Wisconsin Farmers' Institutes : a hand-book of agriculture. A report of the twentieth annual closing Farmers' Institute, held at Plymouth, Wisconsin, March 13, 14, 15, 1906. Bulletin No. 20 1906

Wisconsin Farmers' Institutes
Madison, Wisconsin: Democrat Ptg. Co., 1906

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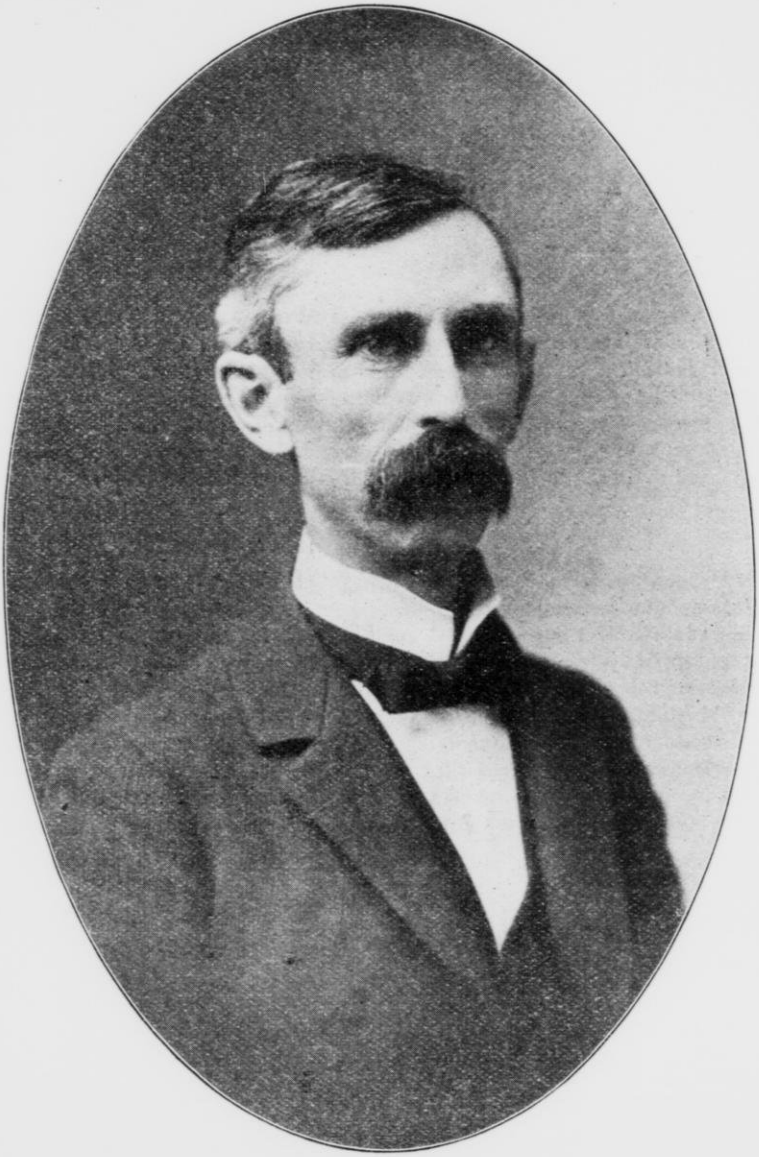
"No nation was ever overthrown by its farmers. Chaldea and Egypt, Greece and Rome, grew rotten and ripe for destruction not in the fields, but in the narrow lanes and crowded city streets, and in the palaces of their nobility. So let us thank God and take courage as we see in our day the movement countryward, and the 'abandoned farm' and lot no longer abandoned. Surely the history of creation is repeating itself, and again is the Lord God taking man and putting him in a garden to dress it and keep it." –Dr. FRANCIS E. CLARK.

"I began life as a lawyer, with a good practice in western New York. I became State Senator from one of the richest agricultural sections of that state; then the highest state office was bestowed upon me, and for several years I was Governor of that great state. After that I represented, in the United States Senate, the richest and most populous commonwealth in the republic; and now I am Secretary of State, holding vast power during the most momentous period of our country's history. All official honors, save one, have been proffered me. With all this experience before me, and within my own bosom, this is the happiest lot I can wish for my sons: To be owners of good farms, well stocked, out of debt, and know nobody more than ten miles from home."—SECRETARY WM. H. SEWARD.



Hon. H. C. Adams.

WISCONSIN

Farmers' Institutes

A HAND-BOOK OF AGRICULTURE

BULLETIN NO. 20
1906

A Report of the Twentieth Annual Closing Farmers' Institute, Held at Plymouth, Wisconsin, March 13, 14, 15, 1906.

"Public prosperity is like a tree. Agriculture is its roots, industry and commerce are its branches and leaves. If its roots suffer, the leaves fall the branches break, and the tree dies." — *Chinese Philosopher.*

EDITED BY
GEO. McKERROW,
SUPERINTENDENT.

SIXTY THOUSAND COPIES ISSUED.

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CLARK ENGRAVING CO.,
Milwaukee, Wis.

STENOGRAPHIC REPORT BY
MRS. A. L. KELLY,
CHICAGO, ILL.

Printed by
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Madison, Wis.

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H. C. ADAMS.

HENRY CULLEN ADAMS, whose death has brought sorrow to so many farm homes, was born in Verona, Oneida county, New York, November 28, 1850, and came to Wisconsin with his parents in 1851; was educated in the common schools, Albion Academy and the University of Wisconsin, after which he engaged in farming along dairy and horticultural lines. Was elected to the Assembly in 1883 and re elected in 1885. During the winters of 1887, 1888 and 1889 he took an active part in the Farmers' Institutes throughout the state, conducting one series of the meetings; was Secretary of the State Horticultural Society two years, 1886–1887, and was president of the State Dairymen's Association three years, 1887–1890. He was appointed by Gov. Hoard Superintendent of Public Property in 1888. In 1895 Mr. Adams was appointed Dairy and Food Commissioner by Gov. W. H. Upham and served until May 1, 1902, when he resigned to become a candidate for Congress; was elected to the 58th Congress and re-elected in 1904. He died July 9, 1906.

H. C. Adams in his public career always stood out as an active, vigorous, fair and aggressive exponent of the best interests of the farmer. Hon. C. E. Estabrook introduced the bill for the establishment of Farmers' Institutes into the Legislature of 1885 and says that Mr. Adams had an Agricultural College bill in at the same session. Mr. Adams was advised by some of his political friends that if the Institute bill became a law it was doubtful if his Agricultural College bill could pass at the same session and that it would be best for his political success to defeat the Institute bill, but Mr. Adams said "No, the establishment of Farmers' Institutes is right and I will support the bill, even if it is to the detriment of my own measure," and thus in fairness he became a champion of the Farmers' Institute measure, which we believe he never had reason to regret. He stood for everything that was meant for the education and advancement of the farmer. To show his great interest in and opinion of the work of the practical education of the farmer we quote from his annual address as President of the Wisconsin Dairymen's Association at Augusta, February 20, 1889: "The most common precepts of good dairy practice cannot be repeated too often. Tne a, b, c's of the dairy business have yet to be learned by the great majority of Wisconsin farmers.

"The Farmers' Institutes have gone closer to the people in this respect than any other educational influence. In every county the short practical papers and breezy discussions have brought about immediate and evident results. One prominent breeder of dairy cattle told me that he could tell where the Institutes were last winter by the letters of inquiry he received about breeding stock. Not only this, but purchasers of butter in towns where these meetings have been held, nearly all testify to the marked improvement of the article they buy. The Institutes have been the means of making the Wisconsin farmers intimately acquainted with the business methods of successful dairymen."

While not a strong man physically, Mr. Adams had an active, vigorous mind, backed by a will that held him up to his work when most men would have given up the fight. In Congress he soon found his place as the leader in agricultural legislation and was so recognized by his colleagues. President Roosevelt and Secretary of Agriculture Wilson both looked upon him in this light and called him to personal conference on the most important matters relating to the agriculture of the country.

In the death of "Cully" Adams American agriculture has lost one of its foremost friends. Who will arise to take his place?

LETTER OF TRANSMITTAL.

Hon. M. C. Mead,

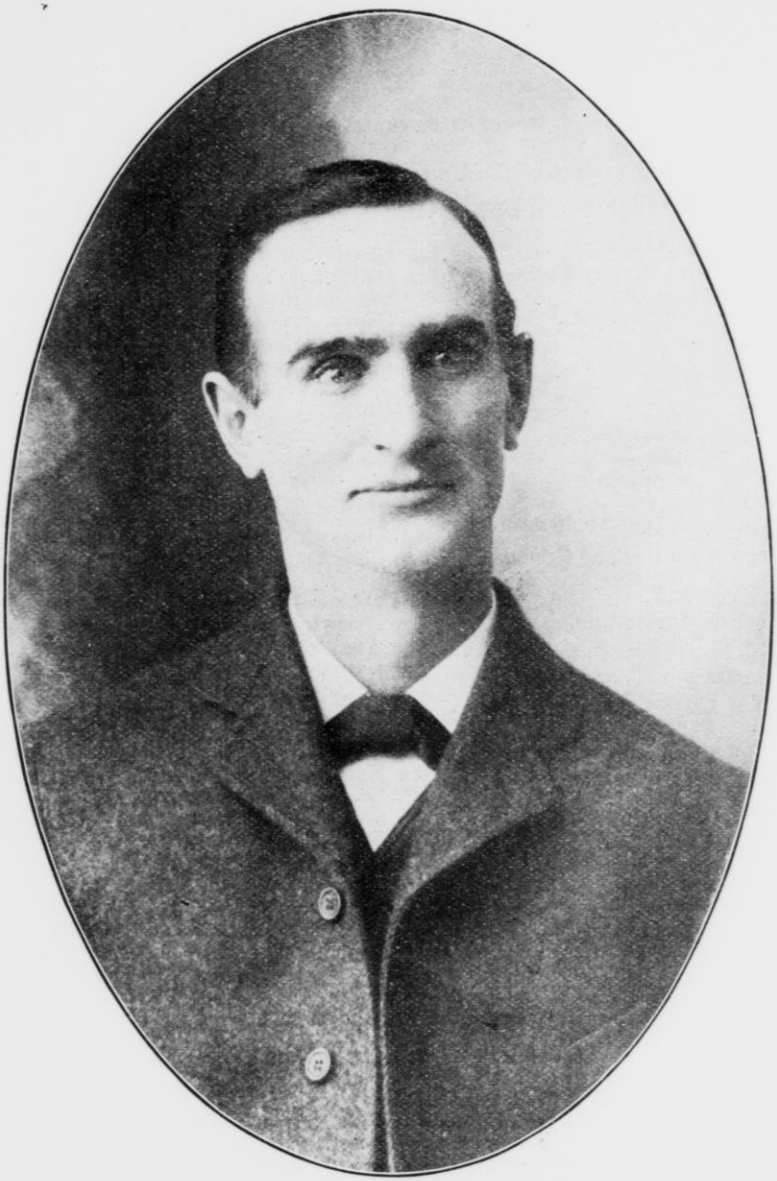
President of the Board of Regents, University of Wisconsin:

Sir:—I have the honor of herewith presenting to you Bulletin No. 20, of Wisconsin Farmers' Institutes.

Most respectfully yours,

GEORGE McKERROW,
Superintendent.

Madison, Wis., Nov. 22, 1906.



D. B. Foster.

UNIVERSITY OF WISCONSIN.

Board of Regents.

The President of the University, *ex-officio.*

The State Superintendent of Public Instruction, *ex-officio.*

State at Large, Magnus Swenson.
State at Large, Mrs. E Ray Stevens.
1st District, Delbert Utter.
2d District, Lucien S. Hanks.
3d District, James Ll. Jones.
4th District, W. J. McElroy.
5th District, Arthur J. Puls.
6th District, M. C. Mead, President.
7th District, Edward Evans.
8th District, Edward E. Browne.
9th District, Orlando E. Clark.
10th District, George F. Merrill.
11th District, August J. Myrland.

E. F. Riley, Secretary.

Organization.

The University embraces—
The College of Letters and Science.
The College of Engineering.
The College of Law.
The College of Agriculture.
The Graduate School.

The College of Letters and Science embraces—
General Courses in Liberal Arts.
Special Courses, which include:
Commerce.
Pre-Medical Studies.
Pharmacy.
Education.
Music.
Home Economics.

The College of Engineering embraces—
The Civil Engineering Course.
The Sanitary Engineering Course.
The Mechanical Engineering Course.
The Electrical Engineering Course.
The Applied Electrochemistry Course.
The General Engineering Course.
The Mining Engineering Group of Electives.

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

The College of Law 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: Eleven languages are taught, viz.: Greek, Latin, Sanscrit, Hebrew, German, Norse, French, Italian, Spanish, Anglo-Saxon and English. In Mathematics there are twenty-nine 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-seven courses; in Political Economy, fifty-five; in Political Science, twenty-nine; in Mental Sciences there are twenty-nine, embracing Philosophy, Psychology, Ethics, Aesthetics, Logic and Education. There are twelve courses in Pedagogics and ten courses in Music, and two courses each in Military Drill, and Gymnastics.

DENNIS B. FOSTER.

Dennis B. Foster died at his home in Fairchild Tuesday morning, November 28, 1905, at 8:00 o'clock. He was born in Rockland, Brown Co., Wis. The end came after many weary months of suffering from tuberculosis of the bowels.

In the death of D. B. Foster, Fairchild loses one of its most prominent and useful citizens; one who was always interested in the welfare and progress of his beloved village and of the commonwealth at large, for he was too broad minded a man to allow his sympathies to be circumscribed by the narrow limits of locality.

Mr. Foster was well known throughout this county and section and had hosts of friends everywhere. For years he had been deeply interested in all matters pertaining to scientific and practical agriculture. During a number of seasons he was engaged in Farmers' Institute work throughout the state, in which he won golden opinions.

One of the saddest features of his untimely death was the call from labor just when he had his farm and buildings fitted for engaging in the occupation he loved best, that of dairying.

