanliness, but, first of all, good breeding, which will mean health, vigor and generous production.

Good housing means plenty of fresh air each day and night without draft, and conveniently arranged for the fowls and for the convenience of the care taker.

Right feeding consists of a well balanced ration of mixed grains and mash fed in the proper way. Scatter all grains in deep litter, to induce plenty of exercise, and feed the mash dry in hoppers to furnish bulk. To supply the needed animal matter, add about five percent beef scrap to the mash, excepting in cases where green cut bone is available, which is preferable if it can be had fresh. It is also very essential that the fowls have a constant supply of good sharp grit, oyster shell and charcoal, and a regular supply of fresh, clean water.

Cleanliness implies regular and frequent cleaning of the houses, which should be kept whitewashed and disinfected to keep out all kinds of vermin. In short, if you will give the hen as good care and attention as you give your other stock, she will give you the best returns of any

stock on the farm for the money invested.

National Egg Laying Contest.

During the last two or three years much valuable research and investigation has been carried on by both State and nation relative to the possibilities and importance of poultry culture in the United States. I want to speak briefly of the far-reaching work carried on last year at Mountain Grove, Missouri, under the auspices of the Poultry Department of the Missouri College of Agriculture in an egg laying contest, which was nation-wide and known as the National Egg Laying Contest, and to call your attention to some of the lessons learned thereby. I want to do this for the reason that many of our Wisconsin farmers, who are well versed as regards the amount of milk a cow should give in a year and the amount of butter fat it should contain, know but little as to what they should expect and demand of the hen. This contest demonstrates in an authoritative manner what many of us have proven in a smaller way on our farms where the poultry have been well looked after.

This contest consisted of over six hundred hens selected from England, Canada and twenty of the States. They were supplied in response to an invitation of the management of the contest, with no other requirement than that there be five healthy females in pen contributed. They were received from all classes of breeders and from all conditions. It was not the purpose of the contest to see how good a record could be made, but rather to see what the average hen was capable of doing under reasonably good conditions, and to ascertain, if possible whether or not there is any best variety. This contest was directed by Prof. T. E. Quiessenberry, head of the Poultry Department of the Missouri College, who is a man of extremely practical methods and of sterling worth to the poultry industry.

The hens in this contest were given about the same kind of care, relatively, that the careful dairyman would give his cows when he was not feeding to make a record. Each pen was supplied with trap nests and a careful record of each hen's performance was kept. Also a strict account of the amount of food consumed by each lot was kept.

Some very interesting facts were developed. Most of the entries were of pure bred stock and represented many varieties, but so far as we have learned, but few of them were of trap-nested stock with proven records. Of the 665 entered, there were fifty-nine that laid two hundred or more eggs in the year, an average of more than eighteen dozen per hen, while the champion hen laid nearly twenty-three and a half dozen or 281 eggs. The average for the entire number in the contest was 134, or about eleven dozen per hen, notwithstanding that several hens did not lay an egg during the whole year. Contrary to the general belief, that the Leghorns excel all other breeds in egg production, it was found in this contest that they were unable to capture any of the prizes offered in open competition for heavy production. It was also found that they consumed nearly as much feed as the larger breeds.

Lessons From the Contest.

The following are some of the lessons learned as taken from Mr. Quiessenberry's own statements:

1st. That there is no breed or variety amongst those in general use that far excells other breeds or va-

rieties, so far as egg production is concerned.

2nd. That more depends upon the strain or the breeding of a variety than upon the variety itself.

3rd. That some hens have a born tendency to lay, while others have a born tendency to put on fat. It is therefore essential to cull intelligently.

4th. That it will pay the average poultryman to trap nest his flock in the fall and winter months and to breed from the pullets that lay earliest in life and from the hens and pullets that lay most in the winter.

5th. That hens like sprouted oats as well or better than any other kind of green food and that they do well on it. It increases egg production and makes a cheap food.

6th. That the Mediterranean class can stand more protein and fattening foods than the larger breeds. There is not so much danger of them becoming too fat.

7th. That the Mediterraneans are affected more than the other classes of fowls by extreme cold, on account of their larger combs, their smaller bodies and closer feathering, affecting their egg yield accordingly.

8th. That hens must be fed liberally if you expect eggs in large numbers, especially in winter.

9th. That hens lay a few more when males are not used in the pens with them and that the eggs will keep better.

10th. That regularity in feeding is very essential for the best results.

These are only a few of the most important lessons enumerated and are well worth remembering.

If these contests bring the same results they have brought to the people of Australia, whose example we are following, it will mean great things to the poultry industry of this country.

On the 16th day of last November the contest was renewed at the same place, under the same management, but along still more practical lines as the experience of the previous contest had directed. During the present year they are conducting a feeding experiment that will be very interesting and instructive, and anyone who is much interested in poultry will do well to subscribe to one of the many poultry journals, which are each month publishing the reports of this work. During the month of January it is reported that more than four thousand people from thirty-two states and several foreign countries visited at the Station, which is significant of the interest that is being taken in the work.

Poultry Business Growing More Profitable.

I want to say to the farmers of Wisconsin that the poultry business is large enough to merit the careful consideration of the farm management on every farm. The rapid advance in all kinds of meat is sure to make poultry products more important and more profitable than they have been in the past. We have always kept poultry on the farm and always will. Scrub chickens may be good enough for the scrub farmer, but if we want to progress we must include our poultry with our other live stock in the matter of improvement. We can improve our poultry more easily and more quickly than any other stock on the farm and at much less expense accordingly. The farmer who does not care to bother with the hens, or who thinks the poultry of too little consequence to deserve his attention, should at least make it convenient and possible for the wife and children to possess and care for a flock of chickens that will be a credit to the farm. Many a youth has found the means of an education through the

proceeds of the poultry yard, and many a farmer's table has been supplied largely with the groceries taken in exchange for the eggs carried to town, to say nothing of the toothsome fried chicken for a Sunday dinner, or the meat so conveniently supplied when the threshers or company come in without giving any notice.

Care of the Flock.

On the farm it is usually best to fence the garden and give the fowls free range, excepting the breeding pen, which I am sure it will pay to select, in order to secure your hatching eggs from your best developed, most vigorous and best producing females. Hatch your chickens reasonably early, and hatch them with the hens if you have the kind that will set and do not care to raise a large family of them. The hen is the best incubator you can get, if you keep her free from vermin.

Mark all the chicks with the toe punch when they are a day old and keep a record of your markings. Give the growing chickens plenty of room and see to it that they do not crowd in the coops. If your chicks are early it will generally pay best to sell the cockerels when they are about ten weeks old, at which time they should weigh about two pounds. If they are late hatched, it will pay best to hold them over until about February, but in that event, be sure you separate them from the pullets.

Raise the pullets on free range to insure good growth and you will find the portable colony house the most convenient way to house them at this time. Get them into the laying house early in October and coop them apart from the hens, as they will require a little heavier feeding at this time to fit them for laying. Early pullets always make the best winter layers.

Marketing.

Last year we were all working for parcel post. We now have it and no one appreciates it more than the poultry man. But if we are enabled to deliver hatching eggs at less than one-third the usual express rates, and they are delivered more quickly and fully as safely. Numerous articles used by the poultryman can also be conveniently carried in this way. Market eggs can also be shipped in this way, but at the present rates it will pay only where they go to a special trade at good prices.

There is great need that better methods should be used in fitting and marketing our poultry products in order to receive the best returns for our labor, but time will not permit a presentation of that important subject here. When, by careful preparation, we place our poultry products on the market in the condition the trade wants them, we will have but little trouble to get satisfactory returns for them.

DISCUSSION.

A Member—Would you advocate a roosting closet when you have an open front?

Mr. Hackett—No, I would not. In these houses that I recommend, we use the dropping boards always in the back part of the house. In case your house is filled to its natural capacity, I would use a curtain to drop in front of the fowls, and that forms a sort of closet. Great care should be taken not to have these closets too close or it will cause dampness, resulting in colds.

A Member—Have you ever used permanganate of potassium for keeping fowls in good shape?

Mr. Hackett—No, sir; except as it might be combined in some of the preparations put out.

The Member—I have used it for several years and find there is no case of roup or any of these diseases around chicken coops but what it will cure. And not only that, but the occasional application in water will keep them in good health.

Mr. Hackett—If you keep your houses and perches sprinkled with air-slaked lime quite liberally with the open front and clean vessels, you will not have roup.

Mr. Imrie—How much space would you advise for each chicken?

Mr. Hackett—Generally speaking, about four square feet of floor space; for the smaller breeds they can be kept in a smaller space, providing you give them a great deal of attention.

A Member—How do you sprout oats?

Mr. Hackett—Put them to soak for about twelve to sixteen hours in warm water, then place them in flats about two inches deep, and those flats should be provided with perforated bottoms to let the water drain off. Then wet them every day and keep them in a comparatively warm room. The warmer it is, the quicker they will sprout. It takes from a week to two weeks. They can be fed to good advantage any time after the sprout is from one to two inches long. We generally feed just about what we know they will eat up clean, one feed a day.

A Member—What do you do for chickens eating eggs?

Mr. Hackett— That is usually caused from something they need to balance their feed. Usually chickens fed plenty of animal matter will not acquire the habit of eating eggs, unless it may be they have not had the oyster shell, but where you feed the animal matter and plenty of clover hay, you will never have any trouble on that score. It can usually be best broken up by feeding fresh lean meat, all they want of it; that generally cures them entirely.

Supt. McKerrow—If you have bad cases, make them into meat. I guess that is the best plan.

A Member—How many would you recommend to run in a flock?

Mr. Hackett—That would all depend upon the amount of time that I was a mind to give to the flock. Some of the big farmers are keeping fifteen hundred in one flock, but, generally speaking, from twenty-five to fifty would be better.

A Member—Will not ground bone break the habit of eating eggs?

Mr. Hackett—Yes, but it is rather a dangerous thing to feed, unless you know exactly what you are getting. Beef and veal bones ground fresh are very good, but our experience has been that pork bones are not nearly so good. Green bone should be fed soon after being cut as it spoils quickly, especially in warm weather. Fresh ground bone is all right, if you do not feed too much.

A Member—What do you use for grit?

Mr. Hackett—Any hard stone. We use the granite stone, chipped fine.

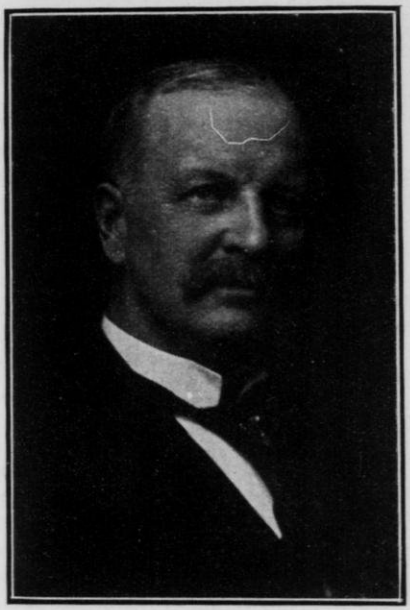
A Member—Is cabbage a substitute for sprouted oats?

Mr. Hackett—It is very good feed, but not nearly as good as sprouted oats, because it does not contain so much protein; however, if you have not sprouted oats, cabbage or mangels, or even raw potatoes, are very good to feed.

Supt. McKerrow—I will appoint as a Committee on Resolutions the Hon. A. J. Plowman, of Marathon county; S. A. Baird of Waukesha county, and Rev. H. A. Brooks, of Waushara county.

THE WATER SUPPLY FOR THE FARM HOME.

L. E. Scott, Stanley, Wis.



Mr. Scott.

The charge that farmers' wives have to go to the barn for water, like the premature report of Mark Twain's death, is "greatly exaggerated." It is true that many farmers have not running water in their houses, but the same could as truly be said of many villagers, and could probably also be said of the majority of city dwellers, were they dependent upon their own individual efforts for supply and disposal. But let us not be too harsh in our criticism of the farmer who has not provided this conveninence. He knows best why he has not done so; he is getting to it as quickly as he is able, and the number of bath rooms and modern lighting systems already in the Wisconsin farm homes would surprise our critics, were they to make a canvass of the State.

I call to mind one instance where co-operative farm capital to the amount of three thousand dollars assisted in constructing a sewer now enjoyed by a whole village.

Th Standard Oil Company long ago demonstrated that the easiest and cheapest manner that any considerable volume of liquid can be conveyed is to pipe it. This is as true of water as of oil. Most farmers have good wells with water pumped for their stock by windmill or gasoline engine. Generally this is piped to the yard, oftentimes to the barn. Long before I felt able to put in a complete system, I piped from the pump into the kitchen at the cost of two dollars and a half for pipe and valve, and about six dollars more for an open tank and faucet, which set, out of the way, on a bracket behind the stove. This was a great convenience, but not the best, though it served for a time.

Over a large area in the northern counties the water is soft and a connection with the well pump is all that is desired, but where the well water is hard, it would be much better to provide rain water for bath and laundry use.

Most farmers have large roof surfaces and in this concrete age, commodious cisterns can be constructed at a nominal cost. I believe it is entirely feasible to place such a one in close proximity to the well, so pumps in both might be operated by the same power. As the water at "Fairmount" is soft, we take it all from the well and we have two pumps side by side, one large one for the open stock tank and a small one (2½ inch cylinder) to pump the water into the

pressure tank in the house basement. The top of this smaller pump is only 1¼ inch gas pipe with stuffing box and driven from a bracket, which I had a blacksmith make, bolted to the side of the pump jack.

The pipe that connects pump to tank should be laid under ground and slant towards the pump, with a "three-way" cock in the well, with stem extending above the platform. If this is turned at the close of each pumping, the pipe will drain back into the well and no difficulty will be experienced from freezing.

Sewage Disposal.

The first thing to establish in installing a water system is a good and safe sewer. Without this, any system would be a failure. For plans for sewage disposal, I would refer you to the Farmers' Institute Bulletin No. 24, or Circular No. 34 of the Wisconsin Experimental Station.

In some few locations it may be possible to place the mouth of the sewer below ice in pond or stream. Or if there is plenty of fall, a dry ravine might be used by protecting the mouth of the sewer in winter.

A large covered cess pool in open soil will prove satisfactory for a term of years, and if provided with a float to register when full, it can, in impervious soil as a last resort, be pumped out with a large pump. Better this, by far, than no sewer at all.

The sewer should be of vitrified pipe, or it may be made of concrete, as described in Farmers' Institute Bulletin No. 24, page 127. It should be of good grade and straight from the mouth to an accessible connection at the house, preferably a man hole, walled to the surface and covered.

In case of a clog, seven-sixteenths inch rods connected with pump rod couplings, or three-eighths inch gas pipe, screwed together, can be run up from the mouth several hundred feet, if necessary, and save much disagreeable digging.

Traps in soil pipe should be of the clean-out type, and clean-out plugs should be placed in accessible elbows. With due care, clogs seldom occur, but should they occur in the small pipes in the house, I am told that concentrated lye and boiling water will generally dislodge them.

Every house should have a good sewer for the reception of kitchen slops, if for nothing more. That once established, one should be able to install a system in the house, with fairly good bath room fixtures, for one hundred and fifty dollars.

Some Good Water Systems.

The three systems commonly used are the Elevated Tank, the Kewaunee or Compression Tank, and the Perry or air reservoir with patent arrangement in the well that enables one to draw the water direct form the well. The advantage claimed for the last named system is that drinking water is drawn from the faucet fresh from the well, but as the conductor pipes have to be first emptied, I never could see much advantage. I believe the stored water is as good for laundry and bath, and in many cases this is rain water.

An open tank in the attic, where there is room for it, and where it can be made frost proof, gives good satisfaction and requires less power to pump into than the pressure tank. But in many houses this cannot be successfully installed.

The Pressure Tank System.

I believe the one in most general use among farmers is the pressure tank system. I would advise a tank

for household use of about three hundred gallons capacity, tapped for horizontal position. This would be about eight feet long by thirty inches diameter. This should be set up on supports in the basement, with glass water gauge in the end, and pressure gauge on top, or, better yet, the pressure gauge should be placed in the living room above, so one can see at any time what the pressure is without going below.

Water forced into this tank from the bottom, against the air, until it is half to two-thirds full, will give a pressure of from twenty to fifty pounds per square inch, which is sufficient to force the water to any part of the house.

Besides the water pump in cistern or well, the tank should be supplied with a good double cylinder air pump, placed in the basement. More or less air becomes inter-mixed with the water and is drawn from the faucet until the air supply in the tank is exhausted and there is no more pressure. Some drain the tank at this time and start over again, but I believe a better way is to apply a few strokes of the air pump. I believe that the absence of this pump is the reason some systems do not give satisfaction.

The Bath Room.

The bath room need not be so very large. Ours is about eight feet by five feet. I would prefer larger, but this was the only available room and by economy of arrangement it is made to do good service. Installation is easier if the bath room is on the ground floor, which will admit of open work piping in the basement. It is a little awkward for a novice to pipe between floors, but he can do it. In this case, I would lay a single board floor of unmatched pine, lightly nailed, and covered with linoleum, so in case of trouble it can be easily removed.

Our walls are of common plaster and these we covered about half way up with sanitas, with the upper part and ceiling of burlap, joined with a molding. The wood work is painted with white enamel and it makes a "nifty" little room at a moderate cost, and is as serviceable as any.

The fixtures should be of good grade and purchased with water pipe (not lead) connections. I prefer a low-down, siphon-jet closet bowl to other styles.

Our range boiler holds forty gallons and is amply large. It is connected with a range water front, which is preferable to a water back, as it does not affect the oven.

The Water Connections.

The water connections are three-fourths inch pipe for cold and one-half inch for warm water, so it will not take so long for the warm water to reach the lavatory or bath as from a larger pipe. The pipe from pump to pressure tank should be 1¼ inch. All pipes and fittings should be galvanized.

Unions, packed with sheet packing, should be used at frequent intervals in open work, but should be avoided between floors and in walls, as they are liable to leak as the packing gets old.

A good check valve should be placed in pipe just inside the basement and a globe valve in the supply pipe, which may be closed to shut off pressure in case of trouble anywhere in the system. All pipes should be well protected from frost. Many houses are too open where the floor joists are spiked to the outer wall studding. I have known the thermometer to register 26° between joists when it showed 60° in the chamber above and 70° in the room

below. A close boxing of such pipes may save much trouble.

By no means allow the supply pipe to the boiler range to remain long frozen. There have been cases where water fronts have been blown out of stoves, but where pipes are open and the water supply constant, so the boiler is full, there can be no danger.

A fine screen should always be placed on the foot of the suction pipe of the pump, so no foreign matter will get into the system to clog the pipes, or interfere with the proper working of the faucets.

The Farmer His Own Plumber.

Shall the farmer do his own plumbing and avoid the exorbitant rates usually charged by the artisan? He can if he wants to. Some think they cannot, but a man never knows what he can do until he has been "up a stump" and has been obliged to work his own way out of it. The average farmer has successfully worked his way off of so many stumps and out into the clear, that he is quite capable of finding a way or making a way to accomplish a task of this kind. Any farmer who can build his own silo can put in his own water works and there are many who have done the former and some have done both.

First secure a set of tools, consisting of a pipe cutter, a pipe vise (securely bolted to a substantial bench), two sets of pipe dies, nos 1 and 2, for pipe ranging from one-fourth to 1½ inch, two pipe wrenches and a can of graphite pipe cement, a cast ladle for melting lead and a calking iron. These tools should not cost over twelve dollars and one can easily save this amount on the job and have the tools for any fitting that he may wish to do in the future.

In cutting threads, use the very best of lard oil or melted lard from your wife's jar. Never use fried meat gravy, if salty. Your wife may suggest that if her lard jar is low. To make a tight joint, we want a clean-cut thread, which cannot be obtained with common machine oil.

For cementing joints, I prefer the graphite cement, well rubbed into the threads, and the fitting screwed tightly.

See that everything is properly trapped to prevent sewer gas. Also let the soil pipe extend up through the roof to afford vent. Or a smaller pipe tapped into it from the closet bowl will answer. I used a 1½ inch pipe for this purpose.

All horizontal joints of soil pipe should be leaded, putting in first a little oakum and then pouring in melted lard and when cool it can be driven home with a calking iron. This may seem like a difficult task, but it is no more complicated than babbitting a box on a wood saw, and many a farm boy can do that.

As we are not bound by city ordinances, the upright joints can be cemented with one part of Portland cement to two of sand, and where the pipes lay on or below the cellar floor, they can be laid in concrete and save the leading. In fact, sewer pipe will do for this and is cheaper than soil pipe.

A cast bath-trap, tapped on the sides, will give less trouble to the novice than a lead trap. In our entire system not a bit of lead was used except a short combination lead bend and ferrule connecting the closet bowl with sanitary tee in soil pipe.

I worried somewhat over connecting the range boiler with the water-front without lead connections, but found it a very simple thing when I got to it.

When I put the water gauge in the tank, I found it was not tapped true,

but by using four one-half inch nipples and as many elbows, I made an offset, which made it the easiest job I ever had in setting a water glass.

Cut clean threads; measure accurately; cement well, and screw the fittings tightly, and you will have no trouble in installing a water system.

DISCUSSION.

Mr. John Imrie—How large a sewage pipe did you have from the bathroom and across between the floors?

Mr. Scott—It doesn't go between the floors. That is just the supply pipe and the hot water pipe. A four-inch soil pipe goes directly down from the sanitary tee and then under the cellar floor. I just laid down some sewer pipe in concrete there.

Mr. Jacobs—Have you a septic tank there, or is it just a cesspool?

Mr. Scott—A cesspool. We have an impervious soil and we have got to get rid of that in some way. In the summer this water runs right out into this dry ravine. There is no trouble in the summer, but there is trouble in the winter.

Mr. Imrie—I should think there would be trouble right along, running the sewage into an open ravine.

Mr. Scott—Not the amount we get from one dwelling. It rains up in our country and each rain flushes the ravine.

Mr. Imrie—Yes, we are not so very far from you. It rains in our country and it smells, too. I believe you need a septic tank and that you will find it out later.

Mr. Scott—There is no objection to putting in a septic tank. You farmers can learn more about this by reading it from Farmers' Institute Bulletin No. 24.

A Member—What is the size of the pipes from your water tank and your bathroom?

Mr. Scott—Three-quarter inch pipe for the cold water and one-half inch for the warm. We only have to draw off about a quart of cold water from the warm water pipe before it comes warm. That is the reason we put in the small pipe.

Mr. John Imrie—We have the same arrangement and you do not have to let it run but a little bit. We have very nicely under-drained soil.

Mr. Scott—I know of one cesspool that did good service for fifteen years and then it became so clogged that the septic tank had to be put in.

A Member—What protection do you give that outside pipe?

Mr. Scott—There is a three-way pipe in the well, and as soon as it stops running it turns back into the well; it never freezes, as it slopes toward the well and drains back into it.

A Member—But would you put an extra wrapping around your storage tank pipe?

Mr. Scott—It is not necessary.

Mr. Imrie—We have had ours for twelve years, piping from the storage tank out to the barns, and some said it was no use putting it byond four or five feet, but we have never had any trouble; it has never frozen.

Mr. Scott—Where this pipe reaches the yard it is always empty.

A Member—How do you pump the water?

Mr. Scott—With an electric motor.

Mr. Jacobs—Doesn't it bother you to keep the right kind of a pressure on that tank?

Mr. Scott—No, sir.

A Member—I have heard some people say they would draw a few pailfuls and it would take the pressure down so low it would not raise the water.

Mr. Scott—That would occur if the air supply is exhausted and the tank becomes full, or nearly full of water. Then your pressure is of very short duration. You pump in some more

air, or drain the tank and start over again.

Mr. Jacobs—In cementing those soil pipes, I think it is an improvement to use the sure-on and iron cement. Although it might cost a little more, it is very safe in making your connection and very much easier applied, especially on horizontal pipes, all the soil pipes. In regard to the septic tank, although Mr. Scott has made a success in planning his system, many of us are on level land where we have no opportunity of running this off into a ravine and if we are going to depend on a cesspool, I feel it is quite important that we have in connection with that a septic tank, which I believe will simplify the whole system. I put in two, one for my creamery and one for the house, and although we had some dfficulty, it is working all right now and I believe in the septic arrangement.

A Member—What is the cause of rattling in the hot water tank?

Mr. Imrie—I think it is air.

Mr. Convey—Where you have only one pipe, the water has got to work out irregularly; there are water and air pressing, and that makes a noise, but if you have two pipes there will be no trouble that way.

Mr. Jacobs—Will you state again the cost of installing this plant?

Mr. Scott—Well, I said one hundred and fifty dollars besides the sewer.

Mr. Jacobs—But you did not pay your plumber fifty cents an hour.

Mr. Scott—No, I did not.

Mr. Michels—Do you put all the water that goes to the stock through this tank?

Mr. Scott—No, this is only for home use, including bath, closet, laundry and washing the milk utensils. There is a larger pipe for the stock. I do not think it would do to use this style for the stock because it would take too much power to pump against the air.

Supt. McKerrow—We have used ours for several years, but it takes a larger machine.

Mr. Convey—Your sheep do not drink much water.

Supt. McKerrow—But our cows do and we have them also.

Mr. Michels—Two years ago I put in a refrigerator, but we have a running water pipe inside this refrigerator, which makes a fine system and needs no attention, winter or summer. I was wondering if this would not be a good scheme to fix inside a refrigerator in a building where you have pressure of this kind. The temperature in the refrigerator is constant and much more satisfactory than ice.

Mr. Imrie—It would take a lot of water, unless you have a flowing well.

Mr. Michels—We have that.

Recess to 1:30 p. m., same day.

AFTERNOON SESSION.

The convention met at 1:30 p. m., Mr. Fred Stubley presiding.

SEED CORN.

E. E. Wyatt, Tomah, Wis.

Seed corn should be grown and acclimated to the locality in which it is planted and better yet to each farm. You do not need to change your seed to get better vigor, but should improve it by a systematic method of growing and selection.

The Seed Plot.

The plot should be good soil, in good condition, and well prepared,

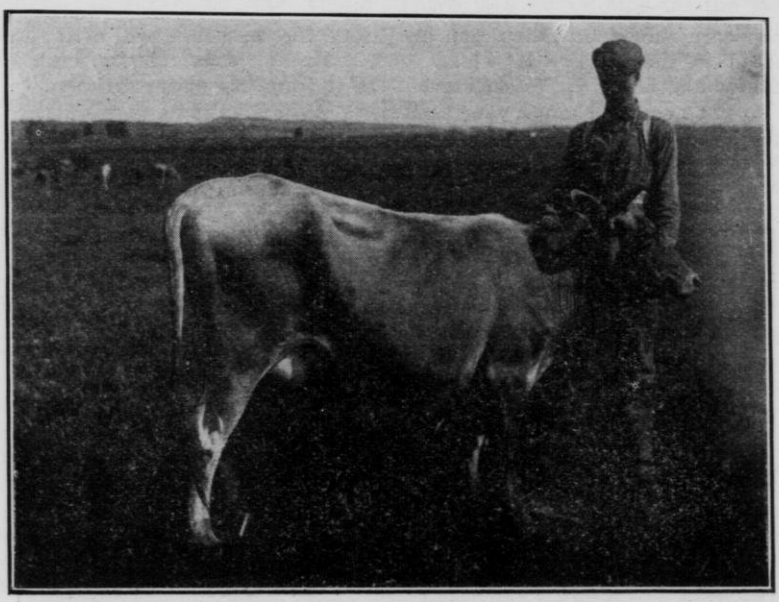
Corn field ready for the silo, Wisconsin No. 7. Wyatt Dairy Farm.

Seed corn should be produced by a system of breeding, making an improvement over the years before, and for this purpose a small plat should be selected as far away from the field as possible, especially of any other variety, for the pollen will drift through the air and thus mix the crop when in the process of fertilization.

and then be given best of cultivation. Like improving live stock, feeding is as important as breeding, so prepare and feed this crop well and get as good development as possible to show the real quality of the crop.

Plant this plot by the ear to the row method, that is, one ear shelled and planted in two adjacent rows across the field the long way, and then the other ear for the next two rows, casting aside any of the kernels left at the ends of the rows. As it grows, study the several rows, compare the stalk, leafage, time of maturity and yield, with condition of ear and other points that note the difference between rows. One will be surprised at the difference that goes on when nothing but the original ear of seed could be charged as the account.

Some rows will appear above ground one day ahead of others, some rows will constantly be ahead of others, some grow a foot on the average above other rows, some tassel a week or ten days before other rows, some have a very even foliage of eight or nine leaves per stalk, while others an average foliage of twelve to fourteen leaves per stalk, on some the ears are on short shanks, while others will be on long drooping shanks, some rows one ear per stalk, while another has two to three, very common. Some rows yield larger amounts of ears to the amount of stalk than others, while some rows will yield three times as much corn as others.



A good Grade cow. Wyatt Dairy Farm.

Selecting the Seed.

Select the rows that make the corn nearest your ideals and pick first about thirty or forty ears of the most uniform stalks and general variations in the rows as a basis for the seed corn plot next year and from these select the ten best, considering uniformity, form and shape of ear and kernel, filling of ends, such as make a model ear. Now from the remainder of the plot, pick the best for the general seed for next year.

Seed should be picked from the

stalk when ripe, but if frosted, as soon after as possible.

Secure as good ears from as uniform conditions as possible because here rests an important point in securing the next year's evenness in stand, then take it in and place it in an airy, well ventilated room, where artificial heat can be supplied. Do not allow any time to elapse between picking and hanging, for if it is left in piles, crates or sacks a few hours, especially with husks on, a sweat sets in very soon and either reduces or destroys the germination at this time.

In placing it to dry, several different methods may be used, either hanging it by the husks, strings or on nails driven into a post or through a rack made of boards, or upon open shelves, taking great precaution not to pile ears too close or too deep. The best shelf method is to use wire like poultry netting stretched tight into shelves, making it so the air can circulate freely to carry away the surplus moisture, and this must be done as quickly as possible before cold nights and freezing weather set in, as this will weaken or destroy the germination. There will be no danger from over-drying or too rapid drying, but it should not be exposed to excess or sudden changes of heat.

Testing for Germination.

Corn thus picked and cured should give an almost perfect germination, but it should be given an ear test in the spring to determine its exact condition, and eliminate the poor ones that do creep in.

A tester for this purpose may be made out of a box about two by three feet and one and a half inches deep. Fill this level full of dirt firmly pressed down, then draw a system of strings across the top, making the surface into a set of plots about two inches square, then denote the several squares by letters and numbers, as a. b. c. one way, and 1, 2, 3, the other. Now, by combining these, like

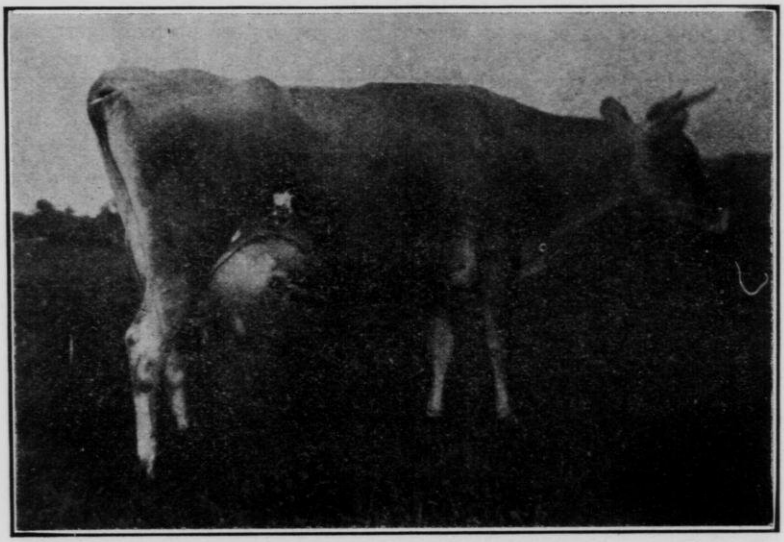
Grade Jerseys bred and raised on Wyatt Dairy Farm.

a/1 for the first square and a/2 and a/3 and so on, each square has a name. Then take an ear and select three kernels, one near tip, roll the ear, one-third around, select the second near center, roll one-third farther around and select the third near butt end, thus giving three kernels representing the several sides, and endwise of the ear. Place these in square a/1, pressing firmly into the dirt, though not covering, then place the ear where you can select it at any time, that is, know its identity until the finish of the test, and when you have about two hundred ears in this series a great deal of pains must be taken, for if they once become mixed the test is valueless.

After you have filled the entire tester, place several pieces of burlap or flannel cloth over the surface and moisten down about the same degree as the soil in the field. Keep in a warm place, not over 60° F., and leave for about six or seven days, perhaps moistening once or twice in the meantime, especially near edges.

Now roll back the covering very carefully, so as not to pull out of place the sprouted corn, placing back all that adheres to the burlap.

Here you have before you the exact ability of your corn and by eliminating all that do not germinate or only weakly, you should get a quantity of seed that will germinate 95% or better when you plant in the field, and that will send up a more uniform, sturdy stand and produce a growth that will stand more evenly, grow and ripen a better crop.



Register of Merit cow, The Owl's Sarah.
Record 414 lbs. of butter as a four-year old. Wyatt Dairy Farm.

DISCUSSION.

Mr. Imrie—Supposing you pick out a kernel, say from two different parts of a hundred or two hundred ears. If every kernel grew, would you go to

the trouble of testing out the ears separately?

Mr. Wyatt—If I could feel very well satisfied that the whole lot of corn was even, it might not be necessary, but I would want to give it a very through test before I would change my practice.

Mr. Imrie—In doing this testing, would you rather use sand, dirt or sawdust?

Mr. Wyatt—Whichever would hold the moisture best.

A Member—Did you ever try detasseling?

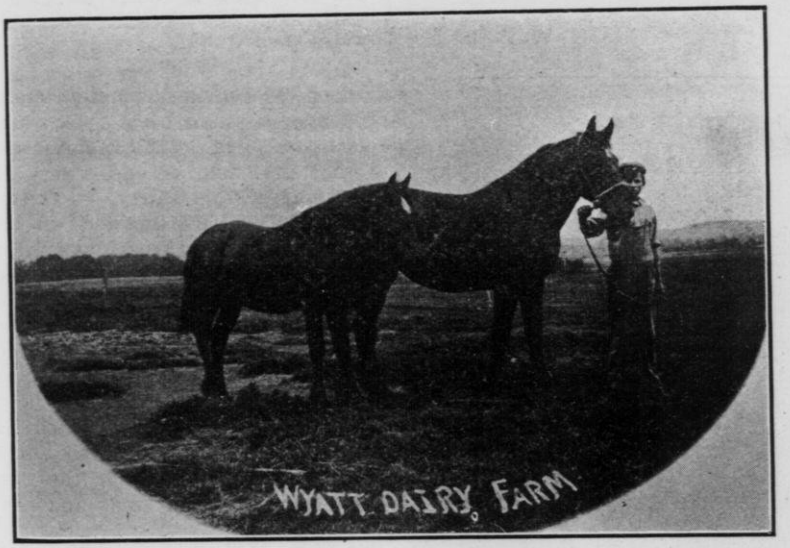
Mr. Wyatt—No, sir, I have not.

Mr. Imrie—There usually isn't much danger of corn not growing well if it is selected early enough and well dried.

Mr. Wyatt—Those are the two important points. It should be well ripened, selected early and well dried before frost. In drying, you might supply all the heat necessary, but if you had not the proper ventilation, it would not work. You have to have heat to dry the moisture from the corn, and then ventilation to take away the air containing the moisture.

Mr. Imrie—Do you select your earliest ears, or the next earliest?

Mr. Wyatt—You have to use your individual ideas. If you want an extra early corn, then pick out the earliest ears, but if I wanted corn that would produce me just as large a yield and have the largest amount of corn on it, then I would select the heaviest yielding rows according to weight of corn.



Pair of Grade Percheron colts bred and raised on Wyatt Dairy Farm.

Supt. McKerrow—If you select the smallest ears, will you not change the type of the corn?

Mr. Wyatt—Certainly you will. You want to select in accordance with the idea of breeding up to your particular ideal.

A Member—Is it not a fact that if one selects the early ears right along for a number of years, the tendency is for the corn ears to get smaller?

Mr. Wyatt—Yes, that is the tendency, and also the kernels will be shorter.

Supt. McKerrow—If it is growing or clay soil, it will be flintier, too.

The Chairman—In selecting your seed corn, wouldn't you want the ears well rounded ears?

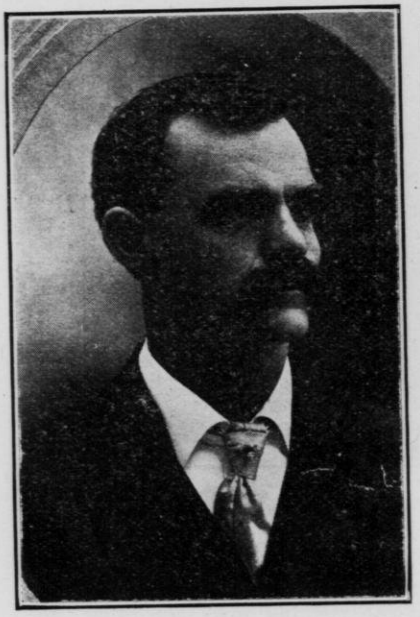
Mr. Wyatt—I do not know as that is as important as some other things.

The Chairman—How about grading?

Mr. Wyatt—I grade if I want to plant it for hill work, otherwise I do not pay so much attention.

CORN CULTURE.

W. P. Bussey, Omro, Wis.



Mr. Bussey.

In taking up the subject of corn culture, we believe there are a number of points of considerable importance, when we are making this crop one of the principal grains grown in our State.

Acreage.

From the latest reports obtainable, we find there is but one grain crop raised on Wisconsin farms that has a larger acreage than corn, but when we look over our crop reports and find that the yield of corn per acre only averages from thirty to thirty-five bushels, we are inclined to believe that there is a great chance for improved methods of handling the crop. When we look over the reports of the different counties to the State Board of Agriculture, we find that in 1911 there were 1,840,000 acres planted to corn in Wisconsin. About fifteen per cent of this (estimated) is used for ensilage. With the high wages for hired help and the increased price of farm lands and consequent higher taxes, every farmer in Wisconsin ought to be studying this question, "How can we improve our methods of corn culture so we can raise a larger and better crop of corn?"

Having secured a perfect seed (by fire curing and individual ear test for germination, as outlined in the previous paper), the most important things for our consideration are: a thorough preparation of the soil, cultivation and the harvesting of the crop.

In following out a rotation of crops, the corn crop should follow the clover crop, with this clover sod plowed in the fall and given an application of stable manure during the winter,

taking the manure each day from the stable to the field, the liquid and solids together and spreading it at the time of drawing.

We realize that if a manure spreader is used the manure will be spread more evenly than if it were spread from a wagon or sled. Whichever plan is used, it will pay to go over the field in the spring with a harrow as soon as you can get on the land. This harrowing mixes the manure with the soil, helps to warm up the surface and starts the weed seeds. It also helps to retain the moisture and fertility. This clover sod with the decaying root growth and stable manure, makes an ideal seed bed for the growing of a crop of corn.

Preparation.

We believe too many farmers are inclined to plant their corn before they have thoroughly prepared the soil. The disk pulverizer, a sharp pointed harrow and a planer or a roller may be needed before a good seed bed is prepared.

Planting.

We prefer a disk planter to a shoe planter, as the disk removes the surface soil and leaves a nicer place for the seed. The disk is followed by a coverer and the wheel, and instead of there being a depression where the row of corn is to come up, there will be a slight raise; this is evened off when the harrow is used before the corn comes up. The harrow can be used once or twice after the corn comes through the ground. Better results will be obtained if the harrowing is done in the afternoon, as the corn will not break as badly as it will in the morning when it is crisp.

Variety.

There has been a tendency to plant varieties of corn in Wisconsin that are not adapted to the locality. In some parts of the State we find that some of the smaller and earlier maturing varieties give better results than do some of the larger and later maturing corns.

Golden Glow corn on farm of W. P. Bussey, planted May 27, 1913. Picture taken Aug. 11, 1913. Corn will be ready for cutting Sept. 5 to 12.

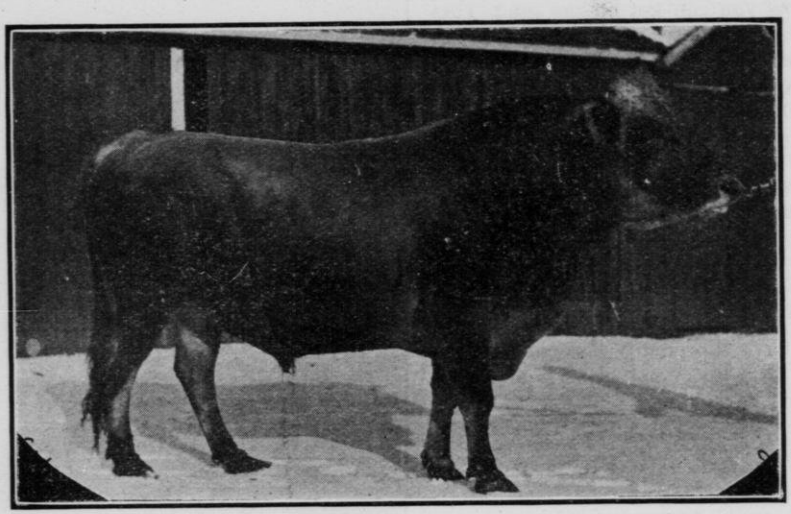
We should be careful in introducing new varieties in new localities. If we wish to "try out" new varieties, do so in a limited way. One or two acres at first, and if the variety does well in your locality a larger acreage may be planted the following year. Very often we find that corn

gives better results after it has been "acclimated."

That part of our crop that we plan to husk, we would rather check row, as generally we get larger ears than we do in the drilled corn, but for ensilage purposes the planting in drills has proven very satisfactory, giving a good growth of stalks and a goodly

seems dry and cracked, good results can be obtained by using a single horse hand cultivator, going once in a row, breaking up the crust, filling up the cracks and stopping the evaporation of moisture.

The crop should be cut at maturity and that part not used for ensilage should be put in medium sized



Mr. Bussey's Jersey bull Director St. Lambert, No. 93801.

amount of ears, though perhaps smaller.

If the land is free from stones, we would prefer a cultivator built along the lines of the "Towers surface" cultivator. The next best cultivator in our estimation is a ten or twelve shovel spring tooth, with the teeth set so that the surface of the soil can be cultivated to a depth of one or two inches. Care should be taken in regard to cultivating too deep, as we cannot afford to "root prune" our corn crop. The cultivating should be kept up until the corn is too tall for the sulky, and if there is a prolonged period of dry weather and the ground

shocks, tying the tops with binder twine, and later husked, either by hand or by the shredder.

It is estimated that about thirty per cent of the value of the crop is in the stalks; if this is true, it seems poor economy to leave them standing in the field uncut, and getting so little good from them.

We believe that very soon a larger amount of the corn crop in Wisconsin will be used for ensilage, and a smaller amount wasted by allowing it to stand in the field. Let our motto be, "More and better corn for Wisconsin."

DISCUSSION.

Mr. Imrie—How deep do you plant?

Mr. Bussey—That depends on the soil; on clay soil, quite shallow, just enough to cover it nicely at the time of planting.

Mr. Imrie—Would one inch be deep enough?

Mr. Bussey—On clay soil, I think so.

Mr. Jacobs—Instead of waiting until the ground was dry and cracked, wouldn't you prefer to keep up cultivation and prevent that condition occurring and conserve the moisture?

Mr. Bussey—I am taking into consideration a farmer having other crops besides corn to take care of. It might be that the soil will become cracked before he could get at it. The farmers of Wisconsin are growing other crops, and we must attend to them as best we can.

Mr. Wyatt—With other crops to take care of, do you think you could take care of that crop of corn with the Tower cultivator alone?

Mr. Bussey—Through the earlier part of the season, and some have used it throughout the season, but the soil must be fairly free from stone, roots and quack grass, I think.

A Member—What do you call a fair yield per acre?

Mr. Bussey—From seventy-five to one hundred bushels to the acre; shelled corn. We have never attained the one hundred bushels yet, but we have gone better than seventy-five.

Mr. Jacobs—With regard to the spring tooth cultivator, Mr. Bussey's experience is different from mine. I have one and I have been waiting until I can find an enemy I could give it to. We have not used it for some time.

Mr. Bussey—There is a great difference in the make of the spring tooth cultivator. In our locality there have been some that have been all right. Years ago they sold the Rowell in our country and it is not very satisfactory. I have used the Bradley and I am going to buy a Deere this coming spring.

The Chairman—Don't you think the nature of the soil has something to do with the kind of cultivator to use?

Mr. Bussey—No, I do not think so. We have all kinds of soil in our locality and we have had good success with a spring tooth cultivator.

A Member—What variety of corn do you prefer?

Mr. Bussey—The variety that will mature and give a good crop in your locality. If No. 7 is the right kind, I should plant that.

Mr. Imrie—The spring tooth cultivator is not much good in quack grass. You want something that is more rigid.

Mr. Bussey—We try not to have quack grass.

Mr. Imrie—What about the disk cultivator?

Mr. Bussey—Where the land is level, it is all right. We find objections to it on rolling fields, because it is harder to guide.

A Member—I have a pointed spring tooth Deere cultivator and it works very nicely.

Mr. Bussey—One nice thing about the disk is that there is a little leveler that follows the work as the disk leaves it, and it leaves the surface practically as good as the Tower cultivator.

A Member—What do you do to stop the cut worm?

Mr. Bussey—My experience is that we will have less trouble with the cut worm if we will follow out a short rotation than if we do something else.

Mr. Convey—In regard to the disk or other cultivators, I think its work is not complete unless you have some style of leveler following the culti-

vator. It is especially necessary with the disk cultivator, from the fact that it is inclined to leave the land too open without a leveler. We always use a leveler on every good style of cultivator. On any cultivator, the knives have to be kept in good condition:

Mr. Bradley— The question was asked a minute ago about the kind of corn. We noticed in the exhibit over here a good many different kinds of corn and only one or two types. There were two or three samples of the Wisconsin No. 7, but those who brought the Wisconsin No. 7 into this locality did not get it quite right. There were a few ears there that were fine, but there was no entire sample but what had shaky kernels, while there were some other varieties that were dead ripe, not as typical as the Wisconsin No. 7. I have noticed perhaps more varieties of corn right here in Clintonville than they have had at almost any other Institute we have had this winter. I think it would be wise for you to try to select some line and not have quite so many different varieties. We found some very nice samples of Flint corn, some of the best in the State, but the Dent corn was not nearly so good as in some other parts of Waupaca county. I presume it is perhaps because your land is heavier, colder clay land.

A Member—Wisconsin No. 7 does not mature fast enough here. Also we had a poor year this year and the Dent corn did not mature as well as usual.

Mr. Convey—In regard to that matter of cut worms, the only remedy I know of to prevent damage from that source is to have a short rotation with clover. I know of a good many who have tried that, and they are having very little difficulty with cut worms or wire worms, or any other worms.

A Member—How is No. 12?

Mr. Bussey—It is about ten days earlier maturing.

A Member—Do yo think it makes any difference with the cut worms whether your ground is spring-plowed or fall-plowed?

Mr. Convey—Early fall plowing will interfere with the cut worm, because the eggs are laid in July and August, but with the white grub it would not make any difference, it stays in the ground three years. It takes quite a while to eliminate that class of insect from your land, but you can eliminate it by following a short rotation of crops, having the grass crop clover.

A Member—I have two pieces of land that were in sod. One I plowed in the fall. It had quack grass in it. I worked it all the fall and that piece did not have any cut worms left.

A Member—What kind of corn would you recommend to plant for the silo?

Mr. Bussey—Any variety that will mature in your locality, whether No. 7 or No. 8. If the No. 8 will mature, it will make you good ensilage.

A Member—Neither of them will mature in this country.

The Chairman—Then select one that will. If you cannot get anything but Flint corn, stick to the Flint until it will ripen.

Mr. Clark—As a matter of fact, I think it is possible that the varieties planted here are not true to type, not adapted to this country. They are trying to raise too large corn. Now, we are farther north than this and we find that if we take these larger varieties they would not mature, and so we have changed the type. It is very necessary to raise corn that we can mature, to select seed that will mature, without trying to acclimate a variety that takes too long to mature.

The Chairman—It is not only in the

north and central parts of the State where that trouble has been experienced. Even in the southern part of the State many are trying to grow too large a corn.

A Member—I had a field which was partly fall-plowed and partly plowed in the spring. It had been in sod three years and the cut worms bothered just as much on the spring plowing as on the fall plowing.

Mr. Imrie—I think the solution of the cut worm is in the short rotation.

The Chairman—Do you practice blind cultivation, or cultivation before your corn comes up?

Mr. Bussey—We have done that once or twice, but that was to make up for not having the soil thoroughly prepared before planting. I would rather give the extra preparation before planting. That year we had considerable of a set-back in the spring in regard to getting our ground ready, so we went on and planted and then cultivated and dragged again after planting, but I do not think we made anything by doing that way.

The Chairman—We have had quite good success in cultivating after planting. We like to have our cultivator cultivate shallow, throwing a little dirt up onto the row soon after planting. That makes the row a little bit higher. We can cross drag after cultivating, and that will work up where the row is. We like to ridge it that way and cross it with the drag, smooth it off right in the corn row, we find that an advantage.

Mr. Bussey—That is true in using the shoe planter, but in using the disk planter, you do not have the depression where the wheels run. It is raised up a little above the level and you do not have to cultivate to ridge up before the corn comes through.

A Member—Can corn be grown successfully on the same field several years in succession?

Mr. Bussey—We want to follow after the corn crop with grain and then clover and back to corn again.

A Member—But, for instance, it has happened these last years that the clover did not catch, or it dried out, so we were compelled to plant corn in the same field again, in a way.

Mr. Bussey—We have noticed generally that the more clover we can keep in our soils, the easier it is to get a stand of clover when we try it, all other things being equal. If you delay those periods too long between the sowing of clover, it is much harder to get a stand in your soil.

Mr. Wyatt—I have a strip in our farm that is a little low and it is a poor place to grow small grain on and to get a catch of clover. We have been growing corn there for many years and by the liberal application of manure I am growing more corn than I can anything else, probably getting an average of fifty bushels to the acre, but it has a liberal application of manure every year. I have plenty of manure.

A Member—You say it is easier to get a catch of clover by sowing it often, say every three years. Now, I have heard just the contrary.

The Chairman—If you keep your land full of clover, it is certainly easier to get a catch.

Mr. Bussey—Of course there are those two years between the plowing of your clover sod and the seeding of clover seed again, but there is more or less of that root growth that has been in the soil for two years.

A Member—Will a person get a good clover catch by plowing up clover and perhaps seeding to grain and then perhaps seeding to clover right away again? I have had experience with that plan and I did not get a catch at all.

Mr. Bussey—If your soil is well manured, otherwise there must be something wrong.

The Chairman—There must be

some conditions. We have had parties who plowed up their clover sod and worked it and put alfalfa right on the same sod the next year and got an excellent catch of alfalfa.

Mr. Michels—We have a field at home of eight acres which was in clover two years ago, was well plowed in the fall, then last year we had a big crop of oats, did not add seed to them and in the fall it was full of clover from one end to the other. It certainly stays there, either from the roots or seed, but the clover was there, and there is no question in my mind that if we had sowed it in the spring we would certainly have had a good stand of clover, because we had it where we did not sow it.

Mr. Imrie—I would like to ask this gentleman if his soil is sandy, light soil?

The Member—It is sandy loam, not so light.

Mr. Imrie—After the oats are put in, it would be a very good plan to put on a top dressing of manure.

A Member—I had a small patch of about seven acres, and I have tried two years to seed it with clover but the clover did not come. Two years ago it was awfully dry and it burned out in the drought, and last spring it was so wet it might have swam away, but I had a little bit of manure, about four manure spreaders full, which had collected in the barnyard, and I took it right on the land on a strip about four, five or six rods in width, put it right on top, and where I put it the clover came up fine, and on the rest of the field you cannot find a bit of clover. The manure is what did it in my opinion. If the gentleman would give his seeding a top dressing, I think he would get a good stand of clover.

EXPERIMENTS WITH CORN SILAGE.

M. Michels, Peebles, Wis.

Mr. Michels.

Of late years much experimenting has been done with corn silage. This is especially true as regards the variety of corn to plant, time of filling the silos, putting up well eared or thickly planted corn with few ears and partly husked corn.

It will be my object in this brief discussion to point out results as I see them. These results are gained from observations and experiments of my own. I have no definite data except the weight of corn husked out, the amount of feed fed per day and the milk yield, as well as the test for butter fat.

Variety of Corn to Plant.

Not many years ago it was a common practice to plant two varieties of corn; one variety that would bring a good yield of well eared, fully matured corn for the crib, another kind that would yield a large tonnage for the silo, regardless of maturity or yield of corn. Today, however, it is almost universally conceded that the variety of corn best adapted to fill the corn crib is also the best variety to plant for the silo.

A few years ago, after listening to a number of fine stories how to grow a larger yield of corn per acre for the silo, by planting more thickly and in drills, I concluded to try it out, with the result that I cut no more tonnage per acre, and in place of nice large ears of corn, I had mostly nubbings.

The next winter we were feeding silage and alfalfa hay without the addition of grain or mill feeds with very satisfactory results, until we came to this thickly planted yet fine looking silage, and within a few days we noticed a shrinkage in the milk flow and had to buy mill feed to stop it. Since then I have planted in checks when possible. When it seems necessary to plant in drills, we do not change the plates in the planter.

Time of Filling Silo.

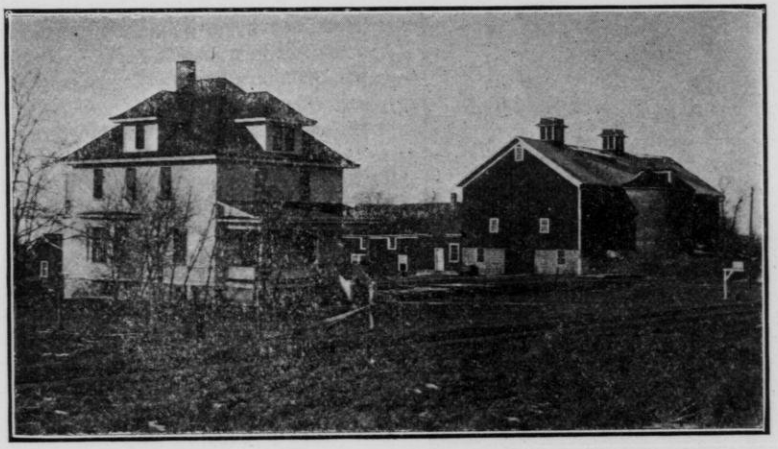
For many years a large percentage of the corn was cut into the silo when too green, resulting in an over-sour and less nutritious silage. Today the tendency seems to be to allow the corn to become over-ripe, to the extent that it becomes necessary to add water when filling the silo. If the right amount of water is added, no particular harm seems to result. On the other hand, if the corn is cut into the silo too dry, the silage will be full of mould sprouts, will be less suc-

culent and consequently less palatable.

The right time to cut corn for the silo is to allow it to mature nearly far enough for husking, but not so far as to make it necessary to add water when filling. It is also well to remember that the riper the corn, the more tramping necessary when filling.

We filled with our own help and machinery. On account of wet weather, we had to cut some of our corn by hand. This gave us ample time to husk from the wagon before cutting. Picking mostly for the best ears, we husked out about fifteen tons of corn.

The first silo we opened was the one with all the corn in it and our cows were milking fine on this silage



Farm home and barns on farm of M. Michels, Peebles, Wis.

Well Eared Corn For the Silo.

Within the last two years we have heard considerable discussion as to the advisability of husking out some corn for the crib before putting into the silo. Many are claiming as good results in feeding of such silage as before. I have seen two silos filled with practically no grain in it. In both cases the owners claimed the results were very satisfactory. I have also seen in dairy publications that the feeding value was practically the same, but would not recommend this practice.

Last year we had no more corn than I thought it would take to fill our two silos and concluded to try husking out some of the corn while filling. and alfalfa hay, changing now and then from second and third cutting to first cutting of this hay and so on, not giving the same kind of hay right along, but no grain or mill feeds were fed. At this time we were milking pure bred Guernseys that had been fresh from four to five months, yielding as high as 30 pounds of milk, testing 5.8 per cent for butter fat.

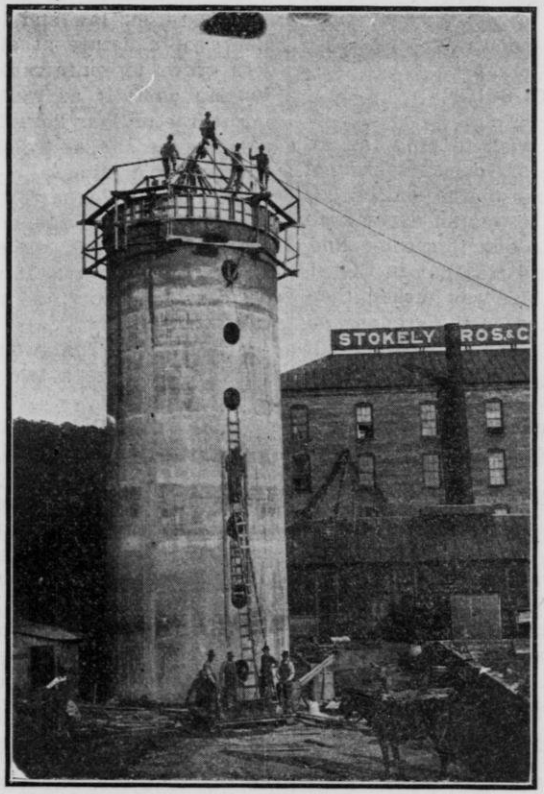
When we came to open the other silo, the silage of which was lacking most of the corn, but otherwise of a very good quality, it was equal to the silage from the first silo in every respect, but for the corn that was lacking. After feeding this silage for a few days, the cows began to shrink and we had to bag up oats and corn

to be ground. We mixed this one part of corn to two of oats and began feeding gradually, starting with four pounds per day. This was not sufficient to bring them back to their first flow of milk. The flow did not come back until we got to feeding five to six pounds of the ground feed. We kept on raising and gaining until we were feeding from ten to twelve pounds per day, when the cows mentioned before were milking from three to four pounds of milk more per day than they had yielded before the change of silage.

Conclusion.

Fifteen tons or 416 bushels of corn at fifty cents per bushel are worth $208.00.

Now, if we figure on the capacity of this silo, which is a little better than one hundred tons, we find it to contain about 200,000 pounds. Dividing this by thirty, the number of pounds of silage fed each cow per day, we get approximately 6,666 feeds. Adding five pounds of grain to each feed to make it equal to the first silage in feeding value, it will take a little more than



Concrete silo built from plans in Farmers' Institute Bulletin by Stokely Bros., Newport, Tenn.

sixteen tons, or 33,330 pounds of oats and corn, or 3,330 pounds more than was taken out of it.

The $208.00, which looked so big when we got through husking, is now more than fading away, to say nothing of the extra labor and expense of grinding.

DISCUSSION.

Mr. Jacobs—I wish to note an experiment at one of our Experiment Stations, the name of the station has escaped me, but it was an experiment conducted right along this same line. One-half of a field was put in the silo and the other half was husked, then the corn was dried on the ground and went back to the shredder. It showed just the same as Mr. Michel's experiment showed here. It showed it was not in so digestible a condition, not of so much feeding value.

Mr. Michels—That is what we found; we found we not only had to put back more than we got, but we had to do all this work for nothing.

Mr. Convey—Did I understand you got better results for the silo from checked corn than from drilled corn?

Mr. Michels—I think so. I think we got better corn and better feeding returns.

Mr. Convey—That has not been my experience. I can raise fairly good corn, even though it is very thickly planted, and get a larger yield of the product to the acre and less labor in taking care of it with the drilled corn.

Mr. Michels—In my case it is just the reverse, it took more acreage to fill the silo than ever before or after. Of course the different years would be different, perhaps.

Mr. Bradley—Where you plant for your silo in check rows, don't you plant pretty thick?

Mr. Michels—No, never above four kernels.

The Chairman—Don't you think that the nature of the soil would have something to do with that proposition?

Mr. Michels—I do think so. Our land is rather low and level and has plenty of moisture at all times; our corn grows up quite rank and I think we can do fully as well by planting only three or four kernels to the hill, even for the silo, as by planting more, or even for drilling.

Mr. Imrie—We narrow up our cultivators, take off one outside shovel on each gang, and we can work it very well that way. It will be three and a half one way and two the other way.

Mr. Michels—That would not do in our case; we use a two-row cultivator altogether.

Mr. Convey—Did you have but one year's experience in drilling corn?

Mr. Michels—No, two years' experience; one year it was altogether drilled and the next year part of it was drilled and part was checked.

Mr. Jacobs—My experience corresponds very closely with Mr. Michels'. I followed the drilled method for quite a good number of years, both for the silo and for the field crop, and we have abandoned it for both purposes. We check all our corn, though we plant it a little heavier in the hill than Mr. Michels does, and I think we get better results, both on account of keeping the corn clean and the amount we get, though some years I have got as large or larger crops in drilled crops than any other way, on account of the moisture being right and the soil just right.

Supt. McKerrow—I do not like to agree with Convey, but I have got to agree with him on this proposition, having grown both ways. Now we grow it all in drills, what we husk and what we put in the silo, but when

we were planting both ways in the same field we came to the conclusion that we got more silage corn and also husked out more corn. You see if we planted the three or four kernels that Mr. Michels plants in his hill in the space between the hills, we would get a better average growth of stalks and corn, but there is a difference in soils, and may be there is a difference in men.

Mr. Michels—I have even tried planting three feet four and three feet eight, and I have gotten rid of my three-foot-four business altogether. I do not want it. I plant it all three feet eight. I am satisfied on my farm it is better feed.

Supt. McKerrow—There again there may be something in the variety of corn. When I was young and foolish, I tried every kind of corn, but I found that the big, late maturing corns were not for Waukesha county, and we have gotten down to the small, earlier ripening corns, which we want to plant closer together to get the bigger tonnage on our land.

Mr. Michels—I think Mr. McKerrow is right there. We started out with No. 7 for the silo and the Golden Glow for the crib, and we have been carrying on both kinds ever since, until last year I had all Golden Glow. I rather think it makes a little better silage than does No. 7. We have been selecting for a particularly large stalk in that variety and we have a much larger stalk than the average Golden Glow. Whether it is that our soil grows the stalk so much ranker, I do not know, but that is the point we started for.

Mr. Wyatt—How close do you put your drill plates together?

Mr. Michels—The drill plates I dropped about eight inches. That was much too thick.

Mr. Imrie—Mr. McKerrow said he found it better where they were scattered along the row. They tried that at the Ohio Experiment Station and they determined it was just the same whether you planted a kernel every foot or three every three feet, it amounted to the same.

Mr. Michels—I see the Illinois Station finds practically the same results, but with us it is a matter of keeping down the weeds, and the only way to keep them down is to cross cultivate.

Supt. McKerrow—We grow a good deal of Flint corn to put in the silo and that suckers more or less. When it is planted out a kernel in a place, it suckers more. We want corn and we also want fodder. We are not growing for a big stalk, we are growing for a moderate sized stalk, and the more leaves the better. Then again, we want a fine stalk, because our sheep like a fine stalk better than the woody, heavy stalk. We do not breed Holsteins, remember. Another reason, when we planted in hills, the hills being larger, we had to keep our cultivator a little farther away. In drills, the straight drill is there and you can narrow up your cultivation, you can get so close that the loose dirt from your cultivator rolls over and if there are any small weeds you get them covered up; whereas, in cultivation the other way, we sometimes miss a weed. Then the weeder which we use completely cuts out that narrow ridge that you leave with your cultivator. There are a good many more things I could say, but I think that is enough.

A Member—Which is the better variety, Flint or Dent, for the silo?

Mr. Michels—I do not know. Whatever is best for the corn crib is best for the silo every time.

The Chairman—If I was in a location where my Dent corn would not ripen well, I would stick to the Flint.

Mr. Michels—We grow Dent corn altogether, the Golden Glow. We had some No. 7 two years ago.

ALFALFA EXPERIMENTS ON SAND.

E. W. Ivey, Millston, Wis.

According to the Wisconsin Bulletin No. 204, we have between four and five million acres of sandy soil in this State. After some experiments with alfalfa, I have become convinced that with proper conditions of soils and subsoil, we can profitably grow this crop on our sandy soils.

Different Soils Require Different Treatment.

Different soils require different methods of farming and my paper today gives my studies and experiments with alfalfa on a strictly jack pine sandy soil. It is claimed that alfalfa does best on a fertile soil with a loose subsoil. Most sandy soil has a sand subsoil, which is loose, and by enriching the surface soil we can have the necessary conditions.

There should be no hardpan near the surface of the soil. What I mean by hardpan is clay or rock so hard and packed that it will not let water or alfalfa roots work through it. Water should not stand in the soil nearer the surface than three feet.

Sandy soil, as a rule, has a fair amount of phosphoric acid and potash but is very low in humus and nitrogen. We can get nitrogen in the soil by sowing such legumes as clover or alfalfa, but before these crops can be grown successfully there must be plenty of humus in the soil or the clover and alfalfa will be a failure.

Humus in the soil is necessary for the rapid development of the bacteria which gather free nitrogen from the air for the purpose of building up plant tissues. We sow rye in August. By winter it has a good root system and in the spring it throws out good, strong healthy shoots. We plow this down about June 1st. We plow about four inches deep, or just deep enough to do good work, then harrow thoroughly to pack the soil.

Although I have never used a roller, I believe it should be used to pack the soil down firmly on the green rye. Unless the harrow follows the roller, never use a roller that will leave the surface of the soil smooth, as it will be sure to drift. After a heavy rain and as soon as the soil is dry enough to work, it should be thoroughly harrowed to hold the moisture. The field is then ready for seeding.

Never sow alfalfa on sandy soil unless after a heavy rain, or it will die out unless the weather continues wet. Soil that is well harrowed after a heavy rain will hold moisture for six weeks or more without any further rainfall.

Sandy Soil Must be Inoculated.

After repeated trials it has been proved that our sandy soils must be inoculated, as they do not show the least trace of bacteria. At the time of the last harrowing, we inoculate by scattering five hundred to one thousand pounds of soil per acre from an old, well-inoculated alfalfa field.

When scattering this soil, if the sun is shining brightly, the harrow should follow closely, for the reason that the direct sun's rays will kill the bacteria in about twenty minutes. If the field is exposed to the west and there is the least danger of the sand drifting on a windy day, we sow broadcast about a peck of buckwheat seed per acre just before we sow the inoculated soil. This will come up quickly and drifting will be avoided. We do not let the buckwheat mature, but clip it

back the same as weeds. We have used this method for years with good results.

In sowing alfalfa, never sow broadcast. We sow about two inches deep with a double disk drill, using five pounds of seed per acre. A thin stand gives the best results. We prefer the Grimm variety. Its characteristics are deep crowns and heavy stooling qualities, which withstand the severe winter weather. Last, but not least, the Grimm alfalfa has a tendency to grow good crops of seed.

The first load of alfalfa hay grown in Millston township, Jackson county, Wis., on jack pine sand.

Exterminating the Cut Worms.

After seeding we kill off the cut worms by scattering a mixture of wheat bran and Paris green, sixteen to one. We mix about fifty pounds of bran at a time, using a mortar box. This takes three pounds of Paris green. This must be thoroughly mixed dry, then add twenty quarts of water. This amount will just dampen the bran and when scattered each flake of bran will be separate from the rest. Do not get it too wet. We use bran with a large flake, for when such bran becomes dampened it will roll up with the gluten side in and will hold the Paris green even through heavy rains.

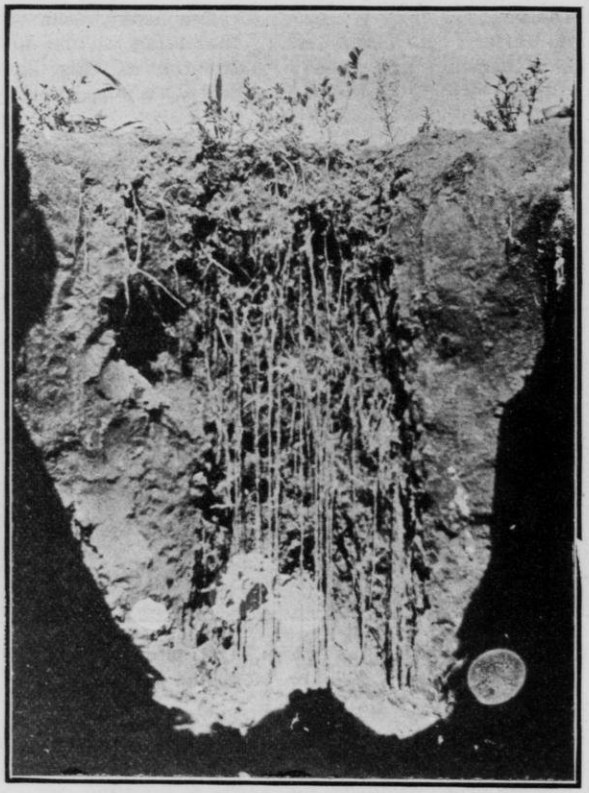
In mixing we use a five-hook hand cultivator, as this does the work quickly. We scatter by hand and a side wind aids greatly in scattering a strip of sixteen to twenty feet. When there is no wind, we can scatter a strip but three to five feet wide. We apply about five pounds of this mixture per acre and after two nights all damage from cut worms will cease.

Paris green on the hands is not injurious, but care should be taken in mixing. Do not stand with your back to the wind, but stand sideways to the wind, or just a little facing it. We have used this mixture for three seasons. It is simple, cheap and very effective.

A Suggestion for Breaking Crusts.

If there should be a heavy rain before the alfalfa comes up, a thin crust will form on the surface of the soil, which the plants cannot break through. As soon as the plant reaches this crust, the lower portion of the root pushes until the upper portion becomes bent and crooked and as soon as the vitality of the plant becomes exhausted it dies. If such a plant should push through it will be in a stunted, weak condition, will not recover its vitality for some time and will go into winter very much undersized and is likely to be winter-killed. Stands of alfalfa and clover are easily lost in this way.

This crust must be crushed in some way. I believe a corrugated iron culvert could be used to good advantage as a light roller. Fasten a block of wood in each end, bore a hole in the center of the block, run a gas pipe through the whole length of the tube and rig up some shafts. I believe the roller should not be over eight to



Root system of four alfalfa plants 57 days after seeding. Roots 35 to 38 inches long. Jack pine sand.

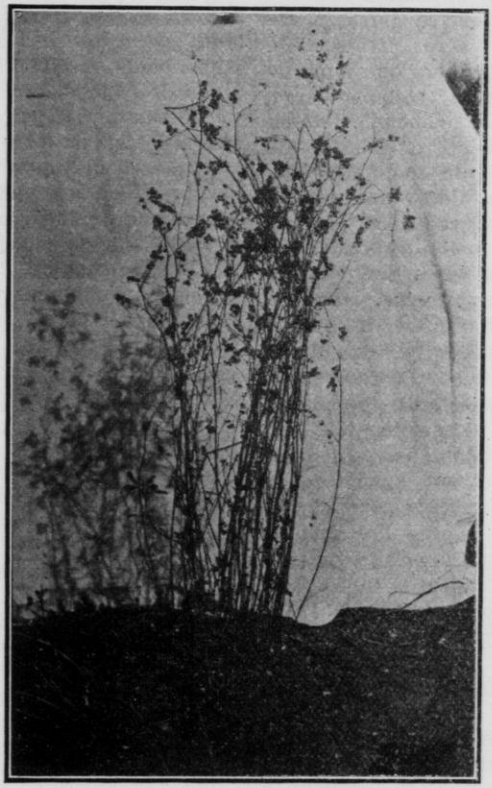
ten feet long, and I believe the diameter should be twelve to twenty inches. I would not advise a heavy roller, as it is likely to injure the young plants. It would also pack the soil, causing it to dry out. Keep the surface loose if possible. If a crust should form after the plants are up, I believe it should be crushed and in doing so it will act as a cultivator and cause air to work into the soil.

This roller for crusts is but a suggestion. We intend to experiment along this line next summer.

As to lime, we found a little was beneficial, but further experiments are needed.

Growing Alfalfa Seed.

I am quite certain we can grow alfalfa seed profitably on our sandy soils. I have letters and bulletins from several state universities which claim that alfalfa will not develop seed where the rainfall during the growing season is over twenty-five inches, and that rains, fogs and heavy dews will dampen the blossoms



Seed pods on one alfalfa plant, second crop, 1912, on farm of E. W. Ivey, Millston, Wis.

and check pollination and fertilization to such an extent that seed cannot develop, and as Wisconsin has an average rainfall of over thirty-one inches during the growing season, it was out of the question to grow seed in this State.

The past season we hulled two and one-half bushels of seed from one and three-fourths acres. This field was inoculated with only one hundred pounds of inoculated soil per acre, which was not enough. About twenty-five per cent of the plants were well noduled in the field, and the plants well noduled were the only ones which produced seed. If all plants had been well noduled, the field would have given a heavy yield of seed. Last July we had ten and one-half inches of rainfall; in August six and three-eighths inches. When our alfalfa was in bloom, we had much damp, rainy weather, and the alfalfa put in full time blossoming and setting pods. I failed to find any blossoms that did not set, except for a short time when it came near freezing.

My idea of the failure to get a crop of clover or alfalfa seed is this. When clover is grown on heavy, rich soil, there is much undergrowth, which acts as a sponge in wet weather and causes a mildew to grow on the stems of the plants. If it continues damp for some time, black spots will appear. I believe this is a rust which blights clover and alfalfa somewhat in the same way that rust blights oats or wheat.

During the wet season of last summer, where our alfalfa was thick and rank it started to mildew on the stems near the ground, but as there was no undergrowth it dried quickly when the weather changed and no damage appeared.

The fact that the Grimm alfalfa yields from two to five bushels of seed per acre, which will sell for from ten to fifteen dollars per bushel, causes me to believe that there is a bright future for the sand farmer if he will but study the requirements of alfalfa. As a start, I would advise him to sow not over two acres. Go slowly at first. If there is a failure, study to find the cause, do not give up. If alfalfa proves to be a success on our sandy lands, we will be able to offer as good inducements to the farmers of the southern portion of the State who are looking for a home as are now offered in the wheat belt of the Dakotas, Montana and Canada, and I believe the day will soon come when we will be able to join with Mr. Plowman in sending out the invitation to come and help us to develop our unimproved land.

DISCUSSION.

Mr. Michels—Have you had any trouble in keeping the pods on the plants while they were developing, say, after they got up to one, two or three rounds? In my case, I had a ten-acre lot that looked very promising the first part of the summer, I expected a big yield for some time. The first cutting was left and they kept on growing out very thick, and it looked fine all over the field, one continuous blossom. Then a rainy spell came where we had rain every few days, and after that the pods were all down on the ground. Then they started to grow again, but it kept on raining and after the rain the pods were all down on the ground again, and that is the way it kept up until after the third cutting. I left it to see what would develop. It kept on blossoming all during this time, kept on developing a pod, and many times got up as far as two, three and even four rounds , and the next rain

storm threw them all on the ground. Now, what do you supose was the reason for that?

Mr. Ivey—Was that on jack pine land?

Mr. Michels—It was on gravel soil, and underneath this, right alongside of it, where they have had gravel pits for forty years, and there is limestone, I dug down ten or twelve feet deep. There is ground enough just to plow it. It had been in alfalfa for ten years and we left it on purpose for seed.

Mr. Ivey—I do not know why that should be. I have only grown alfalfa for a short time, but had no trouble last summer, although we had very wet weather. I never saw a pod or a blossom fall, with the exception of once when it came near freezing for two or three nights in August. During that time, when it was quite cool, some blossoms fell.

Mr. Michels—This last year I cut the first cutting, but left the second cutting, and it never got to the blossoming at all. It was so dry during that time that is what it did probably; it was not a healthy looking field. I practically lost the two years crop from that field trying to raise seed. I haven't got a bushel yet.

Mr. Ivey—We can always grow clover seed on our sandy soil in a wet season when heavier soils fail, and my experience with alfalfa for seed this first season leads me to believe that we can have the same results with alfalfa as we have had with clover. The first crop can be cut for seed and the second crop for hay, or we can reverse it. On our light soil it does not make any difference. The first crop will not grow too rank and blight, as on heavy soil. If there is a failure to grow seed, it will be because of too little rather than too much rainfall. When we have a large acreage we can have part of our haying done in June and part in the fall. In this way we can divide up our work in both haying and harvesting.

Mr. Convey—It has often been stated that red clover would not make seed unless it is fertilized by bees. We know that alfalfa is not fertilized by bees early in the season, as the honey bee does not work on it at that time of year. The bumble bee does work on it. I notice that is the case with quite a number of plants, that you will find some with well developed seed, while some is not developed. I had an idea it was lack of fertilization.

Mr. Ivey—I have found there is the same trouble on our heavy soils in Jackson county. I do not believe it is the bees, and I do not think it is the moisture on the blossom that affects it. I have known of fields that were half sand and the other half of the field was clay, and when we had a wet season or it was quite damp at the blossoming period and afterwards, we would have about three bushels of seed to the acre on the sandy portion and about one or less on the heavy soil. Another year when it rained almost continuously, I had clover that yielded four bushels of seed to the acre, and it was fancy seed, some of the finest that was delivered in Black River Falls that winter. The same season, on the heavy soils, I have known hullers that would hull half a day and get one bushel, and what they got was poor quality, so I do not believe it is altogether the bees or the moisture falling on the blossoms. I think it is mildew on the stems. I have examined clover several times and have noticed there is a mildew will form on the stems near the ground if there

is much moisture, and I noticed the same thing in the alfalfa.

Mr. Michels—Last summer there was no trouble in developing seed, but they would not hold onto the plant and it was full of these black spots. I hauled it to the barn without any drying at all and it made fairly good hay, but it appeared dark in the mow, even at the time of feeding, so it is possible that is the cause of the seeds dropping off as they did.

Mr. Ivey—I believe it was. The mildew developed into a black rust, which sapped the vitality of the alfalfa and caused the pods to fall.

Mr. Michels— These pods were growing all the time and developing full of seed. It looked as if it would be eight tons to the acre, if we could have got it.

Mr. Ivey—I think it was too thick and rank to grow seed in a wet season.

Mr. Michels—If there is any one here who can tell us if this was mildew and how we can cure it, I wish they would.

Mr. Ivey—Sow thinner.

A Member—I had the same trouble, the hay even was black after it was cured.

Mr. Ivey—I think if it was sowed thinly on heavy soil, you could grow seed if the season was not too wet and you are not troubled with weeds. That would have to be avoided, as the weeds and alfalfa together would cause a heavy growth and would give the same trouble as a thick stand of alfalfa. On our sandy soils we are not troubled much with weeds on meadows where there is a thin stand.

ALFALFA EXPERIMENTS IN NORTHERN WISCONSIN.

Prof. E. J. Delwiche, Ashland, Wis.

(In the absence of Prof. Delwiche, the paper was read by Supt. Geo. McKerrow.)

The definite experimental work with alfalfa in northern Wisconsin was begun at the Iron River Substation, in Bayfield county, in 1906. This was on sandy loam soil, the land being originally timbered, mostly with norway and white pine. One acre of land was sown to this crop, using barley as a nurse crop. The season was about normal, with some dry weather near harvest time. The barley was allowed to ripen and the result was that the alfalfa was a failure, although the ground had been previously inoculated. In 1907 the same field was plowed up and refitted, and again sown to alfalfa, this time without a nurse crop. A fair stand resulted this year, although there was a considerable amount of new grass with the alfalfa. Portions of this field which were well inoculated continued to give fairly good returns every year up to and including the year 1910, when the work at Iron River was transferred to the new Branch Station at Spooner.

Tests as to the value of lime and other commercial fertilizers in growing alfalfa were also made at this Station, but so far as could be judged liming did not prove to be of much benefit, probably because the applications were not heavy enough. The yields per acre were approximately

YIELDS FOR CUTTING.

Manure and no inoculation, 710 lbs. per acre. Manure and inoculation, 2590 lbs. per acre.

equal to what could have been gotten from medium red clover.

In 1908 we began experimenting with alfalfa on red clay soil at Superior. The land used was a good clover sod. The field was plowed the previous fall and the latter part of May it was disked up, well worked and sowed to alfalfa, using approximately twenty pounds of seed per acre. A part of the field was sown alone and a part with a nurse crop. Both lots were cut for hay. The same amount of hay was produced the same season on the field sown without a nurse crop as was produced where we sowed with oats, but the portion of alfalfa in the oats was rather small. The stand was not quite so heavy in after seasons where it had been sown with a nurse crop. A check plat was also left without inoculation and there the alfalfa was a poor stand. This field of alfalfa continued to give good returns until 1911. Three cuttings were cut every season except in 1910 when, owing to dry weather, only one cutting was secured. In 1909 the field was extended, sowing with inoculation and without a nurse crop on land which was in cultivated crops the previous season. A good stand resulted in this case also, and approximately one ton of hay was again obtained the same season as sown.

The results on Lake Superior red clay soil have been very favorable in this region, where the ground was well inoculated and the drainage good. It is also better to sow without a nurse crop. It is not necessary to apply manure directly to the alfalfa crop in order to secure a stand.

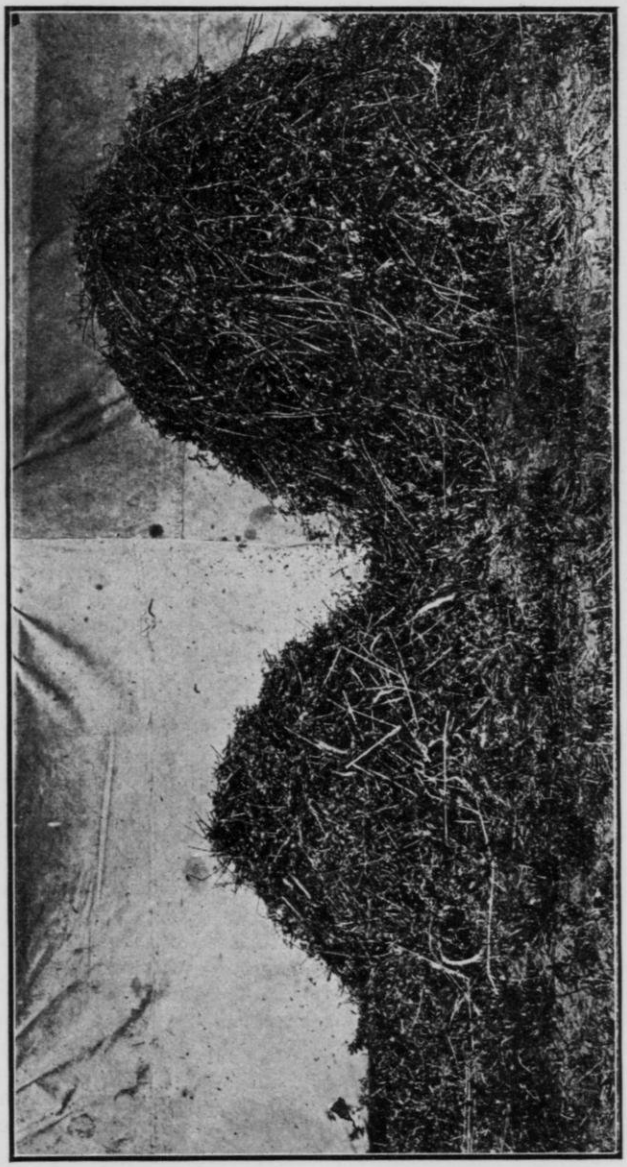
Last year, in 1912, we made a trial of the value of lime on a field which had been in mixed hay for over fifteen years. Apparently lime was beneficial in this case. The dry season may have had some effect on the results, however. The inoculated portions of the field were far superior to the uninoculated portions. No nodules were found on the roots of the alfalfa growing on the latter portion of the field.

In 1910 an experiment was started at Ellis Junction to determine the value of inoculation and of liming on light soils. The season was extremely dry, but in spite of that a good stand was secured with late seedings. Early seedings did not do so well. No hay was cut the first season, but the alfalfa was clipped back to keep the weeds down. The stand was equally good for all different treatments, but no nodules were found on the uninoculated portions, while they were found in abundance where inoculation had been supplied. In 1911 three cuttings were secured. The six inoculated plats gave an average yield as shown in the table.

Table I. Inoculation Experiments, Ellis Junction Substation, 1911.

	First cutting	Second cutting	Third cutting	Total.
	lbs.	lbs.	lbs.	lbs.
Inoculation....	2,316	500	1,454	4,270
No inoculation.	1,300	500	700	2,300

It will be noticed that twice the amount of forage was secured on the inoculated than on the uninoculated portions. In 1912 only one cutting af alfalfa was secured. The second crop was destroyed by grasshoppers. The uninoculated plat was completely run out. June grass occupied all the ground and only a few poor plants were found here and there. The inoculated plats came out through the winter in fair shape. A new field



YIELDS FIRST CUTTING.

No inoculation, 340 lbs. per acre. Inoculation only, 2600 lbs. per acre.

containing approximately two acres was sown at this Station in 1911 on a very light sand knoll. The whole field was inoculated in this instance and the greater part of it was limed. The unlimed portions were an absolute failure, while where the ground was inoculated the results were quite good.

At the Branch Station at Spooner a comprehensive experiment with alfalfa was begun in 1911 on new sandy soil which originally grew jack pine and scrub oak. In this experiment we tried to show the value of inoculation and to find out whether or not lime and manure were necessary to success in growing alfalfa. Results are given in the following tabulation:

Table II. Inoculation Experiments, Spooner Branch Station, 1912.

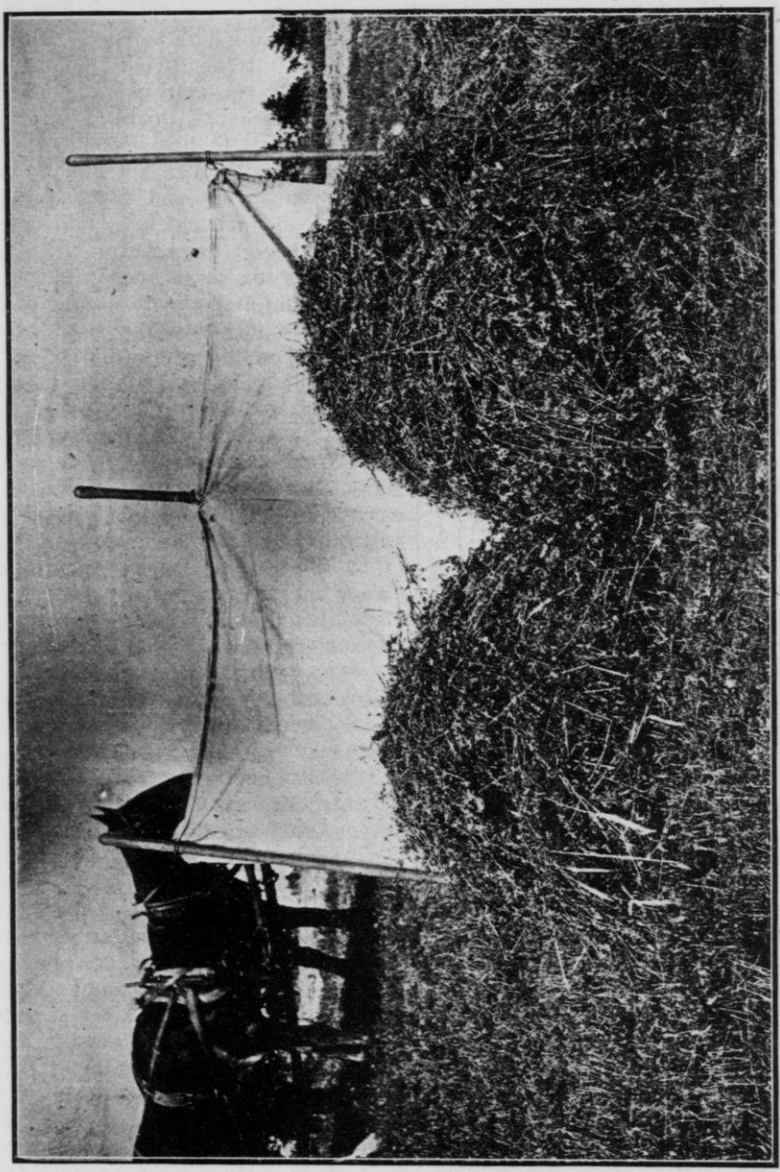
	Inoculated (lbs. per A.)	Not inoculated, (lbs. per A.)
No lime and no manure	2,600	340
Lime only	2,400	1,060
Manure only	2,590	710
Manure and lime	2,500	1,180
Average	2,522	822 5

So far as these experiments go, it is evident that inoculation is necessary for good results. It is also apparent that liming is beneficial, though not so necessary as proved to be true at Ellis Junction. Manure, while desirable, is not necessary to get started with alfalfa.

In 1911 a test was made on the Conrath Experimental field to determine the value of lime and inoculation in getting a stand of alfalfa. The test was made on a piece of land which was in potatoes the previous year. The land was plowed up and given a dressing of manure. One-half of the field was limed and the other half left unlimed. The alfalfa was sown early in June and early in September something over one ton of cured hay was cut per acre the same season as sown. There was a considerable difference between the alfalfa on the inoculated and uninoculated portions the first year, but no difference could be noticed between the limed and unlimed portions. No nodules were found, except where the land was inoculated with soil. In 1912 three cuttings, yielding something over three tons per acre, were obtained as an average for the entire field. The soil inoculation plat yielded about fifty percent more than the uninoculated plat. There was only a slight difference between the limed and the unlimed portions of the field. It is barely possible that the rather heavy manuring somewhat obscured the effects of liming for the first season. If that is the case, then next year or in subsequent seasons, this difference should come out distinctly.

Tests were also made in co-operation with numerous farmers throughout the northern part of the State. Between seventy-five and one hundred farmers co-operated in this work. Wherever a check plat was left, the reports in nearly all cases were in favor of the inoculated portions of the field.

Experiments to further demonstrate the necessary inoculation and liming are planned for this season, the same to be made in different localities throughout the northern part of the State. While we do not claim to have found out every fact in connection with alfalfa culture, we feel safe in recommending soil inoculation, except perhaps in a few places where sweet clover is found growing wild. Liming, we think, is also beneficial in most soils of northern Wisconsin



YIELDS FIRST CUTTING.

Lime only, 1060 lbs. per acre. Lime and inoculation, 2400 lbs. per acre.

in growing this crop. A possible exception to this is the red clay belt of soil along Lake Superior. On most central Wisconsin soils, we think that liming is one of the necessary requisites. Good drainage, of course, is essential to success. With proper soil inoculation, the use of lime when necessary to correct soil acidity, land free from grass, a moderate supply of humus, good drainage and good seed, we think by far the greater part of northern Wisconsin will grow good alfalfa.

DISCUSSION.

A Member—Is it a good idea to use commercial inoculation?

Supt. McKerrow— Mr. Delwiche does not mention what was used, but I think he has told me it was all soil inoculation that gave these good results. It is possible some of these Institute workers know.

The Chairman—He was with us at an Institute and told us it was all soil inoculation. He had his chart at the Institute.

Mr. Ivey—By using that same mixture, 16 to 1, it will kill off the grasshoppers and it should be done as soon as there are many in the field, because as soon as the little shoots are out of the ground at that season of the year, the grasshoppers will take them off and the shoots will have to start over again.

A Member—In our locality, the first year it will get up about seven or eight inches high and turn yellow. What do you suppose is the matter with that ground?

Supt. McKerrow—There may be nothing the matter with the ground, but a shortage of nitrogen to start it properly. The matter is with the bacteria that is not there, he has not moved in. There must be the bacteria that lives in the nodules and feeds nitrogen to the alfalfa root, which draws the nitrogen from the air in the soil and feeds it into the plant, and if it does not thrive, it proves that the bacteria has not moved in yet. It takes time to get him there, unless you go out and gather in inoculated soil and put it on that field.

A Member—I have never had any trouble for ten years and no inoculation, and the first growth was as high as fifty-two inches, while right over the fence, on the same kind of soil, this incident happened that I just spoke of.

Supt. McKerrow—This question of inoculation does not bother a great many Wisconsin farmers. It bothered me and I do not know much about it yet, but I have some ideas and we all ought to have. Some twenty years ago, when I first sowed alfalfa on our clay soils in Waukesha county, it did not grow very well the first year, it turned yellow and I thought the soil was too heavy and it would not grow there. About that time Prof. Henry announced an experiment that they had tried on the farm at Madison, in which he said the alfalfa did not do very well and he advised the Wisconsin farmers to stick to clover. I thought that was all right, and I happened to go into Sheboygan county, where I found a farmer who was growing alfalfa on clay soil. I did not like to go back and tell my wife I had found a smarter farmer than I was; I went into Canada and I found alfalfa growing on heavy clay and I did not want to go home and tell my wife I had found a Canadian farmer who was smarter than I was, so I made up my mind I would try again on the clay, and I did so and it did better, until now we have eighty acres on our farms. But I will tell

you what I think helped a good deal. We have been sowing a pound or two of alfalfa seed to the acre with all our clovers, until now we have no need of inoculation, and I would advise every farmer to do the same. Many are doing this.

I have been asked about this this winter at a great many Institutes and for three or four years, since this inoculation theory has been working with the farmers, because there are so many farmers who will not take the trouble to get a little soil and put it on their fields. If there is not a good field of alfalfa in their own neighborhood, they will not take the trouble to send away, but I have found that practically every one will buy a little alfalfa and mix it with his clover and he keeps on doing that, pretty soon he can have good fields of alfalfa. We have them all around in our neighborhood, where, if I had been talking about it at that time, I would have said alfalfa was a failure. I really thought our clay land was too heavy, but if we have humus enough in the soil and there is sufficient nitrogen to feed that plant without drawing on the air until it develops its own bacteria, then I believe we will get it. The sweet clover that grows on the roadside will help you, put some of that on your field.

A Member—About how much soil should I sow on a small piece of field that has not done so well?

Supt. McKerrow—Go to a field where it did well and put on two or three hundred pounds per acre and harrow it at once after sowing.

Last Monday morning my youngest son said to me (he had argued with me before when I had said that well cured alfalfa was as good as bran to feed, he said I was a little off"), but last Monday morning he said to me, "Dad, I guess you are right, because the lambs agree with you. Those little lambs, from three to five weeks old, will leave the oats and bran and corn meal and oil meal as soon as I put the alfalfa in the racks and will go right over to the racks and eat it." I went down with him to see if it was actually so; he put the grain in the trough for those little lambs and they rushed in there, fourteen or fifteen of them, and began to nibble at the grain; then he put some of the third growth alfalfa in the rack and all but one left the grain trough and went over to eat that alfalfa, the same as this sample.

A Member—How was that cured?

Supt. McKerrow—It was cured in the shade, in this sense, we do not use any caps. This alfalfa was cut when the dew was off and the same day when it was partially withered, it was put up in narrow, high cocks. We have a side delivery rake, also a curved tooth ordinary horse rake, and we use that always, unless I find the alfalfa gets a little too forward before we get it cut. We rake it up in small windrows, so that a mower width can be taken up and laid on this cock, thus building it up in layers. It is green and heavy. We do not want those leaves to get dry and fall off, because they are the best part of the alfalfa. Then again, before the leaves are dry, they are still the lungs of the plant and can throw out moisture. We cock it up, it is only a little wilted, not dry, then the leaves throw out the moisture from the stalks and when we open it up two or three days afterwards we find it quite damp. We open it out by throwing it to the sun and air until the sweat is gone, then we take it into the barn. We used caps some years ago, but they were considerable trouble and we cannot rush the work

as fast. I have samples here of our alfalfa, second and third crops. He put in some of both kinds to show the difference and I think the difference is that on account of rain this particular piece from the second crop did not get cut for four or five days after it was at its best, while this third crop was cut, I think, at its very best, just as the first blossoms showed. We have two ways of watching our alfalfa for the time to cut, one is when the first blossom shows, when there are a few blossoms here and there, and the other way is when the second growth is starting from the crowns. Sometimes the buds will start from the crown before you see enough of these blossoms to decide, but whichever ones comes first, then is the time to cut, because then you are getting it at its best, and then you are not going to cut off those buds and set your crop back a week or two to start another crop of buds.

Mr. Clark—You said you sowed about a pound to the acre to inoculate the land and left it three years. Is it necessary to leave it three years?

Supt. McKerrow—Most of ours is only left for two years. Sometimes it is there a third year when we use it for pasture. The first time I sowed it, it was to fill in, and it did fill in the blank spaces, it is as good as timothy for that.

A Member—Will it do as well to sow in clover with a short rotation?

Supt. McKerrow—Not so well, perhaps, but still these odd plants growing in among the clover will help the inoculation, so you will realize it by the time you get the second crop of clover.

Mr. Jacobs—It has been stated by some of our experimenters that in sowing alfalfa with the clover crop and plowing it up year after year, we will not get it in that way.

Supt. McKerrow—I have seen those roots inoculated after two years. For two or three years at these Institute meetings I have asked the farmers how many of them had grown alfalfa successfully, and I am going to ask that same question here. Good, possibly twenty-five. Now how many of you have inoculated? Four have inoculated. That is about the percentage I find all over the southern part of Wisconsin. Nearly all of them who are growing it are growing it without inoculation, but at the same time that does not condemn inoculation, because I think the large proportion of those who are growing it will acknowledge that their alfalfa developed very slowly. But again, there is a difference in soils. I have seen some soils where I could not see that any inoculation had got near it where the alfalfa started right up and kept growing. It always grows better after the second, third and fourth years.

A Member—We inoculated ours by sowing a pound or two of seed with our clover.

Supt. McKerrow—That is a good plan, but it is a still better plan to take some of the soil from a field where alfalfa has grown for several years.

Mr. Convey—There was a time in this country when we could not grow our clover satisfactorily on account of the fact that there were not the bacteria in the soil to stimulate the clover growth. I heard of that in Minnesota. I feel satisfied that once alfalfa is quite generally grown throughout the country there will be no need of inoculation. We have not inoculated ourselves, except in the method of sowing a few pounds of

seed in connection with our clover seed. I noticed that on timber land in the very beginning it did well where the land was quite rich, and I am sure that is the best way to inoculate for us. I believe you will even get better hay from that practice. If I wanted to have good results quickly from sowing a small acreage, I would use the soil inoculation, but not go to much expense to get it.

A Member— I saw in Hoard's "Dairyman" that a man who is raising alfalfa and feeding it to his cows can put the manure back on the ground where he wants to seed to alfalfa and it will inoculate the ground and it is as good for the cows fed as hay as to be pastured.

The Chairman—I do not know about that. We have been feeding it on our farm for fifteen or sixteen years and applying the manure right back, and I find I can seed alfalfa with my grain crops and get a great deal better catch than I could with my red clover. The first season we threshed forty-five bushels of barley, sowing two bushels, and got a crop of alfalfa the same year. I think that was largely because we had been feeding alfalfa so many years.

Supt. McKerrow—The fellow that tells the last story always can get it a little the biggest.

A Member—Then I want to tell one. I sowed an acre of alfalfa, about my second trial. I bought twenty pounds of seed, but I only got nineteen on. I sowed it with one of these hand shakers and I had a pound left. After I got that ready I sowed a bushel of barley by measure. It had been well fanned. I threshed out of that bushel of seed 42½ bushels by the bag, and the bags over-run a little bit, and I also got a good, big, stout load of hay later.

Supt. McKerrow—I am not going to try to tell a bigger story, but this matter of the amount of seed to the acre is a matter of interest to us. We are changing our ideas somewhat about that. I can remember when Governor Hoard stoutly advocated thirty pounds of seed to the acre, and I advocated twenty. Now I begin to think that with a good seed bed and soil that you know will grow alfalfa, that less than twenty pounds may be all right. Mr. Ivey said five pounds on his sand land. Now, I would not want you farmers to go home and try it by seeding five pounds because Mr. Ivey is a good, honest looking fellow and you believed what he said. Yet do not go home and be satisfied with five pounds to the acre, because on your clay land, if you want to grow a fine hay, you will find your plants will be too far apart and you will get the hay too big and coarse. I want a good-sized root and that is why I stuck to twenty pounds, and yet we have got down to fifteen. I want it thick enough so the hay will be fine stemmed. Where we find it is a little too thin in places, it has bigger stalks, and then the lambs do not eat up the stalks. Mr. Ivey is growing for seed, remember; we are growing for feed, and that is different.

The Chairman—We have seeded with ten pounds and got three cuttings. On one of these pieces we cut seven and one-half tons to the acre. We cut it this last year four times.

HAY MAKING.

Thos. Convey, Ridgeway, Wis.

The quality of coarse food depends so much on palatability and digestibility that remarks along that line are in order. The vital questions are not, how much dry matter do they contain, but rather, what necessary elements do they contain and what is the percentage of digestibility. Unfortunately, those hays containing the most valuable elements in largest quantity are the most difficult to cure in proper condition.

Leguminous hay is seriously damaged by getting overripe, by needless exposure to sunshine or external moisture, by fermentation, when it causes discoloration, as good hay should be green in color. Other food stuffs are damaged by those conditions, but the legumes most of all. Protein in a food is very sensitive to faulty conditions, the palatability is decreased, but the digestibility suffers most.

The loss with other foods from the causes spoken of are very large. This is especially true of corn fodder and ensilage. Heating that causes discoloration is an avoidable as well as a damaging condition. If you have to buy hay of any kind, avoid the overripe, bleached or mow-burned kind. It may reduce the value from twenty-five to fifty per cent.

The farmer who waits until after the Fourth of July to begin haying, especially in the southern half of the State, cannot expect to have good hay, as even timothy is overripe, allowing this hay to remain in swath twenty-four hours to get ready for loader, the usual practice, and it represents about half the value of a hay cut in time and cured in the right manner.

Acreage Mixed.

The largest part of our acreage is mixed hay; alfalfa, five pounds; red clover, three; alsike, two and timothy, two, making twelve pounds per acre. I am aware that some would object to the mixture, because they do not mature at the same time. The first crop is cut when the red clover is in full bloom and later crops when the alfalfa is fit. Our object at first was to get alfalfa established, but it does better than expected and makes more and better hay than any system we have ever tried, except all alfalfa, and the former is better in a rotation.

Curing the Hay.

The following manner of curing hay has given us the best results. Start about eight or nine o'clock, as you cannot afford to lose time to let heavy grass dry off when hay is fit and weather is good. The tedder is used close after the mower. This leaves the hay in better condition to dry out either external or internal moisture. Hay cut after two o'clock is not tedded until next day, early. What is cut before two o'clock is put up the same day. This is carefully built, not rolling it together, but placing forkful after forkful as high as it will stand up well. It is about half cured and will stand an ordinary rain without damage.

We continue cutting and putting up for two more days. To determine when the first cut is likely to be fit to bring in, lift on fork. If too heavy for hay, it may have to be left longer, but if more than three days altogether it is safer to move hay to

prevent damage to growing crop. This is best accomplished by placing fork in bottom of pile and drawing to one side. Rebuilt hay will not shed water. If not perfectly dry when hauling, it is safer to set out a forkful in a place. A half hour drying will be sufficient. After early part of season, much less time is needed in curing.

Alfalfa is no more difficult to cure than clover. We have used hay caps, but have been able to cure good hay without. A loader is not used here. If a loader can be used where hay is set out by the forkful, I would not object, but if it has to be exposed until leaves and blossoms are lost, I cannot afford to use it.

We have had all kinds of trouble unloading hay with a steel track, a heavy load and something would happen. A wood truck has been in use for over thirty years and no trouble. The steel track has been taken out.

Good Hay Appreciated by Wise Feeder

The use of good hay is appreciated by the feeder who expects to get results. Less of it is needed, also less grain. With poor quality, coarse feed, it is impossible to keep stock in prime condition. Generous grain feeding does not overcome the difficulty. The digestion is overtaxed by an excessive amount of crude fiber. Even grain may not be utilized to the best advantage under those conditions.

Diminished milk flow, small amount of growth, harsh hair and unthrifty appearance are some of the conditions brought about by moldy or mow-burned food, and, in some cases, a deceased condition, retention of placenta, is one of the ailments due to its use. A succulent food, such as ensilage or roots, in a measure helps to alleviate the trouble, but it is better to avoid the cause.

Alfalfa is unquestionably the best hay for all kinds of stock and in a few years Wisconsin will make more out of it than any state in the Union.

A ton of alfalfa is worth twice as much here as in the far west, because we market it in the dairy cow, that gives the largest returns for food consumed of any animal used as an adjunct to agriculture, not even excepting the hen.

DISCUSSION.

A Member—Do you cure clover hay the same as alfalfa?

Mr. Convey—Precisely. You may need a little more time to do it.

A Member—How long can you leave those hay cocks on the ground?

Mr. Convey—In three days it will be better to move the pile.

A Member—What objection have you to alfalfa in a three-year rotation?

Mr. Convey—Because it will not get even the two years' growth and it is not at its best. While we have been following the three-year rotation for thirty years, we are going to let the alfalfa stand for three years. It is quite difficult to plow, but we can overcome that difficulty.

A Member—Can you pasture that mixture that you say you have with alfalfa in it?

Mr. Convey—Yes, taking one precaution, that when there is a rank growth of the second crop, particularly in warm weather, you allow the stock to run on it, if it is making a rank growth and is watery it is exceedingly dangerous, liable to bring on bloating. We never have had any difficulty with clover, but we have had difficulty in turning them in on

soft alfalfa. Do not leave them in more than an hour at a time and it will not do much good to feed any dry feed, because they will have bloat from over-feeding too large an amount of green feed in that condition.

Mr. Imrie—Where I sowed about one and a half pounds of alfalfa with the clover, do you think there would be any danger?

Mr. Convey—No, I would not think so, except that there might be a portion of it where it was practically all alfalfa.

Mr. Imrie—It is pretty well distributed.

Mr. Convey—You have got to look out. You had better watch and if you see evidences of bloat take them out. We saw evidence of bloat and some of them died, then we were sorry we did not get them out in time. Of course there is less danger with a mixed crop than with a straight crop.

Now, a great many people think alfalfa will not bear pasturing, but two years ago we pastured the previous year's seeding, allowed the horses to run there until practically winter time. A good deal of the clover was killed out, but the alfalfa stood that severe pasturing. We thought it was best to preserve it for the hay crop the following year, and it made good hay, so it will bear pasturing without a question.

It used to be that I heard so much about people growing alfalfa, still there were so few that were successful I was afraid to sow straight alfalfa, but I thought I would sneak in some with my clover, and I began by putting one pound in and then I got up to five pounds. The first crop seemed to be nearly all clover, but the second crop is heavily alfalfa. We raise it with a grain crop.

The main thing is to have your land in fine condition, have your land as free from weeds as you possibly can, and you can grow alfalfa all right. I believe my biggest mistake was in not starting twenty years ago instead of seven years ago. It is the most important crop to be grown in Wisconsin and when we put up ensilage and grow alfalfa, we will surprise the world in the feeding of dairy cows particularly.

A Member—What method is used in making ground alfalfa?

Mr. Convey—It is kiln dried and ground.

Supt. McKerrow—A good deal of it is ground from the first crop; it grinds better than the second crop.

A Member—Mine was so coarse I thought it would be an advantage to grind it.

Mr. Convey—You will have no difficulty in getting stock to eat it, unless you let it get over-ripe. Hay that heats up to cause discoloration loses all the way from one-third to one-half its food value. It is like eating skim cheese, it is about the same as eating over-ripe hay, or mow-burned hay. Any of those conditions will damage hay, and putting hay in the hay shed, or in a stack where it is subjected to light and moisture, and the atmosphere, it comes to be just an imitation of hay, there is very little feeding value in it.

A Member— What do you think about pasturing it?

Mr. Convey—I believe it is very much better not to pasture if you are expecting the best results. This year we have seventy acres of last year's seeding. We allowed no more running than we could help on it, because we know we will get better

results from it if the ground is not trampled. I am sure it is better for either clover or alfalfa to have no tramping on it.

A Member—Isn't the dry hay, if it is cut in time, just about as good as the pasture, anyway?

Mr. Convey—No, there is nothing equal to the plant just as it comes from the field. There is no more comparison between cured hay and green grass than there is between green and dried apples.

The Chairman—My experience is that if you take your alfalfa, have your succulent feed, with well cured alfalfa, and feed it in the barn, you will produce more milk than you will on grass.

Mr. Convey—I know quite a number of people turn stock out on the pasture, where they have to rustle around and run themselves till they are tired out to get a living, but where stock have green forage as compared with dry forage, I know there is more digestibility, and that we are able to get better results. I know you can feed grain and hay, and in connection with that have the cows on pasture, and of course you will get better results than if you are depending on the pasture alone, but green pasture is much more digestible than the dry forage. Ensilage is better than dried corn, but not as far as green feed is concerned, because you lose from six to eight percent of the digestibility of the feed in curing it.

Supt. McKerrow—I want to say a word concerning pasturing alfalfa. We have lost a few dollars for ourselves pasturing, and that is one reason why I do not advise sowing more than a pound or a pound and a half to the acre in sowing with clover, because so many people pasture their second crop of clover, as we do. One year I think we got in about two and a half pounds, it grew remarkably well, and it cost us a few sheep. We have had no trouble where we mixed in a pound or a pound and a half to the acre. You can pasture alfalfa if you let it get a good growth first, but when it is young, only three, four or five inches and very sappy and green, it will cause the cattle to bloat very quickly.

Now, in regard to what my friend Gov. Hoard says, that it is as good dry as green. In one sense it is, in another sense it is not. This applies only to alfalfa, not to clover. Mr. Convey is correct, you cannot feed green alfalfa to either cows or sheep in sufficient quantities to get the best results, but you can dry that same green alfalfa into hay, and if it is cut at the right stage you can feed it in large enough quantities to show wonderful results, because it would be dangerous to feed it green in sufficiently large quantities, but when it is made into hay it will not cause bloat. I never lost any cattle or sheep yet from bloat on dry hay, although it was made just as good as can be. In that sense Gov. Hoard is right.

A Member—What do you do for a critter that is pretty well bloated?

Supt. McKerrow—If it is a very bad case, we use a trocar and tap right away. Sometimes when we see a cow is just beginning to show that she has got too much alfalfa we give her a dose of saleratus and water, but the cases that have got bad, the only safe thing to do is to tap.

Mr. Convey—A very efficient remedy is to give a tablespoonful of dry gun powder. It should be put in a long-necked bottle and placed well back in the mouth. If they are unable to swallow it will do no good.

Adjourned to 7:30 p. m., same day.

EVENING SESSION.

The convention met at 7:30 p. m. same day, Supt. Geo. McKerrow in the chair.

THE FARM HOME AND THE PEOPLE IN IT.

Mrs. Elizabeth Clarke Hardy, Red Cedar, Wis.

Mrs. Hardy.

I am to talk to you this evening about the farm home and the people in it. You have heard the other speakers talk about the raising of better crops, the breeding of better stock, the conservation of the soil and other out-of-door interests, but, after all, it is to the home that all these industries are contributory.

The Home a Primal Institution.

The home is a primal institution. It was the homing instinct that first led primitive man and woman to set up housekeeping together, and sent the man forth to bring home the spoils of the chase, while the woman kept the fire of sticks burning under the shelter of a rock.

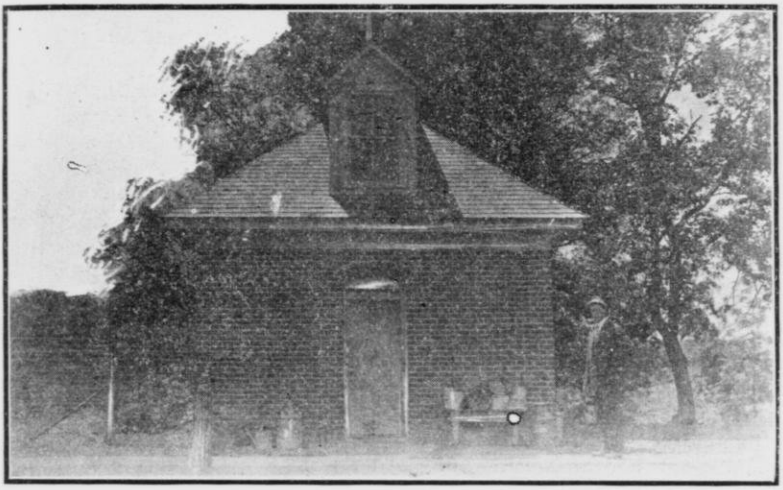
Since that day the desire to possess a home seems to have been growing stronger in the hearts of all humanity, until today the surface of this old earth is lined with paths worn by the feet of men and women and little children, and in every nation and country these paths lead up to the door of a home.

And it is good that this is so, because the home is the crystallized center of the civilization of this world, and every nation on earth owes its prestige and its prosperity to the homes of its people. The home is the "fatherland of the heart," to which we all turn for our greatest earthly happiness, and so I think I may be pardoned for saying that the farm home and the people in it is the most important topic to be discussed.

And agriculture is the only natural vocation of mankind. All other occupations are artificial. When God created man and woman he placed them in a garden, because he knew that was the best place for them to live and work, and even when Adam lost his position as head gardener in Eden, it seems the Creator did not consider that his disobedience merited the punishment of his being condemn-

ed to live in a city, he simply was turned out of Eden and told to go farming on a larger scale. And this very heritage of labor, which has descended to us from Adam, has proven one of the greatest blessings ever bestowed upon humanity.

It seems hard for people not personally acquainted with present conditions of farm life to realize that of all vocations in which mankind is engaged none have made such marvelous progress in the last decade as that of agriculture. But you can no more compare conditions of farm life today with what they were even twenty years ago than you can compare conditions of town life with what they were before the day of electric lights, steam heat, the trolley car and other modern improvements.



Separator house at Sunny Brook Place, home of J. M. Hardy, Red Cedar, Wis.

A Tribute to the Pioneers.

It is not with shame but with honest pride that we farm people look back to the wholesome privations and the independent self-denial of the men and women who pioneered the way to the splendid prosperity of the agricultural districts of this generation. In these humble homes were reared many such men as Lincoln and Garfield, and it was this very poverty and self-denial that has given the men and women of the farming districts the strength of character and the moral fiber to keep their feet on the earth, to earn before they spend, and to set a higher value upon permanent prosperity than upon mere pretention and display. We know that the men and women of the past generation never had the educational privileges that our young people have today, and yet, in the past we have had men of bright minds, large intelligence and wonderful ability, and we have had women capable of rearing and sending out into the world young men and women well equipped for lives of usefulness and honor. It

delights us to do honor to those old pioneers whose intelligence was larger than their education. You know you may educate a man, but you cannot endow him with common sense, and you may polish him, but you cannot rub into him natural ability, but when education and common sense come together the combination is admirable.

It is through the philanthropy of men of the past generation that many of our gilded youth of this generation have been privileged to receive an education, and it always irks us to hear some educated young person ridiculing the unlettered old farmer, for, as one writer has very aptly remarked, "In these days of educational skim-milk in fancy vessels it is a delight to wander into some old farmhouse and get honest cream from the same old crock."