The honesty and integrity of D. B. Foster were never questioned. In public and private life alike he never allowed the fear of enemies nor the favor of friends to become a factor in questions of just and upright dealing. The confidence and esteem of his friends and neighbors were shown by the fact that for the past ten years he has been the treasurer of the village, which office he held at the time of his death.

His candor and fairness compelled and won the respect even of his enemies.

During the long and tedious illness of Mr. Foster, no word of complaint was heard to pass his lips. No man ever faced death more bravely and resignedly than he. He looked upon death as a removal from one scene of labor to another under orders of a Supreme Commander, who had a right to direct and who should be cheerfully and loyally obeyed.

Mr. Foster was essentially a home man. While he loved and was interested in men, he cared nothing for the shams and frivolities of modern society. He seemed to realize that he could not tarry long and wished to make each moment count for the best in life.

He was a born democrat, having all confidence and faith in the great masses of humanity. The only aristocracy he recognized was that of merit.

Here, indeed, was a man; when comes such another?

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 woman's gymnastics by the construction of an addition to Chadbourne Hall, which has been fully equipped. This furnishes ample facilities for systematic courses for young women, and is under the immediate direction of a trained instructor.

In Mechanics and Engineering:—Elementary Mechanics, Mechanics of Material, 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.

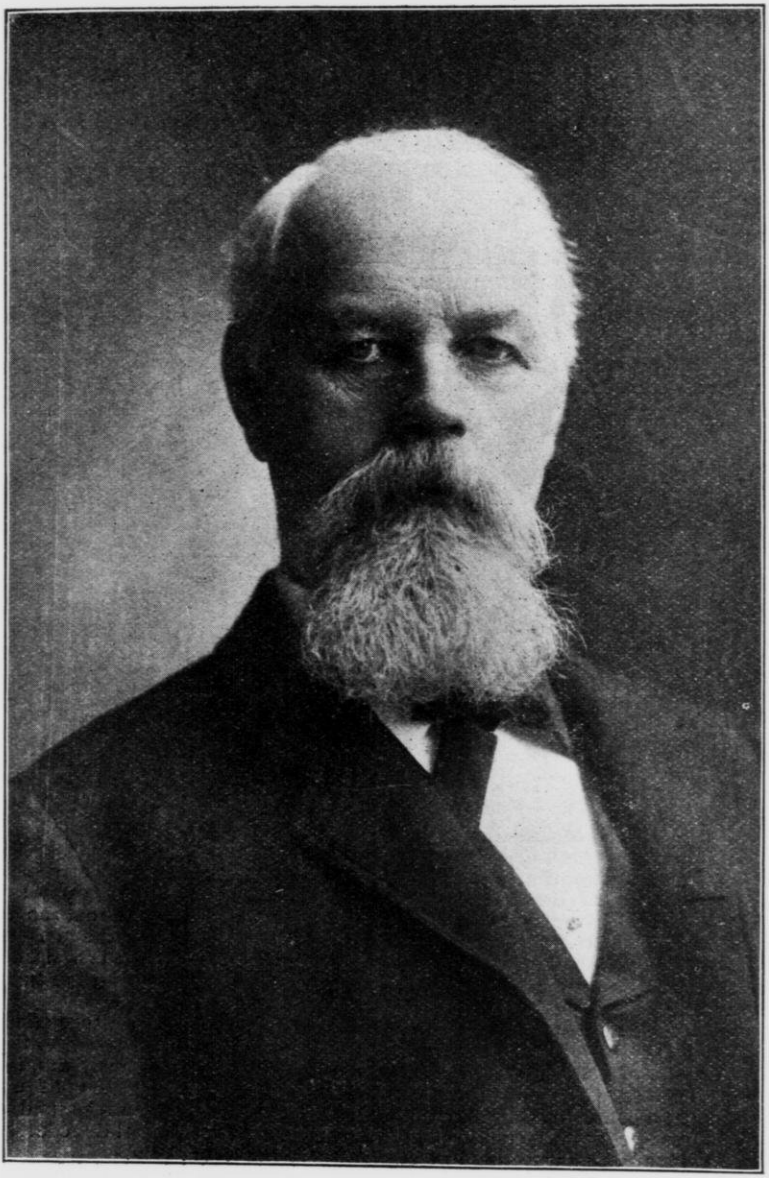
In Pharmacy:—Courses in Practical Pharmacy, Pharmaceutical Chemestry, Materia Medica, Pharmaceutical Botany and Practical Laboratory Work.

General Facilities:—The Faculty embraces upward of two hundred and fifty-seven 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, 113,000 volumes; of the State Historical Society, 275,000 volumes, including pamphlets; of the State Law Department, 42,000 volumes; of the city, 17,000 volumes, besides special professional and technical libraries, making in all more than 447,000 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.



The Late Fred Rietbrock; Friend of Agricultural Education and Farmers' Institutes.

UNIVERSITY OF WISCONSIN.

COLLEGE OF AGRICULTURE.

COMMITTEE.

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DELBERT UTTER, Lake Beulah.
JAS. LL. JONES, Hillside.
E. E. BROWNE, Waupaca.
GEO. F. MERRILL, Ashland.
PRESIDENT VAN HISE.

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CHRIST. SCHROEDER.....*Assistant in Animal Husbandry.*
IDA HERFURTH.....*Executive Clerk.*
IVA A. WELSH.....*Librarian.*

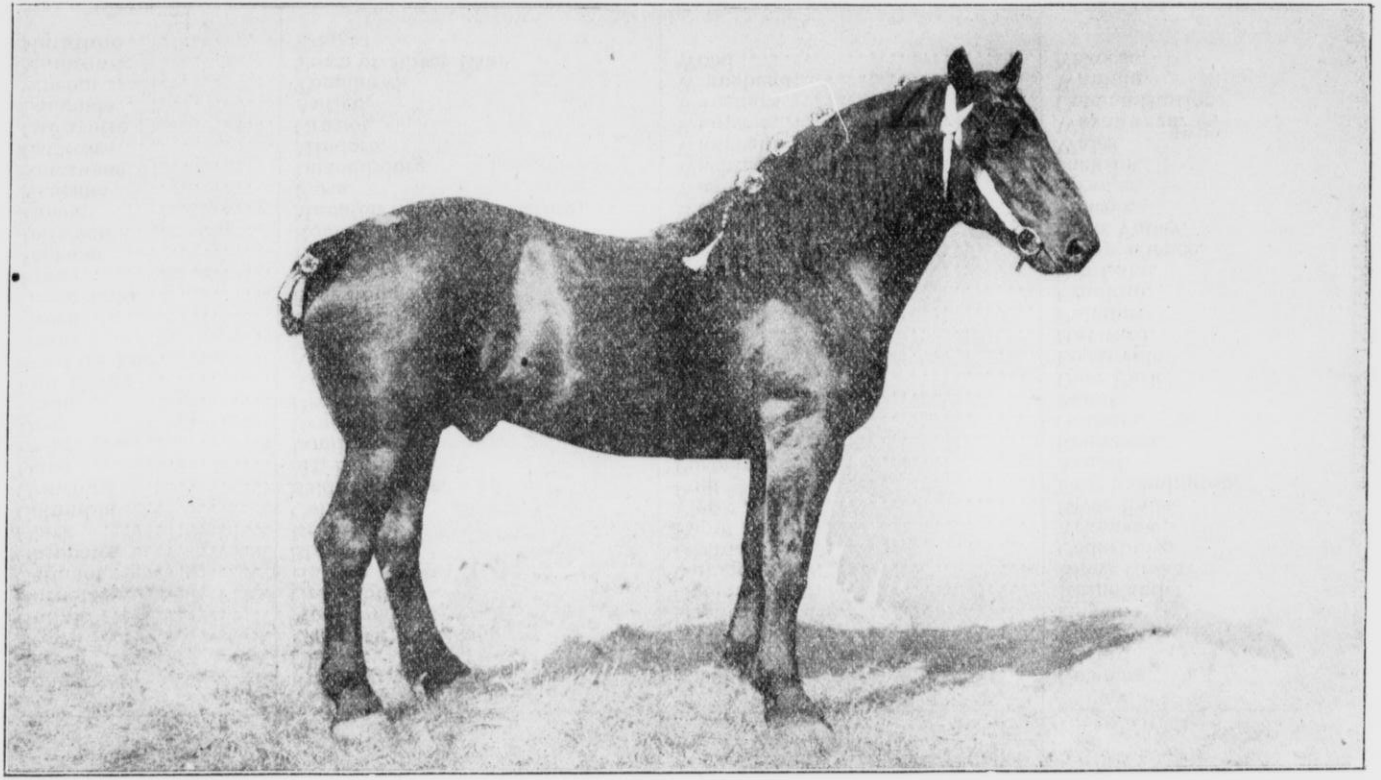
Farmers' Institutes.

GEORGE MCKERROW, Superintendent.
NELLIE E. GRIFFITHS, Clerk and Stenographer.

I. The Agricultural Experiment Station is devoted to a study of problems incident to the agricultural development of our commonwealth. It is supported jointly by the general government and the State of Wisconsin. An annual report and frequent bulletins are issued and distributed gratuitously among the farmers of the State. Any Wisconsin farmer wishing to receive these reports and bulletins regularly should send his request on a postal card addressed to **Agricultural Experiment Station, Madiaon, Wis.**

II. Agricultural Instruction at the University. The College of Agriculture offers instruction in agriculture to college graduates, a four years' course leading to the degree of Bachelor of Science, special instruction to students of mature years, instruction in the Short Course in Agriculture requiring two winter terms of fourteen weeks each, a course in Dairying lasting one term of twelve weeks, and a two-weeks course for busy farmers. For information concerning these courses address **W. A. Henry, Dean, College of Agriculture, Madison, Wis.**

III. The Farmers' Institute. Each year this practical school for the farmer holds more than a hundred two-day meetings in the farming districts of our commonwealth. These meetings are for practical instruction and conference on all matters pertaining to the farm and farm life, and at them 60,000 copies of the Farmers' Institute Bulletin are distributed annually. Any community can secure an institute upon early application to the superintendent. For further particulars concerning this school for the farmer, write **George McKerrow, Supt., Madison, Wis.**



Valseur, Winner of First Prize for Aged Percheron Stallion at Wisconsin State Fair, 1906. Owned by Richland County Horse Breeders' Association. This company, made up of Richland county farmers, was organized in 1903 and now owns 40 head of pure bred Percherons.

WISCONSIN FARMERS' INSTITUTES FOR 1906–1907.

ARRANGED BY COUNTIES.

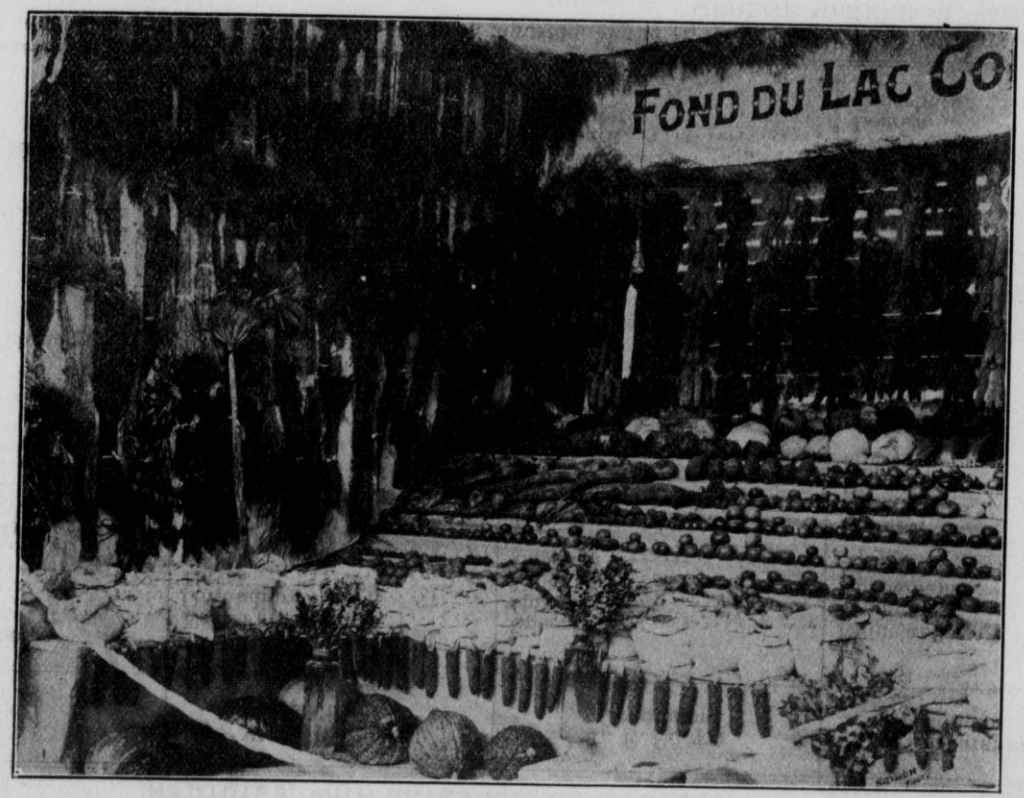
County.		County.	
Adams	Friendship.	Marinette	Coleman.
Barron	Chetek.	Marquette	Oxford.
Brown	Denmark.	Monroe	Warrens.
Buffalo	Mondovi.	Oconto	Hayes.
Burnett	Grantsburg.	Oneida	Rhinelander.
Calumet	Hayton.	Outagamie	Black Creek.
Chippewa	Stanley.	Ozaukee	Cedarburg.
Clark	Bright.	Pepin	Arkansaw.
Columbia	Columbus.	Pierce	River Falls.
Crawford	Soldiers Grove.	Polk	East Farmington.
Dane	Mt. Horeb.	Portage	Arnott.
Dodge	Lomira.	Racine	Rochester.
Door	Brussels.	Richland	Gotham.
Dunn	Drowning.	Rock	Beloit.
Eau Claire	Augusta.	St. Croix	Deer Park.
Fond du Lac	Armstrong.	Sauk	Loganville.
Grant	Lancaster.	Sawyer	Hayward.
Green	Monticello.	Shawano	Pulcifer.
Green Lake	Kingston.	Sheboygan	Franklin.
Iowa	Cobb.	Taylor	Rib Lake.
Jackson	Hixton.	Trempealeau	Independence.
Jefferson	Rome.	Vernon	Coon Valley.
Juneau	Mauston (Closing Institute).	Walworth	Sharon.
Kenosha	Paris.	Washburn	Spooner.
Kewaunee	Luxembourg.	Washington	Jackson.
LaCrosse	Mindoro.	Waukesha	Wales.
LaFayette	Gratiot.	Waupaca	Weyauwega.
Langlade	Antigo.	Waushara	Coloma Station.
Lincoln	Tomahawk.	Winnebago	Waukau.
Manitowoc	Town of Silver Lake.	Wood	Nekoosa.
Marathon	Edgar.		