Since the old days of the ox team and the log cabin, the farmer has been slowly but surely building upon the foundation laid by his forefathers. He has cleared and fenced and drained, and kept up the fertility of his soil. He has improved his stock, built roads and churches and schoolhouses. He has builded barns and granaries, and just as soon as he was able to do so, he has, in most cases, built for his family a comfortable, modern home and fitted it up with as many conveniences as he could honestly afford. And in all this he has had the loyal help and encouragement of his wife, who has had the good sense to know that the barns and granaries must come first, for in these he must house his stock and store the grain that is to furnish means to build the modern home. The wife and children in the average farm home have not been the over-worked drudges that some people profess to believe, but for the most part they have been cheerful and willing helpers, and I do believe that in the past, as well as the present, the farm home has been as comfortable and the lives of the inmates more wholesome and happy than the lives of any other class of working people. The family in the farm home live more intimately together and there is a greater community of interest than where each member of the family have separate and varied occupations. The husband and wife, and the girls and boys all have the same interests and are working together for the same end, and instead of being objects of sympathy or commiseration, the family, working together in the farm home, is the most fortunate of all the working people in the world.

The Dignity of Agriculture.

Today we may look with pride at the beautiful and fertile farms and the comfortable farm homes in the great State of Wisconsin. Anyone who reads the statements of ex-Secretary Wilson will better understand the dignity and responsibility of those who produce the products which feed the world. Mr. Wilson states that there can be no panic so long as the American farmer is able to produce good and salable crops. He also states that the farmer is independent of the banks, the money lenders or anybody else. He says that the farmers now have luxuries that no one would have dreamed of seeing in a farm home twenty years ago, and that the farmer is forging ahead, is putting his money away where it will be safe, and do the most good. Now I suppose I shall be accused of handing out "taffy" to the farmers, and so I want it understood that Mr. Wilson made these statements to a New York "Herald" reporter, and they were published in

that paper. I am telling this because I want to impress upon farm people the dignity and importance of their vocation, and I want them to live up to it at home and abroad. And I want to say to the boys here this evening that the farmer is a business man today. I want you to know that you do not have to leave the old farm for an opportunity to get on in the world. There are now opportunities for financial success bobbing up for the quick-witted boy, every day, on the farm, and you want to make up your mind to do some good, hard thinking for yourself, and when you see the newspaper cartoon of the old farmer with the wind blowing through his whiskers, you want to remember that it isn't your picture anyway, and another thing I want to tell you is, that the most be-whiskered man I ever saw was the editor of a city daily.

Corner of lawn at Sunny Brook Place.

The Real Aristocracy.

Another thing I want to say to the young people is that people who live lives of honesty and industry, who produce by their own labor something of value to the world, who live in their own houses and ride in their own carriages, are the real aristocracy of any country, and the average American farmer is that kind of a man.

We need to realize that the owners of the five million farms in this country represent the greater part of the realty of this nation, and that farm people who live up to their privileges also have responsibilities which they have no right to shirk.

With all the good things that have come to the farmer, they are still deprived of some things which rightly belong to them, and the most important of these is more and better educational privileges for our boys and girls. It is not right that we should be compelled to send our young people away from home in order that they may get the educational and vocational training that will fit them for a life of efficient activity. I am not finding fault with the average teacher in the

6,600 rural schools in Wisconsin, for I do believe the majority of teachers are sincere and conscientious in doing the best they are able with the inadequate training they have had, but do you know we are asking our rural school teachers to make brick without straw. To make efficient all-round men and women, children must be schooled in other things beside the three "Rs" of reading, 'riting and 'rithmetic; they must have the training of brain and heart and hand that will chart their lives into channels of usefulness and good citizenship.

In this industrial age you cannot separate hand work, brain work and culture, for all training must be for service. It has been said that a man is worth two dollars a day from his collar button down as horse power, but that all he earns in addition is based upon his intelligence. We want our farm boys and girls to have the trained brain and the trained hand, and this is the training that farm people should see to it that our rural schools are equipped to give. There are more than nineteen million school children in this country and our whole educational system is based upon the theory that all of these children will go through college, when in point of fact only two per cent of them ever enter college and ninety per cent leave school at fourteen years of age, and this is a mighty reason why farm people should rouse themselves to demand that more of the people's money should be appropriated to the improvement of our country schools. We want a school system that will educate our boys toward the farm, instead of away from it, and our girls toward the farm home instead of into some other vocation or profession. I do not think the farmers have given our Superintendent of Public Instruction the support he should have had in his efforts to make our high school course practical for active life, instead of simply preparatory for the University. It is up to the farmers to look into these matters and give their support to all efforts to make our school course practical for life work, instead of ornamental and superficial.

We want our boys to have the agricultural training that will give them an interest in their work on the farm, and our girls to have the training that will lift housekeeping and homemaking above the plane of drudgery, but whether this will mean a well equipped graded school in every township, or that our district schools shall be equipped for a course in practical agriculture and domestic science, is a question that must be threshed out by the united efforts of farm people and our educators, and it will be well for farmers to take an active interest in these matters before they are taken entirely out of their hands.

The School and the Home.

Then the school and the home must go hand in hand, and this is where the work of the fathers and mothers must come in. The woman on the farm never has much time to go out into the world to help smash some great wrong, but after all, it is the home influence that counts for righteousness in rearing children to good citizenship. And so, perhaps, the farm woman may be able to fulfil her destiny by doing the work that comes to her in her own home.

The farm home is the best place in the world in which to bring up children, not only to give them strong, healthy bodies, but to keep them mentally and spiritually clean. But the bringing up of children does not

belong exclusively to mothers. The father's influence and example is of the utmost importance, and every child has the right to have the right kind of a father. There is an old saying that "not all black sheep were born black." The black sheep becomes black several years after his birth, and more often than otherwise because his father did not keep close to him and give him the moral support of a clean, safe chum and companion. If the right kind of a father will keep close to his boys and insist on being their most intimate friend, he can rest assured that there will not be a single black sheep in his flock.

Sunny Brook Place, farm home of Mrs. Elizabeth Clarke Hardy.

What We Should Teach Our Boys.

One of the first lessons that children should be taught is that they must respect authority and obey the laws that govern the home and the State, and the child that has formed the habit of obedience at home will go out into the world prepared to obey the laws of the land. And we must impress it upon our children that this world does not owe them a living unless they earn it. We should tell our boys that the most successful business men, the great captains of industry, are the men who can go down into their factories or workshop, or out into the fields on the farm and do a better job with their own hands than any of their workmen, and that to make any sort of success in life they must be willing to give the best there is in them to their work, whether it is in the workshop, among the professions, or on the farm.

What We Must Teach Our Girls.

And we need to teach our girls that true culture is not simply an array of glittering accomplishments. The culture that is really worth while has to do with industry and neatness and kindness and courtesy in the home. It has even to do with the cleanliness of pots and pans and kitchen drain-

pipes, and we may apply its living principles to our housekeeping and homemaking, as well as to things in the social world. True culture touches the home life at many points, and makes it broader and richer, and it enables the homemaker to bring her highest intelligence to bear upon her household problems.

Women are said to be the keepers of men and every normal woman expects sometime to have a home of her own, and while we know that accomplishments are good, and I think there should be music in every home, if I was a young man and had to choose between a girl who could play the piano and one who could cook, I would take the one who could cook every time. It is possible for a man to exist without music, but he has to eat his wife's cooking three hundred and sixty-five days in the year. I think it is going a little too far to say that the way to a man's heart lies through his stomach, but it is true that the pit of a man's stomach lies very near to his soul, and for this reason we women should be pretty careful what we feed the average man.

While I believe in womanly progress, and while I am glad that so many avenues of industry are now open to women, I believe this old world would wag along very comfortably if there never was another woman lawyer or doctor or platform speaker, but the need of these times is for broad-minded, intelligent women in the homes of this country, and our girls need to be educated for housekeepers and homemakers above all other professions.

The Farm Home is Not Degenerating.

Now, every once in a while we hear that the American home is degenerating. While this may be true of homes in the larger cities, there never was a time when so much attention was given to home environment among farmers as at present. All over this country earnest, thoughtful men and women are beginning to realize that the eyes of the world are turning to the farm homes for the coming men and women who are to preserve the integrity of this nation, and they are doing their best to uplift the standard of right living in the farm home.

Not All Boys Are Leaving the Farms.

Then again we hear that the boys are all leaving the farms and entering into some other vocation in the city. You know some people are always looking for trouble, but you want to remember that because a boy was born on a farm it does not follow that he must be a farmer if all his inclinations lead to some other vocation. I am always glad when some farm boy makes a place for himself in the world that causes people to sit up and take notice, but not all our boys are leaving the farm. Every year hundreds of our best and brightest boys are flocking to our College of Agriculture to gain the knowledge that will fit them to go back to the farm and make a success of farming.

And right here I want to say to you farmers, if you want your boys to take an intelligent interest in their work on the farm, you want to let them take advantage of what is offered them in the Short Course in our College of Agriculture. Let them go down to Madison and see for themselves that there are men of the very highest intelligence who are devoting their whole lives to the interest of farming and who think it worth their

while to investigate and study and experiment to uplift and give dignity to the vocation of the tilling of the soil. Let them fit themselves to go back and give the old farm a fair deal, that is the best way I know of to keep the boys on the farm.

It is not true that boys and girls are leaving the farm because the farm home is not made a pleasant place to live in. I know that the average farm home is just as pleasant and just as comfortable to live in as the average city home. We farmers do not have to move to town to find things that make life worth living, for the town has, practically, moved out to us. The telephone, the rural delivery, the parcel post and the trolley have brought the town and the farm close together, and when we consider the work in the fresh air and sunshine, with the beauties of nature all around us, and the wholesome living we always have on the farm, then the difference is all in favor of the farm home. And right here I want to say that since the advent of the rural delivery, I know of many farm homes that are better supplied with reading matter than the average city home, and that you will find better read people in farm homes today than you will find among working people anywhere else.

The Woman in the Farm Home.

I have visited in a little sod dugout in western Kansas, and in farm homes in Nebraska, Minnesota and the Dakotas; I have been in the homes of well-to-do farmers all over the middle west, and in many homes where the means were limited, and in all of these homes I have found bright-minded, intelligent women, whose loyalty and devotion to their homes and families entitled them to a place among the honor women of the world. I have found them financing their incomes with a wisdom and a thoughtfulness for the best interest of those dependent upon them in a way that should win for them the respect of all thinking people, and, as a rule, I have found them contented and happy in their work in the farm home. And I want to say to you farm women here this evening that you have no reason to feel either humiliated or embarrassed by the uncalled for sympathy of people who do so love to pose as missionaries to farm people. You may not enjoy being told that farmers need to be trained to make good husbands, and you may resent seeing them lined up like a class of delinquent school boys and berated because they decline to live up to a lot of beautiful but wholly impossible theories, but it is a fine philosophy that enables anyone to sift out the chaff from the wheat and then scatter the chaff to the four winds of heaven.

Life in the Farm Home Should be Simple.

Now, I am not here this evening to tell farm women how to furnish their homes, for the reason that in some farm homes I have visited I have found college graduates, in others ex-school teachers, and in many high school graduates, and from my acquaintance with them I am convinced that the average farm woman is capable of solving her own home problems, and so I only want to talk over these things in a general way.

On general principles, I think the farm home should be simple and wholesome. I am glad the old-time, shut-up parlor is a thing of the past and that the big, comfortable living room, where sunlight and fresh air

have free access and where every member of the family may feel perfectly at home, has taken its place, and I think this room should be furnished with plain, solid, well-made furniture just as good as we can afford, but not too good for everyday use. It is interesting to note that the trade journals state that country people are buying a better quality of everything than ever before, and particularly in the buying of furniture is the change noted. Cheap furniture is dear at any price, but it took people a long time to find it out. If we buy fewer things we can buy better things, and money paid for good, substantial furniture is never wasted. It not only lasts longer but it will be in style a hundred years from today, just as much as it is today.

You know William Morris says that "simplicity even the barest, is not misery, but the foundation of refinement," and I do think we women are too often a slave to our furnishings. I believe if we would screw up our courage and rid our rooms of the accumulation of junk that is neither useful nor ornamental, if we would make a bonfire of the dust-catching bric-a-brac and the jimcracks that wreck our nerves and distract our souls, we would have more time for the things that are really worth while. I know it takes a good bit of courage for a woman to smash her household idols and stamp her individual simplicity on her home, but this very simplicity would be the salvation of many American women from nervous prostration, not only in the farm home but in the town home as well.

Labor Saving Utensils in the Home.

I think it is a good plan to take the money saved from things that are neither useful nor ornamental and invest it in labor-saving kitchen utensils. Every woman who keeps house has a right to all the good, practical labor-savers she can get hold of to lift her work above the plane of drudgery and make it pleasant and interesting, and I do not think she needs to wait for her husband to find out what she needs and get it for her. The wife is the business partner in the matrimonial firm and it is up to her to see that she has her share of the family income to use as she sees fit. A man does not wait for his wife to see that he needs new farm machinery, and a woman has the same right to use her own gray matter to better conditions in her own particular sphere of action. I think a woman is actually wronging her husband when she exposes him to the charge of stinginess and selfishness by failing to provide herself with the necessary working tools, for more often than otherwise she would get them if she asked for them.

I am happy to say I have never invested any money in a red plush parlor set, but I have just as good a range as I could buy and plenty of porcelain and aluminum cooking utensils. I have a bread mixer, a cake mixer, an oil stove and a fireless cooker and out in the separator house there is a gasoline separator that separates the milk and churns the butter for family use, and while I have been very careful not to invest in any so-called labor-saver until I had thoroughly tested its merits, I find those I have are very important factors in lightening household labor. And so I would say to all housekeepers, "Go thou and do likewise."

Now I expect you are all growing tired, but I must not neglect to say something about a bathroom, for, not-

withstanding all we hear to the contrary, the average farmer does appreciate the luxury of a bath, and clean linen. Of course, when we build a modern house we can have an up-to-date bathroom, and I know of many farm people who have, but the most convenient bathroom I ever saw in a farm house was evolved by the farmer's wife, herself, out of a little eight by ten bedroom off from the kitchen. She had a hardwood floor laid in this room and papered it with enameled paper. She sent away to a mail order house and bought a good porcelain lined bath tub with nickle fixtures for seventeen dollars, and installed it in her bathroom. Then, instead of the ordinary bowl, she bought a four-foot porcelain lined sink and furnished it with two enameled wash bowls. She had a plumber come out and fit up this sink and the bath tub with trap and pipes that let out through the side of the wall and the water was carried away through galvanized iron pipes. There was soft water in this house and here, just off from the kitchen, where it was convenient for the men coming in from the field, was a bathroom that was a means of grace to the whole family. You know that just in proportion as we set up standards of refinement in the home will its inmates grow to be refined and gracious of character, and the influence of such a home will reach out and shape and mold the lives of those who go out from it into the world beyond.

Farm People are Fortunate.

It seems to me that the most fortunate man on earth today is the one who owns a few acres of God's beautiful out-of-doors, and that we farmer folk should try to make our home premises just as attractive as possible, within and without. Every farm home should help to make a country beautiful, instead of being a blot upon the landscape. It does not cost much to seed a lawn and plant shrubs and flowers to beautify our home surroundings, and just in proportion as an attractive farm home preaches the gospel of thrift and industry and refinement, just so will the run-down, grassless, treeless, flowerless farmstead have a depressing influence on the family reared within its walls, as well as upon every one in the community.

And we farm people should take an active interest in the social center movement. We need to have a friendly interest in our friends and neighbors beyond our own home circle, and the social center, whether it is in the church or the schoolhouse, is certainly something worth working for.

You know Pastor Wagner has told us that the ideal society is close around us, and if we would have delightful companions we may find them in our neighbor's houses, but while we realize that the city has some desirable things to offer us that we are deprived of in the country, the fact remains that we farm women are not pining for social pleasures. We have learned to love the broad acres of our fertile fields and fragrant meadows, and instead of the terrible isolation of which we hear so much, we love the green lanes and the interspaces between our farm homes are the best of all.

In the great, wide, beautiful country we live close to nature's heart and the soul has a chance to grow, and that is why you will find so many large-hearted, big souled men and women in the rural districts. And

beside all this, we know that we may, if we will, gather into our farm homes all the essentials for right living and all that makes for the highest and best in life.

The Millionaire's Dream of Happiness.

The story is told of a small boy who once lay under a tree on his father's farm and digging his heels into the ground he said, "When I'm a man I'm going away from this old farm, where I never can see anything but horses and cows. I'm going to the city where I can make piles and piles of money."

Later in life, when this boy had grown old in money-making and had piled up his millions: "What are you going to do with it all," he was asked. With bowed head and in a low voice he answered: "My dream of happiness now is to go back to the country and get me a little farm, where I can keep a few cows and horses and have a little time to look at them."

Piano solo, Miss Viola Bunker.

Reading: "What William Henry Did," Miss Rachel Jackson.

Vocal solo, Miss Vesserly.

Adjourned to 9:00 A. M. next day.

THIRD DAY, MARCH 20, 1913.

Morning Session, 9 o'clock.

The convention met at 9:00 o'clock A. M., Mr. David Imrie in the chair.

MORE HORSES ON THE FARM.

Supt. Geo. McKerrow, Madison, Wis.

It may seem a little strange that this subject is worded as it is: More Horses on the Farm. There may be some farms in Wisconsin where there are too many horses. Less than twenty years ago, there were many farms in Wisconsin that had too many horses and horses were so low in price that the surplus could not well be disposed of, and a good many horses, especially of the poorer classes, were eating their heads off while they were waiting for a market.

It is not so today. Many Wisconsin farmers are having to buy horses, so there are not enough on the farms in that sense.

Now, why are they buying horses? Because when horses were so low the farmers became disgusted with the business and quit breeding them. That was not only true in Wisconsin, but it was true all over the United States and also in Europe, because when the cheap American horses began to reach the European markets, the European farmers found out they could make more money growing beef, mutton, pork and other products than in growing horses in competition with cheap American horses, and so we may say for a period of seven or eight years horse breeding ceased all over the horse breeding world.

We began breeding again at the close of that period, but very slowly. In the meantime, in this country business has kept on expanding; new districts have opened up; cities have grown larger; more horses have been required, and if it were not for the fact that the automobile, the motor cycle and the motor truck have taken the place of a great many horses in

the cities and those horses have been released to go back to the country, we would be still shorter of horses on the farms of the United States than we are today, and it is all because there was a period of seven or eight years when we bred no horses.

There is a saying among people that the young may die but the old must die, and that saying is just as true as it applies to horses as to men. The old horses that have been doing the work on our farms and in our cities are fast dropping out of the traces and that means the need of a new supply.

Good Horses Hard to Find.

Now, if any of you farmers that have needed more horse power on your farms in the last few years have gone out to buy a good young horse, you have had a chance to find out that they are very, very hard to find, they are very scarce, so that the traces have been filled up in many cases by old horses that have come out of the city and they are going to die pretty soon, so we farmers have to depend very largely upon anything we can get to make up for this loss.

A good many say that less and less horses will be needed on the farms, because motive power, the great tractors, are coming in to plow and harrow our fields. That may be true on the large farms of the west, but it will be a long time before motors will be low enough in price and made practical enough so we can use them to advantage on our smaller farms and small fields of Wisconsin. We are going to have to depend on horses.

Now, why do we say we must have more horses on the farm? Because the labor question comes in; labor is getting higher and higher, and not only higher and higher, but scarcer and scarcer and poorer and poorer, so that we farmers must depend upon doing the maximum of work with our implements in proportion to the minimum of man labor. Here in Wisconsin, even on our small farms, you may see four-horse teams working in the spring on the larger tools, and that is largely brought about by this lack of help, and upon many Wisconsin farms it would be better if we had larger tools and more horses. So it is especially true of the farmer who needs new horses to put into his work that he should be breeding horses and have more on the farm.

On many Wisconsin farms, even on our small farms, one brood mare might be kept that would do a horse's work through the season and grow a colt as so much extra. On some farms, two brood mares might be kept. On our own farms, we find it practical and profitable to keep four or five, two of them dropping their foals in the spring and two of them dropping their foals in the fall, so those that drop their foals in the spring can be given light work through the spring and heavier work as the season advances, and those that drop their foals in the fall will have little to do through the winter and their foals can be weaned and the mothers fed up and be ready to do the heavier work of the earlier spring. In many cases that plan might be adopted and in this way the farmer is growing his own horse power, and I think he can grow it for less money than he can buy it today with the markets as they are, and I feel sure he will get better satisfaction out of the horses he grows on the farm than those he goes out to buy, because the horses that are for sale are usually not a very good class of horses.

Some Pointers On Buying Horses.

I have bought and handled a few horses in my time, and I find that buying a horse is like buying cows, only a little worse. You go to a farm to buy a horse and if you get your eye on a good one (and it is the same with a cow, probably), the good lady of the house comes out and says, "John, come here." They say the women have a good deal of influence and a good many rights that do not always show under our present system of law, but the result of it is that you do not generally get that horse you have your eye on. I have been on a good many farms to buy horses, as well as cows, and I notice that where there has been a family consultation, my offer is generally refused. The wife would come out and say, "John, come here," and I can hear her whispering, "John, don't you sell that cow; don't you sell that horse, it is the only one I can drive," and yet I have sometimes found out that that very horse was not a woman's horse at all, not even a man's horse, but the woman plays the trick on us just the same.

Now, if you raise this horse yourself, you know all about it. You have educated him, if you are anything of a horseman, and as a rule you get better satisfaction out of a horse you raise than out of one you buy. The best horsemen get fooled in buying horses sometimes.

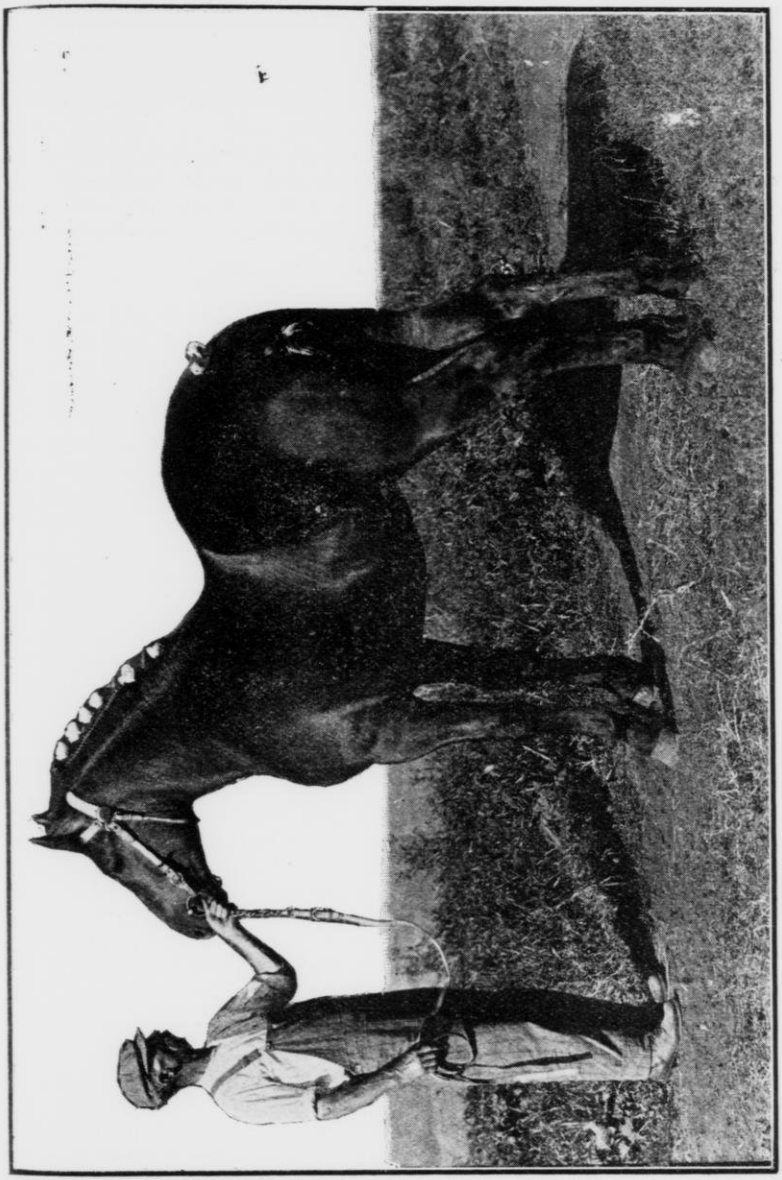
We Must Breed Good Draft Horses.

Now, the question is, if we are going to raise more horses in Wisconsin, how shall we do it? By getting a brood mare and using her for purposes of reproduction. It will not pay in this day to try to breed road and carriage horses for the market, because it cannot be denied that the automobile, the motor cycle and electricity on the street car lines have taken the place of that great class of our lighter horses. It is the heavier horse that the farmer needs, and that is the kind of horse that is today competing in the city with the motor truck, because where the hauls are short and the stops frequent, these large business firms tell me that in many cases the draft horse is cheaper as a motive power than the motor truck. It is the draft horse we should aim to produce, because he is the horse for us on the farm with our large machines and our methods of cultivation today.

Now, the sire comes in there. He is as important as the dam, because it is the common adage that the sire is half the herd or flock, and that is true among horses no less than among other classes of live stock. Good sires are scarce, altogether too scarce, but we should have them and hold them.

Co-operative Buying.

Now, the farmers can get together and co-operate in that line, organize a horse company and go out and buy a good sire, if you will only agree on the breed, the amount to invest and the way of buying it. Do not wait until some gentleman drops down with an over-fat horse, the poorest one from the barn from which he comes, because they always fatten up the poorest horse to take out to sell to companies on the agency plan. The poor ones are the ones they peddle, they can always sell the good ones at home. If you haven't brains enough to organize yourselves into a company to buy a horse, to build a creamery or a telephone line, you haven't brains enough to run that business after



Percheron stallion, Principal, one year old, winner of First and Futurity Prizes at Wisconsin State Fair, 1913. Bred and owned by Ethelwold Farms, Mondovi, Wis.

you have got it, but the farmers in every locality in Wisconsin have brains enough to get together and organize and do these things with each other, so, if you want a pure bred sire in this community, get together and organize; put up your money; send your representatives to the barns where they can see ten or twenty and select the best, after you have decided on the breed. And in making up your committee to buy, put on your very best horsemen, no matter whether they are standpatters, progressives, democrats or republicans, or whatever they may be, whether they are German, English, Irish, Scotch or Scandinavian. Then put on your best business man, who will see that all the contracts are in proper form. I used to say put on the most honest one to watch the others work, but a farmer suggested the other day that that wouldn't do; he said to put on the biggest rogue and then he will catch them if there is any trick in it.

The Right Kind of a Horse to Buy.

That committee, with cash behind them, can go and select the right kind of a horse. What is the right kind of a horse? Some of you may think the horse that weighs a ton is the right kind. I am here to say that the right kind of a horse is the horse that combines weight and quality, and the quality is even more important than the weight, for your own use on your farms, and also when he gets into the market. I mean a horse that is well balanced, well made in every part, that has the right kind of motive power in him, the right kind of intelligence, the right kind of nerve power to put every muscle and pound at work when he is called on to do his work. A deadhead of a horse, no matter how he is built, is comparatively useless the same as a deadhead of a man. There are horses that are dead and still walk around, and they say there are people of the same kind.

How will we see that quality? By sizing up that horse, every part of him from the ground up. See that he has good heels, well rounded and tough, wirey feet. See that he has good joints and a proper slope to his pastern, not straight up and down, so every time the weight of the horse comes down there is a great jar, and the jar passes up from tendon to tendon, clear to the muscles of the shoulder, but if there is a slope to the pastern, there is a spring there and that jar is broken, and remember that practically two-thirds of the horse's weight is carried on those front legs, so it is very necessary to break that jar, which will certainly be there if there is no slope to the pastern to make the weight come down easy. We do not want a horse sprung in the knees, it is not a good thing for a horse because it injures those knees, we want the spring at the pastern.

We want a clean, flat leg, covered with fine, silky hair, because the hair on the leg indicates the quality of the bone under that hair, also the quality of the tendon. The horse that has coarse, kinky hair on his leg has a poor quality of bone.

Why do we want that sloping pastern on the hind legs? Because there is the propelling power of the horse. If that pastern is straight he has no leverage, no fulcrum power in that joint. If it is straight behind and you put him to work, those tendons shorten up a little, the ankle knuckles over and we call him "cock-ankled."

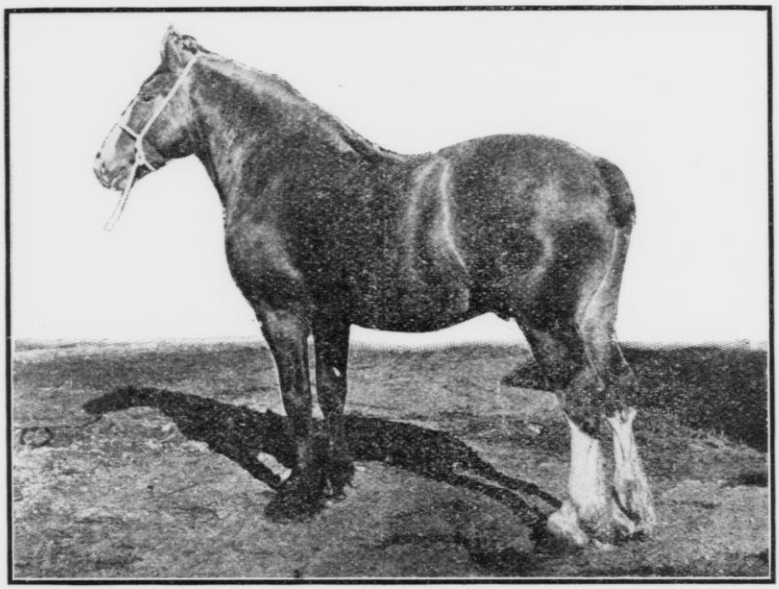
We want a good, clean, smooth,

well built hock, because if it is a loose, beefy, meaty hock, it sprains very easily; there is a heavy strain on this joint every time that horse lifts his load, especially if he slips. If it sprains on the inside, Nature puts on a patch and we call it a spavin. Some people call it a "jack." If you go to the Stock Yards to buy in the auctions one of those rapid-selling horses, do not be fooled by the name "Jack." If it is one of those hock joints that show a hock curvature, it is probably a sprain in the rear and the patch put on it is called a "curb", and if it is loose, beefy, meaty on that kind of a joint, the sprain developes into what we call a "bog" or blood spavin.

Then your horse should be well muscled on arm and shoulder and on his thigh, especially well muscled over the loin because those muscles are worked hard, two very important organs lie under that loin.

Then he must have a short back; he must be comparatively long from the point of the shoulder to the point of the hip, but his back should be shortened up by a good length of hip and well coupled loin, high wither and some slope to the shoulder. Of course a running horse and a trotting horse need a very sloping shoulder. A horse to have a good walking gait must have some slope, so he can put his feet ahead.

Then again, he needs some height to his withers, so he can pick up his feet and put them ahead, with a clean,



Clydesdale stallion, King Norman (16249) 16159, Champion Wisconsin State Fair, 1913; first two years at International. Imported and owned by McLay Bros., Janesville, Wis.

mechanical action without stubbing his toes.

Then again, style in a horse is always worth money. As a rule, a horse with a perpendicular shoulder has his neck at right angles with his shoulder and there is no style there. With a sloping shoulder and a high wither, the neck goes up, and I would have it well fitted with muscle on the top or crest, and I would have it finished off with a well balanced head, with plenty of brains in it; wide between the eyes; eyes standing out well; large, bright, lively eyes, the windows that show you the brains inside, figuratively speaking, and the width pretty well carried up to the ears, but not too wide at the ears, or he will be stubborn. Too narrow at the top, with ears coming out at the same place, look out for that, especially if he winks at you all the time that the ears are flipping back and forth. Do not trust a horse that is winking all the time.

Large heart girth; full chest; large nostrils and well sprung jaw, that lets the windpipe go in free, and as clean a throat latch as possible.

Now, whether this horse weighs 1,600, 2,000 or 2,200 pounds, having quality of foundation, then get all the weight you can. Do not spoil him by over-fattening or lack of exercise. See that he gets exercise every day, and the same with your brood mares. If the brood mares are exercised every day, then you may expect strong, healthy colts.

Care of the Colt.

When the colt is born, see that all the surroundings are clean, no germs to be taken up, and then, to make doubly sure, see that the naval cord is treated with antiseptic, carbolic acid solution, iodin or corrosive sublimate solution will do the work. Follow that up several times at intervals of an hour or two, then it will be all right, no blood poison germs will enter the system to give you trouble.

Keep your colt growing all the time, from the time he is born until he is ready to work. The colt should weigh half his maturity weight at least when he is twelve months old, that is, the colt that is bred to make an 1,800-pound horse should weigh at the very least nine hundred pounds when he is twelve months old, and not that weight in fat, but just muscle enough to cover up his bones.

And so with all classes of horses; they should weigh at least half of their matured weight when they are twelve months old. Too many of us neglect the proper feeding of these animals when they are in the growing stage.

Now I am going to stop and you may ask any questions you wish.

DISCUSSION.

A Member—What do you mean by a clean throat latch?

Supt. McKerrow—Free from meatiness, where the head joins the neck. The thick, muscular draft horse cannot be as clean there as your running horse or your trotter, but have him as clean as possible, so the windpipe goes freely into the jaw.

A Member—When a horse is shown you, what do you ask first, to have him walk?

Supt. McKerrow—Walk. I want to stand in front of him and I want to stand beside him, and see that he has springiness in every joint and a straight, free, mechanical movement.

Mr. Stubley—Suppose you have a team and wanted to match them, but one's gait is slower than the other; what can you do?

Supt. McKerrow—I have handled such teams to some extent. If the difference is not too wide, you can get them to travel together, the same as some men and women can travel together, by a little give and take, or education; also by feeding the slow one more muscle forming foods and the nervous one more fattening foods.

Mr. Martiny—Would you recommend that the farmers raise very many more horses than they are raising at the present time, or would you recommend their employing on their farms quite a number of brood mares?

Supt. McKerrow— Yes, I suggested that on many farms one, two, three or four brood mares might be kept and they could do the ordinary farm work and produce colts as an extra income.

Mr. Martiny—Another point. If any community is going to get ahead in the horse business, it is advisable, is it not, that they all breed the same class of horses?

Supt. McKerrow—Yes, that idea of community breeding is as good in horses as anything else, because the buyer is always looking for a community where he can buy the class of horse he wants. If he knows he can go into a certain community and match up teams, perhaps Percherons, Shires or Belgians, and can get a full carload of one kind, giving him lots of material to match up, this is the place where he will go. He can afford to come there and pay ten or twenty-five dollars more for horses than to travel all over the State to find them. That idea of community breeding of a certain type is one we should get well into our mind in horse breeding as well as everything else.

A Member—What is the cause of heaves in horses?

Supt. McKerrow—I think one of the great causes is feeding too much hay. We spoil more horses in the State of Wisconsin by feeding too much hay than through any other cause. No horse should have more hay put before him than he can eat up in an hour. If it is good clover, or mixed hay, he will eat too much and it will distend his stomach and press the diaphragm against the lungs. Then you take him out to work and the air cannot get into those cells under compression that are waiting to be provided with air to purify the blood, and it congests a cell or two the first time, and another cell or two the next time, and he has to put extra work on his bellows and somebody says that day, "John, your horse has the heaves", and you say, "He can't have the heaves, the best feeding horse I ever owned." Do not feed too much hay, it is these gross feeders that get the heaves early in life.

Mr. Convey—Supt. McKerrow has spoken several times of raising more horses. Wouldn't it be better to raise better horses?

Supt. McKerrow—I should have said more and better. I will accept the amendment.

The Chairman— Mr. McKerrow spoke about the small farms in Wisconsin not being adapted to the use of the large tractor. Don't you think the kind of soil we have is often against the use of the tractor?

Supt. McKerrow—Yes, our rolling farms and the condition of our soil in many places is not just the kind to handle with machinery; then again, the higher price of gasoline is getting in the way. I told my boys only the other day that the automobile would have to stand still because we have five gasoline engines on our farm at work and they are the first things to attend to and keep filled up with gasolire, and we cannot afford to support Rockefeller entirely.

BREEDING AND CARE OF THE PIG.

John Imrie, Roberts, Wis.

The pig has a right to be well born, and I am going to go back of the sire and take a look at its breeding.

The sire should be selected as to his individuality and should be pure bred, from a good and prolific dam, one that not only farrowed a large litter, but raised a large percentage of that litter, showing her to be a careful mother.

The dam should be selected in the same way. She should be the best in the drove individually, be strong and healthy and well grown for her age. Never select an under-sized sow, if from the same litter,, just because she would not bring as much on the market, as there is a reason why she is under-sized if fed the same as her sisters.

The brood sow should be sorted from the rest of the drove early, before she has been fed very heavily on corn, and should not be too fleshy at breeding time. After breeding she should be fed liberally on a healthy and nitrogenous food, so as to have her gaining in flesh all the way up to farrowing time. She needs to be well grown, carrying a covering of flesh at this time, as she must give the little ones a good send-off in life. A day or two before farrowing time do not feed heating or constipating food.

Care at Farrowing Time.

At farrowing time the owner should be on hand to see that the little ones get their nourishment in the natural way. If they seem to be trying to nurse most of the time, see if the mother has a case of congested udder. If so, the glands are hot and swollen and very painful when the milk begins to pass through. In most cases the mother will jump up and may grab a pig in her mouth. If she tastes the flesh she may eat the pig, and we blame the sow when the feeder is to blame in feeding so that he has destroyed all the natural instincts of the mother and caused her to devour her own young.

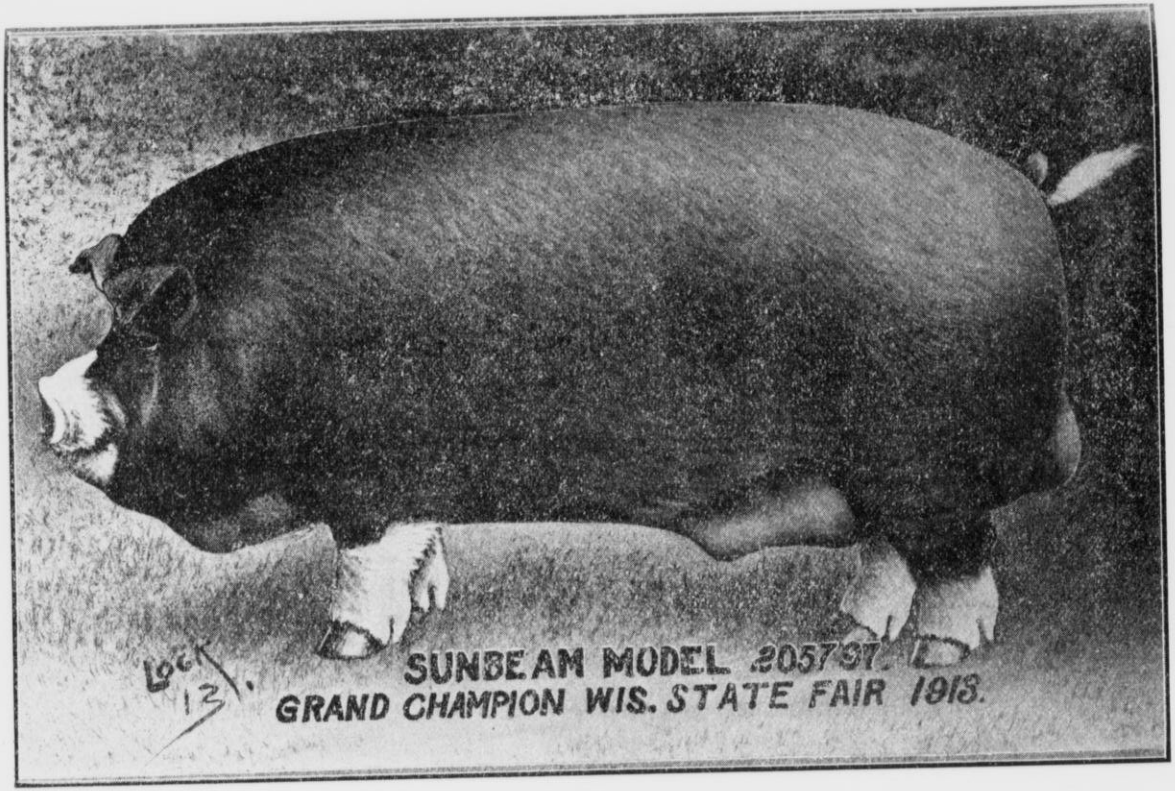
If the milk does not come down readily saturate the udder with kerosene and rub with the hand, gently at first, as the glands are very painful, then harder as soon as she can stand the pain. After the inflammation has been reduced somewhat, she will let the pigs get their meal in the natural way.

A great many pigs die from this cause and I find a great many farmers, and some old hog raisers, who think there is no cure for the trouble and will let the pigs die from want of nourishment.

We have the pigs farrow from the middle of April to the middle of May. The weather is warm, usually, by this time and we can get the pigs following the mother in a day or two after birth. If they can run after her they will get the needed exercise to make them healthy and they will be free from danger of the "thumps".

Feeding the Young Pigs.

Feed warm skim milk and when they will take it a little shelled corn. We make what we call a "pig creep", by raising the door between the pen



First prize yearling, Senior Champion and Grand Champion Poland China boar, bred and owned by L. P. Martiny, Chippewa Falls, Wis.

where the mother feeds and the next one, just enough to let the little ones crawl through, putting the milk in a shallow dish or trough, feeding only what they will drink up clean, then clean the dish before feeding again.

I wish to say in passing that the food of the sow after farrowing is not given enough attention by some hog raisers. The mother needs no nourishment for two days after farrowing, just a little drink, and then increase the feed gradually until she is on full feed by the end of the week.

We do not wean our pigs, that is, shut them up to wean them. They are weaned in the natural way and never know when they cease to depend on the mother and begin to depend on us for their food. If I had to wean pigs from any cause I would confine the mothers and let the pigs have their accustomed run.

The Value of Exercise.

I believe in lots of exercise for the growing pig; he must have it to keep him healthy and grow the bone and the frame so essential to the profitable hog. I could give you examples of the difference of weight at selling time, due to confining pigs in small quarters and thereby losing the growth of frame, that would surprise many hog raisers. We want to care for and feed these pigs so they will grow rapidly while the weather is warm and let them have the run of the clover pasture, or sow some rape, if there is not enough clover pasture.

We provide a self-feeder filled with ashes and salt, mixed as follows: One double handful of salt to a bushel of wood ashes, letting them have access to this at all times.

Get them ready for the market as young as possible to get near to two hundred pounds in weight, as they must be grown rapidly to be the most profitable pork.

Now I have grown and cared for this pig as best I could and I will let my friend, Bradley, finish and market him.

DISCUSSION.

Mr. Imrie—(Continuing)— I want to say in regard to the losing of little pigs at farrowing time, due to the congested udder of the sow, we have found that by careful feeding there is very little danger. Once in a while this condition will creep in, and if we are not right there with our remedy, there may be serious trouble, but if we give it prompt attention, we can save nearly all the pigs in the litter. We think this is a very important thing to watch.

A Member—Would you feed this mother right after farrowing?

Mr. Imrie—I would feed her no nourishing food after farrowing for the first two days. Nature has provided all the nourishment she needs for the first two days, and if that sow has the run of a field, or pasture, you will notice she will go into some low place where there is tall grass, or a bunch of alders, make a nest and lie there quietly for at least a couple of days, without trying to eat. The best feeders will follow Nature's laws as closely as possible. I have found it the best plan to let the animal be quiet with the litter and when she begins to get hungry she will come up to the feeding place. We begin after the first two days with a light feed and increase gradually until we get on full feed about the end of a week.

Mr. Martiny— What points would

you observe in the selection of breeding stock, in regard to age, type, etc.?

Mr. Imrie—In regard to the breed, I think a person should pick the breed he likes best. We started thirty-one years ago with the Poland China and we have staid right by it. It happened to be the breed we liked best, but having chosen, I would not advise any man to change breeds. I believe in improving the breed you have, because there are a lot of good ones, it does not make any difference whether the hair is red, black or white. We are all working for the type of hog that puts on weight at the least possible cost.

Mr. Imrie—Yes, I do. Of course, in greatest difference in breeds is in the color of the hair?

Mr. Imrie—Yes, I do. Of course, in the Berkshires there are other differences, but what we are aiming at is to put on growth and flesh. As to selection for individuality, I think that is highly important in selecting the brood sow. We want one that is strong, hearty and healthy, has got the best growth for the feed fed. We want to select from large, prolific litters, from a mother who has raised a large litter.

Supt. McKerrow—Isn't there danger in all breeds of running to fads, too much fineness and perfection of form, and losing sight of constitutional vigor and growth?

Mr. Imrie—That has been my experience. I have never worked that way. My raising of pork has been practically all for market and we work away from that trouble of getting our animals a little too fine We believe in keeping a good form; we try to strike an average, not too coarse nor too fine. I would rather work a little toward the coarse side than too much the other way.

Mr. Martiny—What do you mean by coarse?

Mr. Imrie—A good strong bone and well built body. I would not mind if the nose was a little bit longer, or the ear a trifle coarser, if I had the body to suit.

Mr. Martiny—You would rather have a pig long bodied and fine bodied?

Mr. Imrie—If we can combine the two, we would have it exactly, but if I have to make a selection, I would go a little on the coarse side, we might say on the ungainly side from the breeder's standpoint. I had rather sacrifice in the drop of the ear, have the ear longer, if necessary, than in the right form.

Mr. Martiny—I think it is possible to get this size and constitutional vigor and at the same time get the ne quality.

Mr. Imrie—I do too, but if we follow one idea too far, we will go a little too far, and the wise man stops just at that place.

Mr. Convey—I have noticed in observing results obtained by some hog breeders that certain people, for different reasons, fail to keep up the size and quality of their stock and their pigs are continually changing for that reason. In many cases, this effect is not because of your breed, it is rather your system of handling. What is your opinion with regard to that? Where do those people fail?

Mr. Imrie—I think it is due largely to the feed they feed their hogs. There is just as much in the feed as there is in the breed of the hog. I have noticed two men will buy a sire for use the coming year; bred just the same, from the same litter, and one will grow wonderfully well, be a strong-boned animal, nice conformation, while, by difference of feeding,

in one or two months you wouldn't know the second one was any relation to the first; no growth of bone, you would not know they were of the same family at all, simply because one had not been fed a feed from which he could find protein enough to build the bone and lean meat and give him constitutional vigor.

Mr. Convey—I have noticed that quite a number of people are inclined to use young stock for breeding purposes, and in many cases they stunt them at weaning time, or they fail to develop normal growth, consequently they are using poor, undeveloped stock, not because of age, but because of poor treatment. That class of people always have defective stock and they are changing breeds quite frequently, just because their stock becomes defective.

FINISHING AND MARKETING THE HOG.

W. C. Bradley, Hudson, Wis.

The hog situation at the present time is a very happy one, pork selling as high as it is in Chicago today, but there are a good many times when hogs are grown at a greater cost to the producer than they get when they come to sell them. For the last two years we have not been forced to a very low price for pork and still with the price of pork at seven or eight cents there is a great deal produced in Wisconsin that actually costs the farmer more than he gets for it.

It is not so likely to be so with the breeder of hogs in large numbers as with the man who only grows a few hogs. In traveling over this State, I have seen five, six, seven, perhaps eight or ten hogs kept in a very small place, where the only practical food was in the shape of commercial foods, like corn or barley or rye, or shorts, which had a commercial value, which was mixed in a barrel and fed as slop to pigs, and that was all they got on which to make their growth. I believe that in nine cases out of ten, pork produced in that way costs more than they usually get for it. There may be exceptions, when you can take a pig as Mr. Imrie has and leave it in a pasture, or put him in a pen and feed him perhaps on commercial feed at the price it is today and sell him at the price pork is in Chicago this week, he will make a little something, but he cannot always be sure of doing it.

Field Peas a Good Pasture.

My idea in fattening the hog after you have the pig well growing is the growing pasture, and one of the best pasture I know of for the growing pig is field peas. Peas and oats sown together and turning the hogs in is very good for them. Labor is getting high and everything we do toward saving work on our farms is to our advantage. That is one advantage with the peas, you turn them in and let them live there nearly a month in that pea field and that gives you little or no work. Then a field perhaps of corn that the hogs can hog down themselves and clean up the

corn field saves labor. We have to look ahead and prepare these special feeds that must be used in finishing off the pig in order to make any money. A field of sweet corn comes on a week or two earlier than the common field corn and makes good feed; rape pasture is all right.

Another thing comes to my mind with reference to the use of whey from the cheese factories in this country, and Wisconsin is getting more and more into the cheese business. Where that whey is fed sweet it is all right, but I have seen time after time a swill barrel so thoroughly foul, the whey left standing in it all the season, or altogether too long, that it was a danger to feed whey rather than any benefit. I believe in feeding whey and feeding swill, and in mixing ground oats or shorts or barley, or whatever may be cheapest, with the swill, but I do not believe that the swill barrel ought to be kept as it is in too many places, it ought to be kept clean, it ought to be cleaned out at least once a day. There are lots of times when these pigs are compelled to eat a mixture that is detrimental to them rather than beneficial.

Marketing the Finished Product.

Now, about the marketing of the pig. A good deal has been said here about forcing products onto the market at a time when the consumer is not ready to take them. That has been one of the troubles with farmers all over the western part of the United States in putting pork onto the market. The pigs should come along in the spring, we feed those pigs as rapidly as possible, some of us do and others do not; but they begin to get onto the market quite rapidly about the first of October.

Now, as a rule, pork is at least $1.50 to $2.00 a hundred pounds higher in the middle of September or the first of October than it is two months later, usually so. There is occasionally a year when it does not go that way, but I believe that four years out of five you will find a drop of $1.50 to $2.00 between the first of October and two and two and a half months later. The price goes down, down. Now, why? Simply because the farmers are rapidly putting that young growth onto the market and the packers take advantage of that and force the price down. They can put them into their cold storage and carry the pork over, it can be held almost indefinitely, so they take advantage and buy that stuff when it goes in rapidly at a less price.

The price, after the first going down, usually goes up and up until it is worth now over nine cents. Three months ago, the dealers were paying seven to eight cents. Very often a farmer will say, "I will not sell my hogs until they weigh two hundred pounds." Let us see about that. Suppose a man has a bunch of pigs in his yard that weigh 175 pounds on the average. The first cost of that 175 pounds at that time is eight dollars. Your pig is worth fourteen dollars. Supposing you keep that pig two months longer and make him weigh 225 pounds and the price has gone down to six dollars. You will get $13.50 for the 225 pounds of pig, when you could have sold the 175-pound pig at fourteen dollars. You have lost fifty cents on the 175 pounds that have been produced and you have produced the other fifty pounds at an absolute loss. We ought to think about these things and not make

up our minds that we will not sell our pigs until they weigh two hundred pounds, but try to grow them rapidly in the spring and put them onto the early market before prices begin to go down, even if they do not weigh two hundred pounds. You had better sell them at 175 pounds and get fourteen dollars than to wait two months, feeding them all that time, and get $13.50.

You have got to make these things a study. You have got some young pigs and it may be better to keep them over until winter when the prices will come up again. When they weigh, say, 250 pounds, carry them along until the price has gone up and get more for them.

DISCUSSION.

A Member—Which one of these three breeds that have been mentioned here can you put the most weight on in six months' time?

Mr. Bradley—There is very, very little difference as to their ability to put on in six months' time. Of course I am a Poland China man, I rather like their looks and believe I can do more with them.

Mr. Martiny—While there is not much difference in breeds, isn't there a big difference in individuals?

Mr. Bradley—Certainly.

Mr. Convey—There is also a difference in the amount and kind of feed to make a certain amount of weight.

Mr. Bradley—There is no doubt about that. The coarser type may take longer, but may produce weight on cheaper feed. The razor back will live on roots and grass, while the Poland China will starve on them.

A Member—You advise us to raise peas, but suppose we cannot raise peas? We used to raise them, but we have not been able to for the last two years. Can you tell us why?

Mr. Bradley—I am sure I do not know. In our country we can grow peas very nicely. On very sandy soil there is not any use trying to grow peas, but on the average soil, cold soil, as a rule, peas can be grown if they are sown deep enough. A good many failures are made by drilling them in at the same depth as oats or wheat and they come up all right, but they do not give you a crop. Possibly your land has been too wet.

Mr. Convey—I would like to ask Mr. Bradley how the hog compares with other animals from an economic standpoint in the production of meat?

Mr. Bradley—I cannot tell you.

Mr. Convey—The fact of the matter is he produces meat more economically than any other class of animals. There is a smaller shrinkage of carcass as compared with the live weight.

A Member—Does that comparison include poultry?

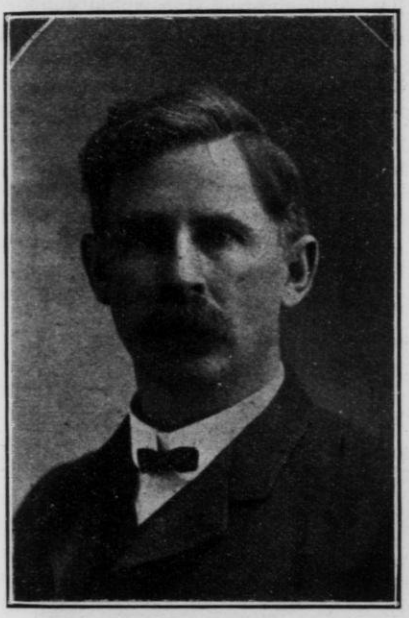
Mr. Convey—That includes everything, even poultry from the egg standpoint, or the hen from the meat standpoint, or the dairy cow, from the meat making standpoint, I am talking about.

Mr. John Imrie—And they are more prolific than any other kind of live stock on the farm.

Mr. Bradley—We find that while we are advancing very rapidly in the dairy interests, we are not advancing as rapidly as we ought in growing pork. In many places in southeastern Wisconsin they are dropping it. Two years ago I found many farmers who were shipping in their hogs. They were selling milk at the condensery and while perhaps they were getting a little more per hundred for their milk, still they were losing the whey and the skim milk, and I think Wisconsin should do more in hog production than she is doing.

METHODS OF DAIRYING.

E. L. Aderhold, Neenah, Wis.



Mr. Aderhold

The circumstances under which our dairy industry was born naturally gave it a wrong start. Dairying was a very insignificant little side issue. Instruction on breeding and feeding was not available; there were no Farmers' Institutes and no Farmers' Institute Bulletins. Each cow keeper labored along under his meager knowledge regarding breeding, feeding and handling of dairy cattle, and under his conception or lack of conception of sanitation in milk production, and there were no regulations to interfere with the worst kind of practices. It was not anticipated that the dairy industry would become important.

There were no cheese factories, creameries, condenseries, ice cream factories or milk trains. The milk that was not used on the farm was marketed in the form of butter, of which each producer had a different brand. Some of it would have been suitable to use as a cure for baldness, that is, if a pound of the butter had been placed on top of a bald head and allowed to melt there, the bald spot would have been covered with hair.

Twenty-five years ago, when cheese factories and creameries were rapidly multiplying in numbers, it was freely predicted that the production of cheese and butter would be over-done, but the industry continued to grow, until today Wisconsin furnishes approximately half the cheese produced in the United States; Wisconsin creameries turn out more butter than do the creameries of any other state, and it is claimed that Wisconsin has more silos than all the other states together have. Wisconsin also has about twenty-five milk condenseries, whose annual output is enormous.

Wisconsin's annual crop of dairy products, in value, is now crowding the one hundred million dollar mark, and the business has not been overdone; in fact, it has not kept pace with the growing demand, owing to the rapidly increasing population, and today the cow population in the United States, as compared with the human population, is smaller than ever before.

New Times Demand New Methods.

The object of the writer in giving these bits of history and statistics

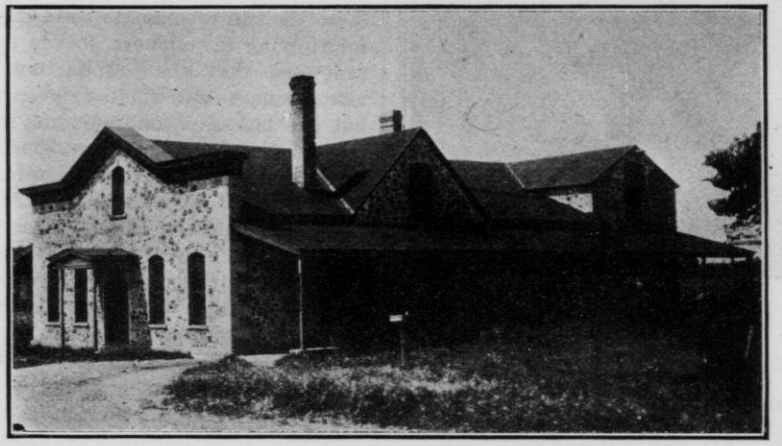
was to drive home two points, towit: Dairying is the big issue, and there is no room for primitive or out-of-date methods of dairying in the older dairy sections.

The farming operations carried on by Wisconsin's pioneer farmers were in many respects, not far from primitive. Grain raising was the main issue. The seed was sown by hand, the ripe grain cut with the cradle, raked and bound by hand, and, some of it at least, was threshed with flails operated by "armstrong" power. It is more than a score of years since these methods were discarded. The seeding, cutting and binding has been performed by rapid operating machinery, drawn by horses.

The dairy industry being now of far greater importance than grain raising, one would suppose that, s in grain growing, methods bordering on the primitive had gone out of practice. One would suppose, for instance, that dairymen would use only pure bred sires to head their herds; that they would not board cows by the year without knowing, approximately, what each cow earns; that general purpose dairy barns containing horse stalls, with their strong odors, and which sometimes also house pigs and chickens, would exist only in memory. One would suppose dairy barns that are dark, that have unsuitable floors and that have stalls which compel cows to lie in filth, would be a rare exception; that compelling cattle to breath stuffy, impure air, through failure to use the King system of ventilation, was a thing of the past; that no dairyman could tolerate the idea of milking filthy cows.

Other practices which show lack of progress are the marketing of cream which has become stale from neglect and age; using unclean separators for skimming the morning milk; using rusty, open seamed, and in some cases, dirty utensils, and failing to protect milk and dairy utensils from flies in the summer. The common milk pail is a back number, because it is a dirt catcher; it should give way to the "small top" pail.

Dairymen grow corn, hay and grain. They provide barns, granaries, silos



Cheese factory owned and operated by Geo. Horneck, Sheboygan Co.

and corn cribs for the proper handling and keeping of those foods which are used as a means of milk production. They have a crop of milk every day in the year, yet most of them have failed to provide a suitable place for cooling and keeping their milk or cream. That is not logical.

A dairy farmer should have a milk house worthy of the name and in it there should be a good cooling tank.

It cannot be denied that on more than ninety per cent of our dairy farms, out-of-date, if not primitive methods are still much in evidence.

DISCUSSION.

Mr. Stubley—What do you think about the open or closed milk pail?

Mr. Aderhold—The open milk pail, as you see by this chart, is a dirt catcher. It has been demonstrated, and there can be no doubt about it. If a pail of this kind is used, that is nearly two-thirds covered, the milk will contain less than half as much dirt and less than half the number of bacteria that it will contain if drawn under the same conditions in the open pail. In other words, if all of you who milk cows would, instead of using the open pail, use the "small top" pail, your milk would be twice as clean, have only half the number of bacteria in it and have good deal better keeping qualities. It would be altogether a cleaner, better article.

Now, the first time a person tries this pail he may not like it, it takes a few days to get used to it, but when you do get used to it, you like it better than the other pails, because it prevents the spattering of milk on your clothes, and because you know the milk is twice as clean, and that is something that should appeal to every decent minded milker.

Mr. Michels—What about the comparative cost of the two pails?

Mr. Aderhold—There are some pails that are more expensive and complicated and not practical for the average farmer. This pail does not cost over a dollar or a dollar and a half. There is no strainer in it, nothing complicated about it; it is a practical proposition, but, as I said, it takes you a week or so to get used to it. Some of us are a little harder headed than others about getting used to things, and I can cite an instance that took place near Madison at the Dairy School. They were sending out these covered pails to the patrons that furnish milk there and they persuaded one certain farmer to use the pail for a week, but he telephoned in at the end of the week and said he had not become used to it. They persuaded him to use it another week, and at the end of the second week he said he now liked the pail, he was used to it. But there was one point he was not satisfied about. He said, "If the cow ever gets her foot into the pail I am not sure that she can get it out again."

Mrs. Hardy—Did I understand you to say that old methods of dairying are used on ninety per cent of the dairy farms?

Mr. Aderhold—I can make it stronger than that. I believe I would make it ninety-five per cent.

Mr. Bradley—Are you including hand milking in that?

Mr. Aderhold—No, I do not include that.

Mr. John Imrie—We used two pails of that kind twenty-five years ago and we prefer them. They were covered, not quite half. It did not take all that time to get used to them.

Mr. Blake—I saw a pail in Michigan some time ago that I liked better than this. It had a round opening near

the top, the cover is like that, but instead of coming clear to the edge, it has this round opening, and into that opening you can set a tin pan that kind of fits in there, and then a strainer and then another tin pan that fits into that.

Mr. Aderhold—That is a Sterillac pail. It is much better than this in keeping out dirt, but you show it to the average farmer and he will say it is "monkey work" to use it. If we can get him to use this other one, so his milk is twice as clean, we will at least secure that much good result. Otherwise we will not get any.

Mr. Blake—I used the one I speak of and I never had a bit of trouble from the very first.

Mr. Aderhold—You are not as hard-headed as some of the others are.

I want to call your attention to one more thing. We have a sediment test now that shows comparatively the amount of dirt in the milk, a very nice thing to use at cheese factories, or wherever milk is taken in. It shows also the nature of the dirt; whether it is from a swamp or the barnyard, or from the cow barn, and it absolutely convinces a man who is bringing dirty milk that his milk is dirty. There is no getting around it, he sees the necessity of taking pains to keep out the dirt. But in the absence of the sediment test, if each one of you people who milk cows would examine your strainer when you get through straining milk, it will show you a lot of things. With people who are careful in milking, the strainer will look pretty nearly as clean after the milk passes through it as before. If it is dirty it is proof positive that you have not tried to keep the dirt out of the milk, and that is one of the things that you should do. In the first place, you must have clean cows; you must brush the dirt off the udder, either with a brush or wipe it before milking. You must have clean hands, the same as a woman does when she prepares the food in your kitchen, and you must use a small top milk pail. If you do not do these things, you are not trying to produce clean milk.

COW TESTING.

W. H. Clark, Rice Lake, Wis.

Cow testing is the base if not the most important subject of the dairy business, as so much hinges on this subject. We would think a merchant very negligent indeed if he should buy a stock of goods without an account of the sales of such, or the cost of same, but most farmers are doing this very thing, we are keeping cows year after year without knowing how much they produce or how much it costs to produce it.

There is only one way to do this and that is to weigh and test the milk and weigh the feed the cow consumes.

For the average farmer, the best way to do this work is to organize a Co-operative Cow Testing Association. This is the main work of the Wisconsin Dairyman's Association, of which Mr. H. C. Searles, of Fond du Lac, is superintendent. There are now fifteen testing associations in the State, testing over six thousand cows. In order to secure an association, a company of farmers get together and organize, usually with about twenty-six members. This will give one day each month to each member.

Farm home of W. H. Clark, Rice Lake, Wis.

The Plan Followed.

A man is hired to do the work. He comes to a member's place in the afternoon, weighs and samples the milk of each cow at the evening milking, and in the morning he again weighs and samples the milk, making

a composite sample. He also weighs the feed that each cow eats. He then tests the milk to find the per cent of fat. Taking this day's test as an average day for the month, he computes the amount of milk and fat and by the average price of fat he can figure the amount of money this cow would make for the month, and by subtracting the cost of feed he will get the profit or loss of this individual for the month.

A book is furnished in which each cow in your herd has a page and on which each month's work of your cow is recorded, and at the expiration of the year you have a very accurate record of each cow of your herd.

In weighing the feed, each kind of feed should be weighed separately, so the member can make this a book of reference. By changing certain feeds or feeding more or less of certain feeds, he can, by referring to his book find which gives the best results and the most profit.

The Value of the Test.

There are many things to commend this test. While it does not take the place of an official test, it does enable a member to weed out and discard unprofitable cows and thus enable him to intelligently select the foundation for a better herd. It also encourages better feeding and better care of his cows.

I know of one farmer who owned a well bred herd but had not been feeding as well as he really knew how, possibly for the lack of a little encouragement or inspiration, such as a Farmers' Institute gives. A testing association was organized in his neighborhood and he entered his herd. For a few years previous to this he had been making about two hundred pounds of fat per cow. After he had begun testing and got his business on a business basis, he saw it paid to feed well and to take good care of his cows, and by doing this he raised the butter fat production of his herd to 308 pounds of fat per cow, or 100 pounds of fat more per cow than the year previous.

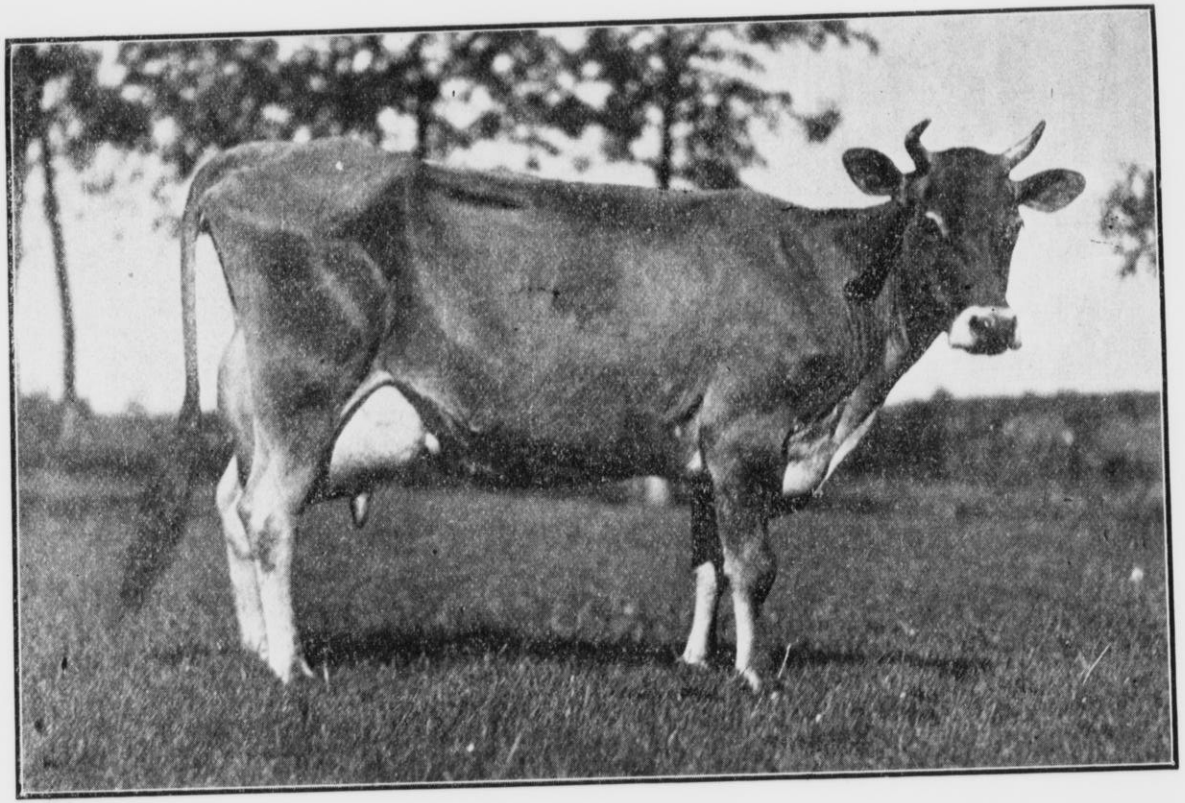
This work gave him courage to enter the Wisconsin Dairy Cow Competition. By studying a balanced ration and feeding each cow according to her individual requirement, he raised the average butter fat production another 100 pounds per cow, or, in other words, doubled the butter fat production of his herd in two years' time, brought about mainly by a testing association and applying the teaching it taught.

A member of another association made an average per cow for his first year's work of 3,547 pounds of milk and 152 pounds of fat. He culled out some boarders and the second year he raised the milk production 1,000 pounds and the fat to 195 pounds. He again culled and the third year his average production was 6,165 pounds of milk and 265 pounds of fat, an increase of nearly double the milk and 113 pounds of fat per cow. This was worth about thirty-four dollars. It cost nine dollars more for feed the third year than it did the first, so he made twenty-five dollars net profit more per cow for a dollar's worth of knowledge.

Some Things Which the Association Encourages.

To organize a successful association, at least four hundred cows must be signed, and one dollar a cow per year is charged for each cow entered in the test. This amount is for the salary of the tester.

The tester should be a man capable



Jersey cow, Lad's Brightest Hope, No. 229039. Authenticated test, 414 lbs. 11 oz. butter in a year as a two-year old. Bred and owned by W. H. Clark, Meadow Creek Farm, Rice Lake, Wis.

of figuring a balanced ration and practical enough to advise the feeding of a dairy herd if required to do so. In some cases he has made out a ration or feeding standard for different members, changing the ration as required, and in that way brought up the average production of the herd very materially.

He has also encouraged the breeding to pure bred sires, and in one locality where I am told there were only two pure bred sires at the beginning of the association, at the end of three years nearly every number was using a pure bred sire.

Other Methods of Testing.

There are other methods of testing cows. If we cannot organize a testing association, let us do the work at home, or take samples and when we go to our creamery or factory get the operator there to do it for us.

Schools that teach agriculture and many high schools have testing outfits, the pupils take samples and test them at school. In this way they are getting practical work both in testing and arithmetic.

With a little care nearly any one can test, and there is so much to be gained from it. Do not stop with the test alone, but find out the cost of production, just the same as a tester would do if you hired the work done.

The association test is more for the farmer with native or grade herds than the breeder of pure bred cattle, but for him it is a stepping stone to the official test.

What a Record May Mean.

Every breeder should make an authenicated yearly test. The public is demanding tests, and at the prices paid for good stock at the present time the buyer should demand a test.

The matter of testing a cow adds greatly to her value. Before I began testing my herd, I sold four head to a neighbor at $150.00 each and offered him another cow at the same price. He did not take her. I gave her an official test and when she had completed it I sold her to the same man for $275.00, making $125.00 extra for an established record.

It makes a lot of difference when one is selling a calf if he can say, "The sire of this calf has a certain number of daughters with official records, and its dam has a record and her dam a record", and possibly the great grand dam a record. Then we have a calf that is worth much more than one without such an established record and we have a right to demand more for him.

It is a whole lot more satisfactory to go along a string of cows and be able to say, "This one makes so much butter", and "This one such an amount", and right along the line the same way. It is also much more satisfactory to your buyer to examine a detailed report of an official or established record than to hear one say, "This is the best cow in the State", or, "She will give a bushel of milk and would beat that great record cow a mile if I would only feed her as that cow was fed."

The testing of cows teaches one to feed better, to feed a balanced ration, and look more to the details of the work. He takes better care of his cows, looking to their comfort, and it teaches him kindness. When a cow is approached by her attendant and she expects a whack over the back or a kick, she is very nervous. A cow disturbed in any manner is not going to do her best. Milk stools, forks and shovel handles, cost money, but kindness does not cost a cent. Usually

a thing that costs nothing is not worth much, but when you sit down to milk a cow and she has no fear of you and turns her head to lick your shoulder and tries to tell you that you are the best calf she ever had, you can figure that kindness is a thing that pays well in dollars and cents and pays big for all the effort it costs.

Room for Improvement in Wisconsin.

Just think what we are doing in this great State of Wisconsin, the leading dairy state in the Union, where the average production of our cows is only about 170 pounds of butter a year. Isn't there a lot of room for improvement? There are thousands of now unprofitable cows that would make three hundred or more pounds of fat in a year if their owners only knew they were worth feeding.

The only way to find these cows is to test them. Test them for a whole year, then another year, and so on. Weigh the feed and charge each cow up with what she consumes. It is not great records that alone should place the value on our cows, but it is what is left after the expense of the feed is paid. It is what we have left that counts.

Let us go after this testing business in earnest and put Wisconsin far in advance of her sister states. Denmark has brought the production of her cows from 136 pounds of fat in 1896 to 252 pounds at the present time. Every farmer is testing in that country. If we would get at this work as systematically as Denmark has done, the world would be looking to Wisconsin for good cows and breeding stock.

DISCUSSION.

A Member—In our country we could not afford to hire a man to weigh the milk and feed every day.

Mr. Clark—The test is just for one day in the month. The milk is sampled and weighed just one day, and it only costs you one dollar a year for every cow you have entered in this test. You are getting that work done by this expert, who knows exactly how to do it, cheaper than you can afford to do it yourself. It is his business to come and do it one day each month, whether you are busy or not. That is one of the nice things about it.

A Member—Couldn't this organization also benefit the farmer by helping him sell his surplus stock? He could let the State headquarters know and through that get a chance to sell his stock.

Mr. Clark—The great benefit is to establish a record. Just a short time ago there was a sale held in Platteville in which a number of grade cows were sold. They had had a test like this one of which I have told you and they had established records in this test. Those cows sold on an average for $124.00 apiece, and I believe the record had a great deal to do with their selling for that price. There are many ways in which the farmer would be benefited by this test.

Mr. Jacobs—I do not suppose the subject of co-operation is one to be discussed this morning, but it has been suggested to my mind several times while this subject was being discussed that this subject could be taken hold of in a co-operative way. I am sure it would be for the benefit of the farmers and help them to develop co-operation in some other ways. Now, I want to ask about records. Don't you think it is of more value

to have a record of your cows, such as these are, a record showing just what every cow in the herd is, than to trace back to some successful record that she may be hoped to make again once in a long time perhaps? Isn't a successful record under your system of more value?

Mr. Clark—It certainly is. I think the value of our stock rests a great deal on the value of the close relationship to heredity of good record cows. We do not hear a great deal of the descendants of these great record cows. They are either sports or something or other, and very seldom are their offspring able to make such records as they have themselves. You very rarely hear of such a thing, but by establishing a record of your herd, where you can trace along several generations of animals having good records, you can reasonably expect something good from the offspring of those cows.

Mr. Wyatt—Of what value is this to the ordinary farmer who is breeding up a grade herd?

Mr. Clark—It is a great advantage, for this reason. He can select his most profitable cows to build up his future herd on. He can throw out the unprofitable ones, because he knows each individual and he knows her average test. He knows all about her, and it enables him to bring up a herd much more intelligently than he can otherwise do.

Supt. McKerrow—And will it not in many cases double the price of the individual cow that shows a good working average?

Mr. Clark—Certainly; not only double, but oftentimes he can treble the price by knowing absolutely what she can do. If you will allow me to do so, I will refer to one of our own cows. We did not think she was much of a cow; in fact, we did not think a great deal of her. We put her in the official test and I did not think she would qualify to the registry of merit, but I fixed a sort of schedule for her to go by and I said if she would make thirty-six pounds of fat per month for ten months, not go below thirty-six pounds any time for ten months, that possibly she would make the forty pounds which she had to do in the remaining two months to qualify—she had to make 400 pounds. As a matter of fact, the highest butter fat production for any one month was 41 pounds. Now, that is not anything big at all. Well, she didn't go below the 36 pounds any month, and the last day of the year, the 365th, she gave sixteen pounds of milk and nine-tenths of a pound of fat, and in the course of the year's time she gave 431 pounds of fat. We had not begun to appreciate this cow until we gave her the test, and she is worth a whole lot more money today than she was before we tested her.

Another case. I sold several head of cattle to a neighbor and priced him a certain cow at $150.00. He left her. I gave her a year's test and sold the same cow after she had established a record to the same man for $275.00, and he said he considered her a cheaper cow at that price than the one I gave him before she was tested.

Mr. John Imrie—A great advantage of it is that you know your best cows and it enables you to select the best heifers from your best cows to keep up your herd. That is a great point of value to the man who is grading up his stock.

Mr. Aderhold—Does this testing association enable the farmer to learn more about feeding from that man who does the testing?

Mr. Clark—It has most everything to do with it. You see if he feeds his cows and keeps a record of this

work, that is, the amount and the kind of feed that he feeds, he can see by referring to the book just what he is doing, just what he has accomplished, so if he needs a little more of a certain kind of feed he can see whether it pays him or not. It is an encouragement to feed better, and the man who is making the test tells you how to feed better. It gives you a greater interest in each cow, you will begin to look her up, her tests and capacities, and to study what will constitute a balanced ration for her.

Mr. Aderhold—Do you think if those cows are kept clean and curried frequently that that makes them give more milk?

Mr. Clark—It certainly does. Anything that makes the cow comfortable is going to increase her product. If she feels well, she is going to do better than if she is uncomfortable from any cause.

Mr. Jacobs—There is one point about this we hardly like to mention as much as we should, and yet it is very important, and that is finding out the class of cows that are not paying their board. Without giving them that test, we are liable to be keeping such cows from year to year, and not only that, but we are pretty apt to be raising calves from those cows, and if like begets like, we are going to perpetuate that kind of a cow in our herd; instead of getting rid of her when she dies, we are going to have another one like her, and we will keep that up forever, unless we test some time.

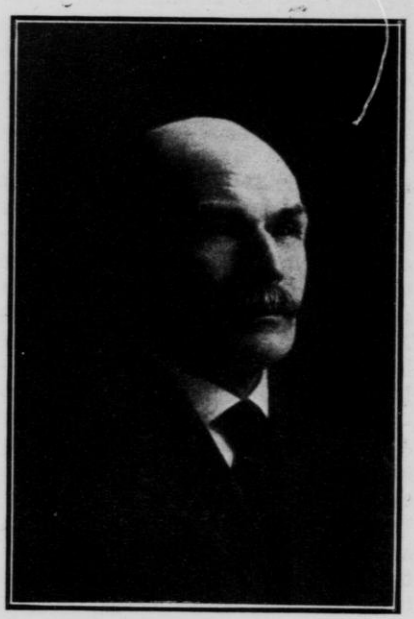
Mr. Michels—For a number of years I had considerable to do with the testing of cows myself, and I found out that when you approach a farmer, in nine cases out of ten he is very sure that he knows his own cows, he knows which is his best cow, when by testing, at the end of the year he would find he is often mistaken. The cow that yields the biggest flow of milk for a short time, in nine cases out of ten, is usually one of the poorest cows in the herd. It is the cow that gives, not such a very large amount at any one time, the cow that Mr. Clark gave us an illustration of here that is the cow that shows the biggest record at the end of the year. In my work I had all breeds of cows, Jerseys, Guernseys, Holsteins, all kinds. In one year I tested over three hundred cows—this was before the Dairyman's Association took this up, and it was pretty hard to get the farmers interested to take up these tests, because most of the farmers seemed to think they know which are their best cows without any test.

Supt. McKerrow—We should judge then there is not so much reliance to be placed on the weekly or monthly test as on the yearly test.

Mr. Martiny—Another good feature of this system is that it inclines the farmer to put his operations upon a business basis all through, so he knows exactly what he is doing.

IMPROVED LIVE STOCK.

S. A. Baird, Waukesha, Wis.



Mr. Baird

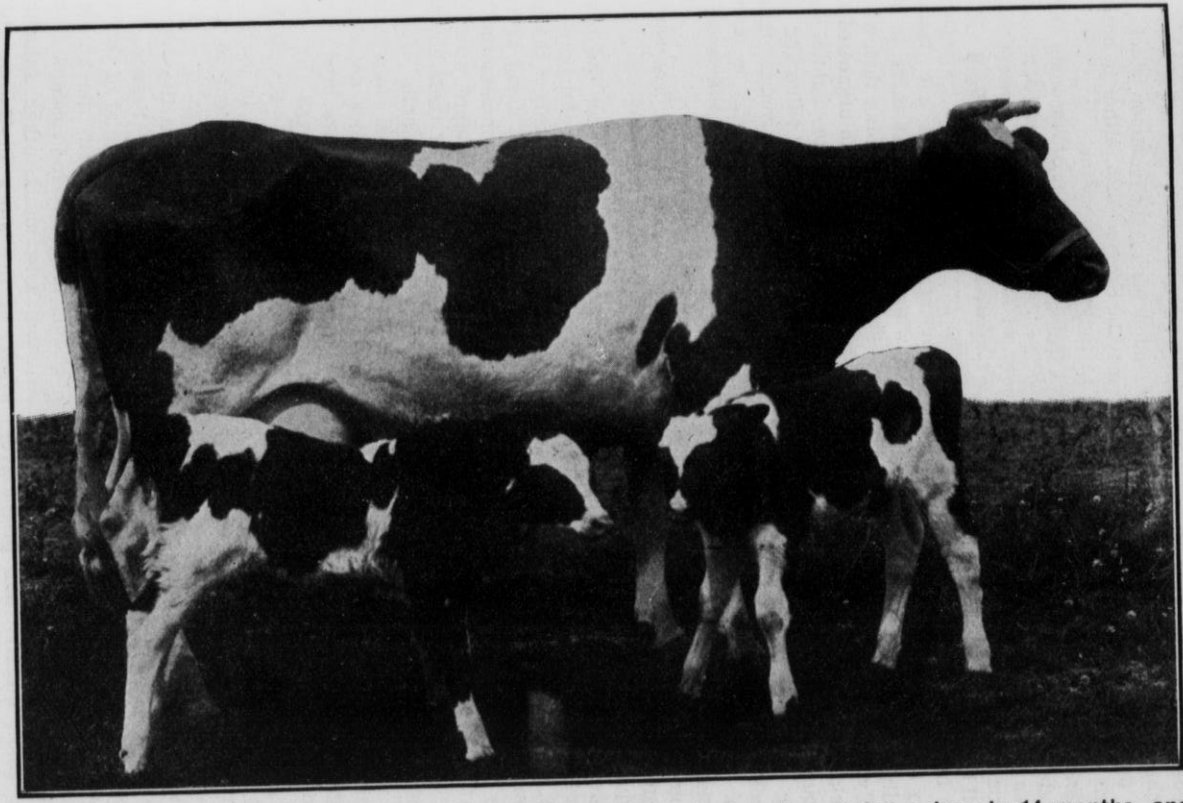
The origin of live stock on our farms dates back to the beginning of time and has always been considered essential to the helpfulness and maintenance of the human race. Neither sacred nor profane history enters very largely into the character of the live stock that Noah liberated from the ark when it landed upon Mt. Aararat and afterwards had in his charge for three hundred and fifty years; neither do we learn whether Noah or Jacob or their many descendants ever tried to make official records with their dairy cattle, or even tried to improve their type, yet in the absence of these records of any improved breeds of either type or production, these people oftimes estimated their wealth and prosperity by the size of their flocks and herds, and from the natural condition of their fertile valleys we can readily believe they were more liberal feeders of stock than are some of our farmers of today.

It was not until the increasing population of parts of Europe and Asia demanded more and better live stock, superior in many ways to that fostered by Noah's care and breeding, that improvement began. The Spaniards soon after the discovery of America brought specimens of those cattle and sheep to this country and again they were allowed to degenerate on the sparsely settled plains and mountains of this country.

In America, where no domesticated cattle or horses existed prior to its discovery by the Europeans, and where no domesticated stock of any kind was kept, the inhabitants, as elsewhere, remained uncivilized. It is largely within the last two centuries that marked improvement has been made, and within the last seventy-five years that the greatest results have been accomplished and the greatest progress toward perfection of type and production been attained. It has become a matter of history that the improved live stock on our farms has gone forward with advanced civilization, in some instances it has preceded a higher education and progressiveness.

Intensive Farming a Successful Evolution.

For periods grain farming has seemed more profitable than live stock



Four-year-old Holstein cow, Iola Piebe De Kol, No. 97717, having four living calves in 14 months, and making a semi-official yearly record of 559.74 lbs. fat, or 699.92 lbs. commercial butter.
Owned and developed by S. A. Baird & Son, Waukesha, Wis.

farming, because at times the price of feeds used most largely in the maintenance of live stock have been higher in price than the animal product. This is likely to occur with less frequency in the future than in the past. Under the present cost of living, it does not apply at all, for it is the farmer and dairyman who is selling well bred well fed, surplus stock from his farm, who is providing most liberally for his home and family, is financially forging ahead.

By returning the stable fertility back to the soil, he is enriching the ground to raise a larger crop to be fed to an increased number of live stock, giving in return increased profits. He then employs more labor to raise more and better live stock, with a larger amount of fertility to be returned to the soil, giving increased crops, profits and benefits to the farm home. It is simply a matter of intensified farming or successful evolution, that has Darwinism or any other "ism" beaten to a finish, so far as it may relate to farming.

At the present time many farmers are without a definite purpose in view, half-heartedly engaged in raising the commonest of common live stock, produced largely by the use of grade sires of first one breed and then another, in an attempt to breed up. We sometimes wonder who the first genius was that conceived the great but fallacious idea of every other farmer cross-breeding the stock on the farm for the purpose of improvement. As known, this alternate breeding from grade sires as practiced is not productive of the highest type and conformation of any one breed; frequently is lacking in uniformity of type, color, quality and productiveness, for the grade sire is not as prepotent as the pure bred in transmitting qualities, because the impure blood of the grade sire is not strong enough to overcome the downward tendencies of the common stock he may be crossed with, either in horses, cattle, sheep or swine.

Members of the Wisconsin Live Stock Breeders' Association and others are showing by precept and example, a little here and a little there, the advantages to be secured by better live stock on our farms. Knowing as we do that there is but one practical way of doing this, when will we take it up as an organized association and advocate public and State recognition of its value and the error of continuing the course many farmers are pursuing today in trying to improve the stock on the farm?

Foreign Countries More Progressive Along This Line.

The Arabs, in producing the most fleet, beautiful and graceful horse in all the world, have recognized the importance of keeping and using breeding records since time immemorial to keep up the high standard attained by the pure breeding of their horses. France and Belgium both foster horse breeding by annual appropriations. Law in France does not allow the use of any but a pure bred sire in the horse line, approved by the government authorities. Practically the same condition exists in parts of Russia for the improvement of the Orloff breed of trotters.

The Jersey cattle from the Jersey Island, off the coast of France, the Guernseys, from the Island of Guernsey, the Ayrshires, from the hills of Scotland, the Holstein-Friesians, from Holland, and many other valuable breeds of live stock in Europe too numerous to mention have been fostered either by local or government protection.

Three two-year-old Holstein heifers, sired by Sir Walker Segis, bred and owned by S. A. Baird & Son, Waukesha, Wis.

In this respect we have not been as progressive as our farmer friends of Europe. While our Federal Government recognizes their value for foundation stock and for that purpose admits their importation duty free into every State of our Union, we, as a State government, take no further recognition of their value to us. In no way do we, as a State, encourage the propagating of this class of live stock as do our farmer friends over the sea. In no way do we publicly recognize their value, only as the assessor levies a little higher tax on their sires. This short-sighted policy discourages, rather than encourages the industry.

Exemption of Taxation of Pure Bred Sires.

Why not the enactment of a law that would exempt from taxation on every farm in our State one pure bred sire of serviceable age, in every line of pure bred horses or cattle? This would not be for the purpose of avoiding the small assessable value that might be placed upon it, but for the express purpose of drawing the attention of farmers who thoughtlessly or otherwise use grade sires to the fact that the law of our State does place an appreciable value upon the ownership and use of the pure bred. This law might be made optional by vote of counties whether they would avail themselves of its advantages or otherwise. To the farmer satisfied with the grade sire, that it was "good enough", it would not be compulsory, but it would conclusively call his attention to the fact that the State did not consider he was doing his best for his own success or the best interests of the State.

Some say that we now have too many laws, that a law of exemption of pure bred sires from taxation would not be effective for good, that where a law is made optional no good would arise from it. Do you not think many of our farmers would, if from no higher motive, secure a pure bred sire so they might enjoy equal taxable rights with their neighbors? The individual farmers and the State would be the gainers by the increased value of the stock upon the farms so produced. As it is now, too many of our best sires are not kept long enough, or are sold into other states, because many of our citizens and farmers who ought to own them have not an appreciative value of them.

It is practical that a law for guidance without a penalty attached could be observed from the benefits derived. Even laws with penalties attached, enacted for the promotion of honesty and the protection of life nearly two thousand years ago, are not as yet fully observed, nor are they likely to be until the dawn of the millenium.

Work of the Wisconsin Live Stock Breeders' Association.

The Wisconsin Live Stock Breeders' Association has given more publicity to the live stock industry of our State; it has assisted in increasing the prosperity of those producing it, whether it be in utility animals or those producing meat or dairy products.

It has not only assisted in creating a demand, but it has assisted in supplying that demand coming to Wisconsin from other states by advocating "more and better live stock" on the farm. It has been a source of profit, it will mean continual prosperity to the individual who will follow it. Prosperous farmers make prosperous communities; prosperous communities make a State of prosper-

Bairdland Aggie Cornucopia, No. 135270, two-year-old daughter of Westview Rose De Kol, semi-official record of 589 lbs. fat. Owned and developed by S. A. Baird & Son, Waukesha, Wis.

ity. Indeed, Wisconsin is peculiarly adapted to the raising of live stock; its future prosperity as a State depends more on the value of its live stock than on any other one industry.

It has been said a pure bred sire is a great educator, for it is the ideas we use, not those we have, that count. By the continued use of pure bred sires, in direct lines, followed by liberal feeding on our farms, we are not only silently educating others to improve their stock, but we are giving the farm home itself an uplift. Our boys and our girls quickly discern the difference between well bred and inferior bred stock. As a result they will become more attached to the farm, the stock and the home. With increasing attachment and prosperity, the desire to hie away to the uncertainties of city life, where crowds and electric lights are among its chief attractions, will be lessened. The farm home, combined with the country school, affords more protection to society and the State than the strongest standing army. It will create a love for the old farm home. This in itself should be an incentive to us as farmers to continue improving the flocks and herds upon our farms. Instead of fighting corporations and high prices, the farmer of today should first fight both the scrub bred and the scrub fed stock on our farms and replace with better bred and better fed live stock.

DISCUSSION.

A Member—If a man is trying to grade up his herd, which should he tie to, the cow with the big record, or the cow that is well built, if the two do not match up?

Mr. Baird—Try to get conditions where they will match up, by the selection and use of prepotent sires having type and conformation. The progeny of such sires should be well built and of a desirable type. We rather take the view of Supt. Gardner, of the Holstein Breeders' Association. He would prefer to have a cow of that breed of the high type rather than an inferior or undesirable cow with the high record. But this is in reference to pure breds. If the cow was a grade, the large record would be the one redeeming feature and we would try to avoid propagating her defects by proper mating.

A Member—In other words, you want both breed characteristics and production.

Mr. Michels—But we might have a high record from a cow whose ancestry has not shown anything remarkable; in other words, she might have a great deal of production, but not a large amount of heredity. This cow breeds from her heredity, not from her production; she may be a sport but not able to transmit her qualities to her progeny; in other words, we may have a grade cow with a small amount of improved blood that can make a great record, but she is handicapped by this small amount of high blood in her veins and will not have the prepotency to pass it along.

Mr. Baird—Those instances can be largely overcome in the more careful selection of the sire to be used.

Supt. McKerrow—You would not throw away a cow that was off-type, as far as form was concerned, which is at the same time a wonderful producer, would you?

Mr. Baird—No. indeed, I would try to improve the type by the use of a perfect sire, the one as near perfect as could be secured, in order to retain the producing qualities and lead up to the type. That would be the point to be kept in view.

Supt. McKerrow—To combine the two. That is what every good breeder is trying to do.

Mr. John Imrie—I have seen cows at fairs, and sometimes a sire, that appealed wonderfully to me, but the judges were looking for something entirely different. They were not looking for a working herd, I noticed that particularly at the Fair at Minnesota last year.

Mr. Baird—Our experience has been that there is no accounting for the opinions of judges in the show ring.

Mr. Martiny—We could discuss these little details from now to doomsday, but we would not be any nearer a solution of it. Here is the underlying principle, the one upon which the Wisconsin Live Stock Breeders' Association is working. There is no more practical, feasible and easy way of improving our live stock than with the use of a good, pure bred sire. That is the general policy that we have been following out for use of the common farmer. We want to uplift the ninety-nine per cent, rather than to quibble over the one or two per cent who fight over these ring points.

Another thing is efficiency of production, particularly along the line of dairy cattle, as presented in Mr. Clark's paper. Buyers today do not go out and buy a cow as a cow. They want to know what that cow is producing. Do you suppose that the herd of cattle sold a few weeks ago in Grant county would have brought $124.00 apiece if they had had no record of their performance? They had the breeding back of them, they had the record of their performance, and they brought that price at a farm auction.

Last night we heard a very good talk on marketing, how the producer was not getting his share of what he is producing, yet there was no specific instance pointed out whereby we could accomplish very much in cutting out the middleman. I believe the time is coming when we shall do so, but I believe in the meantime that we as farmers want to wake up and run our own business a little better than we have been running it, and that will be through the means of co-operation and all the rest; for instance, for all to raise the same kind of cattle in a community, or grades of that kind, and then not keep them under a bushel.

I notice that most of you have on your chair a copy of the "Wisconsin Agriculturist." Look on page 30 and you will find there advertisements of gasoline engines. Now, do you suppose the manufacturers of those engines would have expected to sell them and make money out of them if they had gone to work and made those engines, piled them up in the storeroom and waited for buyers to come to the factory to look for that particular kind of engine, and then when they did come there, the engines were not put up in attractive form, the manufacturer has to pull them out from under some pile of rubbish, how many engines do you suppose they would sell in a year if they followed that method of doing business, instead of confidently advertising as they do? Men who want those machines see those advertisements, they follow them up and go and see the machines; they are put up in an attractive form, whether they are exhibited by the manufacturer or the local dealer.

Now, how about our live stock business? How does the farmer do it? Why he raises stock on his farm, he does not pay much attention to it, he waits for a local buyer to come, and when he comes there the farmer

isn't very decided whether he wants to sell an animal or not, and the dealer buys it at a low price. Why do we not do as these manufacturers of gasoline engines have done?

Then turn over to another page of that same paper and we find another example that is practical for the farmer to follow. Up on top of that page is an advertisement of cattle where the whole community has gotten together, they have gone in on a common basis, and they have used some space in advertising their cattle in this paper, they can afford to do it, and when the buyers go out to see their cattle they are presented to them in an attractive form. They are kept in well kept barns; they are furnished with records of the products of those animals.

I believe it is feasible for the farmer to breed live stock and to organize in a community, to use a little space, perhaps, in some agricultural paper, which may say something like this: "One thousand", or "Five hundred grade Holstein cows for sale. Jones, Secretary, Waupaca County Holstein Breeders' Association." Look at the buyers that would come in here, and it would be well worth their while to come for that bunch. Other counties could do the same thing. That is the plan of organization that the Wisconsin Live Stock Breeders' Association is working upon. The breeding of any kind of live stock is the fundamental basis of our permanent agriculture and that is the way those who are making the most out of their live stock are doing it, through community organizations, the breeding of some pure breed, and then presenting it in a businesslike way to the public.

Supt. McKerrow—Mr. Martiny has given you a good outline of the purpose of the Wisconsin Live Stock Breeders' Association, community breeding organizations. I have been a crank all my life on the subject of pure bred animals, but at the same time I have been much impressed with this subject of grading up, and particularly while moving around in Great Britian. You do not see the same conditions there among the tenant farmers, or men who are not farmers, that you see here. They are all breeding live stock and they all have pure bred sires; those tenant farmers would not think of using a grade sire. While they have what we might call a scrub class of farmers, they have the hill cattle and the hill sheep that they bring from the hill districts of Scotland, and even down in England on these tenant farms, but even with that class they always have a pure bred sire to produce improved offspring. Those tenant farmers pay good prices for pure bred sires, prices that would frighten about half the Wisconsin farmers to death, prices running up into hundreds of dollars of our money, just to produce mutton and beef to send to the English market. Those men would not think of using a grade sire, and they have learned this in the school of experience, it is no haphazard matter with them, they have been at it for years and their fathers for years before them, and their grandfathers and great grandfathers; they know the outcome to a surety, and we wish that every Wisconsin farmer would get the same idea, that the greatest profits must come by the improvement of the grade of the flock through the pure bred sire. We cannot impress that too strongly.

Mr. Martiny—It seems to be the sentiment, it is in the air, that farmers ought to co-operate, they ought to organize. On the other hand, in the average locality in the State of Wis-

consin, a great many farmers will raise the objection that the pure bred sire today is so high-priced they cannot buy it. I think right there is an opportunity for a simple form of organization. You have a dozen farmers, or a number of farmers, neighbors, who can watch each other's actions every day, they can get together in a locality and buy a pure bred sire that they can use right along themselves and improve their herds. I do not think there is much opportunity for an organization of the hog interests. That of which I speak is one of the easiest forms of organization that I know of, and I do not know of any form that will bring more results than an organization along this line of a pure bred sire. Of course, if you have use for a pure bred sire and can own one yourself, that is better, but where this is impossible, you could co-operate, put in ten or twenty-five dollars apiece and get a good animal; that is one simple form of co-operation.

Supt. McKerrow—I know some co-operative creameries that are buying pure bred sires. Over in Iowa they are busy, over in Minnesota they have quite a number of organizations of what they call live stock shippers to cut out the middleman, and some of these live stock shipping associations are now getting into a line of buying pure bred sires that they may have better live stock to ship. So these things can be put into practical channels right along this line of the pure bred sire.

The Chairman—Anything further? Remember this, if you go away from this Institute and do nothing along these lines you have heard so much about, it will not do you any good. It is not much trouble to organize a cow testing association, but somebody has got to do it. If you will write to Mr. Searles, at Fond du Lac, or the Secretary of the Dairyman's Association, Mr. A. J. Glover, of Fort Atkinson, you will find out all about it. Mr. Searles is paid by the State Dairyman's Association to do that very work; he will come down, he will talk to you folks, tell you how to do things, and you will get started in that way. You can get started in co-operation too. Join the Wisconsin Live Stock Breeders' Association; that is a very good thing to do. You come in contact with all the breeders, you get a directory showing the names of all the members and what they are breeding on their farms. Mr. Baird, I am sure, will be willing to take memberships for the Wisconsin Live Stock Breeders' Association, which is only fifty cents a year, and you get this directory and all these other benefits.

Mr. Martiny—If you join this Association, which is a State-wide Association, this directory will contain your name and the list of live stock that you are particularly interested in. These directories are sent out, not only to all members of the Association, but to other people, who for any reason are interested. For instance, there is a big inquiry coming to our Commissioner of Immigration and to our Superintendent of Farmer's Institutes and to the Secretary of our State Board of Agriculture, asking where in Wisconsin different lines of live stock can be bought. Then these people are sent one of these directories, they find there a long list of breeders of the different kinds of live stock, and it is very easy for them to pick out the particular kind they are interested in.

We are getting out a bulletin or pamphlet which is entitled "The Pure Bred Sire." That will go to press in a short time and will be of great value, we believe. It will be a nicely

gotten up, illustrated book. Another thing we are getting out is entitled, "The Pulling Power of Wisconsin," containing different articles on draft horses, written by well known horsemen. All these articles will be freely distributed to members of this Association. We will be glad to have everybody who is interested in this breeding proposition in Wisconsin join this Association.

Adjourned to 1:30 P. M., same day.

AFTERNOON SESSION.

The convention met at 1:30 P. M., same day, Mr. Thos. Convey in the chair.

SYMPOSIUM ON BREEDS OF CATTLE FOR WISCONSIN.
THE SHORTHORN.

F. W. Harding, Waukesha Wis.

(In the absence of Mr. Harding the paper was read by Supt. McKerrow)

Webster gives us as one definition of "symposium", "a drinking together" "a feast." Applicable to this occasion then in the fact that one man breeds Shorthorns, another Holsteins, while others of s have adopted the Guernsey or Jersey, and there being a place in Wisconsin's cattle industry for all, makes it possible for the men championing different breeds to exhibit such feeling as is expressed in the derivation of the word supplied in the subject assigned to us.

Conditions of locality, such as land values, markets and labor, should influence a person in the selection of a breed of cattle where the business is to be purely commercial, that is, the production of beef for market or milk or butter as a farm product, but when the business is to be the breeding of registered cattle, one need not consider such conditions as mentioned that surround us, at least not as the governing reason for selecting the breeding of Shorthorns as against one of the other pure breeds.

You will find over the State a breeder here and there of Shorthorns whose neighbors are engaged in the milk business, and I have no doubt there are men making a success of some dairy breed where the conditions of the neighborhood are more favorable for the growing of steers. It is fortunate, therefore, that the profitable raising of pure bred cattle is not dependent on local support for a market for one's productions.

The foregoing is a well-established fact, but what is of great importance in the business of breeding Shorthorns, or any other kind of registered stock, is a special liking for the work and a well directed purpose along lines which have been known to succeed.

Some Merits of the Shorthorn.

The merits of the Shorthorn can be described as follows: they are the most profitable beef cattle in the

First prize Aged Shorthorn herd at International Exposition, 1912, exhibited by Geo. J. Sayre, McHenry, Ill.

world for the farmer, for they make the greatest weight for feed consumed of any breed and bring as much per pound, finished beeves topping the market with a frequency proportionate with the number of cattle marketed as against any other breed. They are also the best milkers of any of the beef breeds, making them truly the farmers' breed of cattle where diversified farming is carried on.

I am not going to cite here milk records of some Shorthorn herds we have in the country and allow you men who are to speak on the dairy breeds to follow me with a bigger story, suffice to say there are herds of Shorthorns that pay their owners well strictly as a dairy proposition and in Great Britain, generally speaking, the farmers find the Shorthorn the most profitable type of cattle for dairying, because they have learned that the bull calf made a steer of can be developd into good beef, and the cow, when either dry or old beyond usefulness, can be fattened for market, and the whole operation pays better than milking alone, and everything in connection with their business, except labor, costs more than here.

In the United States there is considerable awakening interest in Shorthorns. I have been talking recently with some of these eastern men and find the Shorthorn suits their conditions for the same reasons that they are so well suited to the English conditions, and further, they figure they can conduct the business with decreased dependence on labor, a consideration, by the way, important this country over.

The Milking Shorthorn.

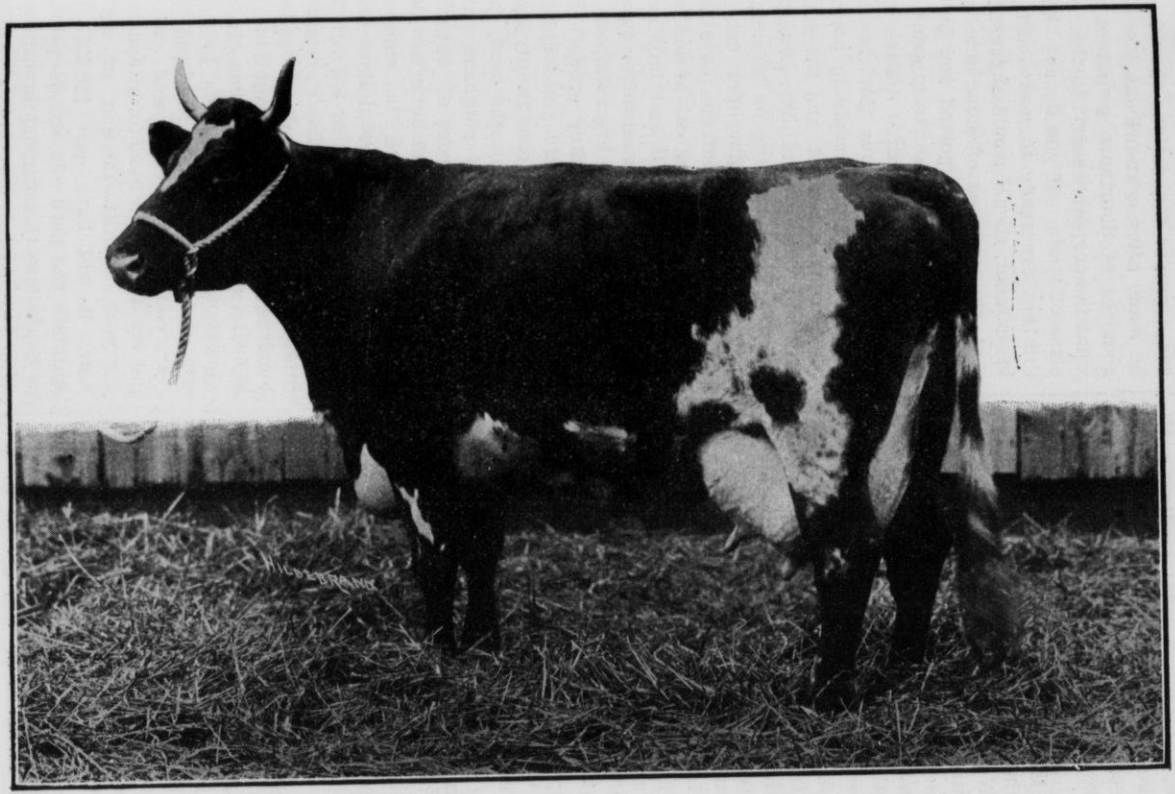
It is a more or less general belief among the uninformed that there are two strains of Shorthorns—the beef strain and the milking strain.

A little story my father used to tell at home comes to me just now. It was at the time when he was getting together our start in Shorthorns, and he paid a visit to a breeder advertising widely a milking strain of Shorthorns. On his return, being anxious to know what he had found out about this dairy strain, we were given his opinion that the breeder mentioned had no foundation for his claims, as it was a "devil of a strain" for him to get any milk at all.

You will find in all herds of Shorthorns, no matter whether Scotch, English or American families, some particular individuals or families within a man's own breeding that are heavier milkers than others, so as to get good milking Shorthorns it is more of a question of selecting the individuals to suit. In breeding Shorthorns, therefore, we should give consideration to milk as well as beef. The breed has attained its preeminence on account of both of these qualities and it is therefore quite fair to assume that if we will breed Shorthorns in the future as they have been bred in the past, to give them and hold for them the place which they occupy in Great Britian and North America, to say nothing of their conceded superior position as beef cattle in every other foreign country of the world where good cattle are raised, we will be sure of trade for our surplus that cannot fail and profitable prices in proportion to ability displayed in breeding and marketing.

The Beef Side of the Question.

It may interest you to know that there are as many as fifteen thousand owners of one or more registered Shorthorns in the United States. This



A milking Shorthorn cow, owned by H. H. Little, Evansville, Wis.

is a much larger number than any other beef breed and presents a particularly desirable situation for those breeders of Shorthorns who will breed their herds up to a high standard. Here there is plenty of room at the top and a very good business with other breeders.

We need no longer to be told of a coming scarcity of beef cattle, for this situation is now here, we all know it, and those who have had beef cattle to sell lately wish they had more, and now the only way to get more is to breed them. A more general use of Shorthorn bulls on your grade herds will help relieve the situation and prove profitable by producing calves that will grow into good beef. When the calves come heifers, keep them in the herd and you will never regret it as long as you keep cattle. The herd of cows maintained at the Waukesha County Poor Farm and Asylum are by Shorthorn bulls out of grade milk cows and are eye-openers, good milkers, with size, build and breeding that make good beef.

Building up a Pure Bred Herd.

What I have said up to this point applies more particularly to Shorthorns as a farmers' proposition, so I will ask your indulgence in a short prospectus calculated to inform the man who may wish to engage in the breeding of a somewhat better class of Shorthorns.

I believe that with an initial outlay, for example, of $3,500, in ten heifers and one bull, eight thousand dollars can be made clear in eight years time. This, of course, with careful management by men who know the cattle business or will accept to act on the advice of persons who have made a success of breeding Shorthorns.

The first step, purchasing animals for a proper foundation, should only be made after a knowledge has been acquired of Shorthorn pedigrees and what is acceptable merit to the best class of trade. If you do not know this but are ready to make such an investment, then I would suggest you seek the services of some one you know who is well posted and in the position of having no axe to grind.

Around three hundred dollars each will, at this time, buy the class of heifers that can be made to pay the best, in my judgment, and the young bull will cost around five hundred dollars. Now, figuring on an eight-year period and eighty per cent of calves saved, and that one buys heifers carrying their first calves and that the calves come half and half bulls and heifers, and that all heifer calves from the ten heifers are retained in the herd and that they produce at about thirty months old, you will have at the end of eight years twenty-eight cows and heifers in the herd, not counting the original purchase, and will have had to dispose of seventy-eight head of bulls and heifers, which should net at twelve to eighteen months old two hundred dollars each above selling expenses, or $15,600. To this add twenty-eight head retained in the herd at same valuation, two hundred dollars each, amounting to $5,600, a total of $21,200. Then charge off cost of maintenance of herd at rate of forty-five dollars per head per year, counting both cows and calves and ten dollars per head for attendance per year, and at the end of eight years it will have cost $10,625 to maintain the herd. It will be proper to depreciate the original investment about seventy-five per cent., or $2,625, leaving $8,000 clear at the end of eight years.

Please note again that I have fig-

ured the sale price of all surplus disposed of at two hundred dollars each after paying sale expenses, such as advertising or cost of consignment to one of the Shorthorn Association sales. Now, this figure must be admitted to be conservative, if you buy strictly good ones at the start and further provided when you get ready to sell you have them in good enough condition to show what they are. You will get for some as much as you paid and for a show animal (and there is no reason why you should not breed and develop one occasionally) you stand to get something extra in way of price. This will take care of cost of changing herd bulls.

I do not think you can take the kind of Shorthorns that you can buy, say, for half the price I have suggested and stand to make the good showing that can be made with the better kind, and this for obvious reasons.

Besides the profit to be made in good Shorthorns, there is to me, and I have heard many others say the same, a certain pleasure from the breeding of good Shorthorns that cannot be had in any other business. I think there is no fear of the business being overdone, notwithstanding the possibilities for pleasure and profit, for the Shorthorn business is like most any other business in that it requires proper attention and application of business principles, and not all who engage in the business take this into account.

DISCUSSION.

The Chairman—There is every reason for considering this breed when we consider the price of beef at the present time.

Mr. Jacobs—Don't you think the estimate of cost of keeping and taking care of the animals given by Mr. Harding is a little bit conservative, under present prices?

Supt. McKerrow—Forty-five dollars for feed and ten dollars for care, making fifty-five dollars per year, for all animals of different ages. No, I would not say it is very conservative, and yet it is possibly on the conservative side, because in feeding these animals for the sales ring, there has got to be special feeding. Feeding for the sales ring is a good deal like putting your cow on the test.

Mr. Michels—I think we could fairly allow for the pleasure that there would be in developing a good animal.

The Chairman—Are the prices for the sale of stock too high in that paper?

Supt. McKerrow—I do not think so, considering the class of animals that Mr. Harding suggests you start with, and there is a point where I think the breeders of all classes of cattle will agree with Mr. Harding, that where you lay the foundation, the best is none too good. Of course, three hundred dollars apiece for ten heifers will not buy the very best, and yet it will go into the best class and permit of the selecting of very good animals with a line of blood that is good to breed on. Five hundred dollars would not buy the champion at the International Stock Show, but it would buy his brother.

Mr. Imrie— What percentage of common farmers would you advise to put that amount of money into pure bred live stock?

Supt. McKerrow—That depends on how common they are. I think I see a good many men before me who might put money into pure bred live stock. I do not know whether they would want to put in $3,500 to begin with.

A Member—A good many of them do not own that much.

Supt. McKerrow—Do not go in debt for them; I will give you that advice, and do not get into pure bred stock until you have had experience with grade stock that shows you are a good feeder, a good caretaker and a fairly good judge. Mr. Harding might give you different advice, if he was here.

The Chairman—You will qualify that, however, with regard to the pure bred sire?

Supt. McKerrow—Surely. Always buy a pure bred sire, I should say if I was giving away any free advice, because he will help you out of debt. Buying a herd of pure breds, before you have had experience and know how to take care of them and how to sell them, might get you into debt.

There is one thing, though, that Mr. Harding states in his paper which I want to emphasize and that is the prospect ahead for all meat products in this country. You know this country is fast reaching the point where we are eating the larger part of the meat products that we produce in the country. The population is running ahead of the production. In 1900 we had eighty-four head of cattle to every one hundred people. By the census of 1910 that gap had grown much wider and instead of having eighty-four head of cattle to one hundred people, we got it down to something like sixty or sixty-two head, and it is still worse with sheep and hogs. For the last three years the gap has grown wider and wider, faster than it did the previous ten years, showing that as the population goes on the live stock is going off, and that is an encouragement for all kinds of live stock, not only the meat-producing animals, but the dairy animals, and especially the meat-producing animals.

What happens in every country in the world where they get population enough to consume all these products? The prices of meats go up, because they have got to import from foreign countries, and it costs money, and they are going up the same in this country. What happens to the price of land in all those countries? It goes up. The best classes of land sell in Great Britian today (and it is about the same in Denmark, Holland and Germany) up to four and five hundred dollars an acre, and yet we meet people here in the United States who say that one hundred and fifty, two hundred, two hundred and fifty and three hundred dollars, as some Wisconsin land has sold for and considerable Illinois land, is too high, it will not pay, it will have to go down. But when we get to the point where we eat up everything produced in the United States, our best lands will be worth just as much per acre as the best lands in the old countries that I have mentioned. I am not afraid of land going down; I am not afraid of meat products going down. The only question for us to settle is whether we want to do our farming business with live stock that produces meat or dairy products. That is the only thing for each one to settle for himself.

Mr. Schroeder—Do you think beef can be profitably produced on one hundred and fifty and two hundred-dollar land; that is, where you raise the calf, finish it for market and dispose of it?

Supt. McKerrow—It is being done on four hundred-dollar land in England, but it is being done in connection with dairying. If I do not look out, that will get me onto the dual-purpose cow trouble. Still I do not think there is any trouble about that, because the man who wants to keep

a dual-purpose cow should be allowed to do it.

In regard to Mr. Schroeder's question, whether beef can be produced on one hundred and fifty or two hundred-dollar land, I think it can where the man is posted on how to do it, and has good stock, of course. If he is posted, he will not have anything else.

I remember spending two days with the late Mr. George Adams, of Faringdon, Berkshire, England. He was milking five hundred cows, his milk going to London to market. His holdings were cut up into half a dozen different farms. He was making money, his books showed it and everybody seemed to know it. He was one of the best farmers I saw in England in every respect, and in every stable were Shorthorn cows. I said to him, "It is strange to me when you have five hundred cows in milk that you do not have a milking breed of cattle, Holsteins or Island cattle (as they call the Guernseys and Jerseys)," and he said, "I tried both breeds but I can make more money from my Shorthorns." He said, "The conditions here are different from your country. Beef is very high in England. I can carry about five hundred cows on my farms with the help I employ on the farms to take care of them and milk and feed, everything of that kind, and that is about the highest economical point I can reach. Now, I want to feed out a lot of coarse feed, the major part of the crops that I grow on these farms, and to do that I would have to keep a thousand or fifteen hundred cows, but I cannot do that and meet the help problem very well, so I raise the steers and feed them off as baby beef at two years old, and the heifers—if one appears to be a poor milker, as a good many of them do in all breeds—I feed them off and they pay their way, because beef is high and the average cow I do not milk after she is six years old. The real good ones I keep on until they are eight and ten, because I want more of their heifer calves, and then I want their milk. By doing business this way, according to my books, they pay me more money and fit into my conditions better than the Island breeds or the Dutch cattle do."