INSTITUTES, WITH DATES AND CONDUCTORS.

DATE.	W. C. BRADLEY, Conductor.	L. E. SCOTT, Conductor.	F. H. SCRIBNER, Conductor.
December.			
11-12	East Farmington	Spooner	Rhinelander.
13-14	Grantsburg	Hayward	Tomahawk.
18-19	Hayes	Pulcifer	Luxembourg.
20-21	Antigo	Coleman	Brussels.
January.			
8- 9	Downing	Deer Park	Stanley.
10-11	Chetek	River Falls	Arkansaw.
15-16	Augusta	Rib Lake	Warrens.
17-18	Bright	Edgar	Mondovi.
22-23	Mindoro	Hixton	Gotham.
24-25	Coon Valley	Independence	Soldiers Grove.
29-30	Coloma Station	Arnott	Weyauwega.
January-February.			
31-1	Friendship	Nekoosa	Black Creek.
12-13	Columbus	Loganville	Waukau.
14-15	Oxford	Mt. Horeb	Kingston.
19-20	Beloit	Cobb	Monticello.
21-22	Sharon	Lancaster	Gratiot.
26-27	Jackson	Town of Silver Lake	Hayton.
February-March.			
28-1	Armstrong	Denmark	Franklin.
5-6	Rome	Rochester	Lomira.
7-8	Wales	Paris	Cedarburg.

Twenty-first Annual Closing Institute and Cooking School, Mauston, March 12, 13, 14, 1907. All inquiries relative to Institutes will be promptly answered.

GEORGE McKERROW, Supt.,
Madison, Wis.



Fond du Lac County Exhibit Wisconsin State Fair, 1906; Awarded First Prize.

PROCEEDINGS

OF THE

TWENTIETH ANNUAL

CLOSING FARMERS' INSTITUTE

HELD AT

PLYMOUTH, WIS., MARCH 13, 14, 15, 1906

The meeting was called to order by Superintendent McKerrow. Mr. F. H. Scribner of Rosendale was called to the Chair.

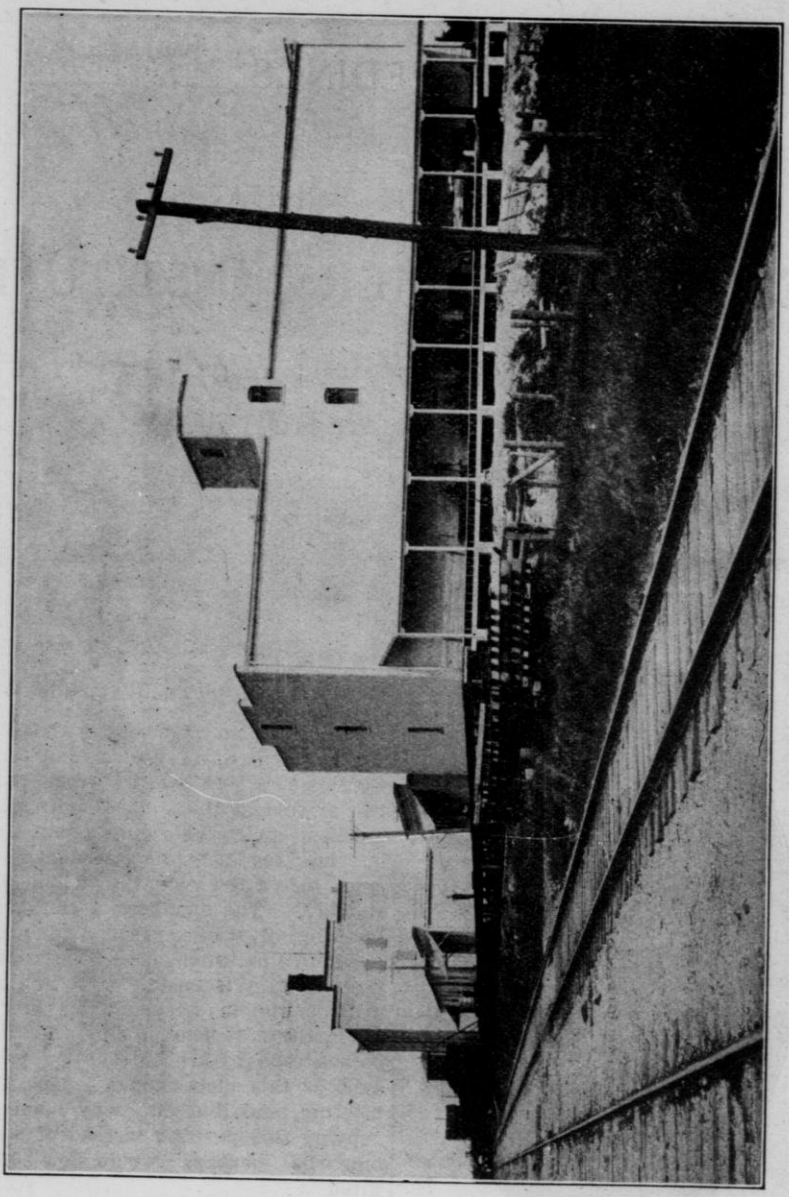
Mr. Krumrey.

ADDRESS OF WELCOME.

Mr. Henry Krumrey, Plymouth, Wis.

Mr. Chairman, Workers in the Wisconsin Farmers' Institutes, Ladies and Gentlemen: For over 30 years there has existed in this place a German Farmers' club, which during that time has met regularly once a month, except for a few months during the summer. The members of this Club, knowing of what great value the Farmers' Institutes have been to the farmers of Wisconsin, were chiefly instrumental in securing this Round-up Institute. That being the case, it was thought proper that the president of this club should open this meeting, and that is why I am occupying this position instead of some one who perhaps would be better fitted.

The work that the University of Wisconsin is doing as a whole and what it is doing through the Farm-



Cold Storage Plant at Plymouth, Wis.

ers' Institutes in particular, cannot be overestimated. I know that those farmers who have followed most closely what has been advocated in the Institutes are the ones whose farms have increased most in value; they are the ones who have the best cattle and horses, the best cows, and whose cows are giving the most milk, their sheep producing the best mutton and wool, and their hogs producing the most pork for the value of the food consumed. I also believe that those farmers' wives who attend the cooking schools held in connection with these Institutes and practice what is taught there, are the ones whose husbands are the least troubled with dyspepsia.

The people of Plymouth join with me in wishing you a hearty welcome to our little city, situated as it is right near the center of the banner cheese-producing county in the northwest. Plymouth is little only so far as population is concerned. In some respects we are quite important, and in order that you may get some idea of our importance, I want to call your attention to a few facts about this place.

First of all, Plymouth is the leading cheese market in all the northwest, just as Elgin is the leading butter market and Chicago is the leading live stock market; and any one all over the northwest, wanting to know what cheese is worth, will look for the quotations of the Plymouth Board of Trade first.

Nearly $3,000,000.00 worth of cheese was handled by the dealers of Plymouth during the last year. We have a cold storage plant with a capacity for storing 160,000 boxes of cheese, more than is stored in any other building in the state of Wisconsin, and I think perhaps I would be safe in saying more than is stored in any building in any neighboring state, and this plant is full to the top much of the time.

I do not know of a place in Wisconsin of the size of Plymouth that has more money invested in its schools; the census last year credited us with a population of 2,760 and we have $70,000.00 invested in school grounds, buildings and equipment, $60,000.00 of which is public school property and the balance parochial school property.

The citizens of Plymouth believe in municipal ownership, and they have a water and light plant which is a model in every respect, furnishing its citizens with water and light at a very reasonable cost.

Now, gentlemen, I suppose it has been the custom in other cities for the mayor to present to you the key to the city, but Mayor Ackermann informs me that here it will be unnecessary, as everything will be left wide open for you while you are here.

Now, I hope that this Round-up Institute will be a success in every particular, and I again wish you a hearty welcome.

RESPONSE TO ADDRESS OF WELCOME.

Mr. F. H. Scribner, Rosendale, Wis.

It gives me pleasure this morning to occupy this position at the start of of this Farmers' Institute here at Plymouth. I realize with the gentleman who has preceded me, that the Farmers' Institute work has indeed been a great work throughout the state. In traveling back and forth as we do through the country year after year, we have noticed great improvements, not only in the farms themselves but in the live

stock, and in fact all through farm operations, and we believe that the Farmers' Institute work has been a big factor in that improvement.

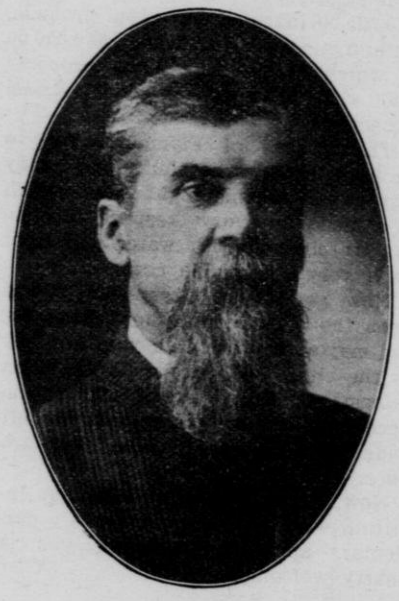
Of course, it has been a hard task on many of us to keep up the work, but still we feel that it has been time and money well spent.

We wish to thank the brother this morning for the kindly feeling shown toward the Farmers' Institute and the confidence he has placed in us in giving us the keys of the city, knowing perhaps that we will not take undue advantage of it.

Now, we hope there will be good general discussions on all the topics and that we may have a profitable meeting.

DIVERSIFIED FARMING.

Delbert Utter, Lake Beulah, Wis.



Mr. Utter.

Wisconsin is noted for its diversified scenery, making it one of the most popular summer resort states, affording the finest landscape effects, which are taken advantage of by the home builder, not always by the farmer, for he ofttimes does not appreciate as he should the beauties of nature that surround him, but by the city man who looks to the country for the best place for a real home. In the way of minerals and forests, nature has provided us with a great variety, as well as liberal quantities and of excellent quality, that add greatly to our wealth and general welfare. Our manufacturing industries are as diversified as our products, and our factories are turning out nearly every article for which there is a demand, ranging all the way from the insignificant clothes pin to the largest sized steam turbine engine. Our soil and climate are adapted to the growth of nearly every variety of crop that can be grown in a temperate zone. Conditions are particularly favorable to stock growing, as our soils produce an abundance of grasses and plants of varieties well suited to the growth of farm animals.

The first thought of every worker is that of profit, but the farmer should look a little further into the future than men in other pursuits. His profits depend upon the productiveness of his soil, and he should, therefore, practice such methods of culture as will not only conserve fertility, but increase its productiveness. Land is increasing in value, labor costs more, and farm machinery is more expensive; consequently larger crops must be grown to assure profits.

Variety and Rotation of Crops Conserve Fertility.

From experience we have learned that to keep up the fertility of our soils a variety of crops must be grown and a system of rotation followed that will improve and maintain the proper physical condition of the soil. If we can improve the texture to such an extent that it will appear like virgin soil we will be assured of good crops, even in unfavorable seasons.

Some leguminous crops should be grown in this rotation for cover crops, as the legumes have that property that enables them to obtain nitrogen from the air. No rotation of crops is complete without returning to the land the major parts of the crops grown upon the land after having been fed to some kind of live stock.

If these statements be true, and I think you will all agree that they are, then only by practicing diversified farming can we keep up the fertility of our farms, and if we cannot maintain and improve the fertility of our farms, then farming is a failure.

Diversity of Employment Beneficial.

We should diversify our crops to the extent that labor may be economically employed throughout the whole season, this applies as well to use of teams and tools. Help that is employed regularly is more proficient and usually of a better character. With regular hours for work and reasonable time for recreation, the help on the farm will be satisfied with life on the farm. This is as true of the boy on the farm and of fully as much importance.

The habits of the employer, as well as the employee, are improved when regularly and fully employed, and with a diversity of work the mind, as well as the hand, is educated and he has the same advantage over the man with a single purpose as does the mechanic who is capable of making a complete machine over the man who makes a single part. The latter is simply a part of the machine, and his work is not conducive to the best development.

Special Crops Vs. Diversified Crops.

Crops should be grown of such varieties as will enable the farmer to formulate a balanced ration from the products of his own farm. The protein feeds are the ones we have to buy and are always high priced. The success that many farmers are experiencing in growing alfalfa encourages us to believe that the time is near when the stock grower may be independent of the feed dealers. The protein crops are the nitrogen catchers. With the diversified crops we are pretty certain to be able to command good prices for some of them, and there is little danger of a general crop failure, as there may be where one crop is depended upon for profit. The localities where special crops are grown exclusively have not been as prosperous as where a mixed farming has been practiced. The prosperity of the farmers of Wisconsin is due mainly to the fact that they have taken advantage of the favorable conditions that enable them to grow a variety of products.

A Leading Crop Profitable.

While advocating diversified farming, I do not mean to leave the impression that we should not make a leader of some one crop or of some one kind of live stock. Far from it, for the system advocated makes possible the very best opportunity of successfully growing into some specialty, choosing according to our tastes, location, soil, markets and transportation facilities. In taking up any special crop, we should take into consideration the amount of

fertility necessary to grow a maximum crop and should not rob the balance of the farm to supply that fertility, as this course will sooner or later bring disaster. Where manure may be purchased, conditions are such that special crops may be grown regardless of the limitations prescribed, but such conditions are exceptional and do not exist to the extent that the general farmer can take advantage of them.