Remember this was four hundred dollar-land on the average that he was farming. He was paying big rental on what he rented and good fair interest on the four hundred-dollar land too, but it suited his conditions. Mr. Adams was an intensive farmer in every respect and no other kind can succeed in England now.

It may suit some men on two hundred-dollar land and if it suits them and they are business farmers and understand it from the ground up as he did, it would probably be all right. He was breeding a peculiar class of Shorthorns, all of the same type, and his steers were nice, plump animals, and his cows were all nice ones, they had fine udders,—yes, they would make the Holstein fellows sit up and take notice. I have seen the Red Polled and the Norfolk Reds bred on the same lines for producing beef and milk.

A Member—Did he allow these male calves to suck their mothers in order to make baby beef?

Supt. McKerrow—No, they were kept for a few days on new milk and then they were changed. Most of his milk was shipped as milk, although he shipped some cream, and so he had some skim milk for the calves. He changed from the whole milk gradually. He began to put in mixed feeds, flax seed was the first thing to go into the skim milk, flax seed jelly, and then his calves, as soon as they could eat, were eating

first oats and then a little mixture of pea and bean meals, cheap peas and cheap beans that came from Yankee land; he rather intimated that we Yankees did not know enough to feed peas and beans over here. He made up a feed for his calves, and they were nice, growthy calves, fed very carefully, fed green feed as fast as they could eat it, and then nice hay. He kept them growing every single day until they went to market.

Mr. Schroeder—What was the weight of the Shorthorn cows that Mr. Adams was milking?

Supt. McKerrow—I should say that those cows in their milking form, and they were in nice form, nice, thrifty, smooth, fleshy form, but not fat, I should say they would average between thirteen and fourteen hundred pounds. They had good sized frames, deep bodies, and they had what Griswold here would call a dairy form, but others would call a beef form, because they were smooth and fleshy.

A Member—Didn't that man let his calves suck the cows at first?

Supt. McKerrow—No I do not think he did. I think they were taken away and the cows milked. Of course they were fed on the mother's milk for the first four or five days, entirely on new milk from the mother.

A Member—I have been told by some people who called themselves dairymen that they never fed their calves at all at first until they get so hungry as to drink, and it is sometimes as long as thirty-six hours. Don't you think that is wrong?

Supt. McKerrow—Thirty-six hours is a good while to wait for a meal, yes.

Mr. Schroeder—What was the average amount of milk from those cows?

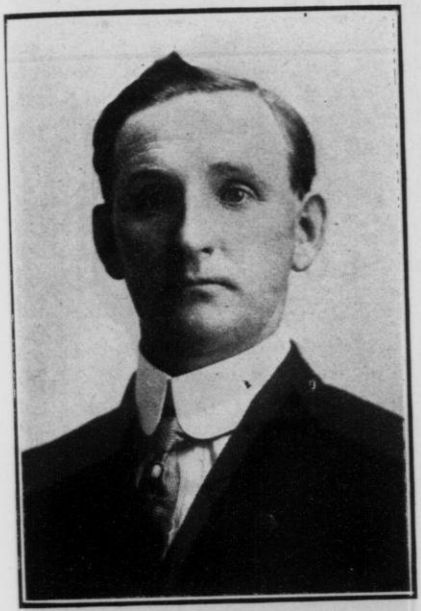
Supt. McKerrow—I am not positive about that. I think, though, he told me they would average over ten thousand pounds a year, but I have forgotten the exact figures.

The Chairman—How can you account for the lack of dairy efficiency that we know of in the Shorthorn over here?

Supt. McKerrow—For the very reason that the American Shorthorn breeders have been looking more to the beef side than the dairy side in their breeding. In the United States, so far as the pure breeding of these cattle is concerned, it has been fostered mainly in the corn growing districts, grown on corn, milked on corn, fed on corn, the calves have been permitted to run with the cow and get their feed, and the cow dried up when the calf got through taking the milk. You see these breeders did not want dairy quality at all, but in England, on this high-priced land, they have had to keep their eyes on both sides and they milk these Shorthorn cows there just the same as our dairymen do here, ten to eleven months in the year, and in fact, Mr. Adams told me they had cows they had to work hard to get them to dry up at the end of eleven months, but here that part has not been looked to and you change these breeds into almost any form you want to by selection, breeding and feeding, or by neglect of care, or the kind of care I have suggested, not milking them, letting them dry up early. Cattle are like men, they will get into bad habits if you give them a chance.

THE RED POLLED.

H. A. Martin, Gotham, Wis.



Mr. Martin

Hornless, or polled cattle, have existed in the counties of Norfolk and Suffolk, England, from time immemorial. The files of early publications of this section make mention of facts in regard to whole dairies of polled cows which were kept as early as the seventeenth century. The year 1846 may be taken as the date from which the Norfolk and Suffolk strains merged into each other, so as to be spoken of as one and the same breed. In 1873 the Standard Description was adopted and the following year the English Herd Book founded.

The first regular importation of Red Polls to the United States was in 1873 and since that date many importations have been made.

Red Polls are a dual-purpose breed. The Detailed Description of Standard and Scale of Points call for such an animal and the breeders are breeding and exhibiting animals which conform to the standard.

As a breed, the cows are profitable producers, they bring forth calves which can be grown and sold as feeders, or retained by producer and finished for market at an early age. The cows when kept in the dairy make a production which shows a profit from this source.

Showing as Compared With Other Breeds.

Whenever Red Polls have had the opportunity to enter into competition with other breeds, they have made a credible showing.

In 1901, at the Pan-American Exposition at Buffalo, the Red Polls were represented in the six months' dairy test by five cows from the herd of one breeder. There were ten breeds in the test, represented by five cows each: Jersey, Guernsey, Ayrshire, Holstein, Polled Jersey, Shorthorn, Brown Swiss, French Canadian, Dutch Belted and Red Polled.

Experienced men furnished by the various breeders' associations spent months in making selections of representative cows of the several breeds, with the result that the Jerseys, Ayrshires, Guernseys, Holsteins, Shorthorns and French Canadians were said by competent authority to be the finest lot of cattle of these

breeds ever seen together. As this was a Model Dairy Breed test, the cows were given credit for their dairy production only and charged for all feed consumed.

In this six months' test, the Guernseys produced the greatest net profit, $230.10. The Red Polled cows were fifth, with a net profit of $197.80. The five Red Polled cows entered this contest under a handicap, as they were all furnished by one man, had been in lactation from 42 to 70 days, an average of 52 days each, when the test was started.

The best cow in the test, the Guernsey Mary Marshall, showed a net butter profit for the six months of $59.41. The second best cow, the Red Poll Mayflower 2nd, showed a net butter profit of $52.10 for the six months. The calves these cows produced were not considered at all in this test.

Showing in Farmers' Cow Class at International.

In 1902, the International Exposition, held at Chicago, Ill., gave a classification for a farmers' cow class. The awards in this class were based on the following percentages: Individuality of cow, 25 per cent; her butter record, 33 per cent; the calf, 40 per cent.

There were five entries, four Red Polls and one Shorthorn. The Shorthorn was fed and exhibited by the Iowa Agricultural College.

First place went to a Red Poll cow, with a total score of 94 points; second, to the Shorthorn, with a score of 92; third, fourth and fifth to Red Polls, with scores of 91, 89 and 88.

In 1903 the International Exposition continued this farmers' cow class, but there were no entries except Red Polls. The Red Polled cow which won first place in 1902 produced 337.8 pounds of butter fat in 330 days. The Red Poll winning in 1903 produced 487.97 pounds of butter fat in one year.

Since 1903 there has been no farmers' cow class, although the Red Polled Cattle Club has a standing offer of five hundred dollars for this purpose, providing that any other breeds competing should contribute a like amount.

Their Record in Slaughter Tests.

Red Polls have been exhibited in slaughter tests at the International Exposition in competition with beef breeds for the last few years.

In 1906, of the twenty-seven head sent from the Show to the block, six were Red Polls. In percentage of live weight yielded, among the carcasses of the two-year-olds, the highest was an Angus, 69.5 per cent; second, a Red Poll, 69.2 per cent. In yearlings, the highest, a Red Poll, 67.5 per cent; second, a Hereford, 67.1 per cent; third, a Red Poll, 66.8 per cent, dressed weight.

In 1907, of the thirty-one head that were sent to the block, three were Red Polls. In the two-year-old class, the highest was an Angus, 66.9. A Red Poll was third in class, with a percentage of 66.6.

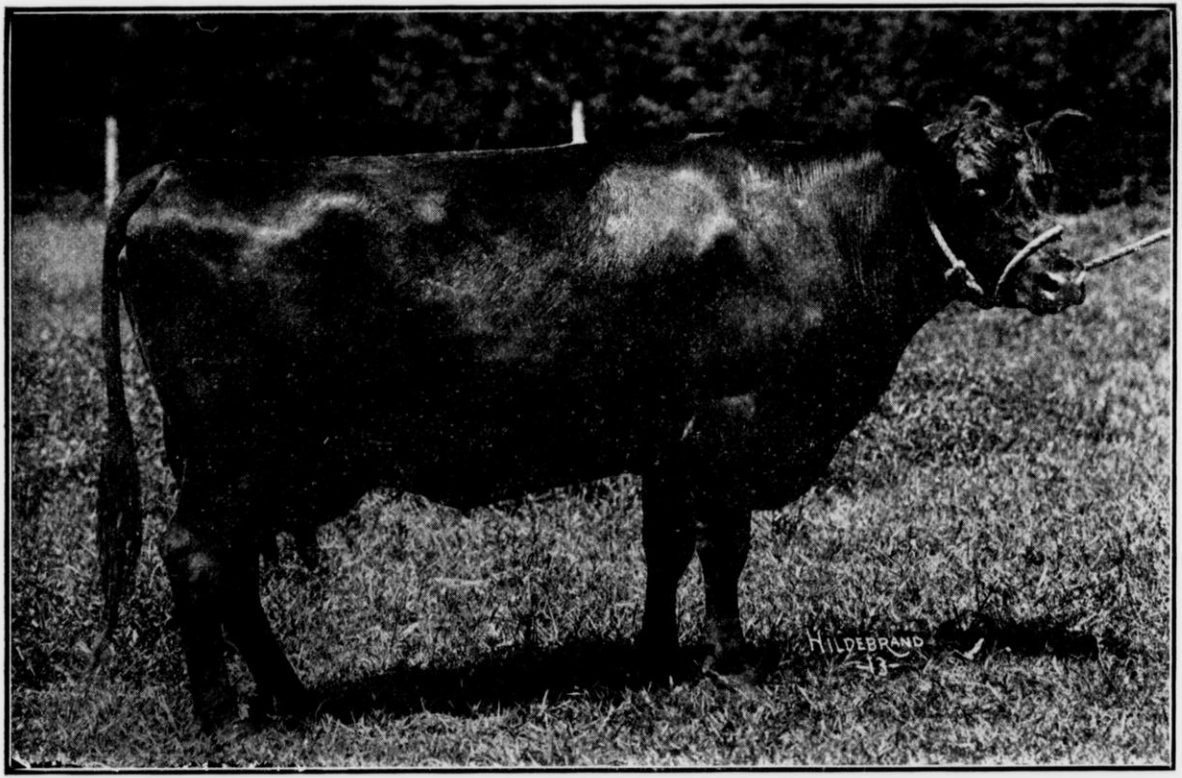
In 1908, in the two-year-old class, the Red Poll got third and fourth, yielding 68.71 and 64.85 per cent.

In 1909, in the two-year-old class, they got fifth and seventh, yielding 65.2 and 65.9 per cent.

In 1910, in the two-year-old class, a Red Poll was fourth, with a percentage of 64.21.

In 1911, Red Polls were third and fifth, yielding 65.6 and 64.7 per cent.

In 1912, they were third and fifth in the two-year-old class, first going



Red Polled cow, Nina, No. 26710, bred and owned by J. W. Martin. Official weight, 1565 lbs.; official record, 9638.5 lbs. milk, 394.14 lbs. fat in 11 months, record made in 1912. In 1913 so far she promises to make around 11,000 lbs. milk and 500 lbs. fat.

to the University of Nebraska, second to the Iowa State College.

The Red Polls in all these slaughter tests were bred, fed and exhibited by their individual owners, while the majority of the winners exhibited by the other breeds were selected by the different Agricultural Colleges, finished and exhibited under conditions the average breeder does not have at his command.

Records in Dairy Tests.

In 1908, the Red Polled Cattle Club drew up rules and prizes for dairy tests for Red Polled cows. The first year ending December 31, 1909, found twelve cows which had finished their records. The cow winning first place produced in 365 consecutive days 1,889.5 pounds of milk, and 510.62 pounds of butter fat.

For the year ending December 31, 1912, forty-five cows had finished their year's records, with twenty-four of them each producing over 300 pounds of butter fat.

These records were made under ordinary farm conditions, the cows were only milked twice a day and given no extra feed or care. It was the aim of the Association to make these tests under the ordinary farm conditions found on most of our farms.

Some five years ago the Red Polled Cattle Club adopted a detailed description of standard and scale of points for Red Polls. Since the adoption of the standard, breeders have worked together, carefully, selecting their stock, until today they present to the public a uniform lot of animals commanding admiration from the most critical.

In 1912 an Advanced Registry for the breed was adopted. Eligibility to advanced registry not only depends on the butter fat production, but an animal to be eligible must scale at least 80 per cent of the scale of points.

The writer holds the question is not which breed is the best, but which breed is best adapted to your specific conditions. Select the breed you like, the one you think will do best under your conditions, then apply the feed test, and with judicious management success is within your reach.

DISCUSSION.

The Chairman—Here is a man who believes in records; he has given you a number of them and they are reliable, too; I am satisfied of that. Now, ask him any questions you choose along the line of that particular breed.

Mr. Griswold—Are the Red Polled men today working more toward the dairy line or the beef line?

Mr. Martin—In order to answer that question, I would have to divide the territory. Our western men never have paid much attention to milk. Take Missouri, Kansas and the entire west, and that is true, but the eastern breeders are in the centralized districts, where the dairy line is given attention in developing animals along dual-purpose lines.

Mr. Schroeder—What are the peculiar conditions to which the Red Polled cow is adapted?

Mr. Martin—I have noticed in a case such as Mr. McKerrow spoke of as to the Shorthorns in England, we find there are many conditions under which they are situated where they cannot milk the number of cows they would like to run a special dairy, so they milk the best cows and the others they turn off and raise the best of the young stock for beef. You find many places under those condi-

tions. The question of labor comes in very materially. I have heard many men bring that up as the one changing point, but I would say to any farmer, stay with the breed you are interested in. If you are interested in any particular breed, stay right by it, through thick and thin. That is where you will win out in the long run.

Mr. Griswold—Is it not the tendency in picking out a sire to pick out the nice, smooth, round-looking animal, and in that way grow toward the beef side?

Mr. Martin—Yes. We have many things we must avoid as much as we can practically. Now, with your special dairy cattle, the average buyer comes and looks over your herd; his eye, the minute he gets in your yard, falls upon the nicest, slickest looking calf, and if he is not very well posted, it will take a good deal of arguing on your part to convince him that that is not the best.

A Member—How is it as to the cost of production of milk?

Mr. Martin—We do not claim that we supersede in any way the special dairy breeds. You must not confuse them in making your selection.

The Chairman—Yet your report from the World's Fair at Buffalo would indicate that they were among the most economical producers. I believe the second prize cow there was a Red Poll.

Mr. Martin—Yes, it was.

A Member—As the boys get more out of the notion of milking, the Shorthorns and Red Polls will come more and more into use.

Mr. Bradley—A few years ago we had a big crop of corn and hay and I said we must have more stock. We were milking all the Jerseys we could with the help, so I bought some Shorthorns, thinking to let the calves run with their mothers and make beef, but I found the Shorthorn calves sucked the Jersey cows instead of their own mothers and soon disposed of them.

STANDARD OF EXCELLENCE, RED POLLED CATTLE.

COW.

Disqualifications.

Scurs, or any evidence whatever of a horny growth on the head. Any white spots on body above lower line or brush of tail.

Color: Any shade of red. The switch of tail and udder may be white with some white running forward to the navel. Nose of a clear flesh color. Interior of ears should be of a yellowish. waxy color .....Points 2
Objections: An extreme dark or an extreme light red is not desirable. A cloudy nose or one with dark spots.

Head: Of medium length, wide between the eyes, sloping gradually from above eyes to poll. The poll well defined and prominent, with a sharp dip behind it in center of head. Ears of medium size and well carried. Eyes prominent; face well dished between the eyes. Muzzle wide, with large nostrils .....Points 6
Objections: A rounding or flat appearance of the poll. Head too long and narrow.

Neck: Of medium length, clean

cut, and straight from head to top of shoulder, with inclination to arch when fattened, and may show folds of loose skin underneath when in milking form... ..... Points 3

Shoulder: Of medium thickness and smoothly laid, coming up level with line of back....Points 6
Objections: Shoulder too prominent, giving the appearance of weakness in heart girth, shoulder protruding above line of back.

Chest: Broad and deep, insuring constitution. Brisket prominent and coming well forward ..... Points 10

Back and Ribs: Back medium long, straight and level from withers to setting on of tail, moderately wide, with spring of ribs starting from the back bone, giving a rounding appearance, with ribs flat and fairly wide apart ..... Points 14
Objections: Front ribs too straight, causing depression back of shoulders. Drop in back or in loin below the top line.

Hips: Wide, rounding over the hooks, and well covered. Points 3

Quarters: Of good length, full, rounding and level; thighs wide, roomy and not too meaty. Points 6
Objections: Prominent hooks and sunken quarters.

Tail: Tail head strong and setting well forward, long and tapering to a full switch.....Points 2

Legs: Short, straight, squarely placed, medium bone.... Points 3
Objections: Hocks crooked: legs placed too close together.

Fore-Udder: Full and flexible, reaching well forward, extending down level with hind-udder. ..... Points 10

Hind-Udder: Full and well up behind .....Points 10

Teats: Well placed, wide apart and of reasonably good size.... ..... Points 4
Objections: Lack of development, especially in forward udder. Udder too deep, "bottle shaped" and teats too close together. Teats unevenly placed and either too large or too small.

Milk Veins: Of medium size, full, flexible, extending well forward, well retained within the body; milk wells of medium size ..... Points 6

Hide: Loose, mellow, flexible, inclined to thickness, with a good full coat of soft hair.... Points 5
Objections: Thin, papery skin or wiry hair.

Condition: Healthy, moderate to liberal flesh evenly laid on; glossy coat; animal presented in full bloom .....Points 10

Total 100

General Description: Cow medium wedge form, low set, top and bottom lines straight except at flank, weight 1,300 pounds to 1,500 pounds when mature and finished.

BULL.

Disqualifications.

Scurs, or any evidence whatever of a horny growth on the head. Any white spots on body above lower line or brush of tail.

Color: Any shade of red, the switch of tail may be white, with some white running forward to navel. Nose of a clear flesh color. Interior of ears should be of a yellowish, waxy color .....Points 2
Objections: An extreme dark or an extreme light red is not

desirable. A cloudy nose or one with dark spots.

Head: Wide, strong and masculine, relatively short. Poll stronger and less prominent than in cow. Ears of medium size and well carried; eyes prominent; muzzle wide with large nostrils .....Points 12
Objections: Long, narrow or lacking in masculine character.

Neck: Of medium length, full crest, of good thickness, strong, of masculine appearance .... Points 5

Shoulder: Of medium thickness and smoothly laid, coming up level with line of back ..... Points 8
Objections: Shoulder too prominent, giving the appearance of weakness in heart girth, shoulder protruding above line of back.

Chest: Broad and deep, insuring constitution. Brisket prominent and coming well forward .... Points 12

Back and Ribs: Back medium long, straight and level from withers to setting on of tail, moderately wide, with spring of ribs starting from the back bone, giving a rounding appearance, with ribs flat and fairly wide apart .....Points 14
Objections: Front ribs too straight, causing depression back of shoulders. Drop in back or loin below the top line.

Hips: Wide, rounding over the hooks, and well covered ..Points 3

Quarters: Of good length, full, rounding and level; thighs wide, and moderately full, deep. ..... Points 6
Objections: Prominent hooks and sunken quarters.

Tail: Tail head strong and setting well forward, long and tapering to a full switch ... Points 2

Legs: Short, straight, squarely placed, medium bone ....Points 3
Objections: Hocks crooked; legs placed too close together.

Rudimentaries: Large, wide apart and placed well forward..... ..... Points 12
Position of rudimentaries, Points 6
Objections: Rudimentaries placed back on scrotum, or placed too close together, indicating tendency to transmit badly formed udders.

Hide: Loose, mellow, flexible, inclined to thickness, with a good full coat of soft hair .....Points 5
Objections: Thin, papery skin or wiry hair.

Condition: Healthy, moderate to liberal flesh evenly laid on; glossy coat; animal presented in full bloom ..... Points 10

Total 100

General Description: Strong, impressive, low set, and of good carriage. Weight 1,800 pounds to 2,000 pounds when mature and finished.

W. D. McTavish,
Prof. C. F. Curtiss,
J. W. Martin.

THE GUERNSEY.

H. D. Griswold, West Salem, Wis.

The Guernsey breed of cattle had its origin centuries ago, and, while the early records are lost, it is generally supposed that the ancestors of the present race of Guernseys came from France to the Island of Guernsey. The people there, recognizing the fact that these cattle were especially good and wishing to perpetuate them, passed laws in 1879 prohibiting the importation of any live cattle, thus the breed has been kept pure since that time.

The small Island of Guernsey maintains about five thousand head of cattle, or about one animal for each two acres of land. This land is very high in price and foods are carefully saved, so that cattle are carefully selected and bred to get the most useful and productive animals. Long years of breeding for dairy production has brought out splendid animals, persistent milkers and of a uniform type. From these cattle have descended the great families of Guernseys distributed throughout the dairy sections of the world.

The Breed in America.

The first importations to America were in 1830 and in 1850, but as no effort was made to advertise them, it was not until 1877 that the American Guernsey Breeders' Association was formed and at that time only 193 Guernseys were registered.

It was not until the World's Columbian Exposition in 1893 that remarkable records were made by the Guernseys, such records being made by those entering the contest, and again at the Pan-American Exposition, where the Guernseys won over all competition. Since then the Guernseys have made wonderful advancement; prices are continually rising and the demand exceeds the supply. Thirty-nine thousand, five hundred registered Guernsey cattle are now distributed over the entire United States. Nearly every state in the Union has good specimens of the breed. Wisconsin leads with three thousand pure bred animals distributed among forty-three counties. New York is second, with 2,340, and Pennsylvania third, with 2,066. These are the three leading dairy states of the Union and would naturally be well represented by the leading breed.

The Advanced Registry.

The advanced register for Guernsey cattle was the first advanced register on the basis of a year's production of butter fat, which is the only true measure of a dairy cow. Since its establishment there has been a great interest taken by dairymen among similar lines by representatives of all dairy breeds.

The requirements for admission to the advanced registry are 250 pounds of butter fat per year for a two-year-old heifer, and 360 pounds for a mature cow. Since the beginning of this work, over two thousand cows have been admitted to the advanced registry.

The average production of milk per cow is 8,200 pounds per year; the average test of butter fat, 5.046 per cent; the average pounds of butter

Pearlson 8208, sire at head of L. P. Martiny's Guernsey herd.

fat, 413. The largest milk yield was made by Dolly Dimple, 18,808.5; the largest butter fat record by Spotswood Daisy Pearl, 957.38 pounds.

The Quality of Guernsey Products.

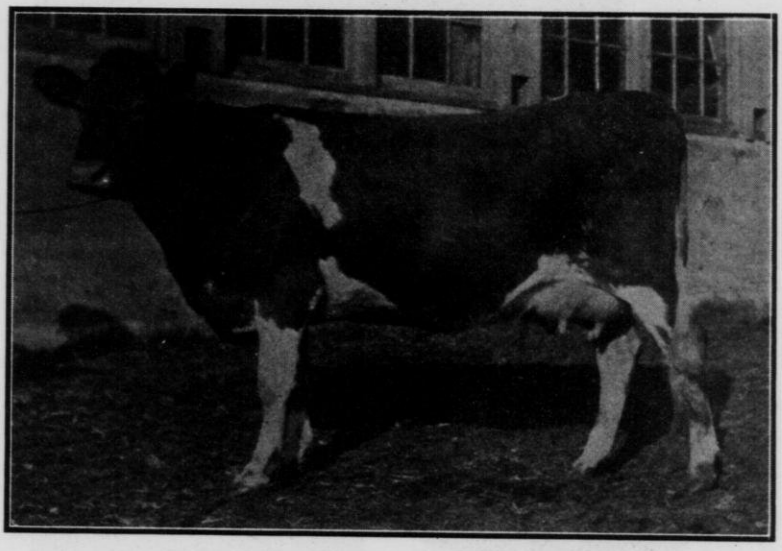
The quality of the Guernsey milk, cream and butter has no equal, having as it does the highest natural color and the best flavor and quality. Today in nearly all of the large cities and towns, the choicest trade is found to be supplied with milk from pure bred and grade Guernsey cows.

This characteristic of the Guernsey milk appeals to two classes, the progressive dairymen who are producing strictly high-class products for a critical trade, where the highest returns are secured, and those who desire the best flavored and colored milk, cream and butter for use in their private families. Men who are keeping other breeds of cattle are buying Guernseys to give color and quality to their milk.

Characteristics of the Guernsey.

Economy of production must always be considered with the production of the cow. In this the Guernsey has never been beaten. Her medium size, good conformation, quiet disposition, and her capacity as a feeder enable her to produce milk at the lowest cost for food consumed. This has been proven in several competitive trials.

From the standpoint of feed consumed the Guernsey breed has the largest percentage of profitable and the smallest percentage of unprofitable cows of any of the breeds.



Mabrino's Lura, 31577 A. G. C. C., three-year-old Guernsey cow making fine advanced registry record for Fruit Bros., Waukesha, Wis.

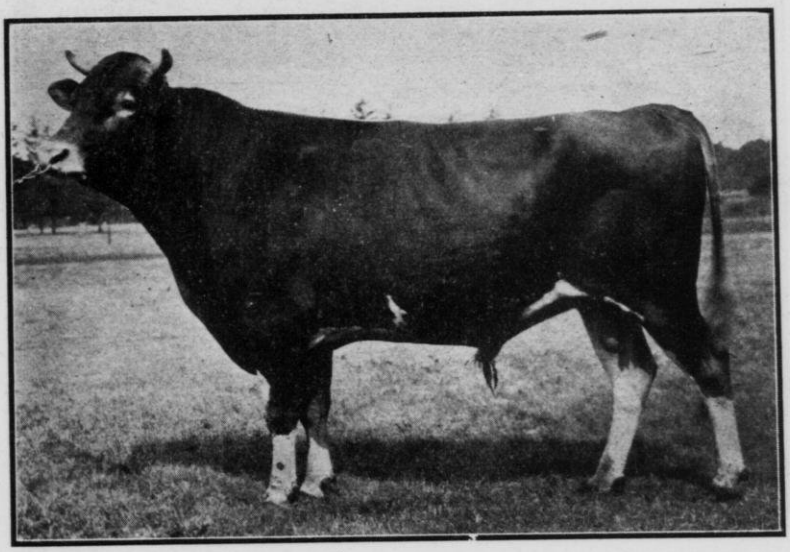
The cows have good, well shaped udders, teats of good size, and are easy to milk.

The Guernsey cows are quiet in disposition and are always pets on the farm. The bulls are tractable, easily handled, work readily in tread powers and are easily managed.

The Guernsey sire crosses well with other breeds. When care is used in the selection of the cows which are used in crossing, uniformly good results follow. Guernsey sires are in more and more demand for crossing with common stock. Grade Guernsey cows are being purchased at high prices, and there are buyers for every cow offered for sale.

In the cow census carried on by Hoard's "Dairyman" for the last few years, the Guernseys have been uniformly the largest and best producers. In our own experience, the use of the Guernsey sire raised the production of our cows fifty per cent. Whenever Guernsey sires have been used on common stock, the offspring have been from thirty to fifty per cent better producers of milk product than the original stock.

I have yet to learn of a man who has given the Guernsey a fair trial who cared to change for anything else. The Guernseys are being handled by some of the best breeders of the country who are making a special study of the breed, to bring out and develop the most economical, profitable and perfect dairy cows that have ever been produced. They have already accomplished this and they are making every effort to still further develop and perfect this breed. As our dairymen more fully realize the

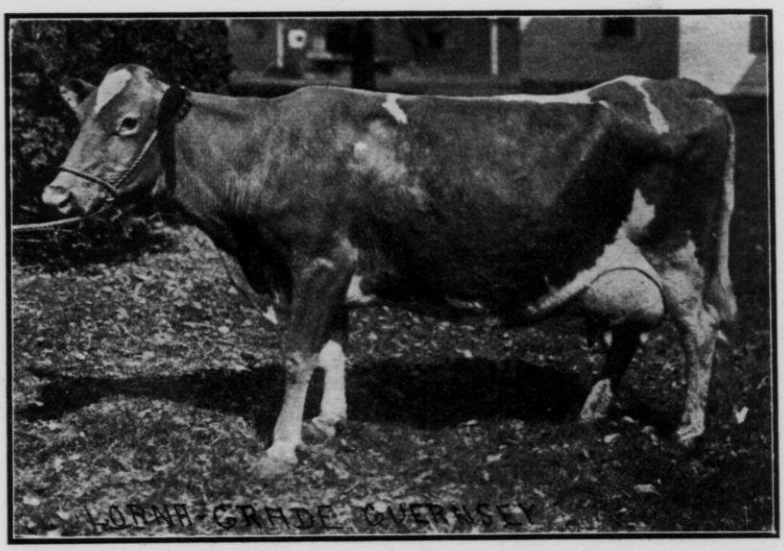


Guernsey bull, Imported Victory of Sarnia, 22001 A. G. C. C., owned by Chas. L. Hill, Rosendale, Wis.

superior merits of the milk, cream, and the animals themselves, the demand will continue to increase for many years to come.

In Conclusion.

The Guernsey cow is of a good size; she is ideal in color and type; she has good udder, teats nd is easy to milk; she is the most economical producer of butter fat and gives the richest colored product; she has a good disposition. This seems to be contagious, as all Guernsey men have it also.



Grade Guernsey cow owned by M. L. Welles, Rosendale, Wis., 57.1 lbs. milk in one day.

DISCUSSION.

The Chairman—Another case of the last story being the best. Now I will not vouch for everything Mr. Griswold has said as being true, but he believes it to be true, no doubt of that. Let us find out what Mr. Griswold's stock has been doing for him.

Mr. Griswold—There is one thing I want to say without regard to breed. I know the farmer is apt to think he never can afford to have these high-priced animals. Now, you can have a full blood sire and grade up your herd, and while you are doing that, you can learn how to feed, how to take care of them, and when you feel that you understand that, you can get a good price for those grades, and then, one by one, bring in a full blood, buy a calf. Do not go out and try to buy a high priced cow. We have got our herd in that way, by grading, and when we have a chance to buy a high grade, we buy here and there a calf. You go out to buy

a cow and you are not through when you get the cow. You are very apt to find something the matter with her, but you buy a well bred calf and you have as good a chance as anybody to get you a good cow. The full life of the animal is ahead of it, you get those cheaper, the freight on them is cheaper, and one by one you can pick up these calves and bring them into your herd. Sometimes you can pick up a good grade that way where you live near a town and some man in town does not care to keep a calf, sometimes you can arrange to give him the service of your sire and take his calf. You can better afford to give a little time than to put in a lot of money to start with. If you will pick up these animals when they are small, have your eyes open all the time to something good, you can get it just as well as anybody else.

A Member—What do your cows bring you in during the year?

Mr. Jacobs—I am awfully sorry that question has been asked.

Mr. Griswold—We sell cream and we have the skim milk left to feed on the farm, and in selling the cream, counting the two-year-old heifers, the mature cows and everything, they bring us in at the present time one hundred and thirty dollars apiece for the cream alone.

Mr. Bradley—What do you get in butter fat?

Mr. Imrie—And do you get creamery price or private trade?

Mr. Griswold—Some of it is private trade. We get a little above creamery prices; we only live three-quarters of a mile from the railroad station. At the creamery we would get thirty-four cents, average price for the whole year. Ours figures about thirty-six cents.

Mr. Clark—It seems to me it is the butter fat production that would really set the value of this cow, rather than the amount of money you got for her, owing to the different prices of this product.

Mr. Griswold—The average per cent of the butter fat in the herd is just about five per cent. The average production per cow is about four hundred and thirty pounds of butter fat.

Supt. McKerrow—You get this extra two cents for the color.

The Chairman—What other sources of revenue have you from your herd?

Mr. Griswold—There is the stock we have to sell and the skim milk we have to feed the pigs. That brings us a source of revenue, because we figure our hogs will just about pay for the bran and the oil meal and those feeds that we have to buy to balance up our ration. The stock we have to sell brings us in as much as the cream product does.

Supt. McKerrow—A year ago I asked Mr. Griswold to let me have some pictures to illustrate his talk on Farm Management last year, so he sent me some Guernsey pictures, and he sent me the pictures of two cows which at that time were under test. I asked him to let me know what they had done or were doing, and in this Bulletin on pages 270 and 271 you will see the pictures of these two cows, one Endymion's Primrose, making 11,000 pounds of milk up to that time. The year was not completed. The year was completed later and she made over 12,000 pounds of milk and 656 pounds of butter fat. The other cow, Yeska's Sunburst, was said to be giving over 10,000 pounds, also estimated, as the time was not up, an estimate of 530 pounds of butter fat, but Mr. Griswold's herdsman told me the first week in February that this cow had not quite completed her year but had gotten nearly up to 580 pounds of fat.

A Member—How are we going to know what kind of cow we should have for this section?

Mr. Griswold—I would say, pick out the cow you like best. You do not want to work with something you do not like.

The Chairman—Mr. Griswold has made these big claims and seems to have proved them too, but I feel satisfied Mr. Jacobs will claim as much for the Jerseys. We admit the better color, but we do not admit the better quality of production. You will soon have an opportunity to take care of the Jersey, and I hope you will be able to do her justice. Mr. Jacobs has been handling Jerseys for a number of years, he has a herd of cattle that he has lots of confidence in, and he also knows what other breeds are doing, so he knows why he has confidence in them.

STANDARD OF EXCELLENCE, GUERNSEY CATTLE.

COW.

Dairy Temperament. Constitution 38

Clean cut, lean face; strong, sinewy jaw; wide muzzle with wide open nostrils; full bright eye with quiet and gentle expression; forehead long and broad .....Counts 5

Long, thin neck with strong juncture to head; clean throat. Backbone rising well between shoulder blades; large, rugged spinal processes, indicating good development of the spinal cord .....Counts 5

Pelvis arching and wide, rump long; wide, strong structure of spine at setting on of tail. Long, thin tail with good switch. Thin, in-curving thighs ..... Counts 5

Ribs amply and fully sprung and wide apart, giving an open, relaxed conformation; thin, arching flank ..... Counts 5

Abdomen large and deep, with strong muscular and navel development, indicative of capacity and vitality .... Counts 15

Hide firm yet loose, with an oily feeling and texture but not thick .....Counts 3

Milking Marks denoting quantity of flow 10

Escutcheon wide on thighs, high and broad with thign ovals ..... Counts 2

Milk veins crooked, branching and prominent, with large or deep wells .....Counts 8

Udder Formation 26

Udder full in front .....Counts 8

Udder full and well up behind ..... Counts 8

Udder of large size and capacity .....Counts 4

Teats wide apart, squarely placed and of good and even size .....Counts 6

Indicating Color of Milk 15

Skin deep yellow in ear, on end of bone of tail, at base of horns, on udder, teats and body generally. Hoof amber colored ..... Counts 15

Milking Marks denoting quality of flow 6

Udder showing plenty of substance but not too meaty .... **Counts 6**

Symmetry and Size 5
Color of hair a shade of fawn with white markings. Cream colored nose. Horns amber colored, small, curved and not coarse. Hoofs amber colored .....Counts 3
Size for the breed: Mature cows four years old or over, about 1,050 lbs .....Counts 2

Total 100

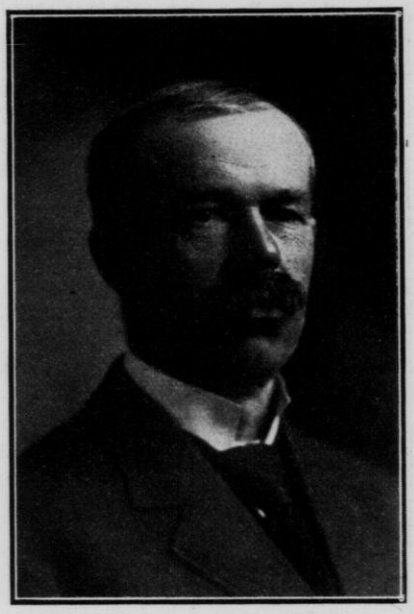
BULL.

Temperament Constitution 38
Clean cut, lean face; strong sinewy jaw; wide muzzle with wide open nostrils; full bright eye with quiet and gentle expression; forehead long and broad .....Counts 5
Long masculine neck with strong juncture to head; clean throat. Backbone rising well between shoulder blades; large, rugged spinal processes, indicating good development of the spinal cord .....Counts 5
Pelvis arching and wide; rump long; wide, strong structure of spine at setting on of tail. Long, thin tail with good switch. Thin, in-curving thighs ..... Counts 5
Ribs amply and fully sprung and wide apart, giving an open, relaxed conformation; thin, arching flank .....Counts 5
Abdomen large and deep, with strong muscle and navel development, indicative of capacity and vitality ....Counts 15
Hide firm yet loose, with an oily feeling and texture but not thick .....Counts 3
Dairy Prepotency 15
As shown by having a great deal of vigor, style, alertness and resolute appearance..... ..... Counts 15
Rudimentaries and Milk Veins 10
Rudimentaries of good size, squarely and broadly placed in front of and free from scrotum. Milk veins prominent ..... Counts 10
Indicating Color of Milk in Offspring 15
Skin deep yellow in ear, on end of bone of tail, at base of horns and body generally, hoofs amber colored ..Counts 15
Symmetry and Size 22
Color of hair a shade of fawn with white markings. Cream colored nose. Horns amber colored, curving and not coarse ..... Counts 8
Size for the breed: Mature bulls four years old or over, about 1,500 lbs. .....Counts 4
General appearance as indicative of the power to beget animals of strong dairy qualities ..... Counts 10

Total 100

THE JERSEY.

E. C. Jacobs, Elk Mound, Wis



Mr. Jacobs.

"The motto of the Club, 'Omnis pecuniae pecus fundamentum', meaning 'The herd is the foundation of all wealth,' was suggested by the late Mr. T. J. Hand, dug out of his store of classical knowledge, and goes back to antiquity, to the days of ancient Rome. Farmers' associations were not unknown in those days, and in an account of the discussion at one of their meetings there is preserved the remarks of one Scrofa, who said, in concluding an address: 'Therefore it is the science of caring for and feeding the herd in order that the greatest profits possible may be taken from it, from which wealth itself is named' (pecus cattle, pecunia, wealth, originally property in cattle); 'for the herd is the foundation of all wealth.' After the lapse of many centuries, Farmer Scrofa's dictum is as pertinent as ever."

If the Jersey needed an advocate to champion her cause, I think one more able than I would have been chosen. The Jersey speaks for herself or rather expresses herself in action. I am not disposed to throw a club at any good dairy cow of any breed and I recognize that there are many such cows in all the dairy breeds and that there are more of them needed than can be supplied by all the dairy breeds—that many of them have made and are making great records. For the men who are developing the great cows of other breeds I have the greatest respect, not only for their skill as breeders and feeders but also for their ability to let the world know what their cows are doing. To my brother Jersey breeders I would say, "Go thou and do likewise."

The Jersey has been established as a distinct breed for many years. For at least two hundred years they have been kept free from crossing with other breeds of cattle on their native Island of Jersey, to which no cattle are allowed to be imported except for their immediate slaughter. On this island the Jersey has for centuries been handled and cared for by women. This fact may explain the reason for her great docility and gentleness of disposition.

Jerseys were first introduced into the United States in 1850, the first importation being to Connecticut. Since that time they have been distributed through every State and ter-

Trio of Jerseys at Meadow Creek Farm, owned by W. H. Clark, Rice Lake, Wis.

ritory and Canadian Provinces. In recent years they have been exported from the United States into Brazil, Mexico, Central America, Cuba and Japan.

The total number of animals registered in the forty-five years since the American Jersey Cattle Club was established to November 30, 1912, was 389,147. Twenty-six per cent of the entire registration for the forty-five years was made in the last five years.

An Age of Specialization.

This is an age of specialization. Economy is wealth. The Jersey is a special dairy purpose animal. Her purpose is economy and quality in the production of animal food for mankind. Her title to supremacy for this purpose has not been successfully disputed. There is a reason. In her physical make-up economy of construction for a definite purpose is personified. She is like an athlete trained for the contest—she carries no dead weight. Every pound of her anatomy is best suited for the manufacture of food stuffs into dairy products. It is easy to make claims. What are the records?

Some Convincing Records.

Jacoba Irene produced 17,253 pounds of milk in one year, containing 2,227 pounds of total milk solids. Compare this with the work done by the average steer weighing 1,100 pounds at the age of two years. When born he will weigh close to one hundred pounds. In two years of growth he has actually produced one thousand pounds of carcass, only one-fifth, or two hundred pounds of which is edible dry matter. This means that Jacoba Irene produced as much edible solids in one year as twenty-five steers.

The World's Fair in Chicago in 1893 afforded the first opportunity to demonstrate in public competition that the Jersey was indeed the "Little Giant of the Dairy." The test was begun May 12, 1893 and continued until October 20th. Jersey, Guernsey and Shorthorn herds were entered.

In this test the Jersey:

1. Gave more milk.
2. Made more cheese.
3. Made more butter.
4. Gave more solids other than butter fat.
5. Produced a pound of butter at least cost.

The St. Louis Exposition in 1904 again afforded a grand opportunity to try out the different dairy breeds in the greatest and most complete public contest that had ever been held.

Speaking of the St. Louis test, Prof. E. H. Farrington says, "There is no fiction in these 'World's Fair' records."

Ex. Gov. Hoard writes, "We all owe the American Jersey Cattle Club a lasting debt of gratitude for its persistence in bringing about a dairy cow demonstration pure and simple."

Prof. M. A. Scoville says, "The tests at St. Louis were conducted in a manner that leaves no doubt as to the accuracy of the results."

In the St. Louis test there were entered Jersey, Holstein, Brown Swiss and Shorthorn herds. The basis of the awards was economic production.

The Jerseys proved to be the most economical producers of butter and of milk for all purposes of dairying.

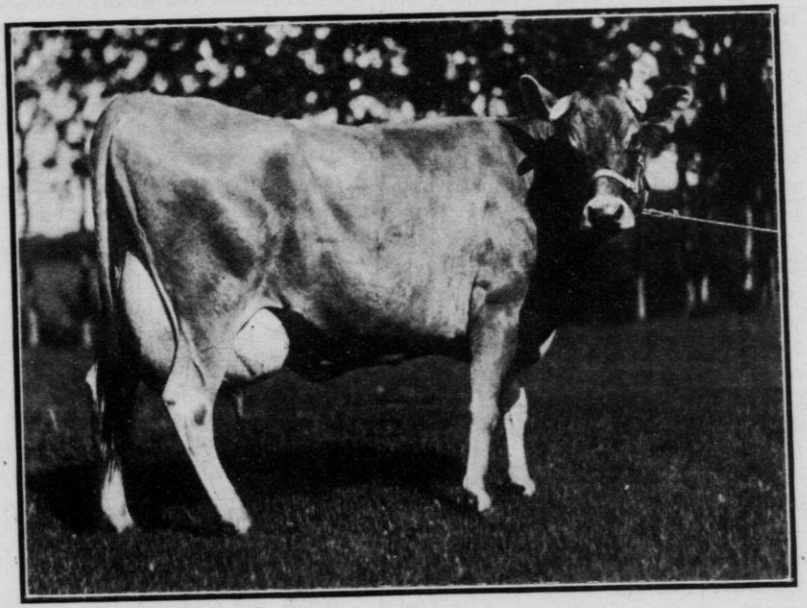
Prof. T. L. Haecker shows that the Jerseys returned one pound of butter fat for every 12.051 pounds of nutriment consumed. The Holsteins

required 14.839 pounds to produce one pound of butter fat. The Shorthorns required 15.52 pounds, and the Brown Swiss 16.919 pounds of nutriment per pound of milk solids. The Jerseys required 2.955 pounds of nutriment for one pound of milk solids, the Holsteins required 3.283 pounds, the Shorthorns 3.421 pounds and the Brown Swiss 3.638 pounds.

Cost per pound of butter, the Jerseys made a pound of butter for a food cost of 10.56 cents, the Holstein, her nearest competitor, at a cost of 13.56 cents.

The Jersey is alleged by some to require a larger proportion of her food in a concentrated form than some others but the results of this test do not confirm such claims, as the Jersey received 50.67 per cent of her nutriment from the roughage she consumed against 50.48 per cent in the case of the Holstein.

The Agricultural Society of Denmark tested all dairy breeds for economic production and recommended the Jersey to the Danish farmers.



CREAMY GOLD.

Highest producing Jersey in Wisconsin Dairy Cow Competition; winner of A. J. C. C. bronze medal as third prize producing three-year-old cow in the United States and Canada for the year 1911. Owned by W. H. Clark, Rice Lake, Wis.

Register of Merit.

The public tests do not finish the story of the Jersey. She has continued to make dairy history. In 1903 the Jersey Cattle Club established the register of merit. The require-

ments for entry on yearly tests are, 250.5 pounds of butter fat for cows two years old and under at beginning of test to 360 pounds for cows five years old or over.

Short tests may have some value as a guide to the production of a cow, but testing cows for a short period and selecting by such tests does not tend to develop cows that are persistent milkers and able to make the best yearly returns.

Prof. Eckles, of the Missouri Experiment Station, says, "A seven-day test as carried on by the most skillful breeders results in an abnormally high percentage of fat."

Prof. Philip H. Smith, of the Massachusetts Agricultural Experiment Station, thus exhorts Jersey breeders. "Stick to the yearly test. No association has a better system of testing than the American Jersey Cattle Club. More breeders should take up the work. The blue ribbon is worth striving for, but is it not a mistake to not at least pay equal attention to the value of an animal as measured by milk and butter production?"

Notable among Register of Merit records is that of Jacoba Irene—1,126 pounds of butter in one year, 2,755 pounds of butter for thirty-seven consecutive months and a healthy calf each year—a record unequalled by any cow of any breed at any cost of feed.

During 1912, 655 yearly records were accepted by the Jersey Cattle Club admitting to the Register of Merit.

Twice during 1912 has the one thousand-pound yearly butter record been passed by a Jersey cow. One of them, Sophie 19th of Hood Farm, making 1,110 pounds seven ounces of butter and a two-year record of 2,116 pounds of butter.

Rosalind of Old Basing, Alberta, Canada, completed her third year test, making during her three tests 2,504.39 pounds of butter, showing that the Jersey is suited to northern latitude.

Golden Dollykin 2nd, one year eleven months old at beginning of test produced 632 pounds of butter in one year. Pogis Irene 2nd, dam of Jacoba Irene, fifteen years old at beginning of test, produced 615 pounds of butter in a year. These cases show that the Jersey produces both early and late.

The Wisconsin Dairy Cow Competition.

But what of the Wisconsin Dairy Cow Competition, of which we have heard a great deal and expect to hear more in the immediate future? In this test the Jersey was said to have been beaten to a frazzle. While no honor has been claimed for the Jersey in this test, yet it will be found by consulting Bulletin No. 226 of the Wisconsin Experiment Station that while the margin is small, the Jersey produced the most butter for food consumed.

When the Babcock test settled beyond dispute the claims as to the richness of Jersey milk, it was soon discovered by the previous doubters that it was too rich for man or beast and a new element called vitality was discovered in thin milk. I think the Babcock test may safely be relied upon to measure this element along with the butter fat, and that it will correspond to the per cent of butter fat in the milk.

Objections to the Jersey.

The Jersey is alleged to be a delicate animal, subject to disease and not hardy. If by being hardy is meant ability to withstand abuse and

exposure, we enter for her a plea of guilty and ask that such cow owners change their occupation or be subject to some of their own treatment. We also wish to note that no good dairy cow of any breed can withstand ill treatment and exposure to cold, because a cow's ability to use her food to keep herself warm measures her inability to produce dairy products at low cost.

If being hardy means the ability of converting a large amount of feed into dairy products, with the least possible waste, and to continue to do so for a long period of time and to do it under conditions available for a dairy cow in all parts of the civilized world, then the record of the Jersey shows that she is indeed a hardy animal.

We do not claim that the Jersey is immune from disease, but the fact that no case of bovine tuberculosis has ever been discovered on the Island of Jersey shows that they are not particularly subject to this disease at least.

The Problem Before Wisconsin Dairymen.

Great records made and contests won may be of interest and have their value in pointing the way for improvement of the dairy herds. The net profit of the dairyman does not necessarily depend upon the size of his herd or the size of his cow. The great problem before Wisconsin farmers is not to secure occasionally a cow with a high record, but to secure herds of cows, each one of which when properly cared for will return a good profit at the pail and by her heredity contribute toward the improvement of the herd.

The cow cannot do it all, even though she be a Jersey cow. If we do not measure up to the standard which has developed the dairy quality of the cow, we shall pull her down to our standard as dairymen.

When we consider the Jersey's wealth and strength of breeding, giving them that prepotency which causes them to breed true to type, and when used to grade up common herds gives them the power to overcome the ordinary blood and fix in a short time the type and characteristics of the Jersey herself, shall we hestitate to pin our faith to and invest our money in the Jersey cow?

DISCUSSION.

A Member—I would like to have the question of prepotency explained to this audience; some of them do not understand what prepotency means.

Mr. Jacobs—By that term we mean strength of breeding; power to transmit the qualities and characteristics possessed to offspring.

Mr. Griswold—Don't you prefer to have a good-sized animal of the breed?

Mr. Jacobs—I do. I think the dairy cow competition of Wisconsin emphasizes that fact, that it was the medium large cows of the breed, on the average, that made the best records. We do not wish to get a delicate, slender animal of the breed.

Mr. Bradley—Don't you think there is a great deal of difference in the way people accept the dairy breeds from what they did fifteen or twenty years ago, when they were shipped into a district where they had not previously been known? There was a good deal of feeling in those days.

Mr. Jacobs—I think when the Jersey was originally introduced into this country, and for a long time afterwards, she was considered simply

as a rich man's plaything. At that time the only way of determining the value of a cow was the fullness of the milk pail; that impressed people so strongly that as a rule that was the only thing they judged by, and the Jersey giving a small amount of milk, richer in butter fat and milking more persistently, never had a fair show in the world until she was judged by the Babcock test.

The Chairman—Is it not a common impression now that rich milk, after being skimmed, is poorer in quality than other kinds?

Mr. Jacobs—I do not know if it is, but if it is, it is a very erroneous notion, because the solids in milk, while they do not correspond exactly to the butter fat, they correspond very closely, that is, the milk richer in butter fat will also be richer in solids not fat.

A Member—Then the Jersey cow would be well adapted for the cheese factory?

Mr. Jacobs—I ask the gentleman, how do you sell your milk, by weight or by test?

The Member—By test.

Mr. Jacobs—I do not care what they do with that milk if I sell it by test and get paid for it by test. We believe that is the fairest way of judging for any purpose. Our Experiment Stations and scientific men tell us that is the fairest way of deciding the value of milk for any purpose.

Mr. Imrie—Over in Manitowoc county they are introducing the casein test as well, the cheese-maker said, to get an accurate division, that the only way he had of finding was to add two per cent to the test. Then, of course, it was divided up. Suppose some of the milk was four per cent and some six per cent, he added two per cent to each, that would be the same as six and eight per cent, and then he came very near to the amount of casein and butter fat in the milk. He knew he could not make twice as much from the six per cent milk as from the four per cent milk, but by adding two per cent to it, it would work. They are going to try to introduce the casein test as well.

Mr. Jacobs—The fact is, six per cent milk is seldom ever found in herd milk, and three per cent milk will not make cheese of the same quality as if it was a little richer, so we admit there is a slight variation as to quantity, but the quality of the cheese would be improved by the extra amount of fat; in other words, the high testing milk of the Jersey will need to be mixed with the low testing milk of the Holstein to make the largest amount of marketable cheese, and the Holstein milk requires some Jersey milk with it to make cheese of the best quality.

Mr. Imrie—Another thing he said, there was more waste in butter fat made from rich milk than in a lower test.

Mr. Jacobs—There is one point that I wish to lock horns upon with my good friend, Mr. Griswold, and that is the stress he places on color. Now, I infer from Mr. Griswold's talk, that the yellower the cream the more valuable it is. In other words, if you get it so yellow it would be red, it would be still higher in value than the Guernsey cream. I believe there is a satisfactory color, and, if it runs over that, it becomes too yellow; if it comes under that, it is not yellow enough for popular approval. Now, we believe that Jersey milk is yellow enough. We do not claim it is as yellow as the Guernsey, but it is yellow enough. If you are using it for butter color to put in Holstein milk, I will admit it would advance

that color slightly, but when you have got anything yellow enough, why not let it alone?

The Chairman—I intended to call on Mr. Griswold to give his understanding of his position, but he also said it was better quality.

Mr. Jacobs—I stated what I thought about quality in giving the records. I am not giving my opinion about it, I am simply giving the records as to quality. I am giving my judgment as to color, but the quality is something we can go to the records for.

Mr. Griswold—I have never yet heard anybody complain about there being too much color in Guernsey or Jersey or any of them, but in selling cream in the city of La Crosse to a very critical trade, a man with whom I have large dealings told me that the color in selling was equal to two points in the price, so the color counts for something.

Mr. Jacobs—I want to ask you gentlemen, when you see a milk wagon delivering milk from some fancy dairy, if it does not claim that it has Jersey milk, and isn't there always a picture of a Jersey cow on the wagon? It is the standard ot quality the world over.

Mr. Imrie—Some of the leading hotels in the country do not seem to recognize the fact, because they advertise Holstein milk served on their tables.

The Chairman—That is for invalids.

Mr. Jacobs—We find too much of it without its being advertised.

Mr. Clark—I have seen the advertisement "Oleomargarine served here." I want to ask you, do you think the Jersey is the most economical in producing butter fat?

Mr. Jacobs—Yes, I do.

Mr. Clark—Mr. Griswold seemed to think the same thing of the Guernsey.

Mr. Jacobs—The trouble is he could not prove it and I did.

A Member—Is there anybody on earth who can tell by the flavor the difference between a pound of Guernsey butter and that of any other breed? Is there anything in it?

Mr. Jacobs—I think the Guernsey will make pretty good butter.

The Member—But don't they taste exactly the same when you get right down to it, if they are made under the same conditions?

Mr. Jacobs— I am not expert enough to know any more than in the tests where it has been tried out they give the awards to the Jerseys, that is all I know.

Th Chairman—I think if Mr. McKerrow knew that you could not tell what particular breed it was produced from he would hardly have asked you to write a paper.

STANDARD OF EXCELLENCE, JERSEY CATTLE.

COW.

Head 7

A—Medium size, lean; face dished; broad between eyes and narrow between horns.... ..... Counts 4

B—Eyes full and placid; horns small to medium, incurving; muzzle broad, with muscular lips; strong under jaw..Counts 3

Neck 5

Thin, rather long, with clean throat; thin at withers..... ..... Counts 5

Body 33

A—Lung capacity, as indicated

by depth and breadth through body, just back of fore legs.. ..... Counts 5

B—Wedge shape, with deep, large paunch; legs proportionate to size, and of fine quality. ..... Counts 10

C—Back straight to hip-bones..... ..... Counts 2

D—Rump long to tail-setting and level from hip-bones to rump-bones ..... Counts 8

E—Hip-bones high and wide apart; loins broad, strong..... ..... Counts 5

F—Thighs flat and well cut out. ..... Counts 3

Tail 2

Thin, long, with good switch, not coarse at setting-on....Counts 2

Udder 28

A—Large size and not fleshy.... ..... Counts 6

B—Broad, level or spherical, not deeply cut between teats..... ..... Counts 4

C—Fore udder full and well rounded, running well forward of front teats.....Counts 10

D—Rear udder well rounded, and well out and up behind..Counts 8

Teats 8

Of good and uniform length and size, regularly and squarely placed ..... Counts 8

Milk Veins 4

Large, tortuous and elastic..... ..... Counts 4

Size 3

Mature cows, 800 to 1,000 pounds ..... Counts 3

General Appearance 10

A symmetrical balancing of all the parts, and a proportion of parts to each other, depending on size of animal, with the general appearance of a high-class animal, with capacity for food and productiveness at pail. ..... Counts 10

100

BULLS.

Head 10

A—Broad, medium length; face dished; narrow between horns; horns medium in size and incurving .....Counts 5

B—Muzzle broad, nostrils open, eyes full and bold; entire expression one of vigor, resolution and masculinity...Counts 5

Neck 10

Medium length, with full crest at maturity; clea at throat.. ..... Counts 10

Body 54

A—Lung capacity, as indicated by depth and breadth through body just back of shoulders; shoulders full and strong..... ..... Counts 15

B—Barrel long, of good depth and breadth, with strong, well-sprung ribs .....Counts 15

C—Back straight to hip-bones... ..... Counts 2

D—Rump of good length and proportion to size of body and level from hip-bone to rump-bone ..... Counts 7

E—Loins broad and strong; hips rounded, and of medium width compared with female..Counts 7

F—Thighs rather flat, well cut up behind, high arched flank..... ..... Counts 3

G—Legs proportionate to size and of fine quality, well apart, and not to weave or cross in walking ..... Counts 5

Rudimentary Teats 2

Well placed .....Counts 2

Tail 4

Thin, long, with good switch, not coarse at setting-on....Counts 4

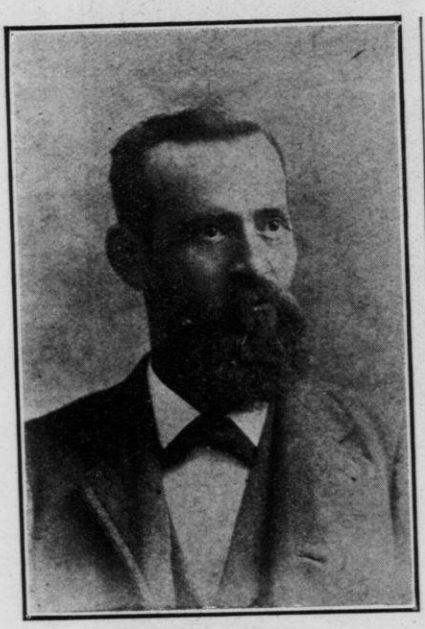
Size 5
Mature bulls, 1,200 to 1,500 pounds ..... Counts 5

General Appearance 15
Thoroughly masculine in character, with a harmonious blending of the parts to each other; thoroughly robust, and such an animal as in a herd of wild cattle would likely become master of the herd by the law of natural selection and survival of the fittest .....Counts 15

100

THE HOLSTEIN.

David Imrie, Roberts, Wis.



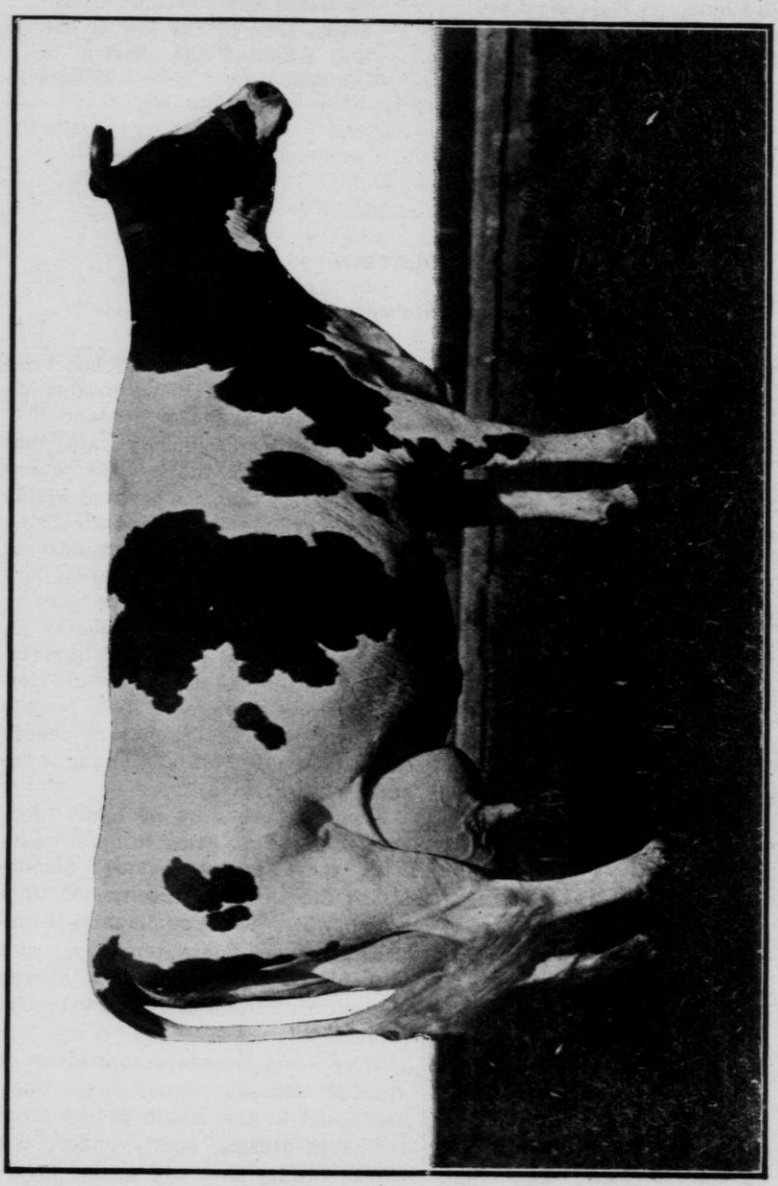
Mr. Imrie

The Holstein cow is a native of North Holland and Friesland, a section bordering on the North Sea, commonly called Holland. The dairymen of these provinces are descendants of the ancient Friesians and their cattle are lineal descendants of the cattle bred by them two thousand years ago. North Holland has been mainly devoted to cheese production and Friesland to butter production.

Chambers' Encyclopedia states that the area of Friesland is 1,253 square miles (53 less than the State of Rhode Island). In 1874 England imported from Friesland 4,565,456 pounds of cheese and 29,796,592 pounds of butter. In 1879 the number of cows in Friesland was 144,802. Assuming an equal number in 1874, this importation of butter and cheese from Friesland was an average of 205¾ pounds of butter and 31½ pounds of cheese for all the cows, old and young, owned in the Province.

Even if there were no home consumption and no sales to other countries, these exports alone demonstrate the great capacity of this breed, which is found in more countries, occupies more territory, and probably produces more milk, cheese and butter than all other dairy breeds combined.

They seem to adapt thmselves to varying climatic conditions. They are found at the mouth of the river Dwina in Russia, nearly under the Arctic Circle; they are great favorites in New Zealand, Australia, China, Japan, Mexico and South America.



Lady Reka Moore, 94410, Grand Champion Holstein cow, Wisconsin State Fair, 1913. Owned by Wm. Everson & Sons, Lake Mills, Wis.

Here in the United States they are as hardy as our native cattle.

The calves are large and strong at birth and develop very fast, making the best of veal at three or four weeks old. In Holland they have been used for both milk and beef for centuries.

The breeders of Holland and Friesland have always avoided in-and-in breeding, hence their vigor and size. Professor Low, an eminent English author on breeds of cattle, writing in 1840, says early importations of Dutch cattle exercised great influence on the formation of the Teeswater afterwards known as the Shorthorn breed.

Some Individual Records.

The Wisconsin cow, Colantha 4th's Johanna, is the only cow that has held all the world's butter records, from one day to 365. This includes the one, seven, thirty and 365-day records, as well as the record made eight months after calving. Since that time, she has been exceeded in each division by other Holstein cows, but the fact remains that no other one cow has been able to surpass her at every point.

More world records have been broken in the last two or three years than ever before in the history of dairying.

Banostine Belle DeKol, year's production, 1,058.34 pounds of butter fat.

Valdessa Scott 2d, seven-day record, 33.5 pounds of butter fat; thirty-day record, 132.39 pounds of butter fat.

DeKol Queen LaPolka 2d, seven-day record 28.3 pounds of butter fat; 845.8 pounds of milk. Thirty-day record, 3,375.5 pounds of milk. One-day record, 126 pounds of milk, an average for thirty days of 112.5 pounds.

Creamelle Vale, one year's record, 29,591.4 pounds of milk; 30,000 pounds in one year and six days.

The breed having been long established, when crossed with other breeds the calves show a strong resemblance to the Holstein, having very few calves that are not black and white and with a few crosses they look like full bloods and make splendid cows.

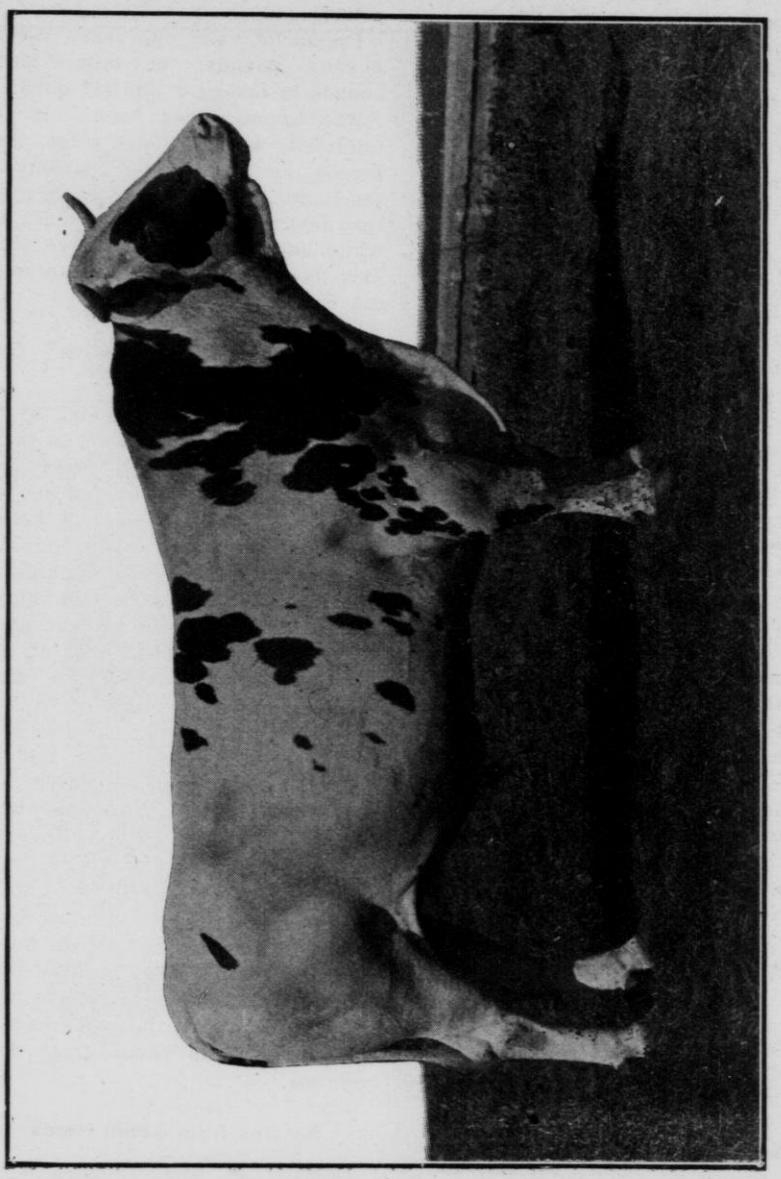
Good Holsteins Command Good Prices.

They are in great demand, as the prices paid for them show. In Dodge county last year, grade cows sold from seventy-five to one hundred and fifty dollars each; two-year-old heifers from fifty to seventy-five dollars. In Jefferson county, about the same. At Lake Mills one shipper alone shipped 1,800 cows and heifers at the above prices. In Green county, at an auction early in the winter, the grade cows sold at an average of a little over $127.00 each. In our own county (St. Croix) grade cows sold for one hundred to one hundred and twenty-five dollars a year ago, when cows were not as high as they are now.

Green county leads in the number of cows per farm, the number being eighteen, Jefferson and Dodge following with twelve each. In all of these counties, the Holstein is in a large majority, showing the preference of the dairymen in these great dairy counties.

Returns from Seven Herds.

From O. E. Sette, Juneau, Wis., I received the following returns from seven herds, patrons of their cheese factory.



Duke Johanna De Kol Mechthilde, 38684, Grand Champion Holstein bull, Wisconsin State Fair, 1913.
Owned by Wm. Everson & Sons, Lake Mills, Wis.

No 1, 10 cows average per cow, $137.22, grades and pure breds.

No. 2, 26 cows, average per cow, $137.61, grades and pure breds.

No. 3, 23 cows, average per cow, $121.60, grades and pure breds.

No. 4, 24 cows, average per cow, $120.30, grades and pure breds.

No. 5, 29 cows, average per cow, $119.70 grades.

No. 6, 18 cows, average per cow, $118.80, grades.

No. 7, 19 cows, average per cow, $115.90, grades.

In these herds there were from five to twenty calves raised and no account was kept of the milk fed to them or milk used in the family.

The Babcock test and cream separator have done more for the Holstein breed, perhaps, than any other. The butter fat globules, being small, were slow to rise in the old way by setting, hence a good many thought they were not there, but they are, and in paying quantities too.

The Holstein cow is a splendid cow and no one will make a mistake who adopts that breed, and by selecting calves from the best cows, growing them well, feeding them to freshen at two or two and one-half years, feeding them plenty of corn silage, alfalfa or clover hay, and a little grain, he cannot help but make money with them.

DISCUSSION.

The Chairman—That is a very fine story.

Mr. Imrie—It is a true story.

A Member—I often see the Holstein Friesian cow mentioned. I was brought up in Germany and I worked on different lands where they had these Holstein cows, but in the old country they had a different kind, the black and white, they called them the regular Holstein, and the other kind was white and spotted, and they called them the Friesian. They were broader in front than the Holstein generally is. I am surprised to hear them called Holstein-Friesian here.

Mr. Imrie—They combined the two provinces and call all the cattle from those provinces Holstein-Friesian. There have been very few importations into this country for a good many years. In the old country, they have not kept records as they have in this country, and perhaps we have better Holsteins here than they have there. Another thing, they could not import them into England for years and years, England would not allow them to import, I think it was on account of the foot and mouth disease, it stopped importation and stopped it into this country. I understand, though I do not know this from personal knowledge, that in the old countries they have some even dark red and white and they are allowed to register them there. In this country that would disqualify a pure bred.

The Member—I was in a place where they kept about seventy-five cows and they were all gray with white spots, and the gray hairs were always longer than the white ones.

Mr. Imrie—You will sometimes notice that in our Holstein cows now, the white hair may be longer than the black, or the black longer than the white I do not know what causes it.

A Member—How do Holsteins compare with Jerseys and Guernseys for veal?

Mr. Imrie—They far exceed them for veal, even the Guernsey and Jersey men will admit that. The average weight of Shorthorns is about eighty-five pounds at birth and the

Holstein ninety, and they are oftener one hundred pounds. It is not hard with an average grade calf to make him weigh 175 pounds at three weeks old.

Supt. McKerrow—I was at the Muscoda Institute and a farmer near there came in and told me he was down and bought a Guernsey bull and when he brought him home, his neighbors, who were breeding Shorthorns and Holsteins, told him he had made a bad mistake, because his calves would not be worth much for veal, and when his first calf was born from a little Jersey heifer his neighbors came in to see it. It was a male calf. They said, "What will you do with that thing?" He said, "I am going to feed it on Jersey milk," and he said he delivered it to the butcher at four weeks and three days old, and his Holstein and Shorthorn neighbors were delivering calves also, and he said, "I got fifty cents more than they did, getting $9.25 a hundred and they getting $8.75." It weighed as much as some Holstein calves.

Mr. Imrie—I sold one this winter three weeks and four days old that weighed just even two hundred pounds.

A Member—I know a Guernsey breeder out at Appleton who says he cannot raise his calves on Guernsey milk.

Mr. Jacobs—Tell him to get some Jersey milk.

Mr. Imrie—I was in a man's herd last Saturday and he had some Holstein cows to raise his Jersey calves on.

Mr. Jacobs—I will bet he gives the Jersey milk to his children.

Supt. McKerrow—Either Guernsey or Jersey milk is too rich for a calf. You can take the butter fat out and then have good milk left.

A Member—How about beef; are they good for beef?

Mr. Imrie—They seem to be. I sold dry cows this summer for $4.75 per hundred pounds. This winter I sold a pure bred Holstein bull for $5.25 per hundred pounds.

A Member—What did it cost to raise him?

Mr. Imrie—I did not have him for beef purposes; that was clear gain.

Mr. Jacobs—I want to make a claim for the Jersey as a beef animal. I think you all recognize that when you make cow beef, you are going to make it at a loss. When you sell a cow for beef, it has cost you more to make that cow into beef than the cow will sell for, and when you have fed a great, big Holstein cow, you have made a big loss in feeding her; the Jersey will make you less loss, so you will save something.

Mr. Imrie—A year ago Mr. Jacobs and I were in Barron county and we were to judge the exhibit there. There was a whole lot of cream in bottles and Mr. Jacobs was selected to judge that cream. I said to him, "You will give the first prize to some Holstein cream", and he said, "Not if I know it." He judged the cream and the one of first quality there was no trouble deciding, but for the second place he wanted me to try it. Of course we did not know what breed it belonged to, but the blue ribbon was put on the bottle and the next morning we were talking to a man and he said, "My cream got first. "I said, "What was it?" and he said, "A Holstein cow."

Supt. McKerrow—I guess that will have to be the last cow story. My friend Convey can stand most any kind of a racket.

STANDARD OF EXCELLENCE, HOLSTEIN CATTLE.

COW.

Head—Decidedly feminine in appearance; fine in contour ..... Points 2

Forehead—Broad between the eyes; dishing .....Points 2

Face—Of medium length; clean and trim, especially under the eyes, showing facial veins; the bridge of the nose straight ..... Points 2

Muzzle—Broad with strong lips ..... Points 1

Ears—Of medium size; of fine texture; the hair plentiful and soft; the secretions oily and abundant .....Points 1

Eyes—Large; full; mild; bright ..... Points 2

Horns—Small; tapering finely towards the tips; set moderately narrow at base; oval; inclining forward; well bent inward; of fine texture; in appearance waxy .....Points 1

Neck—Long; fine and clean at juncture with the head; free from dewlap; evenly and smoothly joined to shoulders..Points 4

Shoulders—Slightly lower than hips; fine and even over tops moderately broad and full at sides .....Points 3

Chest—Of moderate depth and lowness; smooth and moderately full in the brisket, full in the foreflanks (or through at the heart) .....Points 6

Crops—Moderately full ....Points 2

Chine—Straight; strong; broadly developed, with open vertebrae ..... Points 6

Barrel—Long; of wedge shape; well rounded; with a large abdomen, trimly held up, (in judging the last item age must be considered) .....Points 7

Loin and Hips—Broad; level or nearly level between the hook bones; level and strong laterally; spreading from chine broadly and nearly level; hook bones fairly prominent..Points 6

Rump—Long; high; broad with roomy pelvis; nearly level laterally; comparatively full above the thurl; carried out straight to dropping of tail ..... Points 6

Thurl—High; broad.....Points 3

Quarters—Deep; straight behind; twist filled with development of udder; wide and moderately full at the sides.....Points 4

Flanks—Deep; comparatively full ..... Points 2

Legs—Comparatively short; clean and nearly straight; wide apart; firmly and squarely set under the body; feet of medium size, round, solid and deep...Points 4

Tail—Large at base, tho setting well back; tapering finely to switch; the end of the bone reaching to hocks or below; the switch full..... Points 2

Hair and Handling—Hair healthful in appearance; fine, soft and furry; the skin of medium thickness and loose; mellow under the hand; the secretions oily, abundant and of a rich brown or yellow color....Points 8

Mammary Veins—Very large; very crooked (age must be taken into consideration in judging of size and crookedness); entering very large or numerous orfices; double extension; with special developments

such as branches, connections, etc. .....Points 10

Udder and Teats—Very capacious; very flexible; quarters even; nearly filling the space in the rear below the twist, extending well forward in front; broad and well held up.....Points 12

Teats—Well formed; wide apart, plumb and of convenient size ..... Points 2

Escutcheon—Largest; finest. Points 2

Perfection 100

General Vigor—For deficiency Inspectors may discredit from the total received not to exceed eight points.

General Symmetry and Fineness—For deficiency Inspectors may discredit from the total received, not to exceed eight points.

General Style and Bearing—For deficiency Inspectors may discredit from the total received, not to exceed eight points.

BULL.

Head—Showing full vigor; elegant in contour.....Points 2

Forehead—Broad between the eyes; dishing .....Points 2

Face—Of medium length; clean and trim, especially under the eyes; the bridge of the nose straight .....Points 2

Muzzle—Broad with strong lips ..... Points 1

Ears—Of medium size; of fine texture; the hair plentiful and soft the secretions oily and abundant ..... Points 1

Eyes—Large; full; mild; bright ..... Points 2

Horns—Short; of medium size at base; gradually diminishing towards tips; oval; inclining forward; moderately curved inward; of fine texture; in appearance waxy .....Points 1

Neck—Long, finely crested (if the animal is mature); fine and clean at juncture with the head; nearly free from dewlap; strongly and smoothly joined to the shoulders .....Points 5

Shoulders—Of medium height of medium thickness, and smoothly rounded at tops; broad and full at sides; smooth over front ..... Points 4

Chest—Deep and low; well filled and smooth in the brisket; broad between the forearms; full in the foreflanks (or through at the heart)....Points 7

Crops—Comparatively full; nearly level with the shoulders ..... Points 4

Chine—Strong; straight, broadly developed, with open vertebra ..... Points 6

Barrel—Long; well rounded; with large abdomen; strongly and trimly held up .....Points 7

Loins and Hips—Broad; level or nearly level between hook bones level and strong laterally; spreading from the chine broadly and nearly level; the hook bones fairly prominent ..Points 7

Rump—Long; broad; high; nearly level laterally; comparatively full above the thurl; carried out straight to dropping of tail ..... Points 7

Thurl—High; broad .....Points 4

Quarters—Deep; broad; straight behind; wide and full at sides; open in the twist .....Points 5

Flanks—Deep; full .....Points 2

Legs—Comparatively short; clean and nearly straight; wide apart; firmly and squarely set under the body; arms wide, strong and tapering; feet of medium

size, round, solid and deep ..... Points 5

Tail—Large at base, the setting well back; tapering finely to switch; the end of bone reaching to hocks or below; the switch full .....Points 2

Hair and Handling—Hair healthful in appearance; fine, soft and furry; skin of medium thickness and loose; mellow under the hand; the secretions oily abundant and of a rich brown or yellow color.....Points 10

Mammary Veins—Large; full; entering large orifices, double extension; with special development, such as forks, branches, connections, etc .....Points 10

Rudimentary Teats—Large; well placed .....Points 2

Escutcheon— Largest; finest ..... Points 2

Perfection 100

General Vigor—For deficiency Inspectors may discredit from the total received, not to exceed eight points.

General Symmetry and Fineness—For deficiency Inspectors may discredit from the total received, not to exceed eight points.

General Style and Bearing—For deficiency Inspectors may discredit from the total received, not to exceed eight points.

The report of the Committee on Resolutions was brought in and read by Mr. Plowman, and after a few amendments, which were accepted by the Committee, the report was unanimously adopted.

RESOLUTIONS.

WHEREAS, It is so important to the residents of Wisconsin that stock raising be encouraged in every way possible, and

WHEREAS, One very important agency in this important work is the College of Agriculture in the University and

WHEREAS, The control of this great institution is to a large extent vested in a Board of Regents, and

WHEREAS, It is exceedingly important that this great industry be represented upon this body, Therefore be it

Resolved, That the farmers of Waupaca and adjoining counties petition His Excellency, the Governor of the State, to appoint two well informed and progressive live stock farmers to membership on this body.

WHEREAS, Stock raising not only contributes to the prosperity of the farmer, but also to the welfare of the people of the entire State, and

WHEREAS, The Live Stock Sanitary Board was established to protect and safeguard this important industry, Therefore, be it

RESOLVED, That the farmers in attendance at the Twenty-seventh Annual Closing Farmers' Institute, while appreciating the excellent work of this Board as now composed, but believing that even more might be done by this body if composed of men who intimately know the needs of the industry, do hereby petition for the enactment of a law which will permit of one member of this Board being selected by the executive committee of the Wisconsin Live Stock Breeders' Association from its membership, another by the executive committee of the Wisconsin Dairyman's Association from its membership, and a third being selected by the State Board of

Agriculture. The State Veterinarian and the Bacteriologist of the College of Agriculture would be ex-officio members of this Board. To be eligible to appointment by the Wisconsin Live Stock Breeders' Association, the Wisconsin Dairyman's Association or the State Board of Agriculture, a man must be an experienced stockman, qualified veterinarian, or be otherwise actively engaged in stock raising.

WHEREAS, Wisconsin's greatest and most permanent prosperity depends upon its agricultural development, and

WHEREAS, Successful agriculture depends upon the maintenance of the fertility in the soils for the profitable production of crops, and

WHEREAS, Live stock farming is the most economical and rational means of keeping up the productive power of our farms, of increasing the profits from farming and of making farm life more attractive and enjoyable, and

WHEREAS, The Wisconsin Live Stock Breeders' Association is and has been doing an important work in encouraging the raising of more and better live stock on the farms of our State, Therefore, be it

RESOLVED, That we, the farmers of Waupaca and adjoining counties, petition the members of the Legislature to seriously consider all bills which have to do with this, the most important industry of the State, and to enact such laws as will still further develop and encourage this important industry and enable this efficient organization to carry on its important work.

WHEREAS, It is in the interests of agriculture to have high grade stock, our farmers and breeders have found the use of pure bred sires to be of great value in improving the efficiency and production of their herds and flocks, and

WHEREAS, The use of pure bred sires is the easiest and most practical way of improving our herds and flocks, and

WHEREAS, Our Federal government, recognizing their value, has seen fit to admit pure bred sires to this country free of duty as an encouragement of their use, Therefore, be it

RESOLVED, By the farmers attending the Twenty-seventh Annual Round-up Institute at Clintonville, March 20, 1913, that we petition the Legislature to pass a law that a pure bred registered sire maintained for breeding purposes in either horses, cattle, sheep or swine, be exempt from taxation, for the purpose of promoting the live stock interests and increasing the value thereof to our State.

WHEREAS, There will be held in San Francisco a World's Fair, to be known as the Panama Canal Exposition, which will be largely attended by people interested in agricultural development and pursuits, and

WHEREAS, The agricultural interests of Wisconsin have been developing very rapidly and have attained a position of foremost rank in the agricultural world, and

WHEREAS, This World's Fair will offer an exceptional opportunity for advertising the products of our flocks and herds and fields, and

WHEREAS, There exists a growing demand for these, in not only the western section of our country, but also in South American countries and the Orient, Therefore, be it

RESOLVED, That we, the farmers of Waupaca and adjoining counties, assembled in attendance at the Twenty-seventh Annual Round-up Farmers' Institute, respectfully ask

and urge the Legislature now in session, to make ample appropriation for the purpose of making a creditable and high-class agricultural and live stock exhibit for the purpose of stimulating a greater demand for the products of our States agricultural and live stock industries.

WHEREAS, There is annually a demand for many more Farmers' Institutes throughout the State than funds available can provide for, and

WHEREAS, There is urgent need for Farmers' Institutes being held more generally throughout the State to aid in its agricultural development and progress, Therefore, be it

RESOLVED, By the farmers of Waupaca and adjoining counties assembled in the Twenty-seventh Annual Round-up Farmers' Institute:

First, that we heartily recommend that the Wisconsin Farmers' Institute force in the future, in connection with its regular Farmers' Institute meetings, organize Farmers' Clubs to cooperate with the Farmers' Institute in carrying on its work of agricultural education and development.

Second, That we do respectfully ask and urge upon the Legislature now in session the appropriation of funds sufficient in amount to enlarge the field of work of the Wisconsin Farmers' Institute.

To the enterprising city of Clintonville, Wisconsin, we desire to express our most cordial thanks for the thoughtful and generous manner in which they have helped to make this Twenty-seventh Annual Round-up Farmers' Institute of Wisconsin a pleasing and lasting success.

The Mayor of Clintonville here made a brief address, thanking the Superintendent and workers of the Farmers' Institute for bringing the Institute to Clintonville and inviting them to come again.

The Chairman responded, expressing appreciation of the treatment received.

Supt. McKerrow—It has reached four o'clock and all good cow feeders know they have to feed regularly; the roads are bad and we cannot afford to keep you here from feeding your cows, because practice is better than precept, so we are going to close this meeting.

We thank you for your attendance and your attention. We are sorry as well as you, that the roads are not better, conditions better. We feel, as stated in the resolution passed, that the people of Clintonville have made an extra effort to make this meeting a success. They could not control the weather however, they could not macadamize the roads out into the country, and so we cannot blame them for the conditions in those respects.

Now, again thanking you for your interest and hoping you may carry home with you something to think about, because it is in the afterthought that the benefit of all this comes; the mingling together of farmers, as well as other classes of people adds to the benefit. I will call this Twenty-seventh Annual Round-up Wisconsin Farmers' Institute to a close.

We will now adjourn.

WOMAN'S DEPARTMENT.

COOKING SCHOOL.

Held at Clintonville in connection with the Closing Farmers' Institute, March 18, 19 and 20, 1913.

Conducted by Miss Nellie Maxwell, Neenah, Miss Laura B. Breese, Waukesha, and Miss Cora Binzel, Madison.

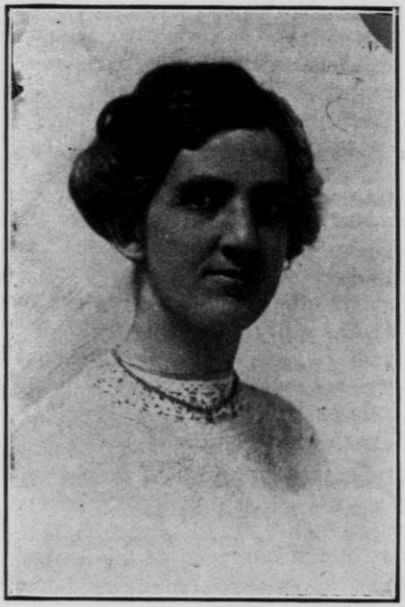
Stenographic Report by Miss Nellie E. Griffiths, Madison.

FIRST SESSION.

Tuesday Afternoon, March 18, 1913.

WHAT THE HOME NURSE SHOULD KNOW.

Miss Laura B. Breese, Waukesha, Wis.



Miss Breese.

You will notice that my talk this afternoon is on what the home nurse needs to know.

Now, it is important to know what to do when our health fails us and when we have emergencies to meet in the home, and I am going to talk chiefly on that side of nursing, but I think it is just as important to know how to keep in good health, and I am going to speak of this phase of home nursing first. I think we all should be pleased to know something about the laws of health and be enabled, thereby, to take care of ourselves, maintaining the best health. It is fortunate that in this day we do not consider it popular to be sick; now we are realizing that we are losing valuable time when we are sick; that we are not able to do good work when ill, so we are constantly endeavoring to keep well in order to accomplish the best results in different lines of work.

In order to understand the laws which control good health, we must know something first about our bodies; we should have a knowledge of physiology, a limited knowledge perhaps, but some knowledge of physiology, a knowledge of anatomy, and a knowledge of the proper care of our bodies.

A Few Definitions.

Physiology is that science which treats of the function of each organ in our body. We should know what each organ in our body is supposed to do, how it accomplishes its work, and then we would understand better how to bring about those conditions most favorable for the best action of these organs. Physiology explains digestion and assimilation, the need of food and how it builds up tissue and yields heat and energy.

Anatomy is that science which treats of the structure of the parts of the body. It teaches the relative location of the organs and the purpose of each organ.

Hygiene is a study of the laws of health, it is a study of learning how to keep well by taking proper care of ourselves. Instruction in health laws to the young adds much to the wealth of the nation and happiness to its people. Success depends upon health; health depends upon habits and habits are formed in youth; youth is to the future man what roots are to a tree. The problem of right living is one of adjustment, and knowledge of the body and its needs enables better adjustment to the ever increasing complexity of modern life.

How To Maintain Health.

There are some rules that must be observed by each of us in order that we may be healthy. It is necessary that we pay proper attention to our diet, to our exercise and to our rest, and to the sanitation of our surroundings.

We need rest periodically in the form of sleep. Why? Because during our daily activities the waste processes within the body are far more rapid than the elimination processes; there is an accumulation of poisonous material within the body during the activities during the day that must be eliminated. The organs of elimination cannot take care of this as rapidly as they accumulate. During sleep the order is reversed, the processes of elimination are more rapid than the processes of waste, so the body during the hours of sleep is eliminating the poisonous substances that have accumulated during the day while we have been constantly busy. Besides, the muscles store up oxygen, the nutriment glands build up substances out of which they make their peculiar secretions; nerve centers store up energy and all cells are repaired.

Physicians who have made a study of the needs of the system state that most people need from seven to nine hours of sleep. It is claimed that women need an hour longer than men. We abuse ourselves right here very often, we are not regular in our sleep and we do not take the required amount of sleep. What is the result? A gradual breaking down of health.

The nervous system controls all of the other organs of the body. If we are over-taxing the other organs, we over-tax the nervous system, and if we do this repeatedly our nervous system breaks down and we feel miserable.

Then we need exercise, regular exercise. Through exercise the circulation is put in better condition, the lung capacity is increased, making

the lungs stronger, there is a more rapid beating of the heart, which makes the heart stronger; digestion is stimulated; the circulation is improved; we develop more muscular energy; the nerves store up more oxygen, which will in turn yield them the energy. We are constantly drawing on our nerves for energy, so you can see the value of exercise for them alone.

We should get a great deal of benefit from housework, provided the housework is well organized and you are not taxing your nervous system too much in fretting over it. If your housework is well organized, you can do the work economically, exercising the muscles without using much nervous energy. People not as active as housekeepers are need to plan regular exercise in some form or other. There are many people, it is said, living the sedentary life who are sick, due largely to the fact that they have not exercised properly.

It is important that the hygiene of the skin be considered. There is an elimination of waste through the skin. It is necessary to take frequent baths to keep the skin cleansed properly and the pores open, as they throw these poisonous substances from the body. The skin, the kidneys, the lungs and lower intestines are the chief organs engaged in the elimination of waste from the system.

The study of the diet is very necessary. Many diseases are due to improper diet or improper digestion. Improper digestion can come from foods improperly cooked, or from foods not well balanced, that is, an excess of one kind of food in the diet. We should know the needs of the system and the composition of the foods, so we can plan a diet that will meet the requirements of the system.

The Classification of Foods.

Our foods are classified according to their purposes in the body; we have three great classes, known as proteids, carbohydrates and the fats. The proteid class comprises such common foods as lean of all kinds of meat, fish, eggs, milk, and we find the proteid in the vegetables, such as peas and beans and lentils, and in bread flour in the form of gluten. Rich in protein, their chief use in the body is to build up the tissues. We are constantly drawing on our tissues, so we must supply food to have them rebuilt, and it is the proteid foods that are used for that purpose. A man who is very active physically needs a large percentage of proteid food in his diet to repair his wasted tissues.

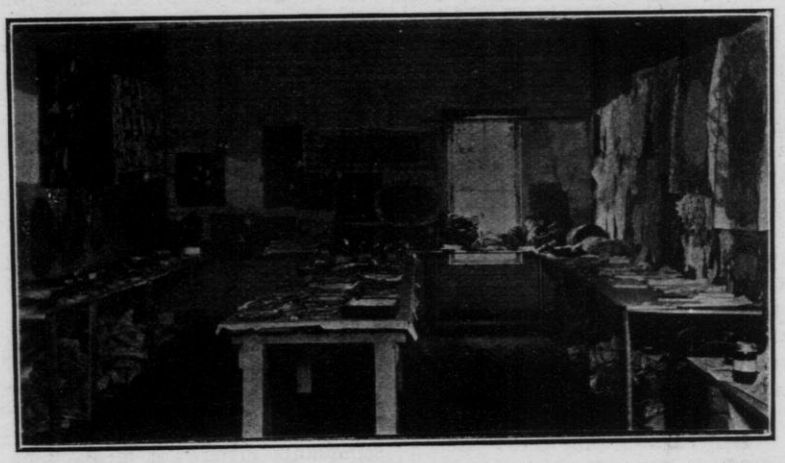
Then we have the carbohydrates, foods used in the body for furnishing energy chiefly, and which also yield heat. Their primary use is furnishing energy. Most of our common foods, excepting those named, belong in the carbohydrate class. Any food which is rich in starch or sugar or cellulose or dextrin or gum, a food rich in any one or more of these food stuffs is a carbohydrate and will yield energy and heat in the body. The common foods are, most of the cereals, sugars, most vegetables, macaroni, tapioca, etc. Most of us need a great deal of carbohydrate in our diet.

The fats you can easily name; the foods that belong here are the fat from any kind of meat, the oils from nuts and the oils from different fruits, such as oil of the olive and the oil of the cocoanut, and we have the products of milk in the form of cream and butter. These foods serve in the body as heat makers, their use is to furnish the heat required for maintaining the bodily temperature, they

will also provide energy, but their primary function is that of producing heat.

Different kinds of people need different diets; a growing child needs a different diet from grown people; it needs a good percentage of protein in its diet, because it is not only repairing waste tissue, but it is building up tissue. The aged person needs very little proteid in her diet, she is not active and is not building up tissue, so needs very little protein in proportion to the other food principles. She will need more carbohydrate and fat.

In order to maintain the health of the members of the family, you must study this question of diet well, study the different members of the family, their age and the conditions under which they live and work, and then plan menus suitable for them, menus which are well balanced for their needs. Over-eating is just as much of a mistake as under-eating; the digestive organs are over-taxed, there is likely to be an accumulation of undigested food in the lower part of the alimentary tract, poisonous gases permeate the system, and we have a breaking down of health. There is great danger of getting too much proteid in the diet. Americans, as a rule, have a fondness for meats. They are abusing their systems by indulging themselves in this food.



Part of the display of cooking and needlework at Round-up Institute

Practical Suggestions for the Home Nurse.

Now I wish to give a few practical suggestions to the home nurse when there is sickness or emergencies to meet in the home.

In the first place, consider your patient above every thing else. Have a room suitable for that person while she is sick. You want to consider these three things for the room; that it is very sanitary, that it has a great deal of light, sunshine and pure air, that it is in a place in the house where it will be away from noise. Pure air, sunshine and light are nature's best restoratives.

In furnishing the room, furnish it in

the most sanitary condition, or if you are not refurnishing, take out those things that are apt to make the room dark and crowded; have just as few articles as are required for comfort. Remove all draperies or hangings, they are dust gatherers and dust is a menace to health. Have the bed arranged so the light will not shine strongly in the patient's eyes. You can control that by placing the bed so the light comes in back of the patient if possible. Then if your chairs or your couch are upholstered keep them covered with washable covers, so they can be taken off and cleansed. It is better not to have upholstered furniture in a sick room. If you must have it, use a vacuum cleaner to clean it, taking out all the dust; avoid raising dust when cleaning the room. Keep the room always looking clean and cheerful. Remember that you are considering the mental state of your patient as well as her comfort.

Sick Room Methods.

One should be able to take the temperature of a sick person. The temperature indicates the heat of the blood. It is taken by using a clinical thermometer. These are self-registering and vary in delicacy—the finest registering in one minute, others vary from three to five minutes. Hick's thermometer is probably the best. The mercury should be shaken down to 95° before using the thermometer, being careful not to shake it into bulb. It is a good plan to keep the thermometer in a glass containing a little listerine, or a weak solution of boric acid. A little cotton in bottom of glass will prevent its breaking.

The temperature is taken usually by mouth, placing thermometer under tongue. The lips should be closed. If the patient is delirious, the temperature may be taken by rectum. This will always be some higher than obtained by mouth. If temperature is taken in the arm-pit, it will be from three-tenths to one-half a degree less than by mouth. Normal temperature is from 98° to 99° F. Temperature is apt to be highest between 4.30 and 8:00 P. M., and lowest about 3:00 A. M. This indicates a lower vitality.

Table of Temperatures.

105 degrees or over hyperprexia, very serious.
103—105, high fever.
101—103, moderate fever.
99½—101, sub-febrile.
98—99, normal.
97—98, sub-normal.
95—97, collapse.
Below 95 degrees, alig collapse, very serious.

When temperature is sub-normal, patient should be kept warm and stimulants given. It is alarming as fever and the doctor should be sent for at once.

Taking Pulse.

Place fingers over artery in wrist, just below thumb, and count the beats per minute. Both the frequency and quality of pulse are obtained in this manner.

Pulse Table.

Normal:
Men—60 to 70 beats a minute.
Women—65 to 80 beats a minute.
Children—90 to 100 beats a minute.

Accidents.

If accidents occur, you have to meet those accidents quickly. Ofttimes when you have to treat them quickly you are not in a location where you

can get a doctor easily, and something must be done to aid the sufferer. I am just going to give you a few suggestions for treatment in the common accidents that happen in the home.

Always be careful in having the materials for use in an antiseptic condition. Now, it is wise for you to keep in your closet certain materials to use in times of accident. Have there the gauze bandages, an antiseptic wash of some kind, it can be carbolic acid, which can be used diluted in washing wounds if you have them to treat. Have salves of endorsed kinds, a few rolled bandages, as you oftentimes have wounds that have to be bandaged.

Wounds.

Remember that there are two kinds of blood vessels, known as veins and arteries; that the arteries carry the blood from the heart and the veins to the heart. The blood from the veins is dark red in color and it flows smoothly; the blood in the arteries is light red and flows in spurts. Now, when there is a wound, look to see what color the blood is and how it is flowing. If it flows smoothly and is dark red in color, you will know it is a cut vein and the vein is carrying the blood to the heart, so you want to bandage tightly on the side of the wound farthest from the heart. Wash the wound with your antiseptic wash, put a piece of sterile gauze or cotton over the wound and bandage it tightly. If wound is severe, press on it with a hard pad of clean gauze. Apply cold by means of ice and if necessary bandage on the side farthest from the heart to arrest bleeding.

If it is an artery that is cut, the blood will be light red in color and will come in spurts, then bandage on the side nearest the heart, bandaging tightly with a clean, sterile bandage. These wounds are more serious. Send for doctor. Elevate wounded part. Apply pressure at once by thumb and finger covered with gauze. Replace this by crowding gauze into the wound and hold it with tight bandage.

For the nose bleed, which is a common ailment, we want to know what to do. Lay the patient on the back, raise arms above head, then apply ice or cold compresses, a bag of ice or a cold compress to the forehead, nose and back of neck. If the bleeding is very severe, it is necessary to put a little piece of absorbent cotton into the nasal passages to stop the blood from flowing and then, of course, after you have done this, the nose should not be blown for several hours afterwards, as it would be likely to start the bleeding again.

If bleeding from lungs, place patient on the floor in a sitting posture, give small pieces of ice, also little doses of salt mixed with vinegar. Place cold compress on chest; send for doctor.

For burns and scalds. If it is a severe burn, remove the clothing by cutting from the burn, then cover the burn as quickly as possible. The action of the air upon the burned spot has a tendency to make it burn more, so exclude the air from it and you will relieve the patient a great deal. Keep the skin moist and cool with an application of some good liniment. Pond's Extract is good. That in time will draw out the inflammation, relieving that burning sensation. Cover with a layer of absorbent cotton upon which vaseline or some good ointment has been spread, then bandage it. If the burn is from acid, treat it with some alkali, baking soda is good, just put it on dry or in solution, first flooding the burn with water. If it is a burn from an alkali, flood it with water and wash it with vinegar or a weak boric acid solution.

Fainting.

Lay patient flat and loosen tight clothing. Allow free access of air. Bathe hands and face with cold water. When conscious, give tea or coffee.

Fits.

Kneel by patient's head. Put one arm under his head and with the other under his collar. Place some hard substance between teeth to prevent his biting his tongue. Do not restrain his movements. Do not give anything to drink.

Unconsciousness.

Lay patient flat, head slightly raised. Apply cold water to head, Keep body warm. Apply heat to feet. Give no stimulants.

Hysteria.

Do not restrain patient nor sympathize with him. Many times it is wise to leave him alone. Mustard plasters at soles of feet, wrists and palms of hands are good.

Ptomaine Poisoning.

Give emetic, purgatives and stimulants.

Fever.

Undress patient and put her to bed. Do not cover too warm. Give cooling drinks, and just milk to eat. Bathe with alchol.

Croup.

Keep room warm, have water boiling in room, that the steam may reach the person. Apply flannels wrung out in hot water to the throat and cover with some water-proof material. Apply hot foot baths. If no relief, try cold. Mustard plasters at feet and chest (for only a few minutes.)

Membraneous Croup.

Slake lime in a room for patient to inhale. Summon a doctor.

Electricity Accidents.

If possible shut off current. In releasing patient do not touch directly any part of the body. If rubber gloves and boots are handy, put them on. If not, try to find a dry paper or board to stand on. Do not use anything metal or a moist stick. Dry paper on hands is good.

Burns caused by electricity can be treated as fire burns. If breathing is suspended, use artificial respiration.

Artificial Respiration.

Lay patient down on back. Raise arms back and up over head, then bring down and in close to sides over chest. For a drowning person, expel all water from mouth and passages in head, by doubling patient over knee or barrel, then lay patient down, tie his tongue out to his lower jaw and use artificial respiration. Keep this up a long time, as sometimes life is restored after an hour's working.

Suffocation.

Dash cold water on face and chest. If necessary, use artifical respiration. Apply hot water bottles to body and put mustard plasters to heart, soles of feet and wrists.

Sunstroke.

Remove to shady place. Lay patient down, level. Loosen clothing, pour cold water over head and face. Rub body with pieces of ice. Apply heat to extremities, if patient is prostrate from heat.

Now, there are various forms of literature that show what to do when accidents occur in your home. I think it best for you to have reference matter on hand. It is necessary to have knowledge right at hand, so we can turn to our book, find out what to do quickly and act accordingly. I have a little book that has been very useful to me, it is a very small book, it is one sent out by the Pond's Extract Co., of New York. It is called the Pond's Extract Book, "The first aid to the injured." It has only about 15 or 20 pages, but it contains information about what to do in case of all kinds of accidents in your home, how to meet them quickly. It is a little book that only costs ten cents and is the best book I know of for the cost. They have taken these directions from good books and put them in condensed form for the housekeeper, so you will find the book very valuable indeed.

Diet For Invalids.

Next I wish to talk briefly on the diet suitable for invalids. Invalids need to be treated very much the same as children. The digestive tract impaired by long illness can be compared to an immature digestive tract, so that the person who has had a slight illness might be compared to a growing child and a diet be furnished similar to a diet for a child.

We know that nursing has as much to do for the recovery of a patient as good doctoring, so it is quite necessary for the nurse to be informed, to be intelligent as how to select and cook foods properly when it comes time to nurse a patient who has been critically ill. The doctor will prescribe the kind of diet for this patient, but he will intrust the nurse with the preparing of this food. If he will say, "This patient must have a liquid diet," the nurse then is expected to prepare that diet, all foods in liquid form. It is not wise to have monotony for invalids, you need to coax the appetite, so vary the kinds of foods served, and then, after preparing this food, it is quite necessary to serve it in a very attractive manner.

In the serving on a tray, have it quite clean, always covered with a clean tray cloth; it is better to have a tray cloth that will cover the edges of the tray. Use your very best china for the food, and your very best silver. Have the silver well polished and shining; then set your tray as you would for a person at the table, never overcrowding it. Just use dishes enough for the serving of your menu, and be sure that you keep them in a good clean condition and set them on the tray in an attractive manner. Maybe you can add to the attractiveness by putting on the tray a small vase with a flower in it. Do not have too large a bouquet, just a little for good cheer, and change that flower occasionally.

These diets for invalids are classified. We have the three kinds of diet, the liquid, the light and the convalescent. The liquid diet includes liquid foods; they are served in times of fever, or at any time when the patient is in a weakened condition and easily digested foods are required.

There are a number of different foods that can be served in a liquid diet. I have some charts here. Under the liquid diet I have put some of the foods that come in this class, so you can see how many different things can be made and served, like beef tea, milk, and various kinds of gruels. We have different kinds of broth made from the meats and fowl, we have cooling drinks for fevers. These are made from the juice of fruits, and

there are albumenized drinks, drinks that have a large percentage of albumen in them made from egg. The hot drinks, as cocoa, chocolate, etc., are often given to produce sleep. Sometimes it is necessary to serve stimulating drinks, when the person needs stimulation, such as tea, coffee, alcoholic egg nogs, etc. Do not serve the latter unless prescribed by the doctor.

There is a great variety of foods coming under the class known as "light diet," as you can see from the chart. It includes all liquid foods and some solids, as represented in the chart.

Then we have the convalescent diet, and those foods you can see are getting much similar to those eaten in health.

An invalid needs very little food at a time and needs it often. This is just an illustration of a liquid diet served to an invalid.

8:00 a. m. ¾ cup of hot milk.

10:00 a. m. ¾ of a cup of chicken broth.

At noon glass of egg nog.

2:00 p. m. ½ cup of hot milk.

4:00 p. m. 1 glass of milk or koumiss.

6:00 p. m. ½ cup of chicken broth.

8:00 p. m. ¾ of a cup of cocoa.

This last would be the hot drink served to induce sleep.

The light diet. This is suitable for a patient that is improving. The following is an illustration of a diet for one day.

For breakfast you would serve such foods as poached egg on toast, and coffee; for lunch, soft custard; for dinner, broiled mutton chop and toast. There is not so much food, but it is a little heavier than the liquid diet. Between dinner and supper serve gelatine or an egg nog, then for supper we can serve milk toast and cocoa. It is advisable to plan to serve your hot drink so you can get the patient in a state conducive to sleep.

In the convalescent diet, you will see that the patient gets regular menus. You can serve for breakfast, mush with cream, minced chicken on toast. For dinner, soup with rice, broiled beefsteak, baked potato, piece of bread and butter, snow pudding, tea or coffee.

These are simply illustrations that might be helpful to us when we have to meet these conditions.

Now, this afternoon in my practical work I mean to make a few of the dishes served in the liquid diet, some in the light diet and some in the convalescent diet.

I am going to make beef tea, two kinds of gruel, oatmeal gruel and gruel made from shredded wheat. Any kind of gruel can be made in a similar manner. I shall make corn soup, you see the cream soup came in the light diet, so the cream of corn soup would be a soup suitable for light diet. I shall make grape water; this would be an acid drink coming under the liquid food, albumenized milk, egg lemonade, that is an acid and albumenized drink, and then I am going to make creamed oysters. There are various kinds of creamed dishes that can be made and placed in a convalescent diet. The cream sauce is light, by an addition of meat or fish you would make heavier foods. I am using oysters, but you can use sweet breads or fowl, etc., cut very finely.

Beef Tea.

In my beef tea I take the following ingredients. One pound of round steak, one pint of cold water and one teaspoon of salt. The meat is ground fine and then allowed to stand two hours in the cold water, then heat it slowly until it steams, using the double boiler. You must watch that very closely, if you allow it to cook

too long the albumen will coagulate, and that is just what you do not want it to do. Albuminous foods are easier digested raw, so keep them in the raw state for patients who are very weak, so the digestion of them will be as easy as possible. Heat it until it is just warm enough to be taken as a drink, as it is sipped as a drink, usually. Now, it will be red, as it is just the raw juice of the meat. Beef juice contains the extractives from the meat all in soluble form, besides the albuminous substances. You have extracted all of this juice from the meat according to this process. Because it is red in color, it may be objectionable to your patient by serving it so, but it is best for her and if you have a red glass, put it in that, if she is at all sensitive to color. This will conceal the color.

In straining the beef juice, use a small strainer, putting a piece of cheese cloth inside and straining it through the cloth and the strainer, so there will not be any of the coagulated albumen (if any occurs in the liquid).

Miss Maxwell—Is there any food value left in the meat?

Miss Breese—There is very little food value left in the meat, there is some, but most of the albuminous substance has been drawn out and left in the water, and that is what we are after. Beef juices are valuable as proteid foods because of the albumen in them. We have been following a process to extract the albumen and extractives from the meat and it is mostly fiber that is left. You see there is very little left from the color of the meat.

Miss Maxwell—Couldn't that be seasoned and used for meat balls?

Miss Breese—Yes, if you add enough in the seasonings or ingredients that will make up for the loss of the flavor we have taken from it, then you can use it, can make it into meat balls, by adding butter, bread and milk and seasonings, or the like.

Here is the beef juice. This is not just the right shaped glass for this, it is better to have a champagne glass, I would not take a large water tumbler, because you want to serve it in small quantities, so do not have too large a glass for the amount you want to serve.

Oatmeal Gruel.

The oatmeal gruel is made as follows. One-half of a cup of oatmeal, one quart of cold water, two teaspoons of salt. Cook together in the double boiler for two hours. This can be cooked in the fireless cooker; just bring the water and oatmeal and salt to the boiling point, and let them boil about a minute, then put the pail in the fireless cooker, let it stand about three or four hours. Remove it from the cooker, strain through a double piece of cheese cloth, dilute with rich milk or cream. That will depend on how rich you want it, if you want it rich, add the full amount of cream; some people cannot stand the cream, so you will have to make it less rich and use only the milk in the gruel. Then you reheat it and serve in a bouillon cup. Sometimes the addition of the well beaten white of an egg is pleasing and it adds to the nourishment. Beat it up well and stir it in the gruel just before you put it into the cup for serving.

Now, this oatmeal has all been pressed through, I want you to see how it looks. This has been cooked slowly and for a long time, the oatmeal has been well cooked by that long, slow process of cooking, and it renders the gruel more easily digested; it is very liquid, as you see. This should be strained through cheese cloth again, particularly if your sieve was a little coarse, and then you won't

have any coarse particles of the oatmeal in it at all, and the patient will not be annoyed by getting any of these little particles in her mouth. Sometimes these particles cause bowel disturbance too.

Miss Maxwell—Are your patients always women?

Miss Breese—Yes, mine have always been.

Now you see after straining that through the cheese cloth I obtained some coarse particles, and it looked as though there was not any left in it, but you see I have obtained a little sack full. When the digestive tract is very sensitive, a little sediment, just as much as that, is enough to irritate it, causing a disturbance. Physicians are sometimes desirous of having liquid food perfectly free from sediment.

Miss Maxwell—Is that true especially in cases of typhoid fever?

Miss Breese—Yes, and when the patient has acute stomach or bowel trouble.

Now this is reheated and served hot to the patient. You had better taste it to see that it is seasoned to your taste. Remember that it is better to under-season rather than to over-season. An invalid's sense of taste is very acute, so it is best to be very moderate in seasoning their foods.

Shredded Wheat Gruel.

I have a shredded wheat recipe, too, that I shall make. I am going to make it in this quantity this afternoon. One shredded wheat biscuit, one-half teaspoon salt, one pint of boiling water and one cup of milk. The biscuit, salt and water are put together and boiled about twenty minutes. Strain the gruel as I did the oatmeal gruel. Add the milk. Reheat it and serve it in a bouillon cup.

Albumenized Milk.

One white of egg, one-half cup of milk. Put them into a glass fruit jar and shake them together. Sometimes it is better to put a piece of cheese cloth under the top to avoid "spilling over". Shake until it is well mixed.

Miss Maxwell—Is there any seasoning?

Miss Breese—No, this is taken without, but if you find your patient would like a little there is no objection to adding it. You could add anything in the way of flavoring, such as nutmeg, vanilla, lemon, etc. It does not add to the nourishment at all, only makes it a little more palatable to some, perhaps.

Miss Maxwell—If it is more palatable seasoned, it is more easily digested, is it not?

Miss Breese—Yes, if it proves more pleasing to the patient, because the digestive juices may flow more freely in consequence.

Question—How long do you shake that?

Miss Breese—Just until you get them well mixed and you cannot see any of the white of the egg on the glass. After a while that will all be worked in with the milk. Then, of course, it should be served at once, and it is better to have it cold. It should be served right away after it is shaken, because there is danger of it separating.

Grape Water.

Another liquid drink that is very popular is a grape juice drink. It is sometimes called grape water, it is just flavored water. It is quite necessary that we drink a great deal of water. It is hard for us who are well to drink the required amount of water. We should drink at least a quart and a half of water per day,

two quarts is better. Many things are accomplished by this amount of water, it aids in digestion, it also flushes the system and helps in the elimination of waste, so you can see water is very essential for health.

For the grape water I use the following: One-half cup boiling water, four tablespoons grape jelly, one-half cup cold water, one teaspoon lemon juice, one tablespoon sugar. Pour the boiling water over the jelly, stir it until it is well dissolved.

Miss Griffiths—Could grape juice be used in place of the jelly?

Miss Breese—Yes, then you would just dilute it with cold water and season it.

When the jelly is dissolved, add sugar, lemon juice and cold water. This should be chilled, but it is best never to put ice into a liquid or into your food. A great many drinks need to be chilled, do that by setting your basin into the chopped ice, letting it stand until the drink is cold enough. Unless you know that your ice is pure, it is never wise to put it into your food.

Here is our grape water. This, of course, is not chilled, I haven't the ice to do it with, but if you are serving it to a patient chill it, as this is one of the best cooling drinks you want in the time of fever.

Egg Lemonade.

For this I take one egg, two tablespoons of sugar, three tablespoons cold water, juice of one lemon.

This is just a plain egg lemonade. You can vary this and make different kinds of lemonade, but this is the one most commonly used.

Beat the sugar and egg thoroughly, (I use a Dover egg beater) then add the cold water and lemon juice.

Never use an iron spoon in anything that has acid in it. It is a mistake to do that, because there is an action of the acid on the metal which ofttimes leaves a disagreeable taste, besides an injurious ingredient.

You can see the consistency of that as I pour it.

Now I am going to make some of the light foods, those served in the light diet.

Oyster Broth.

The oyster broth is made by using one-half cup of oysters and one cup of boiling water, then your seasoning. It takes about a quarter of a teaspoon of salt for that amount. The oysters are taken from the liquid, put into a clean bowl and a little cold water poured over them. Then pick out the oysters and drain them in a clean piece of cheese cloth, then cut them up into small pieces, pour boiling water over them and let them stew for about six minutes, then pour off the broth, season and serve hot. It should be strained through a fine strainer before it is served.

Question—Without any milk?

Miss Breese—Yes, without any milk. This is just one of the plain broths, you can make clam broth in the same manner.

Cream of Corn Soup.

I am using the corn, but any other vegetable can be used in the same way, making a different kind of cream soup.