Diversified farming would not be a success, however profitable a balance was shown, unless it was broad enough and varied enough to make a home with influences surrounding it that would cause every growing member of that family to love the country, making the attractions of that home greater than the attractions offered by those that would allure them from the path that leads toward a life of right living. An ambition for a higher education should be encouraged, but with the fact impressed upon them that there is as much to be learned in the study of the science of agriculture as there is in any of the professions and there is no occupation more honorable or ennobling.

DISCUSSION.

The Chairman—I would like to know how many men in this audience are practicing diversified farming, how many rotation of crops. Well, I am glad to see a few.

A Member—Are you the gentleman from Racine county who raised $1,500.00 worth of melons on three acres last year?

Mr. Utter—I grew melons in Racine county last year.

The Member—I saw in the paper that there was a gentleman down there that did that. If you are the man, I want you to tell us how you did it.

Mr. Utter—It wouldn't come under this subject.

The Member—I should think it would come under diversified farming all right. That is the kind of farming Sheboygan county is after.

Mr. Utter—I grow melons by starting them in hot beds, so as to bring them into market early. I put them in the hot bed about the first of May and plant them in the open ground about the 5th to the 15th of June, planting them in sod, but your sod must have a sandy texture.

The Member—Were your melons sold in Milwaukee to commission houses, or how?

Mr. Utter—I sold them to hotels, groceries and restaurants. Melons are not grown largely in Racine county.

The Member—Wouldn't they grow in the same soil as cabbage?

Mr. Utter—No. A sandy loam soil is the only soil you can grow melons in successfully and get them early in this latitude.

The Member—In Waukesha county they raise a good many, don't they?

Mr. Utter—They grow some.

Mr. Hill—What fertilizer do you use for your melons?

Mr. Utter—I use sheep manure, any kind of manure. I never used much commercial fertilizer, but I am going to use potash this year and see if it will improve the quality of the melon, making it firmer as to texture, and perhaps better in quality otherwise.

Mr. Hill—In what form will you use that fertilizer?

Mr. Utter—I shall use sulphate of potash.

Mr. Geo. Hill—I gather from your paper that there is danger of robbing the farm with special crops, that is, they need to have returned upon them a good deal of manure. How do you keep up the fertility of your farm and raise crops for the market?

Mr. Utter—I am buying manure. I did rob my farm, as very many have

done in growing tobacco and other special crops, and on that account I put all manure I made on the farm on a few acres on which I grew these special crops, but now I am trying to improve the rest of the farm, buying manure from the sheep feeding yards.

Mr. Hill—In your district somewhere?

Mr. Utter—Yes, on the line to Chicago. You cannot buy sheep manure in Chicago; all the sheep manure from the Stock Yards in Chicago is dried and sold in bags the same as commercial fertilizers.

Mr. Hill—What do you pay for it as you buy it?

Mr. Utter—It costs us about a dollar a ton.

Mr. Convey—Do you deem it possible to keep up the fertility of the farm to its present condition or to improve it without buying something in the line of fertilizers?

Mr. Utter—I believe where good rotation is practiced and the manure is kept and used economically, that the land may be kept fertile. Perhaps that would not be true on all soils.

Mr. Convey—Don't you find that in nearly every case where feed stuffs are bought and fed on the farm the farm increases in productiveness.

Mr. Utter—Yes, I think that is true, and yet I believe it is possible without buying any feed to improve the quality of the soil.

Mr. Convey—In the long run, would not the potash and the phosphorous play out? You could keep up the nitrogen by growing clover, but those other elements of fertility would be bound to run out in the end.

Mr. Utter—I think we have a larger surplus of the mineral elements in the soil than we have of the nitrogen, and by the best culture and rotation we make available the insoluble elements of fertility that are in the soil.

A Member—Why do you buy potash?

Mr. Utter—I am buying it now on account of making my product of a better quality. My melon ground is manured well and I do not need it for fertility.

Mr. Convey—Don't you find in the case of a great deal of grain that you cannot get the grain to stand up, and isn't there a probability that there is a deficiency of phosphoric acid or potash or some element that does not give the right character of straw to the grain?

Mr. Utter—That is true, and it may be that it would be profitable to buy some of the elements in the way of commercial fertilizers, but as a rule I do not think I would advise it, because it is pretty expensive. I have no doubt, however, but that in the years to come we will buy it.

Supt. McKerrow—You would not advise it for the average farmer?

Mr. Utter—No.

Mr. Convey—I feel satisfied that the proper way to keep up the fertility is to keep stock, buying food stuffs and getting the additional value as a fertilizer for that food stuff.

A Member—As to general farmers, wouldn't you advise them to keep sheep and get manure that way rather than to go to the market and buy sheep manure?

Mr. Utter—Assuredly that would be the best. I do not think the general farmer can afford to buy manure, but where a man gets $100.00 an acre or more for his products, he can afford to buy manure, or some other fertilizer.

A Member—Don't you think it would pay a man to buy potash in order to stiffen the straw on his grain?

Mr. Utter—Yes, it might. I think the best way, however, would be to experiment in a small way and see the results.

A Member—The gentleman spoke about educating our farm boys so they will stay on the farm. Tell us how we can do that.

Mr. Utter—Well, I would give them some chance for recreation, make their home as pleasant as possible and give them to understand that there is as much to learn to make a good farmer as there is in the professions, and that it is just as honorable an occupation. Give them that impression throughout every day of their life, not only by what you say to them, but from the way you act around the farm. Too many farmers seem to think themselves that the farm is not the best place to live and they are looking toward some time in the future when they will come to Plymouth and buy a little home on a lot 35 feet wide and 125 feet deep and they give that impression to their children. We find today very many of the city men are sending their boys into the country onto farms, they are buying farms and sending their boys to the Agricultural College. I think the farmers are largely to blame themselves for their boys wanting to leave the farm.

A Member—Several of the agricultural graduates have been tried right around here and they don't do much good.

Mr. Utter—There are exceptions of course, but I do not think anybody will dispute that the Agricultural College has done wonders for the boys that have attended it, and to the community where they live afterwards. We have an Association of the graduate boys, about 800 of them, and I believe that association is doing as good work as any agricultural association in this state, and every one of them are boys who have gone back on to the farm from that college.

A Member—What per cent of the boys who have been through the Short Course there have gone back on to the farm?

Mr. Utter—I should say 90 per cent, if not more.

CLOVERS.

Geo. C. Hill, Rosendale, Wis.

The speaker who preceded me had something to say about the value of leguminous crops on the farm and also of the diversified farm with plenty of stock on the farm. He said it was best to keep stock on the farm, and we believe that is true for the Wisconsin farmer.

To feed that stock, we have two great crops, the corn crop and the clover crop, and we believe that the clover crop is next in importance to the corn crop as a feeding crop, and that outside of its value as a feeding crop, it has a value as a fertilizing crop. The clover crop should be on every farm and in every rotation of crops it should occupy a place. Its value to the land on which it grows is well known, and it should be grown in rotation, so that all parts of the farm may be benefited.

Fertilizing Value of Clover.

Now, we believe that the fertilizing value of the clover crop is larger than is generally supposed. At the Experiment Station recently over in Michigan, a farmer was requested to plant an acre of the different kinds of clover on his farm and then to send the crop after it was grown to the station for analysis, both the top and

the root, and in the Medium Red clover they found $24.56 value in fertility. Of course the whole acre was not sent, but a square yard was dug up, root and top, and sent to the Experiment Station, and that was the result they found.

If we had our manurial charts here, they would show us that there are about $8.00 worth of fertility in a ton of clover hay and that it is worth three-quarters of that in manure after it has been fed to the animal. We believe that a ton of clover hay, at present prices, is worth about $7.00 or $7.50, and that we could get two tons of clover hay per acre and that would give us in feeding value about $15.00, and then if we add three-quarters of that for the fertilizing value, perhaps $10.00 or $12.00 more, there would still be one-third of that crop under the ground that we would not harvest at all, which would remain in the soil and fertilize it, thus keeping the humus in the soil, which is a very important element, and altogether a good crop of clover is worth to the farmer from $30.00 to $40.00 an acre.

Its Feeding Value.

We know it is a very valuable feeding crop, because it contains so much of the element of protein, which is the element in feeding crops which costs the most, and the clover plant contains largely of it, much more than timothy or the other grasses, and so we believe that the clover plant and the clover crop to the Wisconsin farmer is a very important crop.

How to Grow Clover.

There has been considerable complaint about the failure to get a clover catch, because in the summer season after the grain crop has been cut off it has been found that the young clover plants dry up and there is more failure in that way than there is in the winter killing, which in former years used to be about the only way that we lost the catch. But we think that with live stock and the farmer handling his manures as he should, applying them on all the portions of the farm and keeping it in good cultivation, and the soil well supplied with humus, that we will avoid the summer killing of the young clover plant. Farmers in the southwestern counties of Wisconsin, some of those which have grown corn continuously, exhausting the humus from the soil by continuous cultivation, have found out that they cannot grow clover any more and they want to know if their land is clover sick. I believe that is what causes clover sickness, lack of humus in the soil.

Clover as a Gatherer of Moisture, Humus and Nitrogen.

I want to refer again to an experiment conducted by Mr. George T. Powell, a fruit grower, not in this state, who used clover for a cover plant in an orchard. Nothing was removed from the orchard but fruit, no other crop was removed. His orchard was kept in good cultivation until about the first or the middle of July and then it was sown with red clover, which remained on the ground through the winter until the next spring, when it was chopped up and cultivated into the soil and the cultivation continued again until midsummer. This was repeated for three years; a section of that soil was dug up, six inches in depth, it was weighed to see how much moisture it contained, then it was dried for the same purpose and a section of the soil in an adjoining field, the same kind of soil, but on which crops had been removed and no clover had been grown, and they were compared, and this was the result; that on an acre of the orchard soil six inches in depth there was found to be 46 tons

of water in excess of the land outside of the orchard. In addition to that there was a great amount of humus, I have forgotten the number of pounds, and there was a great excess of nitrogen and some phosphoric acid and potash. This shows the value of clover as a humus and nitrogen gatherer.

But, you will ask, where does it get the excess of phosphoric acid and potash? It gets it by sending its roots way down below these six inches in depth, bringing it up to the surface and putting it into the clover tops and the roots nearer the surface. We are told there is plenty of the mineral fertilizing elements deep down and the clover plant with its long tap root brings it up.

We had last year in one of our Institutes a red clover plant that measured four and one-half feet in length, and on the lower small roots there were a great many little nodules, which contained, we are told, the bacteria of the nitrogen.

Seeding the Clover Crop.

The best crop to seed with a clover crop we believe is winter rye, winter wheat comes next and spring wheat next, or spring rye is very good to sow clover with, then after that we take spring wheat and then what we call "succotash," which we are using on our farm quite a good deal; then comes barley, which is probably the poorest crop with which to seed. On our farm we think it is a calamity to be without the clover crop, so for that reason we have kept wheat on our farm when sometimes otherwise it was not a profitable crop, because we are more sure of getting a clover catch with that than with oats or some of the rapidly growing crops. Our neighbor, Mr. Scribner, uses spring rye and has found that a good crop to seed with. The rye ripens early, has less foliage than some of the other grain crops, and though the crop may not be as useful as the oat crop, we would sacrifice something in order to be sure of getting a clover catch.

We would not pasture young clover in the fall, unless it was going to seed; we would not put sheep or horses on it in any case. Turn in the cows and let them eat off the tops. We want the grain crop to leave considerable stubble, cut it pretty high so as to leave plenty of stubble for winter protection. There is great protection in a good stubble field. It keeps the snow from melting and helps a good deal to shade the crown, so that it won't freeze and thaw, which is so injurious to the young clover in the spring.

The clover crop is the best the first year and we would never undertake to keep it over two years, for that reason we do not advocate sowing very much timothy with the clover, unless to make a pasture of it. We do not sow any timothy with our clover, having a permanent pasture for the stock to run on. We like medium red and alsike mixed for hay making and for pasture as well, sometimes pasturing the second crop. The alsike mixed with the red makes a finer quality of hay.

Making Clover Hay.

Perhaps not much need be said about making clover hay. We all know it can be injured more easily than any other grass in curing into hay, on account of its broad leaves and its blossoms and its being exposed to dampness, dew or rain, or even to scorching sun, is very injurious to the hay, so it should be cut in good season, wilted and put into heaps, left remaining in those heaps from two to four days, until it cures quite well in the heap.

Possibly in wet seasons we need hay caps. In a season like the last

one, when we got very little clover in without being damaged somewhat by the rain, hay caps were found very useful things to have on the farm.

The poorest of all ways of making clover hay is to cut it down and let it lie until it is cured, then rake it up with a hay loader, breaking off the leaves and the valuable portions and so putting a lot of sticks and stalks into the barn, the feeding value of which is probably very low.

DISCUSSION.

A Member—What kind of cloth would you prefer for hay caps?

Mr. Hill—The subject of alfalfa is coming on later and hay caps will be talked about then.

A Member—After this hay is bunched up green, if there comes on a rain, would you immediately shake it out or leave it in the bunch?

Mr. Hill—As soon as the weather clears, if it is wet in a good ways, I should want to get it out and get it dry, but if it is not wet in more than six or eight inches on the top, and the weather comes clear and a good stiff breeze, it will dry all right. If it is wet clear through, then it must be spread out and do with it the best we can.

The Chairman—You said that the first crop is the most valuable. Do you mean the first cutting is more valuable than the second cutting?

Mr. Hill—No, I mean the first year.

The Chairman—We always think that the second crop of clover is very fine, especially for young stock, calves and other young animals. The first crop usually grows up rather coarse and rank.

Mr. Sears—I heard a gentleman say that the first crop was worth about $30.00 an acre, not making any mention of the second crop. In Calumet county we have raised as high as six bushels to the acre of seed out of the second crop.

The Chairman—We might have Mr. Hill's experience in raising clover seed in our particular locality.

Mr. Hill—We have not had but one crop of seed for many years. For some reason the blossoms do not come out good and it does not produce seed, we do not use it for that purpose.

Mr. Sears—Don't you think it would be better to run over the new seeding and clip it and let it lie as a mulch on the ground?

Mr. Hill—I think it would be, if you can get your mower high enough so as not to mow too close.

Mr. Sears—In our county we always make it a practice to cut the first crop especially early, not later than about the 10th of June. We get better hay and almost as much and we are always sure of a seed crop and the seed crop is worth more than the hay crop.

A Member—In bunching up this hay, do you put it in large, medium or small bunches?

Mr. Hill—That depends on what you mean by large and small. We usually put about two rakings into a heap. We would not have that heap over three feet wide at the bottom and we would run it up as high as we can have it stand, packing it down a little, and we build the heaps, not by rolling together, but by placing one forkful on another. You may say that is a good deal of work to make hay. Well, you can make hay easier, but you cannot make it any better in any other way.

A Member—I see Mr. Hill and Mr. Scribner put barley as the last thing with which to seed. In Sheboygan county that is the best crop we have to seed with.

Mr. Scribner—I think barley will go ahead of the oat crop for seeding and it comes off early, but we have had splendid success with the spring rye crop. We thought we would

rather sacrifice something in the grain crop in order to get a clover catch, but we found the rye crop was a very profitable crop. We found the grain crop was all right, 40 and 45 bushels to the acre.

A Member—How long do you leave the hay in the heap?

Mr. Hill—If the weather is drying, it will cure in two days, and I would not open it at all until we get ready to draw it.

The Member—Wouldn't you think it would cure better if you lifted it a little, loosened it and let the air pass through? Wouldn't it mold if you didn't?

Mr. Hill—No, I do not believe so; I never had that experience.

The Member—I have. The weather was fair and the rain came on; I had small shocks and it seemed to be very dry, but some of it was molded. I live in Manitowoc county.

The Chairman—We find in many of these colder soils it is more difficult to make clover hay. I know that farther north they have more trouble in curing clover hay than down here. The lake breeze has something to do with it, too.

Mr. Hill—Another thing, if we cut our clover before it is really in full blossom, it is very juicy and hard to cure, but if it is a new clover seeding, having a great deal of the old grain stubble, that helps to keep it from packing down, unless the ground is very wet below and the air is full of moisture above. In that case it might become packed too tight.

Mr. Sears—How long would you let it lie before raking after mowing?

Mr. Hill—Well, we usually cut before 11 o'clock, then we immediately run a tedder over it and run the tedder over it again in the afternoon about three o'clock, and before the dew falls we have it all in the heaps.

ALFA LFA.

Chas. L. Hill, Rosendale, Wis.

Mr. C. L. Hill.

The concentrate part of our feed ration is increasing in cost every year, and especially is this true of feeds which are rich in protein. With this thought in mind, it is easily understood why the raising of alfalfa is attracting increased attention in Wisconsin every year. When we understand that early cut, well cured alfalfa hay is as rich in digestible protein as wheat bran, we will begin to realize its true value.

Where Alfalfa Will Grow.

Up to a very few years ago it was generally understood that this plant would flourish only in the west and southwest, and the early failures to grow it in Wisconsin were evidently due in some measure to trying to grow it in the same manner as it was grown in the west. I have in the past two years seen it growing, and doing well, in many parts of Wisconsin and on the bleak hills around Lake Minnetonka in Minnesota, the hay being so plenty there that it was selling for $6.00 per ton delivered. In January I visited three days around Syracuse and Fayetteville, N. Y., and there are fields of it there 20 years old and many 10 years old and in good shape. It is revolutionizing the agriculture at those places.

The Best Soil for Alfalfa.

I believe it can be grown on any well drained soil in Wisconsin, but it seems to do best on soil with clay subsoil, with broken limestone foundation. It is the universal testimony that it will not grow well on soil where water is less than 4 to 6 feet from the surface. It was growing finely in New York on land where there was only 4 to 12 inches of soil on top of limestone ledges. Have the soil rich to start alfalfa.

Planting and Harvesting.

Lightly manure, plow in fall, work very early in the spring and then work it some more.

Sow without nurse crop, or with light seeding of grain, preferably barley, because it comes off early.

Do not cut a crop of hay the first year, but leave a good stand on the ground for winter protection.

Be sure to have good seed and sow 20 to 30 pounds per acre. I have here a sample of good seed germinating on cotton. The best seed costs 14½ cent per pound this year, so use it properly. It will not be so

expensive compared with clover seed as it seems when you realize that the seeding will last for a term of years.

The Hay.

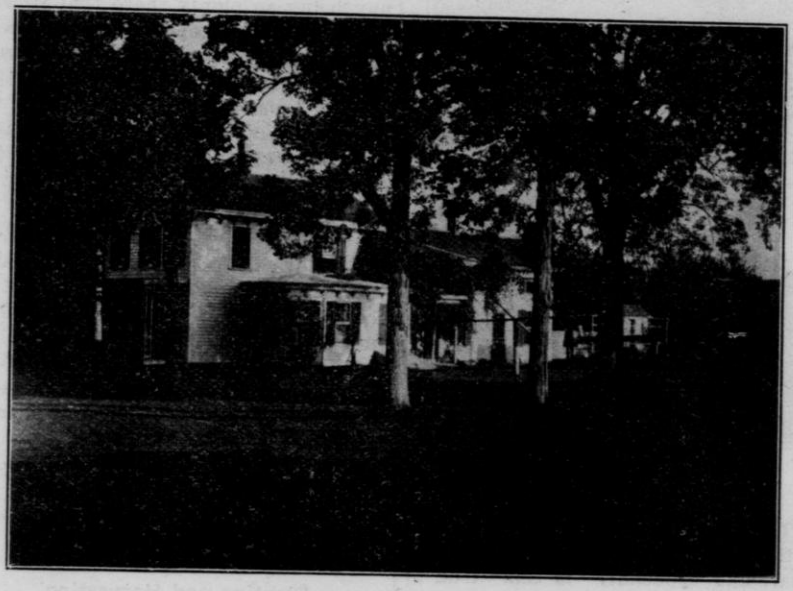
Cut it when 10 to 20 per cent of the blossoms have appeared, slightly curing in windrow, and finish under hay caps. I have a sample here of the cap I use. It is made of heavy, unbleached cotton, 40 inches square, with a weight on each corner attached with a string about eight inches long.

Let it stand in piles several days, moving the piles once if it is to stand more than four days, so as not to injure the plants beneath. My third crop last year was cut in the rain, raked the next day, when the water was barely off, and stood in the piles for a week. It rained or was dark and damp every day, and when a good day came a few hours sun cured it in fine shape. If the capping and moving seems like a good deal of work, remember that your bran costs you $14.00 to $18.00 per ton, and alfalfa is just as good. You would not think of leaving bran out in the rain.

The Feeding Value of Alfalfa.

What will eat it, you ask? I ask, what will not eat it? It is the first thing I ever saw that my cows would leave corn silage to eat. Mr. A. J. Lovejoy says that when ground with grain it is a most excellent feed for hogs, and chickens are very fond of it. I have never fed it to sheep, but am sure that the sheep feeder needs it as much as the cow feeder.

The farms need it, and it is the universal testimony that alfalfa when plowed under leaves the land in the very finest condition.



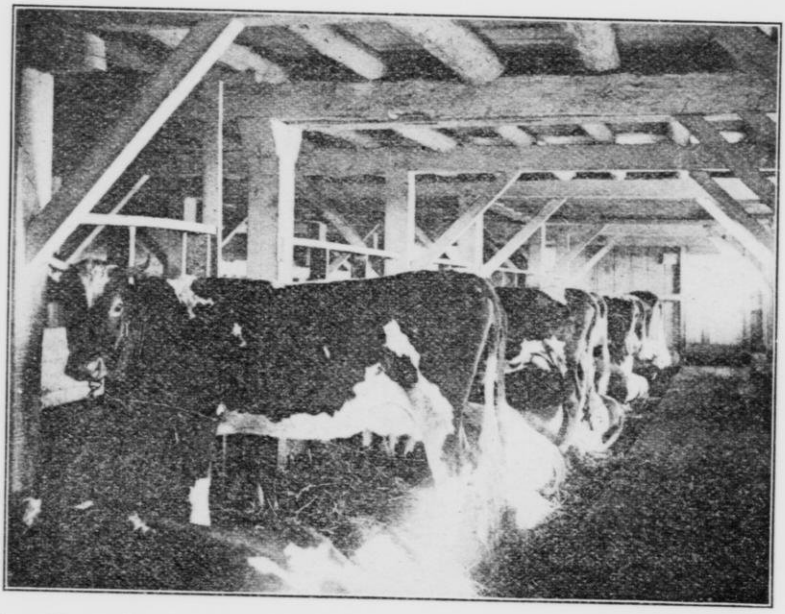
Farm Home of C. L. Hill, Rosendale, Wis.

Field of Alfalfa Hay Cocks with Caps on Farm of Ex-Gov. W. D. Hoard, Ft. Atkinson, Wis.

Alfalfa a Permanent Crop.

Alfalfa culture has passed the experimental stage in Wisconsin and I urge you all to sow at least a small piece this spring, and I am sure you will increase your acreage next year. I recently met a Chicago man whose farm was at Waukegan, just over the line into Illinois, who has been growing it a number of years and now has 120 acres in alfalfa.

Ex-Gov. Hoard and several others around Ft. Atkinson have been growing it for five years or more, and it will pay you I am sure to go there next summer and see it growing.



Cow Barn of C. L. Hill, Every Cow in the Sunshine, Barn Whitewashed.

DISCUSSION.

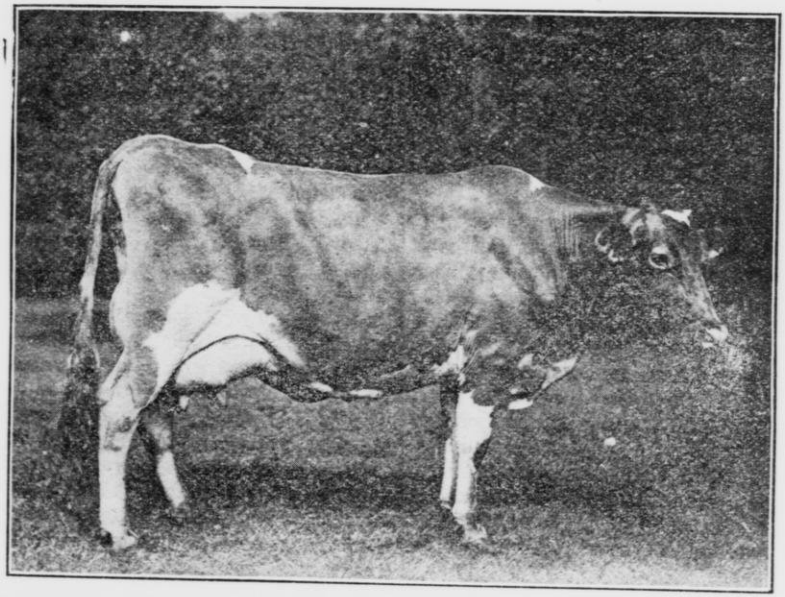
Mr. C. L. Hill—I have a cap here that was used last fall with clover and alfalfa. It is 40 inches square with a weight attached to each corner, they are old half horse shoes and they are all right, the caps never blow off in any of the storms we have had. Mr. Hoard is recommending another weight, a four ounce nut, because they are less liable to tangle. The cloth you want to call for is the same grade as Atlantic A sheeting, unbleached. It will cost you in this quality possibly nine to 11 cents. I think this cost 11 cents, but it is finer than necessary.

Supt. McKerrow—Somebody will ask if alfalfa will grow in Sheboygan county. Here is a sample grown in the southern part of your county by a gentleman who says he has been growing it 10 years, and it is more than 10 years since I saw alfalfa growing on the farm of L. D. Hill of Hingham. Another gentleman has a sample grown at Sheboygan Falls.

Mr. Hill—(Looking at samples) That should have been cut a little

earlier, I would cut it before it blossomed at all. There couldn't be anything much poorer than alfalfa when it is overripe. I bought some at Omaha to feed my cattle and it was so old I couldn't feed it, so I put it in for bedding for the old bull, but he wouldn't lie down on it.

Supt. McKerrow—Here are two samples grown in Sheboygan county.



Primrosedale 8606, Guernsey Cow on Farm of C. L. Hill. Official Yearly Record: 576.75 lbs. fat; 10,914.9 lbs. milk; 5.37 av. per cent of fat.

This gentleman has grown it six or seven years.

Mr. Nordman—Did you inoculate your soil to begin with?

Mr. Hill—No, sir, we did not. The first year I might say the hay was very uneven. Some weeds came in besides the alfalfa and there was also considerable white clover and wild vetch. Before the second crop I inoculated the lot, putting on a six acre piece that I had a wagonload of soil from another field where I had once tried it, and it showed a marked improvement above the previous year, the second and third crop growing better. Mr. Wing told us about alfalfa culture at Madison. You know you never can make a mistake in putting manure on an alfalfa field, and he says that where you expect to sow alfalfa, manure your land just before you plow it in and after that you won't be troubled very much about inoculation, but, mind you, he says it don't do to top-dress alfalfa after the first year; the roots get down so deep in the earth that manure put on top will have hardly any effect. That is the universal testimony around Syracuse where they raise a great deal of it.

The Chairman—Have you tried inoculating it from the roadside where sweet clover grows?

Mr. Hill—No, sir, sweet clover has

only recently come to our farm and I wish it hadn't. It is said to be true that the same bacteria affects it as affects alfalfa and earth taken from the soil that is growing sweet clover will grow alfalfa, will inoculate the field.

A Member—You will probably get the sweet clover seed, too.

Mr. Hill—I do not think we need to worry about that. It is my own observation that sweet clover will not grow where anything else grows. It is a waste plant. It will grow where nothing else will grow and alfalfa will do the same thing.

Mr. Nordman—Did your alfalfa develop those nodules on the roots like clover?

Mr. Hill—Yes, in some places. It was uneven, some of it was not over six inches high, and in other places it was two feet and a half.

Mr. Nordman—Yes, and the low places were the places where there were no nodules on the roots.