One cup of canned corn, one cup boiling water, one-fourth teaspoon onion juice, one tablespoon corn starch, one-half cup sweet cream.

Now remember, when you serve foods in small quantities, you want them rich and nourishing, so we have this a rich soup, as you see.

Press the corn through a coarse sieve, getting just as much of it through as possible. Then add the boiling water, salt and celery salt to

the strained corn, scald the cream, rub the butter and corn starch to a paste and add to the cream, stirring until well mixed. Add the corn mixture and stir until the soup is just a little thick. Let it cook about two minutes longer. Occasionally the doctors will prescribe soup where the milk is not boiled. Boiled milk sometimes causes constipation. In that case cook the butter and corn starch with the corn mixture and add the milk which has been heated only to the point of forming a scum.

Question—Do you think corn starch will be cooked in two minutes?

Miss Breese—Yes, I think it has plenty of cooking in two minutes and it cooks while the milk or corn mixture thickens.

Now I have my corn pressed through the sieve, you see it is just the pulp of the corn. I will add the boiling water and seasoning to this.

Miss Maxwell—What is the advantage of using corn starch over flour?

Miss Breese—Simply because we consider corn starch makes a smoother soup and yields a little bit more in energy than flour. Arrowroot is also very good for smooth thickening.

I haven't any butter here this afternoon, so I am going to omit the butter. When you do not add butter, you see your problem of adding the corn starch is a little different. Measure it out and add a little milk to mix with it until it is smooth and well mixed with the milk, then put it into the rest of the soup. I have the corn starch all mixed thoroughly and I will stir it into the soup in the kettle. Serve this soup hot. A spoonful of whipped cream on top of the soup will make it more attractive.

Raw Beef.

I have some raw beef I want to tell you how to prepare when the doctor calls for raw beef foods. Just cut a piece from a round steak and for sandwiches scrape the pulp of the meat, take a real sharp knife and just scrape pulp from the meat so you can get enough to spread between your bread. Spread that between your sandwiches as a filler, taking a thin slice of bread, spreading it slightly with butter and putting a thin layer of raw meat in between as a filling. You can toast them on the outside after they are prepared, as this makes them a little more attractive and more easily eaten. Do not let the raw meat show around the edge, so the patient can see it. You can make them in attractive forms; cut them round or long or in triangles.

Meat Balls.

Another way is to make little meat balls of it. Wash your hands clean, then dip them in cold water, form little balls of this meat pulp, then heat your frying pan until it is very hot, put in your balls (put a little salt in the frying pan first), and move the balls about, tip the frying pan so the balls will roll around the bottom. When brown on outside, put them on small, dainty pieces of toast and then serve them to your patient.

The bread was too fresh to toast, but the method of making balls is simple, as you can see. The bread should be at least two days old in order to toast well. Dry the bread out well first, then the bread is more easily browned. Put it in the oven until the slices are well dried and brown it on the toaster.

Creamed Oysters.

Make a cream sauce. The oysters must be drained before using.

For the cream sauce, use one tablespoon of butter and one of flour and three-fourths cup rich milk. Melt butter, stir the flour until butter and

flour are well blended, adding milk gradually, stirring the mixture all the while you are adding the milk. Allow it to cook until it gets thick, about five minutes. Season it with salt and white pepper. White pepper is best used in white sauce or soup. Then add the oysters, allow it to cook about one minute longer. Serve either in ramekin dishes or on toast. Minced cold meat or fowl may be used in place of the oysters.

Another very nice thing to use is sweetbreads. Sweetbreads are the throat glands of the calf, they need a great deal of preparation before you can put them into the white sauce. Wash them well and cut off any hard portion that you will find in the glands, put them to soak in cold water for about two hours; put a little lemon in this water to draw out the disagreeable flavor from the sweetbreads. Drain, then boil them in boiling salted water just about fifteen minutes. Drain and cut them fine and add them to the white sauce.

Boiled Rice.

Boiled rice is very good to serve to patients when they are convalescing, but it is a food that is very often improperly cooked; very few people know how to cook rice and serve it properly. I want to dictate the proper method.

Use two quarts of boiling water to a cup of rice. It is necessary to have a large quantity of boiling water to cook rice successfully. Wash your rice well, put it in a coarse sieve and let the cold water run through it. Then take two quarts of boiling salted water to a cup of rice and put the rice into the boiling water gradually; stir it as you add it. After the rice is in and well mixed with the water, you need not bother about its burning, the circulation of the large amount of water will keep it from sticking to the bottom of kettle. If you dump it in, the very force makes it stick to the bottom of the kettle, but let the water work through the kernels while you are adding it and it will cook without sticking at all. As soon as it is tender it is cooked enough. You can try it by taking a few of the rice kernels in your fingers. Pour it into the colander, let the boiling water drain off, then turn about two cups of cold water to wash off any of the starch that is still sticking to the rice kernels, and that will allow the rice kernels to become separated. Dry it for a few minutes in the oven and serve with cream. Sugar and cinnamon may be added if desired. This rice would be far more easily digested than rice would be when cooked until it falls to pieces, because the digestive juices can get around it and through it more quickly than they can when it is mushy.

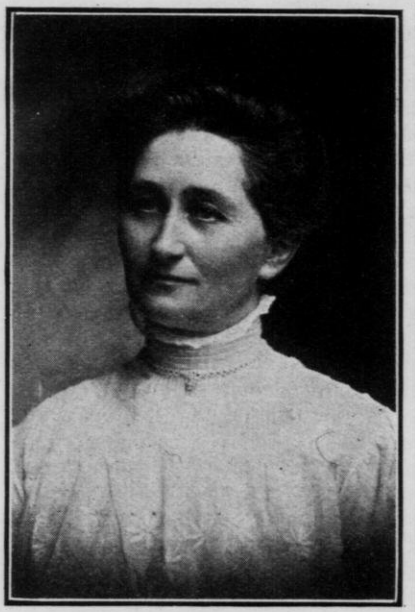
I have placed the foods made this afternoon upon the table and you may come up and observe them all, if you wish. I thank you kindly for your interest and attention.

SECOND SESSION.

Wednesday Afternoon, March 19, 1913.

CASSEROLE AND CALORIC COOK-STOVE COOKERY.

Miss Nellie Maxwell, Neenah, Wis.



Miss Maxwell.

The ladies were especially anxious that I should tell you something about the judging of the bread. It is quite interesting to know why people get prizes and why others, who had very good looking loaves, that look to you just as good as this, should not. I think I can say that none of these ladies have poor bread, it is all good, but some was not as good as others, it is all very fair bread.

One of the first points in the testing of the loaf is the appearance, it must be a good shape, it must be of good color, showing that it is well baked, because an under-done loaf is unwholesome; we want it to have a fine grain, and have what we call the pores of the bread all of the same size. The authorities in their estimate of good bread give as the proper size of the pores the size of a grain of wheat. When we are making bread we do not want cake texture; in cake the finer the texture the more delicate it is, that is what we are looking for in cake.

Then the flavor must be good, we do not want a surplus of yeast, it must be nice and light, but not smell yeasty, and it must have a good nutty flavor. The crusts should be rather thin, not hard and brittle, and of a good golden brown color.

Some of the bread looked very good, but when we lifted the loaves they were heavy, which showed that they had not risen sufficiently. One mistake we make is not letting the bread rise long enough. It must rise until it is more than double its bulk and many good cooks are able to tell by lifting the pan, it feels buoyant if well risen. Young housekeepers have to have something else to test the lightness of bread, and a good rule is to let it rise until it is more than double its bulk.

I neglected to say that when entering a loaf of bread for a prize, always bake it in a single loaf, do not send a loaf that has been broken off from another, so it shows the ragged edge

on the side. It may be excellent bread, but it would always be marked down because of that rough side. In this State we like a pound loaf, some states use a two-pound loaf. If you have a large family you will bake perhaps eight or ten loaves at a time and you would not want to be bothered with washing so many single pans, but when entering bread for a prize it should be baked in a single loaf pan.

The Cake.

We have here a very nice angel food. In testing the angel food we test for appearance, lightness, texture, smoothness of grain, and well baked. We want a fine grain in judging cake, a moist crumb. Some very nice looking cakes will have a fine crumb, but it will fall in pieces just like flour when taking hold of it. That is too dry, not a good point. We have a different test for angel food than for a layer cake. It is made of eggs without butter, it should have a finer grain and be very light and tender. If it is tough it shows it has been over-baked or over-beaten.

The same rule follows for the butter cakes. The grain of the cake, the texture of it, the flavor of the filling and of the cake, has it been well mixed, was there enough baking powder or too much, how about the appearance, was the fosting made well, was the filling good, all of those things are considered. The flavor, the appearance, the texture, the form, all come into consideration.

This afternoon we have a big program; I do not know whether I shall be able to get over it or not, but I think if I talk fast and you give me your attention, I shall be able to do it. The questions that come from you will be very welcome, do not be afraid to ask them. I shall be glad to answer any you may ask, if I can. I am learning something new every day in cookery.

Farmers' Meat Dish.

The mutton dish that we have this afternoon has been called at the Farmers' Institues this winter a "Farmers' Meat Dish." This is not strictly a farmers' dish any more than a city people's dish, but it is one that you can get ready and have all your vegetables served at the same time, and if there is anybody who needs to get her work done in a hurry it is the farmer's wife, she has so much to do we like to save her all we can in the preparation of meals. The farmer's wife should have (and there is no reason why she cannot, and I always feel like saying that a farmer's wife ought to use) all the things she wants for cooking, because she has the butter, eggs, fresh meat, and chicken, there is nothing you can buy in town that is more delicious than the things you have on the farm, and the farm table is always the best table. I am sure you will agree with me in that statement.

There are some people who say the farmer's wife does not have time to do these fancy dishes, perhaps not when she has threshers, but she does not have threshers all the time and she likes to have fancy dishes just like other people occasionally. She has a pocket-book just as full as most people's in town, she can get the luxuries, the fresh vegetables and a lot of canned goods that the women in town get, and have things served just as the town women serve them. The woman in the country cannot put on her hat and go around the corner when she needs something, but she can provide for emergencies by having a shelf of needful things to draw on when she needs them. They are

expensive perhaps, but when you use them only occasionally and only for an emergency, you do not feel that you are doing anything that is extravagant.

This mutton is to be cooked brown in a frying pan and then it is put into the fireless cooker. I have two cookers here, one is a homemade affair and the other is one I use in my own home. You can get your Sunday dinner cooking before you start for church, have your pudding and your meat and potatoes all cooking and then all you have to do is to serve them when you come home, your dinner is all cooked ready for you. That does away with the Sunday problem, so many have to stay at home to get dinner. If a woman has a fireless cook-stove she has her dinner all ready before she goes to church, puts it in the fireless cooker and when she returns it is ready to serve. For stews, broths, the cooking of cereals and rice, and all of those foods that need long cooking, it is almost indispensable in a household, especially during the hot weather.

This mutton I am going to put into a hot frying pan, brown it on both sides. The reason so many people object to mutton is because of the wooly flavor. How many cook mutton in your homes? Six people. How many do not like it at all? We won't pass you any this afternoon. Another reason most of us dislike mutton, is that it is not prepared right. We do not take the skin off. You know the wool grows next the skin, and if that is carefully cut off it will do away with that wooly flavor that is so objectionable. Another thing on the farm that we have to be careful about is, of course, that the meat does not come in contact with the wool. When the men on the farm are doing the butchering you can see to it. The carelessness of some butchers makes mutton taste wooly, as they handle the wool and then the meat, the wool should never touch the meat.

I am going to cook some carrots with this meat. I have a little slicer here. We do not get tired of vegetables and things so much as we do of the way they are served. We do not get tired of potatoes, because we eat them every day, year in and year out, but we do get very tired sometimes of the way they are served. I wonder how many ways you ladies serve potatoes? Five or six ways? Yes, that is about the average number of ways we serve them. Well, there are over two hundred ways of cooking potatoes.

One nice way of serving them is by using this little cutter, which is just a little ten-cent affair, a little fluted cutter, and you can cut your potatoes in strips like this, called "shoestring" potatoes, or you can cut them in lattice form, which makes a little different way of serving them. You know that one of the first organs of digestion is the eye. If we tempt the eye and the food looks good to us, what happens?

A Lady—We get a good appetite to eat it?

Miss Maxwell—How do we get a good appetite? What happens in the mouth before the food gets to the mouth?

The Lady—The mouth waters for it.

Miss Maxwell—Yes, it looks good to you and the mouth waters and you start to digest the food before it gets to your mouth, then you are going to masticate it well. That is why we make our food attractive, if it pleases the eye it is sure to please the mouth, if it pleases the mouth it

is sure to please the stomach, if it pleases the stomach it will be well digested.

One nice thing about cutting carrots this way is that they cook quicker. The steam passes through them, and then another thing, you have a uniformity in the slices, the vegetables will all be done at the same time.

I am going to add these carrots to the meat, with some boiling water and cook them in the fireless cooker. Just as soon as the meat is brown, we are going to add the carrots and the boiling water, and then we will put them into the fireless cooker.

One thing we have to remember in using the fireless cooker is that there is no evaporation; what we put into the cooker in quantity we take out in quantity, there is no chance for evaporation whatever. So in making gravies and sauces, do not add any more water than you want to use when your meat is ready. You can add a little bit of flour to this if you like to add thickening. I am going to use another dish with a thickened sauce, so I am not going to thicken this at all. This is put into the cooker with the carrots to cook for an hour and a half, then a can of green peas is added. This can be cooked in a casserole if you haven't a fireless cooker; you can use one of these dishes, a little brown stone dish that has been fired and made perfectly fire proof, with a tight cover. This makes a very pretty dish to have on your table if you want to have your table look nice. Here we have another with a case to set it in that is very pretty, a different style.

Utensils used in demonstrating casserole and caloric cookstove cookery at Round-Up Farmers' Institute.

The seasoning must now be added to the meat. The amount of salt that we need to add to the meat depends upon the amount of meat we are cooking, of course, and then too upon the taste of your family; do not get things too salty. If we over-season the foods we are going to disguise the flavor of the food itself. We want the flavor of the carrot and the mutton. Too much seasoning is not good, it destroys that delicate sense of taste which we all want to cultivate, the power to appreciate fine distinctions

of flavor, so we must be careful of our seasonings. A teaspoonful and a half to a pound of meat is about the right proportion of salt. That does not mean a rounding teaspoon, or what we call a "heaping" teaspoonful, our spoons are leveled off with a knife when we are measuring. All measurements are level.

The reason so many of our young cooks are not able to follow their grandmother's recipe is because grandmother said take a spoonful or this and fill up the bowl with that, and when the young cooks try to take a spoonful they forget that this (showing a heaping spoonful) is the kind of a spoonful she took. Here our measurements are level and there is no reason why we should not have good success in our cooking if we are careful about our measurements.

In the measuring of cups we use the half pint cup, and the teaspoon and tablespoon are all uniform in size now. It is nice to get a set of the graduated spoons, they can be used very quickly, a teaspoon, a half and a quarter, you can very easily measure a half or a quarter without crossing it off as we have to do with the teaspoon.

I expected some one would ask me about not having a certain kind of seasoning in here that I haven't said anything about putting in. There has not anybody said anything about pepper. Do you all use pepper in your cooking? We should use very little. I think if we could get along without using so much pepper in our cooking we would be better, especially when we are using a white sauce, a white gravy, or anything that is perfectly white. It does not look attractive to see specks of black pepper in it. Paprika or the cayenne pepper, which is wholesome, is better. Cayenne is strong, but if you are careful about using it, it is always all right. If you get too much red pepper in a dish you will not be apt to make the same mistake again. You have to use care in using red pepper.

We put the stone in the bottom of the cooker. This is just hot enough so it feels hot to the hand. If I were going to roast the meat, I should have heated it so hot it would almost glow, there would be a sort of gleam to it. Then you put in your food, put another stone on top of that of the same heat and you will have a roast that is beautifully browned all through. As this mutton simply needs moderate cooking, it does not need that extra stone on top and I will not put that on.

The late cookers have a little convenience that is very nice. You know very many people object to these cookers because there is no chance for the steam to escape. This has a little steam valve which you can use to let out the gases or steam once or twice during the cooking. It has a little thimble that goes over the top.

I will add the peas to the mutton when it is done. If you cook this in your fireless cooker and you want to serve it in a nice hot dish, heat up your casserole and serve it from that, where it will keep hot. One nice thing about a casserole of meat is that it keeps hot so long, just piping hot.

Preparing Eggs in the Fireless Cooker

I am going to cook another dish that needs a little time and that is a dish with hard cooked eggs, and I shall cook these eggs in the other cooker. the home-made one. This has a little pail that sets down into the box, which is lined with these little pads, just an ordinary box. There is wool batting in the pillows. I want to cook four eggs for a salad. We will put them in boiling water, then cover

them in this dish, put them in the cooker and let them stand half an hour. You can cook eggs that way without having a cooker by putting them in a dish and standing it back on the reservoir, but if you have a cooker you can put them in that and not have to watch them. Use a pint of boiling water to every egg.

Question—How long does it take to soft cook them?

Miss Maxwell—From six to eight minutes. If you want them medium cooked, take them out in fifteen minutes; if you want them hard cooked, leave them a half hour.

Western Salad.

I will give you the proportions of this salad. It is called "Western" salad. You know the mutton dish is going to have peas in it, so I shall save a cupful of peas out of the can. If you plan your menus for a week or two in advance, you know pretty well what you are going to have for dinner and you can plan ahead. Some town women spend all afternoon at the club or calling and then rush home to get something for supper that they can get in a hurry. The woman who lives on the farm does not get those bad habits, and she often plans her meals for weeks ahead, and knows what she is going to have. The wise planner will arrange her meals at least several days ahead, and if she is going to have peas one day for dinner she will save out a few for her salad for the next day and will not have the expense of opening a can for just a few peas. I would not serve them, even in different dishes, the same day, for we need to have a variety. People get tired of the same kinds of food.

The salad calls for one cup of peas, four tablespoons each of grated cheese, onion and ripe water melon pickle chopped and four hard cooked eggs. If you do not have ripe water melon, perhaps you have some ripe cucumber pickle; that will do very nicely. Cut the pickle in very small cubes, as well as the onion. If you or your husband are not fond of onion, do not put so much in, but do not fail to put in some, because it will not be good unless it has the flavor.

The people who are the most healthful are those who have a variety of vegetables on their table. We ought to eat onions often all the year around. The onion, of course, gets libeled a great deal, because it leaves a very bad odor on the breath, that is due to the volatile oil contained in the onion that gets into the blood and is given off from our lungs.

We all enjoy onions better ourselves than we do to have our neighbors eat them, but at the same time, we must use consideration, eat them at night, then no one is going to be annoyed by your odorous breath.

Cut your pieces in very small cubes, the attractiveness of the dish depends upon the way you prepare your material, if prepared in a careless way it never looks well, but have your materials all cut in uniform pieces, and do not use your hands while preparing food when you can use a utensil as well. So many people put their hands into food all the time; it is not a good habit to get into. Get into the habit of using utensils instead of your fingers. We all know that the nails may harbor many dangerous germs; it is also bad for your hands. We should try to keep them looking well.

This seems like a very strange combination, but I think you will like it. I give this salad because it is something that every farm woman has in her house; she always has eggs and onions and things of that sort, and if she has just a few canned vegetables

on her shelves she can put this salad on her table in a hurry.

In the morning when you are preparing your breakfast eggs you can cook four extra eggs and in that way you are going to save the time of preparing them when you want them.

I will save your feelings this afternoon and not put so much onion in this salad, as you are all away from home.

I wonder if any of you know people who say, "it does not run in our family to like cabbage," and "we do not any of us like turnips," and "we never eat onions in our family." I know people who sort of boast about it, think it is something to be proud of, these characteristics. This is a secret. If you ever hear anybody talking that way, just remember there is something wrong, they have not been brought up properly. Of course there are some people who are not able to eat certain kinds of foods, because it hurts them, some people cannot eat strawberries, because they irritate the skin; others cannot eat fish because it makes them ill; those are things we cannot always govern. I speak of the people who are just naturally finicky and are proud of it. Train the children to like all kinds of food, then they will not be a bore to themselves, their families or the people who entertain them. Have you ever had a guest who could not eat anything, did not like this and that and the other thing? As they grow older, they are ashamed of it and blame their early training.

When you have a bit of onion to put into a dish and you want to mince it, just cut a slice off and then score the onion very closely and then at right angles, and when you cut the slices you will have your onion chopped just about as fine as you would chop it in your chopping bowl.

The peas should be taken out of the can and aired for awhile before they are used. All canned vegetables are better if they are aerated a little; let them stand in a bowl after they are poured out, pouring off the water, and they will have a nicer flavor than they will if taken right out of the can, because you see the peas have been standing in this can for a long time and have a flavor that is not always desirable. If these peas had been home canned, I should leave the water on, because that would have a good flavor that we would like, but as these are canned in a tin, we will pour the juice off and let them stand and air to remove that tinny taste.

The yolk of the egg cooked this way without boiling, is dry and mealy, the white is thoroughly cooked. You see how dry and mealy that yolk is, it falls in pieces like corn meal. An egg cooked in this way is digested by the most delicate stomach; a person having stomach trouble can eat an egg cooked like this without any difficulty whatever. The digestive juices can divide it and digest it.

This Western salad does not have any salad dressing. You notice there is no salad dressing in it, because it is made of such moist material, and if you want a little bit more moisture just add a little of the juice of the water melon pickle, that makes all the salad dressing needed for it.

If you want to make this salad very, very pretty, save out one or two egg yolks, put them through a sieve and sprinkle over the top of the salad.

To serve it in the head lettuce, makes a very pretty way of serving it.

All of our proteid foods need to be cooked at a low temperature. That is one reason why we are talking so much nowadays about buying the coarser cuts of meat, they are cheaper, and need long, slow cooking, and the ideal way to cook them is in the fireless cooker. One hundred and

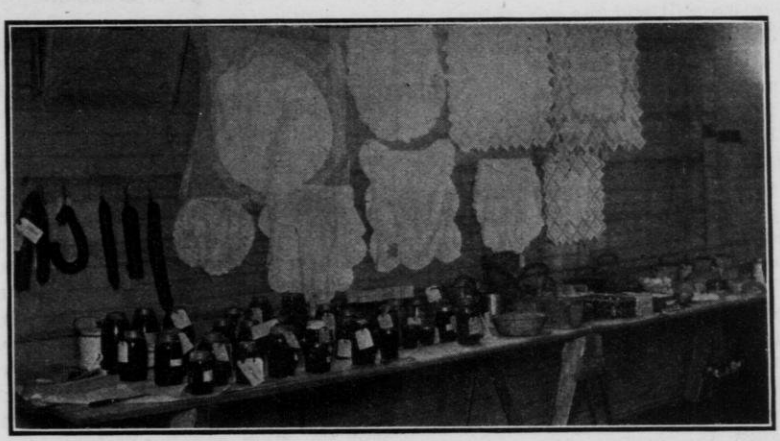
sixty to one hundred and eighty degrees will cook an egg, so eggs should not be boiled to have them wholesome. Two hundred and twelve is the boiling point.

I am adding a cupful of peas. We must season this salad to taste, because "much tasting means no wasting." We want our food well seasoned. Add a very little pepper and a little celery salt.

Now you see how pretty this can be served in a head of lettuce.

Cut your carrots and potatoes with the scoop, have your little onions all the same size, and it makes a very pretty dish. When you use the cutter they are all of a uniform size and they are all done at the same time. Somebody would say that it wastes the potato to take those little rounds out of a potato, but you can cook the potatoes and serve them mashed, so it is not necessary to waste a particle.

One nice way of serving potatoes



Part of the display of preserves and needlework at the Round-up Farmers' Institute.

Casserole Cookery.

We will now prepare what we call "Chicken en Casserole," that is, we are going to fry the chicken brown in a frying pan, then put it into one of these casseroles, set it in the oven and bake it and serve it in the casserole with a few carrots, a few pieces of onion and the potatoes. If you have the time to prepare the potatoes, use a little cutter like this little French cutter. Of course if you have a large family, you would not want to take the time to do this, but it is nice to do for occasional use. for a change is take an apple corer, scoop out a hole in the center of the potato, and then put in pieces of chicken chopped up, or bits of bacon, put your lid back on the potato, put it in the oven and bake it. When the potato is baked, the chicken or bacon will be cooked and will give a nice flavor to the potato.

A nice thing about cooking in a casserole is that you can have all of your vegetables and meat, everything in the dish, served right on the table all together. It makes a very palatable dish and in this time of high prices a little meat will go a good

way, and you can add as many potatoes, carrots and onions as you care to serve to your family. Serve a small portion of meat to each one, with a generous helping of the vegetables, and you have a good meal. All will be nicely flavored with the meat and it makes a very economical way of serving meat with the vegetables.

We brown the chicken because we want the flavor of the browned chicken in the casserole, when we have finished our dish we want the delicious brown flavor.

Now we will add the seasoning. In turning over our meat in the frying pan, always be careful not to puncture the meat with the fork. Can some one tell me why?

A Lady—It lets out the juices of the meat.

Miss Maxwell—Yes, and we want every bit of the flavor of the juices left in the meat.

I am going to add the seasonings. The other day I was just adding my seasonings to a dish I was making and I heard a lady say to her friend, "I know that is going to be too salty." When the dish was passed I watched her to see how she liked it. She remarked the meat was not salty enough. You see you cannot please everybody. Do not season too much, it is easier to add than to take out salt.

The potatoes are always better parboiled just about five minutes before putting them into any mixture. We like the carrot flavor to come out in the meat, but the potato has a rank flavor which is better to cook out before adding to any of these dishes, although it is often done.

Question—What was the chicken fried in?

Miss Maxwell—A little butter and fat of the chicken.

Pour on enough of the soup stock that you stewed the chicken in to give plenty of moisture in your casserole, put on the cover and put it in the oven. Parboil the potatoes, so they will have removed some of the strong flavor. Add those, it makes a very pretty dish when it is served. We will cook that about an hour or an hour and a half. As the chicken was pretty well cooked, it just needs cooking long enough to cook the vegetables and a little slow cooking to finish it.

Little Pigs in Blankets.

I want to prepare some steak now. This is what we call "Little Pigs in Blankets." It makes a very nice casserole dish. A piece of steak cut in small pieces and a little piece of bacon rolled in the pieces of steak. Cut the steak in long, narrow pieces, two by three and one-half inches, roll them up with a piece of bacon in the meat, fasten with a tooth pick. Take the rind from the bacon, not using too much bacon, just enough to give it a good flavor. We will roll the steak up, skewer it with a tooth pick, then brown them in a little hot fat, thicken the gravy with a little flour, pour that over the meat and put it into a casserole. You can add potato, onion and carrot to this if you like, but since we are using them with the chicken today we will not add the vegetables to this dish.

In a round steak there is always the marrow which is nice for use for frying your meat. Always save that, for it is the finest kind of fat. Do not use too much fat, just enough to keep the meat from sticking to the pan. We simply want to brown it, we do not want to fry it in fat.

We will dredge these little pigs in blankets with flour, so there will be a nice brown sauce to serve with them; as I said, you can add potatoes, onions and carrots to this dish and you have a whole dinner right in this

one dish when you are serving it. We will brown them in the frying pan until they are a nice brown all over, then pour on the water, put them in the casserole and let them bake.

Question—Do you add salt and pepper?

Miss Maxwell—Yes, they are to be seasoned after they are browned. You can season them now if you like, because the flour has covered the meat and there is no danger of the juice coming out.

Now I will add the salt to the meat. I am going to put a little celery salt in this dish put it in a casserole and let it cook for about three-quarters of an hour.

An Attractive Salad.

We have another salad that I want to prepare this afternoon; this is one of the salads that I like to give both farm and town women, because there are times when we like to have fancy dishes. This is a very pretty one and one that you will enjoy making. One should always have gelatine in the pantry. Perhaps you will have to ask your grocers to get you some canned pimentoes. They come in little round cans, they are canned red peppers, and your grocer will be glad to keep them if you ask for them.

One-half package of gelatine, one-half cup cold water. Soak the gelatine in the cold water until it is perfectly soft, then add the juice of one lemon. If you get the kind of gelatine that I have here today, which is already acidulated, you will not have to add the lemon, it will save you that trouble. A pint of boiling water and half a cup of sugar, two cups of celery cut in small pieces, two cups cabbage, one-fourth can sweet red peppers thinly cut, one teaspoon salt. Mix all together.

We will add the sugar, salt and boiling water to the softened gelatine, one pint of boiling water, that would be two cups. That dissolves the gelatine, then it is ready when it has cooled a little to add the vegetables, then turn it into any kind of a mold and let set until it is firm.

I have the celery and cabbage ready. You want to drain it, to be sure all of the moisture is out of it. If you have cabbage in the spring that seems solid but has lost its juiciness and flavor, just cut it up in quarters, if you are going to boil it, and let it stand for a couple of hours in cold water. If you are going to use it for a salad, slice it and put it in cold water. In that way you will have your cabbage crisp and tender.

The amount of salt, of course, may be varied with the taste and the amount of cabbage you use; it may need a little more salt.

Question—How much sugar?

Miss Maxwell—One-half cup of sugar.

I have some salad dressing that I made this morning, because when I dressed the chicken I found she was a nice fat hen who had been doing her duty and should not have been killed, so with the eggs I made the salad dressing. I want to show you what a nice kind of salad dressing you can make with three or four eggs and equal parts of vinegar, cook that in the double boiler, then add a little cream to it when ready to use. Cook the egg and vinegar add nothing to it, put it away in a jar and when you want to use it add salt and pepper and cayenne and a little cream to it, and two or three tablespoonfuls of the dressing will go a good ways.

Sometimes we accidentally break eggs, or have two or three broken eggs, there may be three or four or five yolks and one white (do not use too many whites), or we may make angel food and have eight

yolks, take an equal measure of vinegar, beat the egg yolks and add the vinegar and cook it in the double boiler, then strain it, because there are always lumps of egg that are cooked that are not nice in salad dressing, and it is a good plan to strain them out. If you have a very strong vinegar, dilute it with water, or you will have a salad dressing that is too acid. This vinegar is very strong.

This is a salad dressing I like to give to my farmer friends, because it is one you can make any time of the year. In summer you have your ice chests and you can keep it. If you do not have ice, you can keep it in the cellar. Some of our young farm women do not have all of the modern things yet, but they are going to have them just as fast as they can. You who have good cellars can keep salad dressing on the cellar bottom and it keeps just as good as it does in the ice chest.

Now, I have my celery and cabbage, the cabbage was shredded, and the pepper all mixed up in this dish and we will add the gelatine. If this is poured out in small molds you can serve it in individual molds. It takes quite a little while to set it and I want to set it in cold water. Now I am going to serve this salad with this salad dressing I was just telling you about.

This makes a very attractive salad if you want to pour it out into a long flat dish and cut it in little squares and put a few little pieces on a lettuce leaf with a little salad dressing.

Some Casserole Dishes.

I wanted to serve something in these little brown crockery cups, they are very nice to serve individual dishes, but I will not take your time to prepare them, will just tell you how very nice they are. You can use them for baking muffins, they make prettier pop-overs than any other baking dish I know of, they will puff twice as high as a cup.

For the creamed eggs, just break an egg into one of these little dishes, then put about two tablespoons of cream on it, put it in the oven and let it cook until the white of the egg is set.

A Lady—The farmers who sell milk do not have very much cream.

Miss Maxwell—This lady says that the farmers sell their cream.

A Lady—They sell their milk to the cheese factory.

Miss Maxwell—Now, you know when a man married his wife he said, "With all my worldly goods I thee endow." Now, doesn't that mean cream? Begin right. I would just have it and I would take all I need. I would not be extravagant about it. If he is cross about it, just tell him you need it in your cooking. You have to be firm with these men sometimes, tell him you are just going to have it and he will be reasonable I am sure. Make him such good dishes that he will be glad to let you have all you need.

Break the egg into the dish, put in the cream and over the top put on some bread crumbs. The crumbs are buttered and then we sprinkle a little bit of seasoning over them and set them in the oven long enough to set the egg, then they are ready to serve. That makes a very delicious way to serve an egg to an invalid, or, in fact, anybody.

Steamed Cherry Pudding.

Now I want to make a steamed cherry pudding. We are going to use some of the prize butter. We did not ask the lady who owns it if we

could have it, but I think she will be willing we should, and we are to use some very fine cherries that were brought from Sturgeon Bay, which were grown down there in that wonderful cherry district. They are the Montmorency cherry and have a very fine flavor.

I am going to give you the recipe for this cherry pudding and use these cherries in it. It calls for one egg. How many of you have a choice as to the color of your eggs? When you buy them or when you use them, what color do you prefer?

A Lady—Brown shell.

Miss Maxwell—Why?

The Lady—They are better, for one thing.

Miss Maxwell—You think they are better? Somewhere I read that the New York housekeeper always asks for the white eggs and Boston ladies want brown.

A Lady—I get two cents a dozen more for sorting them.

Miss Maxwell—It is just simply a matter of taste, there is no difference in the food value of the egg, as to the color of the shell, the food value of the egg depends upon what the hen has been fed on.

A Lady—You do not think the feeding of a hen makes a difference in the value of the egg?

Miss Maxwell—Most certainly, as to quality and flavor. For every day of age they lose some of their nutritive value.

A Lady—I think if hens are fat they will not lay as well.

Miss Maxwell—No, they should not be too fat.

One egg, one-half cup milk, one-fourth of a cup of sugar, one cup of flour, one tablespoon melted butter, two teaspoons of baking powder and one-fourth of a teaspoon of salt. This is steamed in small cups, it will take about twenty minutes. Grease the cups well, so they will come out nicely when they are done.

I am going to ask to have some cream whipped and be ready with your questions just as soon as we are quiet again.

I have beaten the egg, now I am going to add the milk, then I will add a little flour. I always like to have two measuring cups, when I am working, so I can have one for the dry ingredients and one for the wet, and in that way I do not have to stop to wash a dish. A tablespoon of melted butter. These little wooden spoons are so nice for mixing, they are so much easier on the hand. We know when we do a great deal of stirring and mixing the hand gets calloused and tired from holding a large, heavy spoon. Enameled spoons are dangerous to use for the enamel often chips off.

I want you to be sure to get this pudding sauce because it is so delicious for this pudding, and be sure to have a taste of this pudding, because we are going to serve it very soon.

The sauce is simply whipped cream that has been sweetened and some of the juice of the cherries added to it to give it flavor, and it is very nice if you have a little bit of almond extract to add a little of that, just enough to flavor it a little. If you haven't the cream, you can make a sauce of cherry juice, thicken it with a little of the butter and flour cooked together and add perhaps a little bit of almond extract if you like.

Question—Do you put the cherries in the pudding?

Miss Maxwell—Yes, the cherries, juice and all, right in.

I am going to set that right down in the water and let them boil in the water. Do not have water enough to

boil up into them, but just enough to cook them without boiling dry. This is an emergency pudding that you can get ready when you see your company coming.

These little aluminum cups do not hold very much and some of these farm women are saying, "That would not go far in our family," but if you have had a good, hearty meal, a simple, small dessert like this is better than too much. It isn't a good thing to eat too much of the good things. We Americans do eat too much and have too many rich foods.

This recipe is delicious for blueberry pudding in the summer, stir your blue berries right into it. Put a few spoonfuls of the dough, then a few cherries, into each cup, some dough on top and put them in to cook. Be sure that the water is boiling hot, because they must begin to cook as soon as they are put in. You do not need to put any sugar in it at all, if you like you can put the sugar in the sauce. Make the sauce very sweet and leave the sugar out of the pudding.

Question—Could you make it with strawberries?

Miss Maxwell—Yes, it is very nice with strawberries.

A Valuable Recipe.

I am going to give you ladies a recipe for something that is worth about four hundred dollars. If I had a little of it with me today it would be worth fifty cents to me now. Our cream does not whip. This is a substance which you can make in your own homes, it is called viscogen, and you must take the directions very carefully and make it so or you will not be successful.

Dissolve five ounces of sugar in ten ounces of water. Add six ounces of cold water to two ounces of quick lime. Let it slake and then strain it. Combine the two liquids and shake occasionally for two hours. Then keep it in a bottle in a cool, dark place. When you want to use this viscogen, use one-fourth of a teaspoonful of it to three-fourths of a cup of cream, and you can take very thin cream that is skimmed this morning by the separator and can whip it just as nice and thick as you can cream thirty-six hours old. I like to keep it in a dark bottle, because you know lime water decomposes in the light. This is nothing but lime water and sugar and you need not be afraid to use it, because we give lime water to babies, and the amount you see is very small. It is just sweetened lime water, only you must get your proportions right.

This closes the demonstration; the dishes will now be served. Thank you very much for your good attendance.

THIRD SESSION.

Thursday Afternoon, March 20, 1913.

FOOD FOR THE GROWING CHILD.

Miss Cora Binzel, University Extension Division, Madison, Wis.

Miss Binzel.

It is a well recognized fact that the progressive farmer is giving more time, thought and money to the study of the foods and conditions fitted to produce the best results in his live stock than the average mother is giving to the study of the child and its development. This is not because of a higher valuation placed on the life of the cattle, but is due to the fact that the average woman is not awake to her responsibilities and her opportunities in caring for and rearing her young.

Women are prone to accept indigestion, colds, colic, and other ailments of children as necessary evils and they content themselves with the thought that it is just as well to have them over with; the sooner, the better. These women are behind the times and should learn at once that illness is not necessary and that the evil effects of mistakes made in the care of children are often never entirely overcome. Many American people are suffering from indigestion and other ailments because they were the victims of parents who were ignorant of the requirements of the child. We blame nature for the unhappiness which is a result of ill health, and yet, we are ignorant of her laws and are constantly disobeying them. The results may not be immediate, but sooner or later the day of reckoning comes and we suffer for the carelessness and indiscretion of a week, a month or even a year ago.

Judging from personal observation, I believe women are no longer willing to permit the men to have a monopoly of the intelligent use of the terms, five food principles, their sources and purpose, and in the application of this knowledge to the care of the live stock. Women are observing that the farmer finds the returns sufficient to pay for the effort and they are willing to assume that a careful, persistent study of

the human body, its functions and its needs will result in a healthier, happier, more efficient race.

I come to you therefore today with the desire to help you, if I can, to a better understanding of the food problem. Because of the limited time, we can but touch upon the subject; a thorough knowledge requires years of study. I hope, however, that the work this afternoon will be helpful. The printed matter which is being passed is a mere outline which I prepared, thinking it might be of value in our study today and in your home study of these problems. You will please me greatly by questioning, should I fail to make the points clear.

The Organism of the Human Body.

If we would understand the food problem, we must have some knowledge of the human body. The human body is made up of countless, little living parts called cells. Groups of certain kinds of cells form the different organs and tissues of the body; for example, certain kinds of cells known as brain cells constitute the brain, bones are composed of bone cells, nerves of nerve cells, and so on. These groups of cells are dependent upon each other for their well being and when one group of cells is not working properly, other groups will suffer. We all know that a severe cold affects the appetite, the digestion, the muscles, etc.; if the nerves are diseased, there is a state of general ill health; it is only when all the cells and all the groups of cells are in good working order that we enjoy good health.

In order to keep all these cells in good condition, we must have clean air, exercise, proper food, rest, and care. Our problem for study today is that of food, and yet, with the best of nourishing food, we cannot maintain healthy bodies unless we breathe plenty of fresh, clean air and take plenty of good exercise. Not one of us would take into the mouth food and drink that has been in other people's mouths, put on underclothing that has just been taken off by another, and still we do not hesitate to take into our lungs the air that has just come from other people's lungs. Breathing deeply of clean air fills the lungs with oxygen. This oxygen is carried by the red corpuscles of the blood to the cells and in the cells the food is oxidized or burned, giving as much energy in the body as these substances would give if they were burned outside of the body. This process of oxidization or burning is best when the supply of oxygen is large. Breathing deeply of pure air is as essential during sleep as during the waking hours.

The body must be kept warm, energy must be supplied for work in and outside of the body, and old, worn-out tissue must be replaced by new. The foods we eat do this work in our bodies.

The Five Food Principles.

It will be sufficient for our purpose today to know that all foods contain one or more of the five food principles. All of the food principles are familiar to you, though you may recognize but the three terms, fats, mineral matter and water; proteins and carbohydrates may be new terms to some.

Each food principle has a particular purpose or purposes in the body. The outlines may help you in following my explanation. The foods called proteins build and repair tissues and may produce energy. The white of egg is largely albumen, a form of protein; the casein in milk is a protein; and that grayish, white, gummy substance which remains af-

ter grains of wheat have been chewed until the woody fiber and starch have been washed away, is a protein, called gluten. It is the gluten in good bread flour which produces a light, spongy loaf, provided other conditions are favorable.

We need to remember that proteins are tissue builders and that their principal sources are meat, fish, eggs, milk, nuts, cheese, and such vegetables as wheat, peas, beans and lentils. This does not mean, however, that these foods contain only protein; each may contain one, two, three or even all of the food principles. Take milk, for example, you know that it contains water, fat, sugar and mineral matter; it also contains protein, if it did not, an infant could not live on milk alone, for there would be no food for the building of tissues and for growth.

Let us pass on to the second class listed—carbohydrates. Rather a long name, but not difficult if we remember that it is a family name for starches, sugars, vegetable gums and cellulose. Starch we know is found principally in cereals and vegetables; sugar we are familiar with as found in the sap of the maple tree, in the sugar cane, the sugar beet and honey. Cellulose is the woody fibre which forms in the cell walls of plants, vegetables and fruits. If a grated potato be pressed dry in a cloth, a woody fibre is left; this is cellulose.

Certain fruit juices under proper conditions will make jelly, this property is due to pectose, a vegetable gum.

It is very evident that the principal sources of carbohydrates are cereals, vegetables and sugars. This class of food supplies heat and energy and surplus carbohydrates may be changed into fat and form fatty tissues.

Fats, like carbohydrates, produce heat and energy and may be stored as body fat. This serves as a reserve supply of fuel in case of illness or when food cannot be taken. During illness, tissues wear out quickly and fuel is necessary to maintain the body temperature and to produce energy to carry on the body processes; were there no fat stored in the body, the tissues would be utilized for this purpose. Fats are called fuel foods because a definite amount gives off more or less heat and energy when burned, that is, given off by the same amount of either carbohydrates or proteins; one pound of fat produces two and one-fourth times as much heat as either of the other two. This is the reason people in very cold climates consume such large quantities of fat and the reason that we, in our climate, eat more freely of fatty foods in the winter than in the summer. So few people realize that we are not kept warm by the clothing we wear and by the fire in the house. I mean to say that we do not take heat from the outside; the clothing and warm air around us prevent a loss of heat or a passing of the heat of our bodies to the surrounding air. Remember this and next winter when your daughter feels abused because she is not permitted to wear low shoes, short sleeves and summer underwear, explain to her that the greater the surface of the body exposed to the air, the greater will be the loss of body heat. This means that work will not be well done and that the state of health will be impaired unless sufficient food be eaten to maintain body temperature and to supply energy for work in the body, as well as work done by the body. All body heat comes from food eaten and digested. Fats are found in both the animal and vegetable foods; the principal sources being fish, meat, cheese, cream, milk, butter, eggs and

vegetables, such as olives, cotton seed, cocoa, linseed, etc.

Mineral matter, a fourth food principle, is necessary to maintain life. It is necessary for the development of the cells, for the growth of the bones, for the production of red blood corpuscles; the heart would stop beating and life would cease without mineral matter. It is most abundant in vegetable foods, eggs, milk and meat.

The fifth class of foods, water, constitutes sixty per cent of the body. About four pints of water are excreted daily through the lungs, kidneys and skin, and though most all foods contain water, the supply will be insufficient unless some is taken as a beverage. In the body water dilutes the blood stream, carries food to the different parts of the body, carries off waste and regulates the body temperature.

The fats, carbohydrates and proteins are not used in the body until they have been divided and split into simpler compounds. For example, starch must be changed to sugar before it is of use in the body. These changes are brought about by grinding and churning and by the chemical action of bodies in the digestive juices called ferments or enzymes. When food has been changed to a soluble form, so that it can be taken up by the blood, it is said to be digested. The blood stream carries the food to the cells and the cells select whatever food they require; the bone cells, for example, select mineral matter.

Selection of Food for the Child.

Now we may make application of the information gained to the selection of food for the child. First, let me emphasize that it is not the amount of food eaten, but the amount of food digested that is of the greatest importance. If all food eaten should leave the body in undigested form, the body will have received no benefit.

Too many mothers are ignorant of this fact and feel quite satisfied that they have done their duty in providing a large proportion of whatever food she and the child may desire. It is not safe to rely on the child's instinct and judgment in the selection of food; neither is it fair to gage the child's needs by the likes and dislikes of the adult. You and I know that were a child permitted to select its food, the diet would consist largely of candies, cakes, ice cream sodas, pop, pickles, etc. The growing child is naturally very active and has a larger surface in proportion to its weight than the adult, and must have therefore plenty of energy producing foods. It is not wise, however, to furnish this entirely in the form of sugar; starch and fat should both be given. Children have a natural craving for sweets and this appetite may be satisfied by serving dates, figs, prunes, raisins, simple wholesome candies and cakes. Cane sugar ferments more easily than the sugar found in the dried fruits. For this reason it is wise to restrict the use of cane sugar on the breakfast food and to supply the sugar by mixing cut dates or figs with the cereal. The child who eats freely of candy and cake between meals has little or no appetite for milk, bread and butter, eggs and the foods served at regular meals, the result is a pale, weak, undersized child. It is a common belief that candy ruins the teeth. True, children who eat a great deal of candy are very apt to have poor teeth. This, however, is not due to the candy but due to the fact that sugar itself contains no mineral matter; the lack of appetite for vegetables, milk, meat, etc., resulting from the unwise use of sweets, means a lack of mineral matter in the diet,

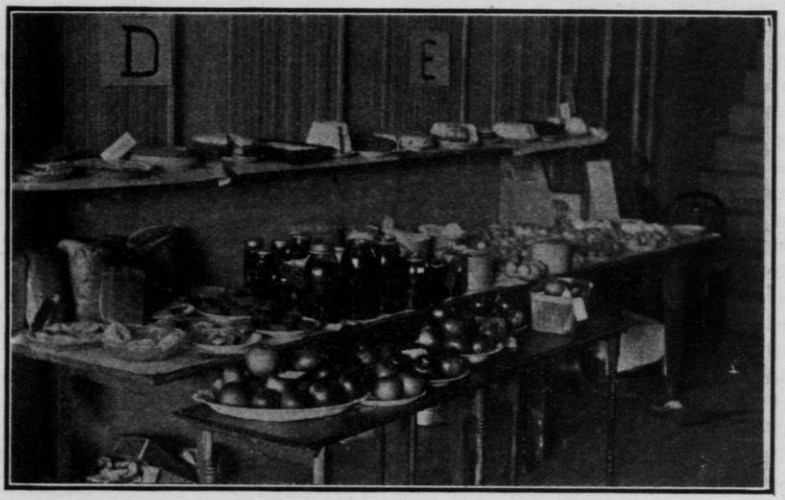
the food principle necessary to build bone tissue. Satisfy the craving for sweets by serving them as part of the meal, not as a lunch between meals.

Many children have an aversion for fats and vegetables. Sometimes there is no reason for the dislike, the food never having been tasted. Often the dislike may be traced to preferences expressed by adults. It is unwise to express a dislike for nourishing food in the presence of children. Again the prejudice is the result of poorly prepared and poorly served food. The vegetable that is underdone, or has been cooked until it has no flavor, is not palatable.

Fat in some form must be found in the child's diet. The mother may find difficulty here, but she must learn that there are many forms of fat which are acceptable to children; whipped cream, butter, bacon, nuts, peanut oil are easily digested and palatable.

The growing child is not only growing tissues but is building new ones; protein foods are therefore very necessary and unless the supply is adequate, the child will not develop properly. The demands of rapid growth are great, any mistake made in the critical period of childhood may result in life-long suffering. Parents must not forget that there is a limit to the time of physical growth, while the development of the mind is a life-long process. Under no conditions should a strong body be sacrificed for high marks and early graduation. Many of the breakdowns among school children are due, not to overwork, but to improper food and lack of rest and exercise.

Exercise in the open air is essential for girls as well as for boys, and neither boys nor girls can accomplish good work and build up fine physiques if they keep late hours for study or for play. Some one has said that if we looked after breathing, digestion and elemination of waste we should never be sick. It is the mother's



Household corner, Institute exhibit, River Falls, June 13, 1913.

duty to watch these processes in her child and teach him as early as possible to attend to his own needs.

It is a custom for some children to take no breakfast. This is very unwise and should not be permitted, unless the child has been placed on a diet. You have all noticed the absence of fat in the young chick and the abundance in an old fowl; you know that mutton contains more fat than lamb; beef more than veal. This same condition exists in the human body. Now, you and I may miss a meal occasionally without experiencing ill effects. This is not true, however, in the case of the child who has not the surplus of fat stored in the body to produce heat and the energy required in his work. The result is a tired, sleepy child. Start the child out for school after he has had a wholesome, nutritious, easily digested breakfast. Lack of appetite for breakfast may often be traced to poorly ventilated sleeping rooms, or to a bad taste, the result of indigestion or poor teeth. All of these may be remedied.

Children are hungry more often than adults, because their digestive processes are very active. For this reason it is well to give the child a lunch between meals. This does not mean nibbling continuously and nibbling at sweets. Simple, nutritious, easily digested foods, such as milk, toast, bread and butter, will furnish the required nourishment and will not interfere with the meal which is to follow. The digestive organs require a rest if they are to function properly; a continuous lunching interferes with their rest and should never be permitted. The pennies spent for cheap candies at the corner grocery store had best be saved.

The child must be taught to wash his hands and face, to brush his hair, before coming to the table. As soon as solid food is taken he should be taught to masticate the food well and to eat slowly.

The general rules for feeding the growing child which are given in your outlines are quoted from "Food & Dietetics", by Mrs. Norton.

"If children are to be allowed to eat freely the food must be simple in character and easy of digestion.

The ordinary meats, with the exclusion of pork, simply cooked, few 'made' dishes, an abundance of vegetables and fruits, no pastry, only the simplest puddings, occasional plain cake (not between meals), plenty of the best bread and butter, of well cooked cereals and of milk and eggs will furnish variety sufficient for any one. Tea and coffee are to be reserved for the adult, while cocoa may be used in moderation, chiefly for the milk with which it is made. Highly seasoned foods are to be avoided, as they tend to excite unduly the flow of the digestive juices and make such flow dependent on their stimulation. Their continued use also seems to induce a craving for strong stimulants."

Before leaving this work for the demonstration, let me ask you not to become discouraged if you find the food problem a puzzling one at times. These notes will help you and all the magazines are giving information to the housewife on all the problems pertaining to the home. True, time and study will be required for a better understanding and the raising of children will always mean work; the manner and spirit in which this work is done, however, will affect the moral, physical and spiritual welfare of the child. If the work is worth doing at

all, it is worth doing well, and surely there is no bigger, better, more beautiful work than that of bearing and rearing children.

The School Luncheon.

Because of long distances, many children are obliged to carry their lunches to school. Have any of you ever happened in at school at the noon hour to watch the children open the boxes, pails and newspaper bundles which contained their lunches? Those of you who have, may remember the pity that swelled up in your heart at the sight of some of those poor, miserable, unappetizing, unpalatable lunches. How much work could you and I accomplish on a dill pickle, a dry sandwich, a greasy doughnut, or a piece of soggy pie? And what if this lunch were frozen as often happens in the winter? Children cannot do good work on such fare, and the child who is poorly nourished is irritable, dull, hard to manage, is poorly developed, is feeble and pale.

Many schools are remedying this evil by providing some means of preparing hot soups, cocoa and other nourishing foods for the noon-day luncheon. Teachers need the cooperation of the parents in making the noon-day lunch nourishing and appetizing and the noon hour a happy and profitable one.

The luncheon should be attractive, appetizing, nourishing and easily digested. To facilitate work of preparation and packing, have definite place for utensils and materials required; arrange to work in the same place, learn to pack neatly and closely. To keep food moist and fresh, use paraffin paper for wrapping.

Twenty-five cents will buy a pound of paraffin paper, eighty-five cents will buy a thousand paper napkins; paper clips and rubber bands are convenient to fasten the paper. An attractive and convenient lunch box or basket is essential. Variety may be secured in: sandwiches, salads, vegetables, eggs, cheese.

Simple desserts, simple cakes, fresh fruits, dried fruits, candies, nuts, gelatine pudding, baked custard, etc. etc.

A demonstration on school luncheons concluded the work of the day. The food values of the dishes served in the luncheons were discussed and explanations were given as to the methods of preparation.

SANITATION AND HYGIENE IN THE PUBLIC SCHOOLS.

By Dr. A. L. Russell, Midway, Pa.

(From Bulletin No. 229, Pennsylvania Department of Agriculture.)

I want to emphasize what these ladies have said; they have said what I would not dare to say, what no man would dare to say, and yet what is true as gospel. I don't know what your politics are, and I don't care, but I dare not say one word about the way our public schools are conducted today without some one jumps up right away. These ladies have told you a part of the thing, and I am going to tell you some more, although they have left but little for me to say.

Our public schools are the citadels of our nation, but they are not all they should be—to our shame be it said, but it took these noble, pure women to tell you so. If you want to know what the conditions in our public schools are today, ask your doctor. He could tell you, but dare not. His lips are sealed. I know it now, but I did not know it twenty years ago; these women know it today, but they did no know it twenty years ago; it is a matter of sex. I could give you instances from my own experience, which I would not dare give you, and I know it is the same in your own section, and in your own town; it is the same in Bradford county as it is anywhere else. But don't ask your preacher; ask your doctor, even though he will tell you what will make your hair grayer than it is now. Doctors have known it for years, but they didn't dare come and tell you, and now you leave it to the women to tell you. I am ashamed of myself.

One of the speakers told us about the girl who drank from the cup from which her fiance had just drank, when he was ill with tuberculosis, and of the bravado with which she did it, and how she died of it. Now, ladies and gentlemen, the next time you have occasion to use a common drinking cup, wash it out thoroughly, and then drink in this way, without letting the cup touch your lip.

The Secretary—I suppose the ability to do that depends somewhat on the length of your lip.

Dr. Russell: I'm Irish; are you? I would like for every one in this audience to remember this the next time they have occasion to use a common drinking cup. It is very easy to do.

Now there is another matter, a very important matter, and that is the matter of breathing. There are two types of breathing, the male and the female type, and the nearer the female approaches the abdominal or male type of breathing, the better it will be for her. But it is not right to breathe first through one nostril, and then through the other, as the lady has shown us the foreign people do. That may be all right for foreigners, but it is not for Americans. You want to breathe deeply through both nostrils; breathing properly this way for any material length of time will increase the chest or bust at least four inches.

One of the ladies spoke about the cost of education. I think the people of Pennsylvania have reached the point where they do not care about the cost of education, so long as they get the proper kind of education. It is the right kind of education that we want, but we have not been getting the right kind of education. Remember that I have all due respect for the authorities in charge of this work, they

have not been able to do the work as it should have been done, and with all our short-comings, there is not a state in the union that has the excellent public school system that we have in Pennsylvania.

Observations made during seventeen years' service as a priest of the suffering, has convinced me that the whole field of hygiene and sanitation, in its relation to the physical, mental and moral nature of the child during its school life, is deserving of a consideration at the hands of parents and educators which it has never yet received. It is amazing when we consider the efforts put forth to equip children with the mental powers which will enable them to wrest a livelihood from the world, that it has never seemed to occur to any one that the child might need to be taught how to live. The teacher can not impart this information, for she has never, herself, been taught, and the rigid county or state curriculum leaves no time for such a minor detail as instruction in the methods of right living. The parents cannot give the instruction, for they have not the knowledge. The pastor cannot fill the need, for he knows less about how man should live his physical life than does the average person. The doctor could, of course, for his life's training and experience has fitted him for this sacred duty; but, bless you, are not doctors to make people well after they become ill? And so, although the whole world is calling for the physically fit, our children are permitted to acquire their bodily development just as chickens and horses do, and any information of value in teaching them how to live must be self-acquired, and then it is everlastingly too late to be of any practical value to them.

The rational aim of education should be the correct and symmetrical development of the physical, mental and moral nature of the child; and that system of tutelage is deficient which neglects any one of those three attributes of all normal human beings. The relationship between these three is too intimate and too intricate to be dissolved, or to be interfered with by any man-made scheme, and a proper development of each is possible only when the development of one is made to assist and accelerate the development of the others. The desirable goal is a sound mind in a sound body; for a brilliant mind in a deficient body is a sorry spectacle, and a feeble mind in a perfect body is pitiful to contemplate, while a depraved moral sense coupled with a keen mind and a vigorous body makes devils laugh and angels weep.

Because our common school system ignores these facts, it is failing to give the child the advantages to which he is entitled. The state has assumed the responsibility of the care of our children during their school days, and parents have conceded to it that right. Yet it has provided no adequate means for discharging that trust. For who is so utterly ignorant and thoughtless as to claim that the child's future is wisely provided for when only his mental training is comprehended? Our common school of modern times, in its curriculum, customs, discipline and deportment, has been fashioned in ignorance of, and in defiance of the simplest elementary rules of hygiene and sanitation, and it is small wonder that the normal balance established by nature has been disturbed. It is of vastly more importance to the school child that his triune characteristics be symmetrically developed, than it is that he shall excel in any text-book. It is of vastly more importance to him that he be taught to breathe properly, that he know how to insure for himself an adequate supply of fresh air and pure water, that he appreciates

the importance of masticating his food properly, that he learns how to work, and how to sleep, and how to clothe himself hygienically, that he be made competent to guard himself from infections and contagion, than it is for him to be able to bound Patagonia correctly, or to trace the course of Mason's and Dixon's line.