Mr. Hill—Yes, you would dig down there and find there were no nodules on the roots, or practically none, while in the other places there were plenty. What made the difference I cannot tell. The places where it was best was where years ago we had an onion bed.

A Member—How was it last year on those bad places?

Mr. Hill—It continued to improve all last year. It was heavily seeded all over and all it lacked was inoculation. I might say that the land was the poorest piece of land on the farm, and I am confident now that if I had manured it thoroughly I should have had no trouble.

Mr. Nordman—I sowed about 11 acres in alfalfa last year and none of it developed any nodules.

Mr. Hill—It will come later on, it will live through the winter and you will get them all right.

A Member—I found when I sowed some alfalfa seed that I got a dose of this sweet clover in it which I never had on the farm before.

Mr. Hill—Did the sweet clover die down after you cut it?

The Member—I pulled most of it out by the roots. Lots of people think it is worse than Canada thistles, that it will live through a rotation of crops.

Supt. McKerrow—We have had it for 15 years on our roadsides and in our fields, but it does not bother us in the rotation. Where do you get your seed, Mr. Hill?

Mr. Hill—I got it of Salzer, of La Crosse. Prof. Moore recommended it to me and it was remarkably fine seed.

Mr. Martiny—I secured some alfalfa seed at Madison and I also got some inoculated soil. I tried to grow alfalfa without inoculation, and by the fall I could hardly see any alfalfa on that strip, while on the strip that was inoculated it was about 18 inches high, so I think it would be impossible to start alfalfa up in Manitowoc county without inoculating the soil.

Mr. Hill—Mr. Wing is sure that if your ground is covered with fresh cow stable manure, that you will not be bothered about inoculation.

A Member—Wouldn't it be a good idea to sow a little alfalfa with your clover?

Mr. Hill—That is a good question. I never will sow a bit of clover seed without putting two pounds of alfalfa seed with the clover seed on every acre of land, and in that way your farm will gradually be inoculated.

SEED CORN.

R. J. Coe, Ft. Atkinson, Wis.

This subject of seed corn is one of very great importance to the farmers of Wisconsin, and I sometimes wonder how many of us really realize the magnitude of the corn crop of this country. I remember a few years ago, at a Farmers' Institute held in a school house, I picked up one of the text books, turned over the leaves and ran across this subject of corn, and the statement was there made that if all the corn grown in this country in one year was piled up in the city of Chicago and we could start and load a wagon with 40 bushels of shelled corn and start it on its way toward New York and start another load right behind it, it would make a good long string of corn, longer than I ever thought of. I asked the question once in a Farmers' Institute if they thought it would reach to New York, and one man said, "No, sir." Well, the statement in that book was that it would not only reach to New York, but it would go to London and then around the world, and then our story had just begun; it would go around the world again and again about six times.

Now, if this is true, and I cannot dispute it, it seems to me that it is worth our while to have the best seed in order to grow the biggest crops, and in order to get the best seed, it is worth our while to take considerable pains.

Farm Home of R. J. Coe.

Selecting the Seed.

I believe the best way is to select the seed in the field. I not only want an ear of corn that is good, that has lots of vitality, is of good form and is as nearly perfect as we can get, but I want an ear of corn that is grown upon a good stalk, that is well furnished with good foliage, because that kind of an ear will give the best food value in our corn. So, then, we

select our seed corn as it is standing in the field. We go through the field and when we find an ear of corn that pleases us, and upon a stalk that pleases us, a stalk that is well furnished with a goodly number of broad, healthy leaves, that is the ear we are after.

Now, having selected this ear of corn, we must either mark it in some manner or cut it. I prefer to cut the stalk at this time, take it to the outside of the field and let it cure in the shock, just as our shock is cured a little later on. Then, before we have any hard freezing weather, this corn is husked and placed where it is exposed to a current of warm, dry air, until it is very thoroughly cured. In this way we believe we have the best corn grown in the field and that we have preserved all the vitality of that seed and therefore we have the best seed corn. We all of us know that a goodly proportion of the corn that is planted in this country, or any other country, has a very low vitality; in fact, I believe that 40 per cent of the corn that is planted ought never to be planted at all, and a crop that is of so great importance to the Wisconsin farmer ought to have the advantage of the best seed that can be grown, and every planter ought to know to a certainty that he has the very best of seed.

Now, Mr. Chairman, I do not care to make a long talk, but I do want to say this much; before you go into your field to select your seed corn, you want to have a type of corn in your mind that you want to select for, and then select every ear as nearly as possible to that type. Do not select an ear of one type this year and the next year select an ear of another type, but get it uniform, have the type you want clearly defined in your mind, and then select every ear as nearly as possible to that particular type. Follow this up year after year and it will only be a few years before you will have a type of corn that when you take it to market or have it in your own crib, you will be proud of.

DISCUSSION.

A Member—What kind of corn is that No. 7 that is spoken of in the "Wisconsin Agriculturist?"

Mr. Coe—I do not know.

Mr. Martiny—Wisconsin No. 7 is what they call the Iowa Silver King. I grew it this last year for the first time. It is a white corn, and down in Sauk county it matured about the same time as the North Star and the Pride of the North and it very greatly out-yielded those two varieties.

The Member—Would you recommend it for this section of the country?

Mr. Martiny—I hardly think I would, it is a little bit too late.

A Member—I have a sample out in the exhibit room that I grew up in Manitowoc county.

A Member—No. 7 in Sheboygan county was pretty nearly a failure this year, it is too far north. They recommend another corn, No. 8, for these northern counties.

Mr. Everett—This No. 8 corn is what was known in Minnesota as No. 13, it is a yellow corn, quite early, which was developed by Prof. Hays. He propagated it and developed it until he got a corn that was a very good producing corn for the latitude of St. Paul, Minn., and they brought it in Wisconsin and called it Wisconsin No. 8. It is a yellow Dent corn, and I should think that would be better developed in this part of the state.

Mr. Coe—The statement that a certain kind of corn will do well in the northern counties of the state is somewhat misleading, because we probably all know that in the western part of the state, the limit is very much farther north than it is in

the eastern part of state, the corn belt starting from Racine county runs way up to the latitude of St. Paul. It would seem to me that on this side of the state the Flint corn might be better than the Dent varieties.

A Member—The Flint corn is all right, the Summer Yellow or Canadian, but the stalk is so small.

Mr. Nordman—I do not take much stock in this matter as the gentleman has stated it. I planted Dent corn for two or three years and got a certain amount of feed for my silo. This year I planted Flint corn of a variety that matured in that country up there in Waupaca county, and off of my nine acres I got more fodder than I did before off of 12. It was done by planting it a little closer, I got just as much corn to the acre and a great deal more fodder.

The Chairman—You raised this crop in Langlade county. Did it mature there?

Mr. Nordman—The Flint did, the Dent did not, but that was very much on account of the season two years ago.

A Member—Where would you keep dry seed corn?

Mr. Coe—It is best to have a loft of some kind and if you have a loft where the kitchen chimney goes that is a good place, but put it thin enough so you get a good circulation of this warm air. I have a place where there is a slat floor and the air goes through there and dries it, but be particular that you save your seed corn before a hard freeze comes, because if it is full of moisture, then the hard freezing weather comes and it is liable to injure the germ.

Mr. Convey—If the corn is thoroughly dry, you can subject it to a lower temperature after that. I saved quite a lot of seed corn one year and had a lot left over. It was very satisfactory the first year, but the second year it would not grow at all. I am satisfied that if you have damp weather, it will take up enough moisture to spoil it later on.

A Member—Sheboygan county farmers, nine-tenths of them, have their corn hanging up in the barn under the eaves.

Mr. Coe—It may grow pretty well, but I do not think it is the best place. If you will take a little more pains with it and be sure to keep it dry, I am sure it will pay.

Mr. Martiny—What method do you employ in testing your seed corn?

Mr. Coe—Just about the same method that Mr. Hill does in his clover seed. Get a common pie tin and a piece of canton flannel, moisten it, put your seed on that and another tin over it and keep it warm.

A Member—If a man saves his seed corn and treats it the way it should be treated, I do not think there is any need of testing it. I never have done it for 40 years.

Mr. Coe—It is a measure of safety. I had a neighbor who a few years ago said that he had never tested his seed corn, and it never failed, but that season was pretty cold and wet, particularly in the spring, and it failed him and he had to go and buy some seed at a high price, and he had a failure that year.

CORN CULTURE.

Thos. Convey, Ridgeway, Wis.

He who would not consider it important to secure sound seed of a good variety, never can expect to make a success of corn growing.

Independent of this, there are two important divisions of corn culture; the first, the condition of the land, the second, the cultivation of the crop.

Some Erroneous Ideas Corrected.

It is a common opinion that only the best land on the farm can be expected to yield a satisfactory crop. The system of farming is not right if that is the case. All parts of the farm that are cultivated should be capable of producing a good crop, because if not capable of producing good corn, it is not much good for anything else.

No farmer who is worthy of the name ignores rotation of crops. It is a necessity and no crop is more satisfactory in a rotation than corn. There is a mistaken notion that corn does not take much from the soil. It takes about twice as much as oats and about three times as much as wheat in fertility to make an average crop in each instance, and yet all crops do well after corn. Our system of cropping is a three year rotation, being corn, small grain, usually oats, then grass, mostly clover, to be followed by corn, the grass being top-dressed with manure. Since using a manure spreader, the entire field is top-dressed. The manure is applied just as soon as the hay crop is taken off and during the fall and winter, the earliest applications giving the best results.

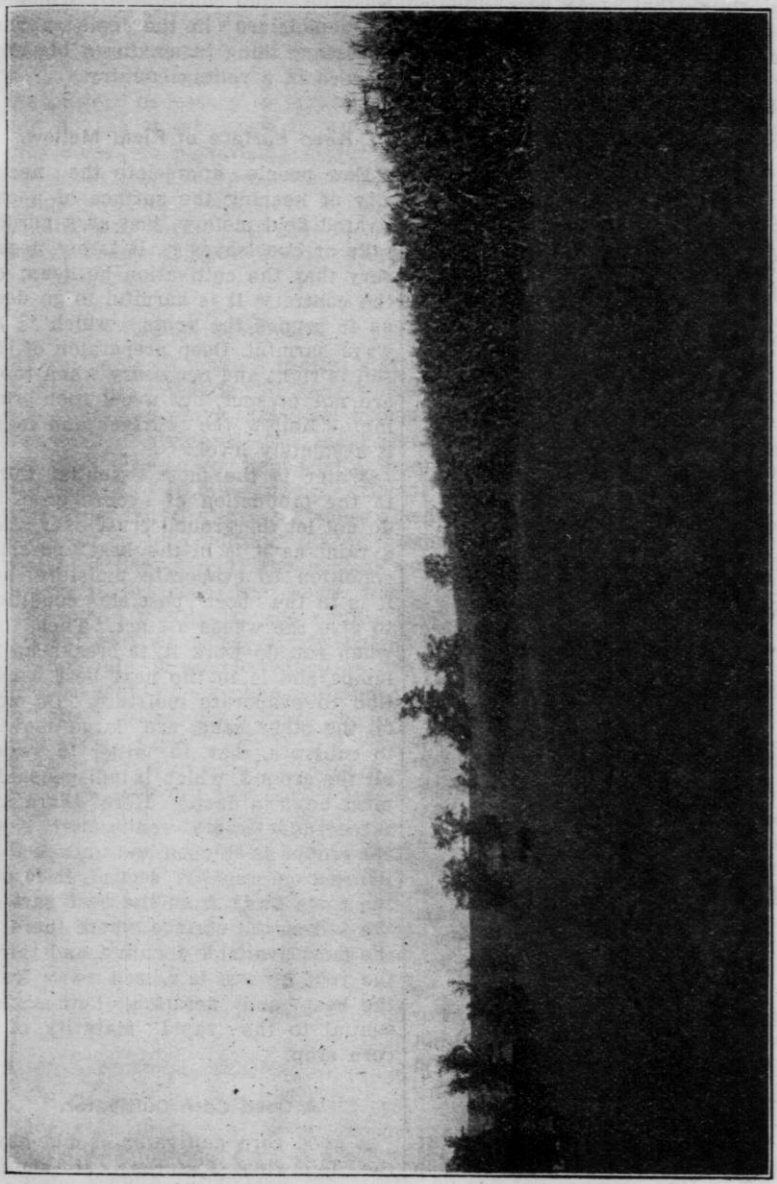
When to Plow for Best Results.

Everything is spring plowed. Twenty years ago I was an advocate of fall plowing for everything, but I know better now. This, of course, in connection with clover growing. If any one is fool enough to think he can keep a fall plowed field in as good condition as a clover field, especially for corn, he had better experiment a little and find out. We have been at this now for 20 years and it is no experiment with us.

There is a little uncertainty in spring as when to plow. If the season is dry, it is safer to plow early, as the growing crop may rob the land of moisture, and in no case should it be deferred until the crop gets woody, as in that case it does not decay rapidly and would injure the corn.

Grass land top-dressed with manure does not dry out rapidly and we usually leave it until the second week in May. As soon as we start to plow, we harrow after the plow, working the ground when the least work will do the most good, and just as soon as it is worth while we start the planter, thus one team is kept plowing, the other harrowing after the plow, then planting, then harrowing after the planter. Poor results would be obtained with spring plowing if it were allowed to get cloddy and dry before the harrow was used. A sharp harrow with upright teeth is the best implement that can be used in a corn field. It took me over 20 years to muster up courage to use it as much as we do now, which is until corn is six inches high at least.

Always use plenty of seed (not more than 10 per cent of corn fields



What a Corn Crop Should Be.

have a good stand), then an occasional stalk that may be uprooted with the harrow will not leave a thin stand.

Care of the Field After Planting.

We harrow immediately after planting, after every rain as soon as the ground is sufficiently dry, and once a week if it does not rain. When corn is six inches high, start a two-horse cultivator, and close after this a weeder. The latter is an excellent implement in a corn field when rightly used, but will neither pull weeds nor work hard ground. That is the reason we run after cultivator, as the secret of killing weeds is to work all the ground and never let the weeds get established. By carefully looking after the crop the first six weeks, it is comparatively easy to keep the field clean. When corn is first coming up I prefer to quit for a few days, but not too long.