"The building of a perfect body crowned by a perfect brain, is at once the greatest earthly problem and the grandest hope of the race." The morality of clean blood ought to be one of the first lessons, and by every consideration, the very last and most emphatic lesson ever taught in any public school anywhere on earth. The preservation of health is a moral and religious duty. "Life is not merely to live, but to live well."

Not only are the fundamental principles of correct living ignored in our schoolrooms, but every day, in every schoolroom in this land, the commonest mandates of hygiene are audaciously violated, and bodily infirmity, physical deformity, and mental deficiency are recklessly encouraged. The vital force which should be utilized in the production of blood, muscle and nerve, is lavishly expended upon illy advised studies. There is something radically wrong with the mode of conduct of our schools in their actual working upon the health and physique of our children. We send our children to school happy, healthy, blooming and lusty; and the monster hands them back to us with adenoids, incurable catarrah, round shoulders, crumpled chests, distorted spinal columns, sallow cheeks, deficient vision and shattered nervous organizations. Such maladies, and many others, are thrust upon children all over this broad continent by the customs, mode of conduct and environment of our common and high school systems. I have never seen a schoolroom, city or country which was not in some way a positive menace to the health of the children forced to occupy it. And the universal errors of construction are intensified and augmented by the method of discipline, habits of study and mode of recitation now in vogue.

I am not arraigning the teachers; I am not accusing the school boards; it is you, the patron, who is guilty of these crimes against your own defenseless children. Your teachers and your school boards remain in this benighted ignorance because you have never demanded knowledge or competency when you selected them.

The common country school should be a kindergarten for the farm, and from it the farmer population should be recruited and come forth educated into, and imbued with, the high and noble ideals this nation now so much needs. The country school is of the farmer, for the farmer, and by the farmer, and the farmer cannot shun the responsibility for the condition of things as they are. The curriculum of the common school should lead the child toward a life on the farm, and should fit him for being a good farmer. We want more competent farmers; we have too many poor ones. We have too many mediocre preachers; too many incompetent doctors; too many shyster lawyers; too many alleged business men who have not the mental capacity to run a well-regulated peanut stand. What are your farmers' schools doing for the future generations of farmers? Nothing! The moment the child enters the schoolroom he is educated away from all desires or tendencies toward a farm life. Not a single thing does he learn during his whole common school course which will instill a love of the farm into his withering soul, or which can help him if he is forced to take up that occupation. And when he enters high school it is still worse. Don't shake your head at me

that way! Don't say you can't help it! You can help it! You don't want your boys to be farmers! You want them to be pastry-faced counter-jumpers at $15 a week—you are training them for it in your public schools. You can help it, I say! The farmer pays the taxes which support the common schools in the country; he elects the school board, which selects the teachers. It is all in your own hands, if you care to assume the responsibility.

Our school system of today is so diametrically opposed to common sense that it is difficult to suggest a starting point for reform in study, but I might call attention to the most useless branch of all—physiology. What we have, however is only alleged physiology, for it was prepared and concocted, and it is taught, by those who have no physiological knowledge, so that its teachings are of no practical value to anybody. The average human being will be no better because he knows how many bones there are in his body, nor because he knows how many ounces of blood his body contains. What he needs most to know in this line is what to do when he breaks a bone, and how to check the flow of his life's blood when he cuts an artery. The children need to know how to marshal and conserve their physical and spiritual forces so that they may go out into the world and play the part of whole and healthy men and women.

Generations of educators, utterly failing to grasp the import and purpose of the science of physiology, have attempted to mold one of the most difficult branches of the study of medicine into a form suitable to the immature minds of children in the public schools. Naturally the result is a failure. No one who had himself any conception of physiology would ever have made the attempt. After over twenty-five years of teaching of alleged physiology in the public schools, the simplest sanitary truths and principles are unknown or unheeded by the most intelligent members of the community. The lingo taught in the public schools, dignified by the term physiology, was conceived regardless of the child's environment, nature, body, or immortal soul. It does not teach him how to live, and it certainly does not teach him how to die. This outrage is perpetrated and perpetuated in cheerless, barn-like structures, without provision for any adequate supply of fresh air; without the facilities of getting even a clean, decent, drink of water; with arrangements for lighting which seem devised to place the greatest possible strain on the eyes, with heating arrangements which vitiate the air, with unsanitary surroundings, and with no proper adjustment between mental processes and physical activity.

We must conform our teaching of physiology to more rational standards, if we hope to benefit the human race. "The knowledge that a man can use, is the only real knowledge; the only knowledge that has life and growth in it and converts itself into practical power. The rest hangs like dust about the brain, or dries like the rain-drops off the stones." (Froude). Our children need no anatomy and no physiology except what is necessary to enable them to apply the rules of health to their modes of life; all physiological education in excess of this is junk. And, strictly speaking, such knowledge is not physiology at all—it is sanitation and hygiene.

Therefore we insist that the so-called physiological education of the common school pupil should be limited to those practical matters which enable him to ward off pain, prevent sickness, promote physical efficiency and postpone death. No workman is

fit for any task unless he is first of all fit in body and mind; and school conditions, as now existing, for six hours a day, for nine months in the year, for ten years of our life, do powerfully and injuriously affect both the mind and the body. This powerful influence should be made to work for good instead of evil. It is working for evil at the present time, and no man with a knowledge of the facts dare deny it.

So that, instead of teaching physiology, which is the science of the organs of the body and of their functions, I would teach hygiene and sanitation, which is the science of health and right living. In place of spending time and energy in teaching a child how its teeth were formed, or how its hair grew, or how its skin was constructed, I would have him learn how to take care of and how to preserve his teeth; how to care for, and how to make his hair luxuriant and beautiful, and how to keep his skin clear, active, and free from disease. I would teach him how to know what ventilation is, and how to secure it. I would teach him the ineffable dangers and filth of the common drinking cup, and how it distributes germs from the ailing to the well. I would teach him the nature of typhoid fever, and have him know that every case of typhoid fever is a crime, which he can aid in preventing when he knows how the contagion is transmitted and disseminated. I would have him learn the dangers of the common house fly, and its capacity for spreading disease. I would inform him upon the principles of stratification of soil, and the proper modes of drainage. I would teach him of the germs which go to make up the infection of simple wounds, and how they produce lockjaw (tetanus) and blood poison (septicaemia), and how they should be dressed and cared for to avert these calamities. I would tell them of the nature of scarlet fever, diphtheria, (acute anterior poliomyelitis) infantile paralysis, measles, whooping cough, and how those diseases are carried from the sick to the well. I would give them an idea of the rules of disinfection and quarantine, and how to carry them out to cut short an epidemic. I would teach them the nature of tuberculosis, and how it is transmitted and disseminated, and how the great principle of the use of fresh air is baffling the "great white plague." They should be impressed with the fact that if fresh air is so good for the consumptive and cures him, that fresh air is good for him who has not contracted consumption, and will prevent him from taking it. They should learn how thorough vaccination prevents smallpox, and be taught enough of the statistics of this fact to be able to discuss the matter intelligently with the rabid and fanatical antivaccinationists. I would teach them that absolute cleanliness of body and soul encouraged longevity and make for happiness. I would make good health contagious, instead of disease. This would not be physiology, but it would be a knowledge that would be of practical service to every child every day of its life.

Theologians tell us that "Sin is any want of conformity to or transgression of the law of God." But there are sins and sins. There are sins of the body as well as sins of the soul, and both involve inevitable retribution—sins of the soul in the life to come, sins of the body in the present life. There is such a thing as physical morality, just as surely as there is such a thing as spiritual morality. We teach our children how to conduct their lives in accordance with the precepts of spiritual morality, so that they may not be gross sinners against God, but we ignore the existence of physical morality, and permit our off-

springs to become the most heinous of physical sinners.

Just so surely as a moral sin is a crime against God, so is a physical sin a crime against man, and because that physical sin is often committed against our own bodies, it is none the less atrocious. Our God is a God of Nature, and our physical sins are quite as certain to demand retribution in the body as are the spiritual sins to demand retribution in the spirit. Every instance where a preventable disease is found to exist is an instance of the commission of a physical sin.

We can enforce public hygiene by law, if necessary, even at the bayonet's point, but personal and domestic hygiene must be taught, for it can never be enforced by law. And general sanitary improvement in the lives of our citizens, or in the conduct of the homes of the nation must take its origin in an enlightened and public intelligence. There is no other way to formulate an enlightened public intelligence, except by creating a hygienic conscience in the young and growing souls of our children, and this can only be accomplished by appropriate instruction in the public schools.

Patrons, superintendents and school boards are evading the moral responsibility for this physical sin, for it is a physical sin to permit the child to grow up ignorant of the methods by which he may take the proper care of his body, and likewise ignorant of the manner of life which tends toward physical rectitude. Conscience is almost wholly a matter of education, and we could develop a physical and sanitary conscience in our children with equal facility, as we develop a moral and spiritual conscience within them.

The Application of the Principles of Hygiene.

The earliest copy-book, whose admonitory lines our cramped fingers laboriously followed in our primary school days as we kept time with wagging head, should have given us an inkling of prophylaxis. When a doctor says "prophylaxis," he means the warding off of the disease. These copy-books told us that "A stitch in time saves nine," and "An ounce of prevention is worth a pound of cure." Our teachers never appreciated the golden truths locked in those few words; oh, no! they were teaching us how to write. We children might have got something of real value out of that lesson if our teachers had realized that they had in their charge developing minds and immortal souls, and if they had been competent to discharge the duties of their trust. A few chosen words of instruction and counsel regarding the meaning of those phrases would not, probably, have unduly strained the mental powers of those teachers, but the words were not forthcoming; they were teaching us how to write.

An ounce of prevention is worth tons of cure! The quiet, modest physician who prevents the development of disease, is greater than the most skillful and famous physicians the world has ever known. The man who wards off an infection from an innocent, healthy child, is richly deserving of the Hosannas, not only of men, but of angels. The greatest and most noble victories this world has ever known are not those of the battlefield with its glory, its thrilling bugles, and its waving flags. No! The sublimest victories ever won by men have been those of sanitation and hygiene, or in other words, prophylaxis; that is, prevention in place of cure.

Pasteur will be immortal because he changed an art to a science; the name of Koch will never die because he taught us the baleful power of germs; Reed goes high in the glory line because he swept Cuba free from yellow fever; Jenner banished the plague of smallpox from all those who wished to be free; Gorgas changed the reeking quagmire of Panama to a sanitary land of wealth and beauty; Behring has saved his tens of thousands from the horrors of death by diphtheria; Stiles is even now driving out the hook-worm from the Southland; and it was all done by the men who realized and accepted the plain laws of hygiene and sanitation. If you will put teachers in your schools who know the laws of sanitation and hygiene, you can banish parasitic diseases from the earth within a dozen years.

Fresh Air.

Children in school, in common with all mankind, consume three kinds of food: air, water and solid food. Air is the cheapest, the most abundant, and easiest secured, the most important, and the most neglected. We can live without solid food for three weeks, without water for one week, and without air for three minutes. Most of us are rather fastidious about our solid food, and the national government has a Pure Food Bureau maintained under the auspices of the Department of Agriculture, with a cabinet official at its head to guard our interests. But there is no bureau or law to prevent us from bathing in or from drinking the water that has passed over or through the body of another, though most of us would be very loath to use such water if we knew it. However, we seem to have no scruples about breathing the sewage from other persons' lungs and throats, even if we know that they cannot all be healthy. In the winter time we conduct ourselves, our houses, school-houses and churches, as if their purpose was to contain air to keep us warm. It is astounding that humanity has never learned what air is for, but they have not. Air is to breathe, not to wear; it is food, not clothing. You should depend on your garments to keep your body warm. The first consideration is to have the air you breathe as pure as possible, for warmth at the price of vitiated air is wicked and vicious.

Most people think it is the oxygen in the air that our bodies most imperatively need. In a certain minor sense this is true, but any old kind of air contains oxygen enough to support life, even that air which has been breathed over and over again. It is the carbon dioxide in the air which poisons us. When air enters our lungs, it contains but four parts of carbon dioxide in ten thousand. but when it leaves our lungs it contains 430 parts of carbon dioxide in 10,000 parts, or more than four hundred times as much poison. The problem of ventilation is not to get air into a room, but to get the carbon dioxide out. Very little excess of carbon dioxide in a room will induce drowsiness, mental dullness, and slight headache. Long continued exposure to such conditions induces pallor, systemic weakness and general ill health. In order that each pupil have enough fresh air to breathe, it is necessary for him to have 3,000 cubic feet of fresh air every hour. To secure this amount of fresh air he must have 600 cubic feet of air space, and the air must be changed five times every hour. It is a mistake to think that the apparatus must be expensive or elaborate in order that the ventilation be adequate. If you will give me a few elbows of four-inch stove

pipe and tools for making openings through the walls, I can install a perfect system of ventilation in any room at the cost of a few cents. There is no mystery about air currents. Any one who knows anything about hygiene and sanitation can explain them to any school board in a few minutes. Heated air rises; carbon dioxide is heavier than air, and falls to the floor. Hence make openings for fresh air to get in; heat and moisten the air; make openings for the carbon dioxide to get out, and provide for circulation, and you have a perfect system of ventilation.

Many townships in this state have a perfect (?) system of ventilation. They know it, because the agent who sold it said it was. The fact of the matter is that the schoolroom has no ventilation at all. The furnace has all the fresh air it needs, and the carbon dioxide the furnace creates has an outlet, and there is a perfect circulation of air about that furnace, but the schoolroom is not ventilated, for there is no provision for air currents. The air the children breathe is vitiated, and loaded with carbon dioxide, for there is no fresh air reaches the part of the room where the children stay. I can bear witness, however, that the furnace is perfectly ventilated; it has all the fresh air it needs, and its carbon dioxide is taken away.

These conditions are not likely to last always. Pennsylvania has already provided, in her new school code, for ample air space for every pupil in all schoolrooms which shall be constructed in the future; she has provided for proper methods of lighting; provisions are made for sanitary surroundings. But, let me call your attention to the fact that this is merely law. It is of absolutely no account unless it is enforced, and it will be your duty, as patrons, to see that its provisions are executed. School Boards will obey it, you say. Will they? They violated the laws of God and Nature before; perhaps they may remain unterrified before this statute.

We will soon try the experiment of compulsory medical examination of children in the public schools. If you, as patrons, support this measure, many of these abuses will be nullified and abolished, and our disgrace in this line will disappear and be forgotten, except where it is manifested in the crippled victims who will live as relics of the barbarism gone before.

But the attempt has not yet been universally made, and if the people resist it as they resisted the attempted compulsory vaccination a few years ago, and the State is as weak-kneed as it was then, we will slide back again into our former condition of apathy.

Our new school code is a great stride forward, and it will doubtless do much good, if the people support it. But there are glaring errors in it, which, we will hope, will be remedied by future legislatures. No legal enactment can absolve the parent from his duty, and no law can remove the responsibility from your shoulders. You cannot put a sanitary conscience in a man by law. What do you know about the course of study, or the methods of recitation, in the school your child attends? What about the actual sanitary condition of the room and its surroundings? You know what the conditions and studies were when you went to school. Do you realize how greatly conditions have been changed? Where is the emphasis laid? Does your experience tell you that your child will be better fitted for life than you were? Is the school better today than it was twenty-five years ago? It ought to be. Yes! But is it?

Who is responsible for the curriculum? You can see the problems which will confront your boy in the future to some extent. Is he being equipped bodily and mentally to meet them? If not, what are you going to do about it?

Every one of you knows in your heart that the horrible conditions I have detailed are true. They are common talk. What are you going to do about it?

One of the most vicious customs of construction of school buildings is applied to the position of the windows. Almost universally we see the country schoolhouse with a row of windows in each side, with the desks ranged between. Quite commonly the blackboard is in front, or between the windows. Wherever it is placed, great care is taken that the light from two windows will fall upon it, so that the pupils' eyes will be continually subjected to the greatest possible strain. If you have never thought of this, try placing a clock directly, and endeavor to ascertain the time of day at the distance of the average pupil from the blackboard. You will feel the tension of your muscle of accommodation at the first glance, even if you succeed in reading the figures on the dial. Yet your children's eyes are subjected to this inhuman strain for ten years of their life.

If blinds are used at all, they roll down from the top, and either aggravate the condition, or shut out part of the light from its best point of entrance. They should, of course, roll up from the bottom, in order to afford protection to the children's eyes. The windows, of course, should be on one side of the room only, or be placed so high that the glare would pass over the children's eyes, and the desks should be arranged so that light would come from the child's back and pass over his shoulder to the book or blackboard.

We ridicule the Chinaman who pays his doctor to keep him well, and who rolls his window blinds up from the bottom, and who does everything just the opposite from the way we do it; but the slant-eyed celestial exhibits a sound common sense which we westerners would do well to humbly imitate in these things as in many others.

I might take up the illy-adapted seats, which cramp the chests, hump the shoulders and strain the eyesight. I can name a dozen flagrant common abuses in every schoolroom. But my purpose is not to be a pessimist, or, as our school children now say, a "knocker," but only to make you consider actual conditions and to take steps to remedy them.

The United States has twenty-four and a quarter million pupils in her public schools, and for their education $401,397,747.00 are expended annually. Pennsylvania alone spends $42,647.00 each year in maintaining her schools. We have ninety millions of people. Our orators declaim about such glorious statistics and we applaud.

Let me mention a few statistical facts, of which I am not proud. Out of our ninety million people, twelve million are ill during the year, and two millions die. Deducting the deaths from old age, the most of those remaining could have been prevented. Doctors call them "unnecessary deaths." There are eight million people now living, who will die of tuberculosis. One hundred and seventy-five thousand died last year of this disease. Yet tuberculosis never occurs under hygienic and sanitary conditions, and when it does assail a victim, hygiene and sanitation will save him, if he subject himself to their rules while the disease is in its

incipiency. Tuberculosis is preventable.

There will be over two hundred thousand cases of pneumonia in the United States this winter, and over 50,000 of these patients will die. Yet pneumonia is a preventable disease, and never strikes unless the victim has violated the known laws of hygiene.

The comparatively mild diseases of whooping-cough and measles cause more deaths than the deadliest diseases we have—scarlet fever and diphtheria—yet they are practically preventable.

Every case of typhoid fever is a crime for which some one is responsible, and a knowledge of hygiene and sanitation among the people would enable us to blot the name from our catalogue of diseases for it would become unknown. It is easily preventable.

There are very few diseases that are not preventable. Hygiene and sanitation will prevent the vast majority of sickness and pain. Is it not a matter of importance that our children should learn the principles and laws of the system which has such beneficent possibilities? But teachers who do not have this knowledge cannot impart it, and teachers will not equip themselves with this information until it is demanded of them.

What can you do, you ask? You can do much. Protest to the Department of Public Instruction against the false physiology taught in our schools, and demand that the curriculum be modified to a rational basis, so that our children may be taught hygiene and sanitation—sense, instead of nonsense. Implore the school board to instruct the teachers to ignore, so far as possible, the physiology now prescribed for the state, and substitute therefore a plain common sense teaching of hygiene and sanitation. Any teacher can teach hygiene and sanitation from any competent text book, but no teacher can teach physiology properly unless she is a graduate of a good medical school and has practiced medicine for a number of years.

You can visit your schoolroom, and try to help the teacher devise a means of deflecting the light which is blinding your children by its glare. You can supply your own children with individual cups, and ask the teacher to require all other children to have them, and to prevent any child from dipping his cup into the bucket. Think upon conditions in many schoolrooms today, even where there are a few individual cups. Those who do not have them, use a common cup, and dip it into the bucket, the clean and the unclean, black and white, healthy and diseased, cheerfully depositing the germs and filth from their hands upon the sides and rim of the cup, and then washing it off in the fluid your child must drink.

You could insist upon the school board providing desks which will not crumple up the chests and starve the lungs of the children. You could see that an inexpensive system of ventilation is installed—your doctor will be glad to look at your schoolroom, and instruct you how this should be done. You could take a few flowers in the coming spring and plant them in the bare and cheerless playground. Oh, there are a thousand things you can do to mitigate the condition of these poor children, if you only will.

If your cow contracts tuberculosis, or if one of your swine becomes ill, the afflicted member is accorded the attention of a member of the President's cabinet. If your apples develop an imperfection, you can summon,

without cost, the vast machinery of this mighty government to your aid. The ailments of trees, and the indispositions of hogs are matters of national importance; the diseases of clams and fish are held to be deserving of the closest study of highly salaried government officials; but when a human being sickens and dies of a preventable disease, there is no visible excitement about Washington, D. C.

This great nation, with such a splendidly developed governmental machine that it can catch a mail sack, dig a Panama Canal, manouvre an army along a whole frontier, or chase a plant louse, and do it all with the same power, grace and dispatch, has no provision for caring for the health of its people. Ohio can dump her sewage into the Mississippi to poison the people of Louisiana; New York can dump her refuse upon Pennsylvania, and the government cannot prevent it. It is a notorious fact that the government cares for a sick hog and ignores a sick citizen.

There is at the present time pending before Congress an act known as the Owen Bill, which provides for a National Department of Health. It is the duty of every good citizen to write to his Senator and Representative in Congress and urge upon him that he vote for and work the passage of the Owen Bill. This action is imperatively needed, for against this bill are arrayed all the fanatical and ignorant sects, such as the Christian Scientists, Osteopaths, and backed by the money of the patent medicine and dope distributors, they are putting up a powerful fight against the protection of human life and the health of mankind. Your duty here is as plain as it is in your own school district.

CO-OPERATION.

Robert A. Campbell, Sec. State Board of Public Affairs, Madison.

Agriculture is fast becoming a very complex undertaking. It used to be very simple; there was cheap land in abundance; help was plentiful and markets close at hand. If the farmer exhausted his soil by constant cropping and hard use, other lands, new and oftentimes much better, might be had. He might give up the stony, hilly eighty in the east for a rich and fertile half section in the middle west. Until recently there has been an abundance of fertile virgin soil, where the season was long and the rainfall sum cient for all crops. During the last two or three decades there has been a marked change, the change becoming more and more marked as time goes on. The best lands are now occupied and the settler must either take up thin soil, land that is difficult to clear, or settle in a region where the growing season is short, the climate rather disagreeable, or the rainfall light.

While land was plentiful, no thought was given to soil exhaustion. Mining, not agriculture was practiced. The increasing population, however, drove the farmer to poorer land and decreased production, both because of the poorer land brought under cultivation and because of soil exhaustion compelled him to give attention to scientific farming. The United States Department of Agriculture, agricultural colleges, state departments of agriculture, farmers' institutes and the agricultural press of the country have all been devoting much time and attention to better farming methods. Scientists, agronomists and stock breeders attacked the problem from different angles. They all put forth a united effort, however, to increase productivity; some through soil analysis with the idea of supplying defects, some by rotation of crops, some through the improvement of seed grain and others through improvement of live stock. The object to be accomplished was to increase the quantity and improve the quality. The cry was for more and better production. It has been a very commendable work, deserving much praise and encouragement, and should by all means be continued. In spite of our efforts, the amount produced has not kept pace with increase in population and the result has been a very pronounced upward trend in the cost of living.

Take the nation as a whole. The increase in rural population has not kept pace with the increase in city population. The population of the United States increased from approximately seventy-six million in 1900 to approximately ninety-two million in 1910, an increase of about sixteen million, or 21 per cent. In other words, one out of every six persons now in the United States has been added during the last decade. The cities received eleven million of this increase and the country less than five million. Eleven out of every sixteen persons added to the total population went to the city and five to the country. The number of food producers decreased relative to the number of food consumers and the total amount produced proves that the advantage of present day machinery does not make up for the difference in the number of workers. During the same period (1900-1910), the number of farms increased 10.9 per cent, or less than half the increase in population. The amount of land in farms increased 4.8 per cent, or less than one-fourth the population increase. Improved land in farms increased 15.4 per cent, or about three-

fourths the population increase. The amount of land under cultivation is not keeping pace with the population and the productivity is not keeping pace with the increase in improved land under cultivation, and is falling far below the increase in population. In brief, the productivity does not keep pace with the amount of land brought under cultivation and the amount of land brought under cultivation does not keep pace with the population. It is very evident, therefore, that the ratio between productivity and population is far from satisfactory.

The number of farm animals, including cattle, horses, mules, swine, sheep and goats, has actually decreased in the last decade. In 1900 there were approximately two hundred twenty-two million, five hundred thousand, while in 1910 there were two hundred six million, five hundred thousand, a decrease of 7.2 per cent. The number of certain kinds of animals has increased, but the increase has been among those animals not in common use for food consumption, namely, horses, mules, and goats. The actual number of cattle, swine and sheep has decreased, cattle and swine over 8 per cent and sheep over 14 per cent.

The number of acres sown and planted to cereals has increased from approximately one-hundred and eighty five million in 1899 to one hundred and ninety-one million in 1909, an increase of about 3½ per cent. The productivity in bushels increased from 4,439,000,000 to 4,513,000,000, an increase of but 1.7 per cent. The acreage planted and sown to cereals increased 3.5 per cent, while the actual increase in bushels was only 1.7 per cent. The increase in population was 21 per cent. In other words, the acreage increase was double the increase in productivity, and both were far below the increase in population.

This condition of affairs would be serious even with a decreasing population, and is alarming with the present marked increase in population.

The agricultural conditions in Wisconsin are not unlike the agricultural conditions of the United States as a whole. The total population has increased from 2,069,042 to 2,333,860, an increase of 264,818, or 12.8 per cent. Out of this number 193,224 were added to the cities and 71,594 to the rural sections of the state. The increase in city population was 23.8 per cent and in rural population only 5.7 per cent.

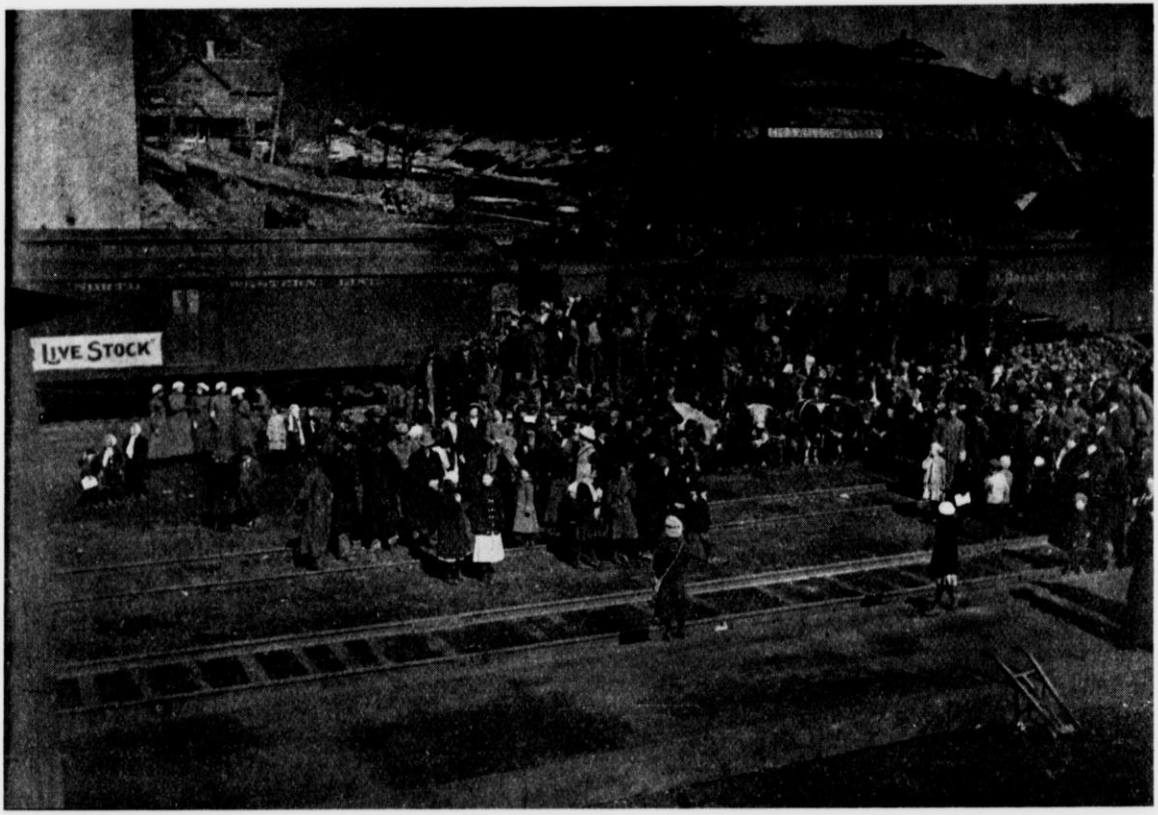
During the same period (1900-1910), the number of farms increased 4.3 per cent; the amount of land in farms 6 per cent, and the improved land in farms 5.9 per cent.

The number of acres planted and sown to cereals in Wisconsin has decreased from 5,376,944 in 1899 to 4,951,066 in 1909, a decrease of 425,878 acres, or 7.9 per cent. The number of bushels produced has decreased from 170,689,848 to 150,584,600, a decrease of 20,105,248, or 11.8 per cent.

The figures indicate a heavy decrease in the acreage, a still heavier decrease in the amount of the product, and at the same time a marked increase in the total population of the State. The greatest increase in population is among the consumers of the city.

The number of farm animals, including cattle, horses, mules, swine, sheep and goats, has actually decreased in Wisconsin in the last decade. In 1900 there were 6,731,991 domestic animals and in 1910 there were 6,189,143, a decrease of 542,848, or 8.1 per cent.

Compared and briefly summarized, the facts are as follows: The number of acres sown and planted to cereals has decreased 7.9 per cent; the amount of cereals measured in bushels, 11.8 per cent the number of farm animals, 8.1 per cent. The number of



Live Stock train at Norwalk, Wis., run under the auspices of the Wisconsin Live Stock Breeders' Association.

farms has increased 4.3 per cent; the amount of land in farms 6 per cent, the improved land in farms 5.9 per cent, and the total population 12.8 per cent.

These facts and figures do not mean that scientific agriculture is a failure. They simply indicate that scientific agriculture is not the whole solution. Better methods have made individual farmers more efficient producers, but increased production due to their efforts has not kept pace with the increasing demand for food products. The result is a decided upward trend of living expenses. It is this upward trend in living expenses that has focused the attention of the nation upon present day methods of production and marketing. The fact is that during all this period of scientific agriculture, there has been a very great waste in our methods of marketing farm products. The farmer has left his marketing to chance and, consequently, has been deprived of advantages that should naturally come to him as a more efficient producer.

When food products were plentiful and the cost of living low, he alone suffered. Now, however, when food products are less plentiful and cost of living high, the consumer as well as the producer is affected. The result is that our methods of production and marketing are arousing criticism and commanding more careful consideration.

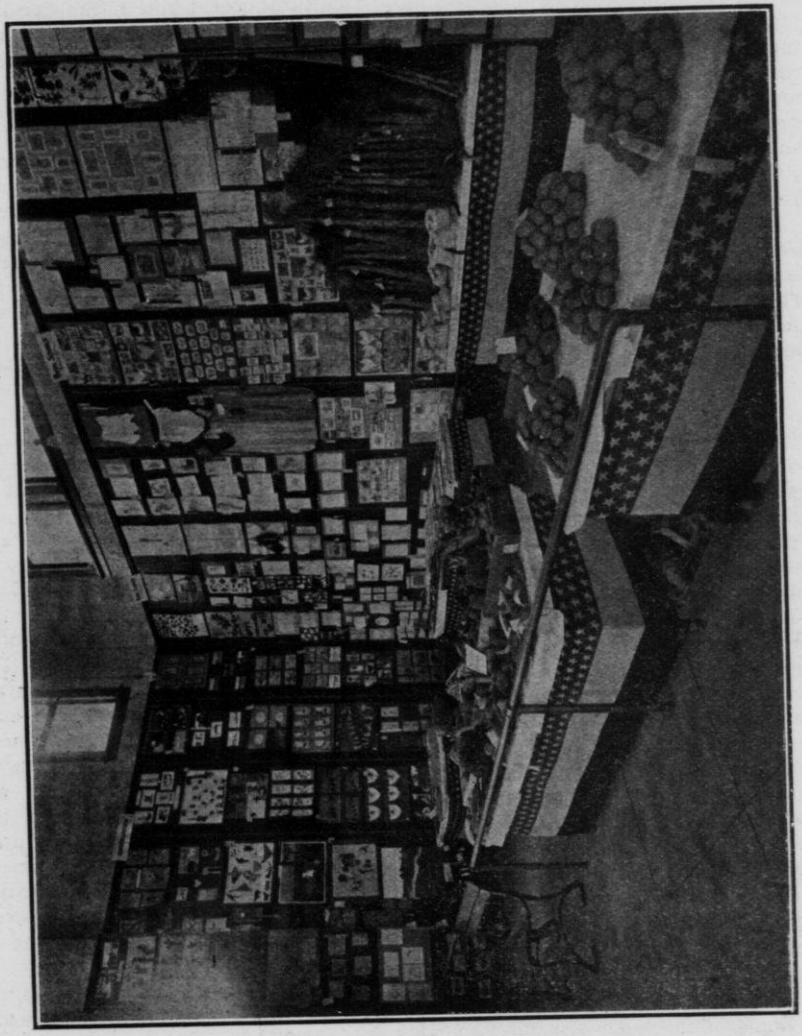
The wastefulness and extravagance of our marketing methods need no proof. Some measure of the extent of loss due to our present system has been determined by investigations. A survey carried on by the Department of Agriculture in 1909 showed that the consumer price for beef was 38 per cent higher than the wholesale price received by the great slaughter houses: that the dairyman received a scant 50 per cent, or half the price paid by the consumer for milk; that the poultry raiser received only 55.1 per cent of the consumer's price; and that the ratio between consumers' and producers' price for all commodities averaged about one-half. In fact, the loss between producer and consumer was so great that the Secretary of Agriculture in his report printed in 1911 said: "The consumer pays a dollar for food; the farmer gets less than 50 cents. Who gets the rest?"

This 50 cents is lost between the producer and consumer. Certain definite, legitimate services are rendered by the middlemen and transportation companies in the process of marketing and no one believes that the middlemen should be entirely eliminated. The excessive middlemen, like men displaced by labor saving machinery, must be gradually turned into productive employments. Neither does any one believe that the farmer or consumer alone should reap all the benefits that will naturally follow better organization.

What is needed is a better system of marketing; a system so good that all marketable products will find a ready sale. In the past there has been little inducement for the farmer to grow big crops when big crops meant low prices and no markets. If a well regulated system of marketing can be devised to take care of the farmer's products, it will encourage production and stimulate increased activity in scientific farming.

Co-operation the Remedy.

The method most commonly suggested is the organization of farmers into co-operative concerns for production and marketing. This will simply be following the example set by every other industry. The individual shoemaker, weaver and butcher is a relic of an industrial age that is passed. He has gone to the factory, mill and packing house to become a part of



Part of Educational Exhibit at Wisconsin State Fair, 1913.

a great system. He could not produce and sell at the same time to advantage. Organization and specialization were necessary. The purchasing, marketing, sales, credit, accounting and all other departments of a really successful manufacturing plant must be strong, well balanced and well managed. No department can be neglected. A successful business gives as much time to marketing as to any part of the work.

If the American farmer does organize, he will be following not only the example set by big business everywhere, but the example set and practiced for years by men of his own occupation in Europe.

Co-operation in Other Lands.

In the most prosperous agricultural countries of Europe, co-operative organization and effort is the rule and not the exception. Devastation, soil exhaustion and poverty compelled the farmers to introduce improved methods of agriculture and to organize for purposes of production. Scientific agriculture and organization increased production, but the farmer did not reap the full reward of his labors. He had neglected one very essential step —organization for marketing purposes. With this step taken the system was complete. Years of trial and experience have added many improvements. A ready market encouraged production and the desire for a large product encouraged scientific agriculture. The three working together have brought progress, prosperity and wealth to every agricultural community where it has been tried. In some of the most prosperous countries of Europe, countries like Denmark and Holland, agriculture is so carefully planned, the resources so fully utilized, the product so carefully prepared and so successfully marketed that one is reminded of the organization and management of our most perfect business concerns. These countries occupy a position in the agricultural world not unlike our industrial centers in the business world.

Perhaps the best illustration of successful agricultural co-operation is found in Denmark. This little country has an area of less than 16,000 square miles and a population of more than 2,500,000—in area considerably less than one-third the size of Wisconsin and in population slightly greater. It is a dairy country and the people in their organized effort have naturally turned to co-operative creameries, cheese factories, cow testing and cattle breeding associations, and butter, cheese, egg and bacon marketing associations. In 1911 the total value of butter exported to Great Britain alone was over $51,000,000. The total value of milk and cream for the same year amounted to over $4,000,000; the exports of bacon amounted to over $32,000,000, and the value of eggs exported amounted to nearly $8,000,000. "More than that," says Jacob Riis, "the Danish farmer has met and beaten the trusts that would rob him of his profits in the London markets. He maintains now his own selling agencies, sends his wares across the North Sea in his own ships, and buys his supplies from the manufacturer at first price. He has eliminated every front of the jobber, and the jobber himself, by the simple formula of co-operation, and has become the most prosperous agriculturist on record. He owns his own farm, borrows the money he needs on his own terms, runs his own country—about one-third of the men who sit in the Rigsdag, the Danish parliament, are farmers—and has earned the reputation of being the best farmer in the world."

Denmark has built up an unique and characteristic rural civilization. The agricultural population has reached a

Live Stock train at Mt. Horeb, Wis., run under the auspices of the Wisconsin Live Stock Breeders' Association.

high grade of intelligence and citizenship. They are bound to the soil by interest, religion and patriotism and have found comforts on the farm sufficient to offset all attractions of the city. Their tastes are simple, their homes cheerful and their lives full of real pleasure. An excellent system of education and co-operation in production and marketing are the two great secrets of progress in Denmark. Other forces and factors have entered in, but these two seem to be the real foundation.

The children begin work as soon as they are able to do light chores about the house, and their education goes hand in hand with their daily tasks. Their studies are intensely practical and very closely related to their actual needs. Among the smaller farmers the practical training is given at home, but those better able to afford it usually send their sons to well known farmers where they spend three years in practical work.

This practical training and elementary education is only the beginning. Denmark has a special type of schools with religious and patriotic aims, called People's High Schools. These schools are in truth the people's schools, for both men and women of all ages from 18 to 60 attend them. It is to these schools that the Danish farmer owes much of his practical knowledge, culture and breadth of view, and the Danish housewife much of her cheerfulness and thrift. The object seem to be to develop character and resourcefulness. The students are not confined to agriculture and sciences closely related thereto, but are taught language, history, literature and song, as well as biology, physics, chemistry, bookkeeping and surveying. Denmark has at the present time about eighty of these schools receiving government aid with an enrollment of over 8,000, over 3,000 of whom are women. Besides these high schools, there were in 1911, thirteen schools proper, with an enrollment of over 1,000, three agricultural schools for small lot holders, with an enrollment of 271; two dairy schools, with an enrollment of 138, and three horticultural schools, with an enrollment of 63.

Above these schools is the Royal Veterinary and Agricultural High School at Copenhagen. This is a state institution of university rank, offering higher education to farmers, gardeners, foresters, veterinarians and surveyors. Instruction in this institution is divided into two parts, regular instruction in agriculture and special training for extension and demonstration work.

The Danish educational system has no upper age limit. The old attend with the young and whether in school or out, they are always students. These men and women gathered together meet people from all over Denmark. They know that the nation's progress depends upon united action and they learn to trust each other and to work together. Above all, these schools teach patriotism and the solidarity of the Danish interests.

Ireland too, under the leadership of Sir Horace Plunkett and others, has done a wonderful work in agricultural co-operation. The poverty and despair of Ireland was as great or greater than the poverty and despair of Denmark in her worst days. All who could well leave the country had gone to seek new homes and new opportunities in a new land. This island was torn with religious and political strife. The English and Continental markets were lost. The outlook was extremely hopeless. Organization and co-operation were finally started and now a new life and new hope is coming to the Irish people.

Co-operation is not confined to Denmark and Ireland. It extends to

France, Germany, England, Belgium, Italy and every other country of Europe, even to the interior of Russia. Not only that, but it is rapidly gaining in strength. The number of men belonging to co-operative societies has increased no less than fifty per cent in the last five years, and the organizations themselves, both local and national, have been greatly perfected.

Co-operation in America.

Co-operation is not unknown in America, but the societies are more scattered, the movement is less extensive and the organization less thorough than in Europe. We have however, numerous illustrations of very successful co-operative associations. The citrous fruit growers of California, the apple growers of the far west, the creameries, cheese factories and grain elevators of the middle west are all good examples of organizations that have accomplished wonderful results by co-operative methods.

Wisconsin One of the Leaders.

Wisconsin takes pride in the fact that she has been and still is one of the leaders of the movement in America. Co-operation began at an early date in Wisconsin. Its history may be divided roughly into two parts, the organization and management of local co-operative concerns, and the great state and nation wide brotherhood movements of farmers and laboring men, like the organizations of the Grange, the Equity and the Knights of Labor. Each played its part. The brotherhood movement supplied the inspiration and enthusiasm and local units developed practical working principles. Accounts of the first have been written, the story of the second is still a part of the unwritten social and industrial history of the State. We know that each of these local groups learned as best as they could how to form their company, manage their business, market their products, keep their accounts and divide their profits. It was an exceedingly difficult task and many failed. No well developed rules or fundamental principles had been laid down. There was no central organization to steer them clear of needless difficulties, or to give them aid and assistance in times of trial and stress. There were many such times, and with them came many failures. Out of them too came many successes. Today group after group, in industry after industry, are working together in a co-operative way. Co-operative stores are organized to serve their patrons and reduce the high cost of living, co-operative fruit growers to encourage the production of a better variety and grade and to sort and market all that come up to a certain standard; co-operative grain, potato and tobacco warehouses to store, grade and sell these commodities; co-operative live stock shippers' associations to handle and economically market live stock; co-operative butter and cheese factories to make, grade and sell dairy products; co-operative cow testing associations to weed out poor cows and thus to make or increase profits; co-operative cattle breeding associations to improve the grade and increase the productivity; mutual fire insurance companies to protect animals, buildings and other property; and mutual telephone companies for the pleasure and convenience of the rural population.

Several sections of Wisconsin are unusually well adapted to the raising of fruit and berries. Within certain

of these areas, well organized co-operative concerns have been formed. The Sparta Fruit Growers' Association is the oldest and best known. The Door County Fruit Exchange, the Bayfield Peninsula Fruit Shippers' Association, the Alma Center Fruit Growers' Association, and the Merrillan Fruit Growers' Association are similar organizations with similar purposes. These associations have as a whole been very successful.

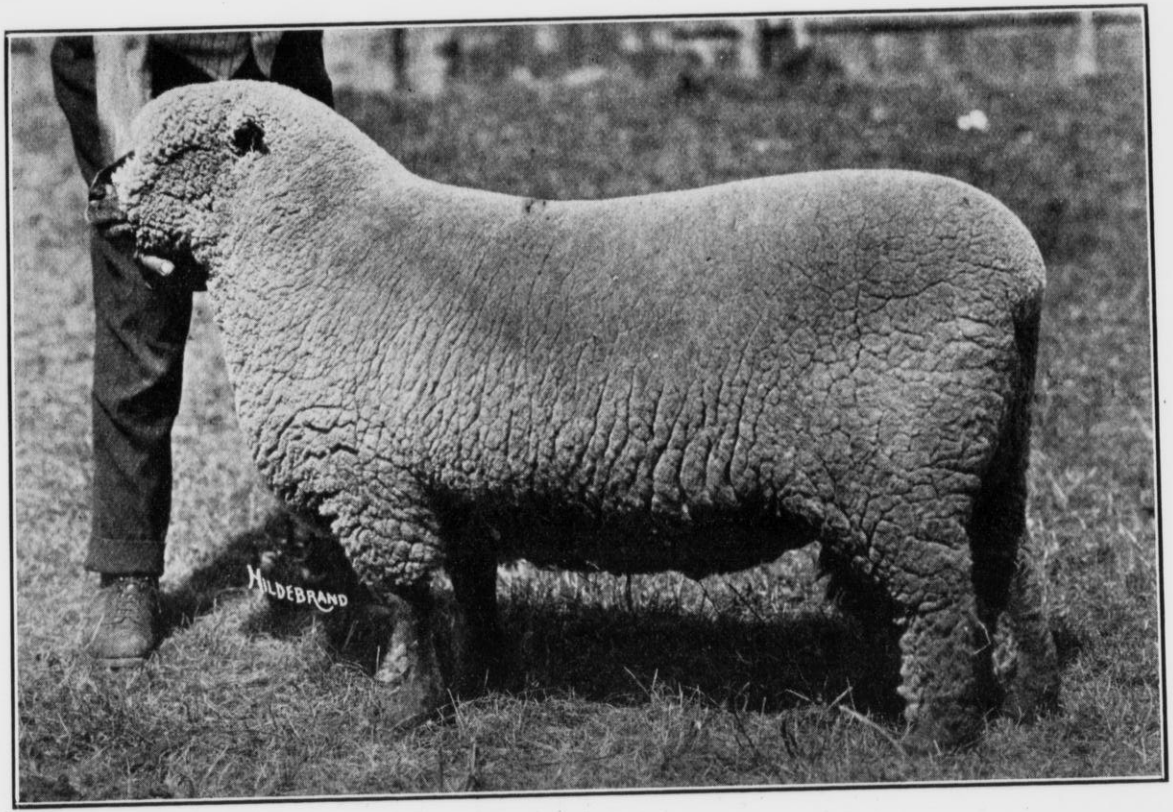
Wisconsin is the leading dairy state in the uinon. The total product of the year 1912 has been estimated at $100,000,000. The whole State is dotted with cheese factories and creameries and in certain well defined sections literally every village and cross road has its plant. These forms of organization lend themselves particularly well to co-operative endeavor and a number of very successful companies have been organized in this State. These co-operative efforts are gradually improving the quality and increasing the quantity of milk and cream supplied and little by little raising the standard of the output of butter and cheese. They have done very little to encourage the establishment of closely related co-operative undertakings, like cow testing and cattle breeding associations, or to encourage social activities in the community.

With the co-operative manufacture of butter and cheese should go improvement of the dairy herd. Some cows produce large quantities of rich milk, others do not produce enough to pay for their feed. The only true test of amount consumed is the measure and weight and the only true test of the amount and quality of the output is the scale and Babcock test. When these tests have been made for a year and the owner knows the cost of consumption and the value of output for every cow in his herd, he is in the best possible position to weed out the "boarders" and make improvements both by selection and breeding. The individual owner seldom, if ever, makes these tests regularly, or for any length of time. The State Dairyman's Association has, therefore, taken the initiative and organized co-operative cow testing groups for this purpose with striking success. Owners who have had these tests made from year to year have always improved their herds. The beginning was made six years ago. Since then 1,500 dairymen have been members and 17,500 cows have been tested for a full year.

It is not enough to determine which cows are poor. The poor must be weeded out and their places taken by better animals. Not only that, but more cows must be added to our present herds if Wisconsin is to retain her position in the dairy world. The dairymen of Wisconsin have already organized into cattle breeding associations for this very purpose. The Holstein breeders have thirty-six locals; the Guernsey breeders thirty; the Jersey breeders nine, and all breeds seven, making a total of eighty-two.

Certain sections of the State are particularly well adapted by soil and climatic conditions to the production of tobacco and potatoes. Co-operative marketing and production can be used to advantage in these industries. The quantity produced is large, the output easily and satisfactorily graded and the market fairly stable. Conditions have in fact been so favorable that about twenty-three co-operative tobacco and potato warehouses are at the present time owned and successfully managed in this State.

This brief survey of the co-operative activities of the State proves



Champion Shropshire ram at Wiscon sin State Fair, 1913. Owned by Arthur Broughton & Sons, Albany, Wis.

that many lines of industry have been taken up and that even without material assistance from a central organization many of the local co-operative companies have been very successful. These associations have proven that groups of men can work together in the organization and management of business, that they can produce and market in common and labor in harmony for the general welfare of the community. These societies have demonstrated that it is possible to improve and increase the product and to serve their own convenience.

Co-operation has been most successful in Wisconsin where certain conditions have prevailed and certain methods have been followed. In the first place, it should be remembered that the American farmer is not naturally a co-operator; he is by nature, habit and training an individualist. In the past he has had the price of independence and has been willing to pay it. The force that will draw the farmers together must be stronger than the force that keeps them apart.

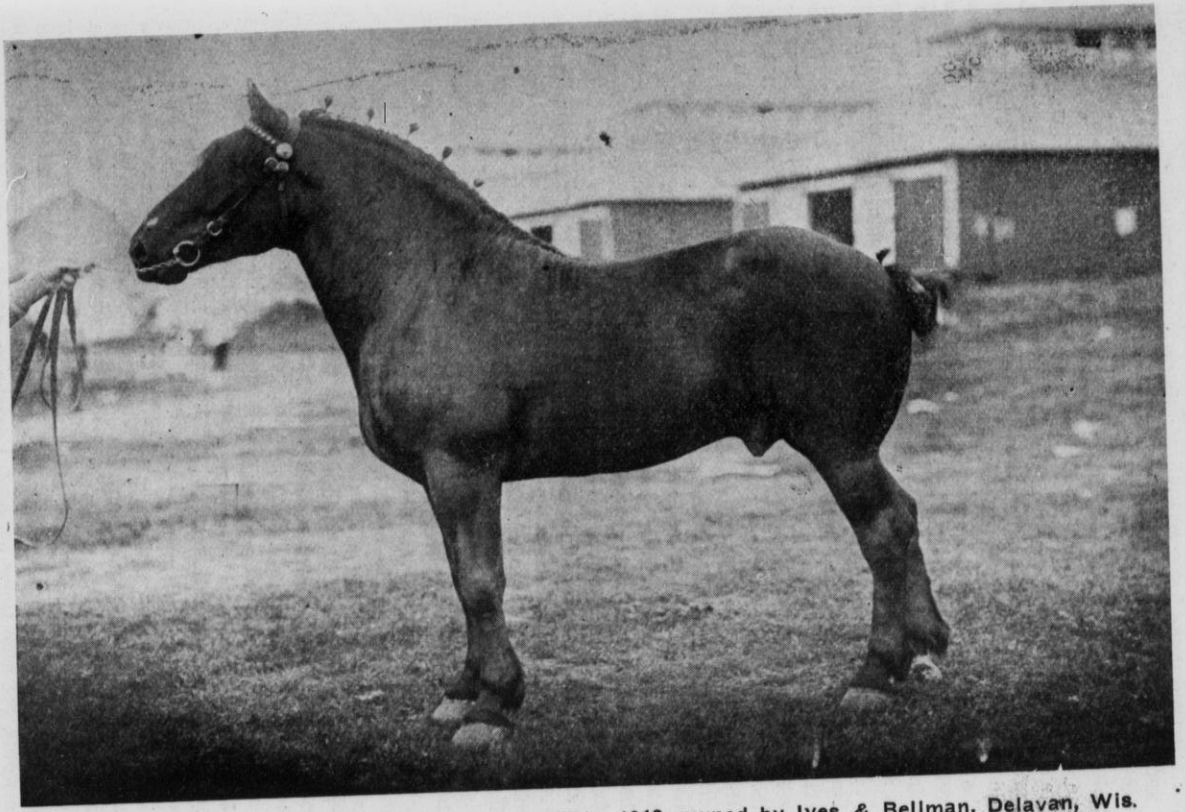
The disastrous effects of individual action must be felt and the need of united effort clearly shown before they will work together to the best advantage. Some of our agricultural pursuits, like dairying and fruit raising, have been seriously hampered and in places their very existence threatened by present day business methods. A desire to enjoy all the profits now taken by the private owner, a resolve to reduce the middleman's services and charges and a determination to participate in all the earnings of the undertaking are additional motives for united action. When such conditions as these prevail, the farmers have sought and found relief in co-operative effort.

Some Essentials for Successful Co-operation.

The most successful organizations are formed by groups of farmers primarily interested in raising and selling a single product, or in working for a single purpose. In such cases the farmer devotes the major part of his time and attention to this one commodity and depends very largely upon it for his income. To him it is more like a commercial undertaking. He figures the costs and the profits and knows that co-operation is good business.

Improvement in the quality of the product is another essential to success. Farmers have persistently refused to seriously consider the tastes and wishes of the city consumer. As soon as they learn to improve, grade and properly pack and wrap their products, they will find it much easier to obtain a good price and a ready market. Where specialized agriculture is followed and the farmers are organized, they learn more quickly to improve their product and market it properly.

Sound economic principles and sound business methods are necessary to the success of any of these undertakings. The ultimate aim of co-operation is justice to all concerned. The man who supplies the capital is entitled to a fair return in the form of interest, but no more. The producer who supplies the raw product like milk and cream, the consumer who buys his goods from the co-operative store, the laborer who aids in the production and sale of the commodity, these men have all added to the earnings of the undertaking and should all share in the profit. To do this it is necessary to determine the part played by each and to fix the proportion to be enjoy-



First prize Percheron stallion at Wisconsin State Fair, 1912, owned by Ives & Bellman, Delavan, Wis.

ed by each. When these and other important facts have been decided, it is necessary to incorporate them either into the statutes of the State or into the constitution and by-laws of the association.

The fundamental principles of organization are so essential that they should receive careful consideration by the members of every co-operative concern. Under the corporation form of doing business so common in the cities, each shareholder has one vote for every share of stock held and all dividends are fixed on the basis of capital invested. Under the co-operative plan it is essential that each member should have but one vote and that the profits should be divided in accordance with the amount of product furnished to the marketing or manufacturing concern, or goods bought from the warehouse or store. A simple example will illustrate this difference. Let us assume that the business under consideration is a creamery with a capital stock of $10,000. Ten men own ten shares of stock at $100 a share, or $1,000 in building and equipment, and that each of these men own one hundred cows, or one thousand in all, nine men own ninety shares of stock at $100 a share, or $9,000, in building and equipment. The nine men holding the $9,000 in shares have but ten cows among them. At the end of a year $5,000 net profits have been made. If the creamery were organized as a private corporation, the nine large shareholders would get nine times as much dividend as the ten small shareholders. If, however, the creamery were organized on a co-operative basis, the nine large shareholders would get nine times as much as the ten small shareholders in interest, but only one-hundredth as much of the profits paid on milk as the ten men who owned the large herds.

Herein lies the explanation of the one man one vote plan. If, in the illustration used, the men were voting by shares, the nine men owning $9,000 in stock could outvote ten men owning but $1,000 in stock. They would, no doubt, insist that the price paid for the raw product should be low and that heavy dividends should be declared on the stock. Under the one man one vote plan, this would be absolutely impossible.

Any attempt to co-operate where the profits are not divided upon a basis of fundamental justice, that is, pro rata on quantity and quality of product supplied, does not as a rule last long, unless the number of shares of stock held by each patron is about the same and the amount of raw material supplied or finished products bought is about equal.

It is not enough that the organization should be sound and the business principles correct. It is absolutely essential that all co-operative companies should have good business managers. The farmers' organization ought not to engage in business where the competition is keen and the chances of failure great, unless they engage on equal terms with other organizations. They must meet business men with business men, and business methods with business methods. Good business includes an adequate system of accounts; the books must show briefly and clearly all the business transactions of the company. Nothing will disrupt a co-operative organization so quickly as suspicion and distrust and nothing will arouse suspicion and distrust so quickly as failure on the part of the management to account for all the business done and moneys handled.

There are many inherent difficulties in the co-operative form of or-

ganization. Americans are naturally independent and naturally individualistic in their tendencies. They lack the spirit of co-operation and a loyalty that means success. In business, it is true, they do form partnerships and corporations, but the firm is usually formed after several years acquaintance and new men are taken in only after a severe test. Their training, their ability, their integrity, their temperament and dozens of other qualifications and traits are carefully considered. Old and well established firms have many employes but comparatively few members. Whole groups and communities are formed into co-operative societies. There is but little choosing and selecting. These groups may be made up of men of different habits and traits. They may not be well acquainted, they may not even speak the same language. Some of the men may be dishonest, many may be quarrelsome, and all may be suspicious of their fellow members. The force that will bind such men as these together, make them trust each other and work together for the good of the community, must necessarily be a powerful force. These men must either have been in poverty, or their hope for gain and reward is great.

Even when these groups do work together in peace and harmony, they often fail to master the fundamental principles of business organization. They sometimes practice loose methods, they are often too close and stingy to employ a good business manager and they not infrequently neglect to keep their books properly.

Their difficulties are not confined to internal strife and dissension, or limited to faults of their own. Keen competition and powerful opposition is brought to bear. This competition is often unfair. It is the competition practiced by line companies that are willing to pay high prices in all territories where the competition is keen and low prices in all sections where competition no longer exists.

It is discouraging to know that the rural population is decreasing, that production is not keeping pace with the increase in the number of consumers, that our marketing methods are exceedingly wasteful, and that the cost of living is high. It is, however, worth a great deal to know these facts now and to make a determined effort to remedy our present condition at once. If our marketing methods can be improved it will encourage scientific agriculture, stimulate production and increase the profits. It has been demonstrated that co-operative production and marketing is successful when properly organized and managed, and that men can work together for the common good. What we must do now is to solve our agricultural problems and build up a new and better rural civilization. Conditions are favorable. A comprehensive co-operative law was passed in 1911 and already 165 new societies have been organized under it. Unfair competition has been forbidden by law and steps taken to prevent it. Agriculture is now taught in the public schools, in the county agricultural schools, in the normal schools and in the university. The Farmers' Institutes and the university are giving co-operation and marketing special attention. The State Board of Public Affairs has made several investigations of this subject and while it carries on no propaganda work, it stands ready to help those who ask for aid and assistance. The Federal Government has just established a Bureau of Markets and a Rural Organization Service to study