Drilled vs. Check-Rowed Corn.

All our corn is drilled and after following the system as long as we have it makes me smile to hear the corn experts state positively that you cannot keep corn clean unless check-rowed and worked both ways. We have plenty of opportunity for comparing both systems here. We keep our field cleaner and with less labor than any check-rowed field I have seen; not one year, but every year, wet or dry, and we can raise more corn. Our early corn used to be check-rowed and the late drilled. For feed and silage, drilled corn, if not more than two weeks later, would mature as early and outyield it every time.

In laying out rows, we pay no attention to margin of field, but start in the direction that will give us the largest number of level rows that it is possible to get in the field. This is easier to cultivate and cut, will wash less, and consequently will hold more moisture in the soil, a very necessary thing in making a big crop of corn in a rolling country.

Keep Surface of Field Mellow.

Few people appreciate the necessity of keeping the surface of a cultivated field mellow, just as a garden rake or hoe leaves it. It is not necessary that the cultivation be deep; on the contrary, it is harmful to go deep as it prunes the roots, which is always harmful. Deep preparaion of the soil is right and necessary when roots are not present, but avoid root pruning. Mellow the surface and leave it absolutely level.

Water is the most essential thing in the production of a corn crop, so do not let the ground crust over after a rain, as it is in the best possible condition to evaporate moisture, but it is in the best possible condition to give the weeds a start. Then, too, when you do work it, it breaks up in lumps and is in the next best condition to evaporate moisture. Do not, on the other hand, use large shovels to cultivate, that, in order to work all the ground, which is indispensable, must be run deep. Here there are three undesirable conditions; first, the ground is so open and uneven that it dries out rapidly; second, it forces the roots away from the best part of the soil at the surface where there is the most available fertility, and third, the root growth is forced away from the heat and aeration, both so essential to the rapid maturity of a corn crop.

A Good Corn Cultivator.

A good corn cultivator should have the following features. It should work all the ground to a uniform depth, the latter being adjustable, and it should be left level and finely

pulverized. The system of cultivation still much in vogue, of large shovels running at right angles to the line of draft, could not be arranged on a worse principle. They double the power necessary to move them and do the worst possible work, as they have no pulverizing power and leave the ground open, uneven and lumpy. Could you move it at all and have it worse? It goes to show we do many things without rhyme or reason.

A Radical Statement.

I am going to make a radical statement. My object is to have somebody to try to prove that I am wrong. I am fully convinced that the growing crop, I mean corn especially, can take moisture from a damp atmosphere through its roots where the soil is in proper condition, that is, has plenty of humus and the surface is mellow. In those dry years when corn would roll up in the middle of the day and we would almost expect it would die, it would freshen up and look all right if we had a damp atmosphere, especially where the surface was mellow.

When to Work the Corn Last.

I have given a rule for the last working of corn. It should be after the last rain. Now, you cannot always do this, but get just as close to it as you can. That last working pays big wages. It may be that it will have to be done with a single horse and little cultivator, but the pay is sure.

DISCUSSION.

Mr. Convey—One other matter that I neglected to speak about is the necessity of planting corn at a proper depth. I know throughout the northern part of this state and on the east side, many of you mark your corn both ways with an implement that goes down two to three inches in the soil; then you go down with a hand planter and generally more than that, it will go in a great many cases five or six inches deep, and this is enough to kill good seed, you cannot raise corn satisfactorily that way. I believe everybody should plant with a horse planter, and it should always be shallow, not more than two inches deep in the ground and uniform. If I only had 10 acres of ground to plant, I would have a planter. One planter will plant all the corn in the neighborhood. I spoke to my friend, Mr. Nordman, about the necessity of planting with a corn planter. They were not in use in his locality and I am satisfied he is satisfied that he gets much better results planting with a corn planter. If you go to work with a harrow you are pretty sure to bury the corn too deep, and after deep planting the result is your corn won't come up within two weeks and it won't have the same vigor, so prepare your ground well and plant it shallow.

A Member—How soon would you harrow after it is planted?

Mr. Convey—Right away. You cannot afford to let it dry out, and the weeds will start up. Run it over as soon as possible.

A Member—You follow the planter with the harrow?

Mr. Convey—Yes, right close after the planter.

A Member—Would you disc your land before you plant it?

Mr. Convey—No, not with spring plowing, it is not necessary. We give it a good harrowing. We plant after clover, leave it seeded down one year, and it breaks up very nice if you harrow right away after plowing.

A Member—That would depend upon the soil a good deal. How deep do you plow?

Mr. Convey—Five or six inches deep, not more than that.

A Member—Wouldn't your drag disturb the seed one or two inches deep?

Mr. Convey—Oh, no, it doesn't pull the seed out at all.

A Member—What kind of a plow do you use?

Mr. Convey—A sulky plow. We have not used a jointer, but I know better work is done with a jointer. Ours is prairie loam soil.

A Member—Is it best to manure the land in the fall and plow it, or manure it in the spring and plow it?

Mr. Convey—We manure the land as soon as we get the hay crop off. I notice that the early manured land gives the best results. Spring manuring is bad for corn if you do not have rain enough to leach out the fertility from the solids and get it into the soil. We plow as early in the spring as we can and plant. In a dry season late spring plowing would take moisture out of the land. Fall plowing is all right for corn, but I find I can handle my land more satisfactorily and have less weeds on spring plowing. I have fall plowed for corn and top dressed with manure, and it was all right, but you have a lot of weeds. People who want to keep their land in the best condition, want to keep a growing crop on their land as nearly all the time as possible.

A Member—Did you ever plow the land in the fall and top dress in the winter?

Mr. Convey—Yes; I used to recommend that way, but I get better results the other way and cleaner land. We have no difficulty whatever in keeping our corn land clean, and by our method it also prevents washing and blowing.

A Member—I notice up north, wherever the ground is very rough, it is necessary to plow the clover sod very late, so as to have the soil rather thin and keep it from washing away.

Mr. Convey—I am not alluding to land that is cropped with grain crops in a locality where you have a stiff clay; I am speaking of clover sod. Clover sod will always dry out rapidly after rain. People who follow the other system should begin with the harrow early, because the land has not enough humus in it, and it will dry right out rapidly, so you want to get in just as soon as the ground will work well after a rain.

A Member—I always think it pays me to harrow with the disc harrow once or twice over my plowed ground before I would get ready to plant, with spring plowing.

Mr. Convey—Our land is just as fine as you can get it just as soon as we plow. I have a photograph here that will give you my idea of what a corn crop should be, and this corn was all cut for husking purposes. I did intend some of that for silage, but we didn't need it. That is a corn crop that amounts to something. This year there were parties from this county who raised 80 to 100 bushels to the acre, shelled corn, not baskets but bushels.

A Member—You are not in quite so good a corn country as Mr. Scribner?

Mr. Convey—Mr. Scribner is a remarkably good corn man. Our climate is a little better than his.

A Member—How do you plant corn for husking?

Mr. Convey—About three feet eight inches one way and six inches the other way.

A Member—What difference is there in using a round toothed harrow or a square toothed harrow?

Mr. Convey—I didn't say either of those. I said a sharp harrow, and if it is sharp it doesn't make any difference whether it is round or square, because that part doesn't get in the ground. A perpendicular toothed harrow will do better work and less damage. I have tried them both on the same field, the perpendicular and the slanting toothed.

A Member—Is that the same thing as a drag?

Mr. Convey—Yes, I call it a harrow and you call it a drag. One of the principal advantages of a short rotation is that it removes the danger of cut worms, wire worms and white grubs. Where clover is used in a three year rotation and corn follows clover, we have no trouble with these pests. The cut worm is the offspring of a moth and the others of beetles, the click beetle being the parent of the wire worm and the June bug of grubs. Both wire worms and grubs remain from two to three years in the pupa state and feed on roots. The eggs from which they are produced are usually laid in timothy or blue grass sod.

SUGAR BEETS.

Geo. W. McCormick, Menominee, Mich.

The introduction of sugar beets as a farm crop into Wisconsin has met with the usual obstacles that every new agricultural industry must contend with before becoming established, but it is most gratifying to note the steady, healthy development of sugar beet growing in this state. You are all familiar with the years of hard work expended in getting the dairy industry established, until now it overshadows nearly all others in which our farmers are engaged. The lack of knowledge on the part of our Wisconsin farmers as to how this crop should be grown and the necessary preparation of the soil and the several benefits to be derived, was the greatest barrier and many thousands of dollars and much per-

Beet Field of Miss Everard, Brussels, Door Co., a 16-year-old girl who has taken care of two acres.

Sugar Beet Field Cultivated by the Farmer and his Family.

sistent labor have been expended on the part of the state and the sugar factories, until now it has been demonstrated in nearly every part of Wisconsin that our soil and climate are splendidly adapted to sugar beets and the farmers can make a financial success in growing them.

The Soil and its Preparation.

As to the kind of soil upon which beets can be grown, it may be broadly stated they will grow successfully on any fertile, well cultivated soil, except very light sandy soil or light mucky land, if the field is reasonably well drained.

The field for sugar beets should be carefully prepared in the fall. If possible it is best to plow under a good second crop of clover and if that is done it is only necessary to plow once, but that should be deep, and the plowing should be done not later than early September.

If a grain stubble is selected, it should be plowed over about three or four inches deep as soon after harvesting the grain as possible and given a harrowing right after the plowing. This will allow the foul seeds to sprout, and another harrowing after the weeds put in an appearance will kill most of them and save much labor the next year. Then a good coat of barnyard manure should be spread over the field and in October it should be plowed deep, eight to 10 inches, depending upon how deep the field has been plowed heretofore, as it is not wise to turn up more than an inch of green or unsubdued soil in any one year. One thing should not be neglected, and that is the running of water furrows to carry away your surface water so the field may soon dry up in the spring and allow you to get in it early. As soon as the land is sufficiently dry in the spring, it should be gone over with a disc harrow or spring tooth cultivator and well worked up, this will warm up the soil, conserve your moisture and give the weeds a chance to sprout. Then when you are ready to seed, which will normally be from April 20th to May 20th, go over the field again and cultivate it thoroughly so as to get a smooth, well pulverized seed bed, and just before seeding go over it with a float or plank, or, if sandy soil, a roller is all right.

The seeding can be done with a garden drill or a regular two or four-row beet drill. Two very important things should be noted here; the seed should never be planted over three-fourths of an inch deep, and half an inch is better, and never less than 15 to 20 pounds to the acre should be used. The rows may be from 20 to 24 inches apart, that is wide enough for horse cultivation.

Cultivating the Crop.

Under normal conditions the plants will come up in from seven to 12 days after seeding; and as soon as you can see the rows you should go through with a cultivator, a fine tooth cultivator or regular beet cultivator will do best.

When the plants are up so they have the fourth leaf, then start in to block out and thin, never wait longer if you can avoid it, as it injures the plant and costs much more labor if this work is delayed until the plants get large.

The person who does the blocking takes a sharp hoe about seven or eight inches wide and cuts out the plants, striking crosswise of the row, leaving a little bunch of plants, say an inch long, between the strokes and then the person thinning follows and pulls out all but one plant in a place, thus leaving a beet every eight to 10 inches apart. After this work is done, it is only a question of going

through frequently with a cultivator, and, if necessary, cutting out the weeds.

The leaves grow rapidly and about the last of July or first of August the rows close up and nothing more is to be done until harvest.

Best Method of Harvesting.

As the sugar beet grows down in the soil it is not possible to pull them out by hand in harvesting until they are loosened up, and the best tool I know of is a subsoil plow, or an old plow with a very narrow shear and the mouldboard cut off at least half way down. Drive the plow immediately to the left of the row you want to lift, getting partly under the beet, and as the plow goes along you lift the beets up just enough to make them loose, so you can readily pull them by hand. The person doing the pulling takes two rows, pulls a beet with each hand, knocks them together to get the dirt off, and throws them in piles of a wagon load each. This done you can take a topping knife and cut off all the crown upon which the leaves have grown, throwing the beets in one pile and the tops in the other, then cover the beets safely with the tops and you are ready to ship.

All of the sugar companies furnish the seed.

Why Grow Sugar Beets?

Why should farmers grow sugar beets? By so doing:

1st. They are encouraging the manufacture in this country of a very important food product that is being largely bought from foreigners, thus they would keep their money in this country and at the same time support an industry that opens up a market for another farm crop.

2nd. Because it is exceptionally profitable, as can be proven by the fact that over 4,500 Wisconsin farmers in 1905 took from $50.00 to $100.00 per acre from their beets.

3rd. Because the crop is contracted for and sold at a good price before the seed is planted.

4th. Because it does not take from the soil more than any ordinary farm crop and leaves the land in a splendid condition for the succeeding crop.

5th. Because most of the work can be done by boys and girls who would not be able to do other heavy farm work.

6th. Because you can realize from one acre of good beets as much as you can from five acres of grain or hay and then have the remaining four acres left over for other crops, and last, but not least, it is another crop to introduce into your rotation.

There could profitably be very much more said of this crop, but your time would probably not permit it.

DISCUSSION.

(Lead by Supt. McKerrow in the absence of Mr. McCormick).

The Chairman—How many men in the room are growing sugar beets? Only two.

Supt. McKerrow—And how many have grown sugar beets for factory purposes and have quit? I see one.

A Member—What has become of the organization that started up in Plymouth four or five years ago and rented 40 or 50 acres of land? We know how they came out.

A Member—I know a neighbor of mine who made $61.00 off of one acre, net. He had quite a little help from his neighbors that didn't cost him anything.

The Chairman—That is where the "net" came in.

Supt. McKerrow—Some Wisconsin farmers are getting most excellent profits from their sugar beet crops.

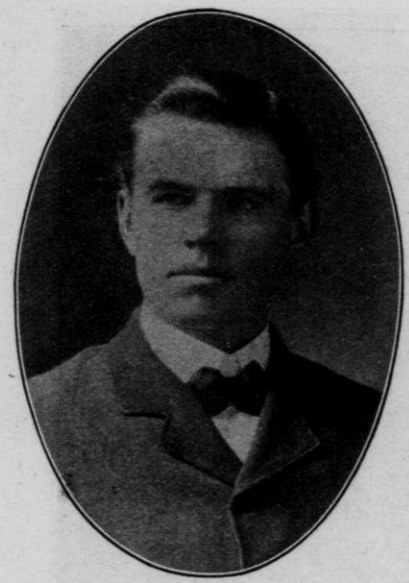
Adjourned to 1:30 p. m.

AFTERNOON SESSION.

Convention met at 1:30 p. m. Mr. Thos. Convey in the Chair.

SWINE BREEDING.

L. P. Martiny, Chippewa Falls, Wis.



Mr. Martiny.

On nearly every farm in Wisconsin some hogs are kept for breeding purposes and the manner in which the breeding is carried on may be classed under three quite different classes.

Those of the first class, and they are altogether too small, are those that are taking great pains in the selection and breeding of their hogs, using nothing but the best pure bred stock and disposing of a large proportion of their stock for breeding purposes to be used in the improvement of other herds.

The second class would be those farmers that are exercising good judgment in getting pure bred sires and selecting the best female they have, whether pure bred or grade, and using this class of breeding stock for the production of hogs for pork.

Those belonging to the third class, and they are altogether too numerous, are those farmers who are paying no attention to their breeding operations, using such breeding stock as happens to be the handiest, without any thought of improvement or what the progeny is going to be.

A Profitable Field for Young Farmers.

In commenting on these three classes of swine breeders would say, first, there are not enough good swine breeders of pure bred swine. I do not mean to advocate that every farmer should be a breeder of pure bred swine, but there are a great many that could take up this line of breeding and not only improve their own herds, but those of their own locality. In this state there are a great many young men on farms and about to go to farming. Among them are a great many who have taken the Short Course in Agriculture and the Farmers' Course at our College of Agriculture. I would say to these men that from my own experience I have found the breeding of pure bred swine one of profit and it has afforded a great amount of pleasure. At first thought, a great many may think the breeding business would soon be overdone on account of too many

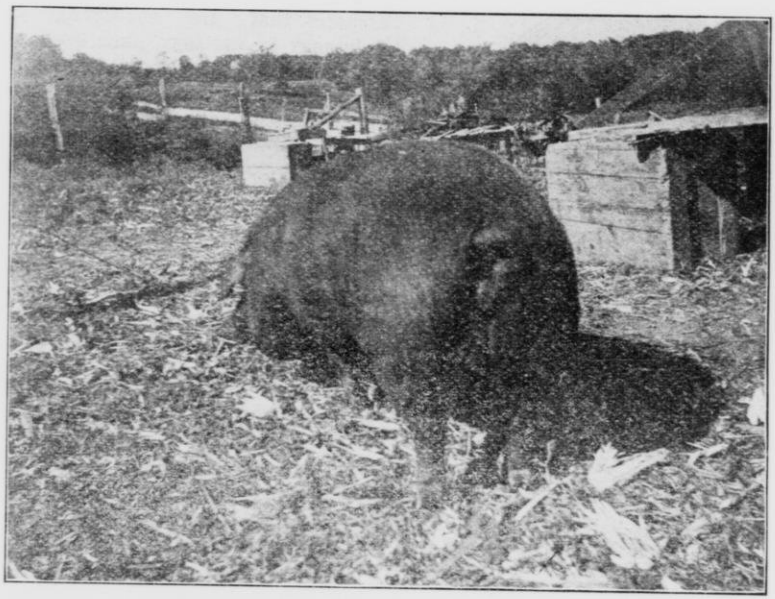
breeders, but I do not think so. With more breeders of pure bred hogs would go an education to the more indifferent fellows and the swine themselves, if they are of the right kind, would stimulate their own demand. I have heard so many say in answer to this, "that would never work around here because the farmers here do not appreciate the value of good hogs and they would not patronize you." In answer to that I would say, that is the very best place to start to build a herd, for human nature is nearly alike everywhere, and they will soon learn to appreciate when they see the profit to be derived from using good breeding stock. There is plenty of room at the top for the best breeders.

Concerning the second class of breeders, I have nothing to say. The farmer that is using nothing but pure bred sires and using his best females, using mature stock as much as possible in producing hogs for pork, is on the right track and is always going to make some money.

Successful Breeding Must be Systematic.

Concerning the third class, will say that as one travels over the state and notices the inferior, nondescript stock that is being used, he will be surprised; no definite system being followed, going on the supposition that a hog is a hog and one hog is as good for them as another. They breed from immature stock, without any regard for their breeding, type or conformation.

So many times we hear a man say, "I have tried this breed and they seem to run out; they are not what they should be, I guess I will try some other breed and see what they will do for me," so he trys some other



Ideal Girl, 251,206, Poland China Sow, Property of L. P. Martiny.

breed with about the same results, and then he is ready to try some other. If he would stay by one breed and use judgment in selecting the best individuals from the breed he has, he would make better progress and get more improvement. Do not think that any breed is your salvation. Any breed will do for you in just the proportion you do for them. The man that is a true admirer of a certain breed and has been successful in improving that breed under his selections, breeding, care and management, has a greater appreciation of other breeds and their merits than the man has that is continually changing breeds with the hope of finding something that is going to work wonders in the improvement of his herd. Stick to your breed and learn to appreciate that you are to blame and not the breed.

Prize-winning Yearling Poland China Sows, owned by L. P. Martiny.

Some Points to be Noted in Type.

No matter which breed we choose, they should all have about the same type and standard of conformation, for they are all intended for the same purpose, namely the production of pork. We would note the different breed characteristics in the different breeds, such as a black color with nicely drooping ears in the Poland China, a dished face and upright ears in the Berkshire, and the white color in the Chester Whites, but the best individuals of these breeds should be very nearly alike in shape, type and conformation.

The first thing we should look to in the improvement and selection of our breeding swine should be the sire. This is very important, as it is a law in breeding that the progeny partakes more of the conformation of the sire

and more of the disposition and temperament of the dam, so it is very important to have a well bred, good individual for the sire.

The first thing I would note when I looked at him would be that he was a strong, vigorous, growthy fellow, with plenty of energy and lots of vigor. I like to see a nice head, not coarse but showing strength. Nose not too long, face nicely dished, wide between eyes and ears. We like them wide between the eyes and showing a good broad forehead, because any animal that has a wide forehead usually has plenty of brains and intelligence. Some may ask why we want brains and intelligence in a hog; he don't know anything and is always on the contrary side anyway. We have found by experience that the most intelligent hog is the best dispositioned hog, that means he is the best feeder. A hog that is long in the head, narrow between the eyes, is usually a bad dispositioned hog, and we know a restless dispositioned hog is never a good feeder. Such a hog converts too much of his feed into energy and energy never weighs anything.

We want a wide, straight back, and we want this hog to be of even width throughout his entire length; not cut in back of the shoulders, or at the loin, or running to a point behind. He should be as nearly parallel in his top and bottom lines as possible. It would be a serious defect to have a droop behind the shoulders, or drooped rump. He should be well let down in the flanks and not tucked up between the fore legs, as we so often see.

In selecting the females, I should like to have them as near the type of the sire as possible, a little longer in the neck, more roomy in the body and not so massive in head and shoulders.

Breeding Animals Should be of Fine Quality.

I have given a brief description of some of the essentials a hog should possess, but there is one thing that is as important as all of the others, and that is the quality of the animal.

I think the average farmer, and some breeders, are very much mistaken in what constitutes quality in a hog, or they don't want any quality at all. I get so many letters inquiring for coarse hogs. Now, this is a mistake. We do not want a coarse hog any more than we would want a feeding steer of a coarse conformation. Any one knows that a steer with a big head and big, coarse horns, long, coarse legs, with a thick hide, is a poor feeder and no one would go out to buy a horse with a big head and ears, big, meaty legs, with hair growing all around them and showing a coarseness of conformation all through, but when it comes to hogs that is just the type some people seem to be looking for.

I like a hog with plenty of size; in fact, I have been called a crank on size by some of my fellow breeders, but I like a certain amount of quality. We want large, heavy-boned hogs, but they should be of a fine quality. So many farmers select a coarse hog with big legs, saying they want something that is not going to break down when they come to finish it for market. Now, I do not consider that the size of a hog's leg has nearly as much to do with its strength as its quality, and we cannot judge of its strength by its size.

The first thing I would note in determining the quality of a hog would be to see that he is covered with a thick coat of fine, silky hair, and that his skin is free from wrinkles. If a hog is wrinkly, he is sure to be a thick hided hog and a thick hided hog

is always a hard feeder. I should like to see his ears medium sized and covered with fine, silky hair.

Care and Feeding.

In caring for our breeding stock, we should see that they are fed on properly balanced rations. It is just as important that our breeding swine should have a balanced ration as our dairy cows.

So often we hear farmers complaining that their hogs are getting too fine, too small, lack constitution and vitality and are not prolific enough. This is due to two causes, first, they have not the right kind of breeding stock, and second, they do not care for and feed them properly If any one will keep good breeding stock and feed and care for them properly, they are sure of success, and if they fail they have gone wrong in one or both of these points.

In the winter care of our brood sows, there are two things that we always keep in mind; first, to feed them such feeds as will promote the greatest growth of bone and muscle and develop the strongest pigs, and second, see that our breeding stock gets plenty of exercise.

The ration for our brood sows the past winter has been as follows: In the morning and evening we give them a slop made of about two parts wheat middlings and one part ground oats and barley. To this is added some germ oil meal, or a little of Swift's Digester Tankage and a bushel basket of clover leaves and blossoms, or fine cut second growth clover hay. This feed is soaked from one feed to the other and fed in a thick slop. After the morning feed, we sow some whole oats around the yard very thinly for the hogs to pick up. It takes them a long time to pick them up and they get lots of exercise in this way. We have bred hogs to be good feeders and make good use of the feed fed them in laying flesh on their backs, so we must bear this in mind in caring for our breeding stock and see that they get plenty of exercise, or we may be disappointed at our results and say the well bred hog is a failure.

In conclusion I will say that if we select our breed, use nothing but the best individuals of this breed, and breed, feed and care for them in a systematic and intelligent manner, there will be good money in hogs.

PORK PRODUCTION.

R. E. Roberts, Corliss, Wis.

Mr. Roberts.

This is a time-worn subject and I cannot expect to say anything new or startling, but may say some things so old they will sound new again. However, I can only hope that in the discussion which may follow something may be brought out that will be instructive and profitable.

He who starts at the bottom and works his way up the ladder is the one who generally makes a success of the business. On the contrary, the inexperienced man who starts at the top with more theory than practice, more money than brains, and more hogs than practical ability, generally meets with disappointment and lands at the place where he should have started, the bottom. "Well begun is half done," is a good motto to bear in mind.

The Best Hog for Pork Production.

A question often asked is what type of a hog is best for the farmer and feeder. I will say the hog that is bred and developed as a pork-making machine, or the hog that makes the best returns for the feed consumed. This hog should be of medium size, with bone firm and strong with the largest per cent possible of high-priced meat, possessing good shoulders, ham, back and loin, with a small head and clean from flabbiness on the under line. This is the hog for the feeder, butcher and consumer, or the ideal hog for the trade and traffic.

Some of the Ways by Which This Type May be Secured.

How shall we secure this type of hog? By careful selection and mating. While the selection of our brood animals is important, the selection of a sire is vital. He should possess outstanding, individual merit, backed up by good breeding, as to him we look for improvement in the herd. But to come a little nearer to the subject assigned me.

The hog trough has much to do with making good hogs, as good breeding and good feeding go together for successful pork production. While it is not my desire to recommend any set rule for feeding, their ration should consist of a variety of feed of proper proportion for growth and stamina, using care that corn shall not constitute over one-third of their ration.

Another important thing is daily exercise, this is essential for health and bodily vigor. No matter how well we feed, if the brood animals do not have sufficient exercise they will not thrive so well, nor be so healthful, will not produce those strong, vigorous pigs we so much desire, and will not have those straight limbs and feet we wish to see. In order to have a crop of pigs properly started in life, it is necessary to have the brood animals in good condition, as I have found those in good flesh, judiciously put on, with flesh forming foods, raise the best pigs, while, on the contrary, those insufficiently and poorly fed, in thin flesh, are anything but economical suckers.

At Head of the Swine Herd of R. E. Roberts.

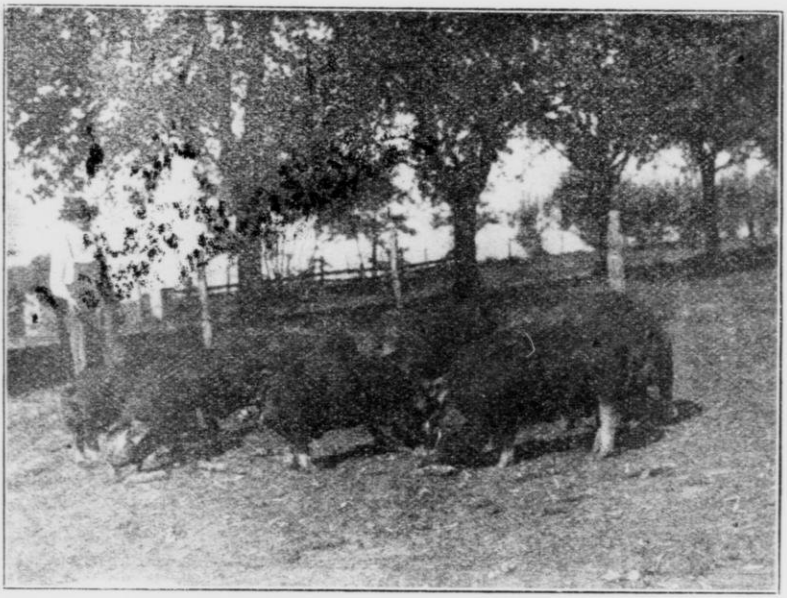
A Good Ration.

I favor feeding slop composed of middlings, bran and a little oil meal twice a day, with a light ration of corn, the run of a grass lot, or provide them with clover or alfalfa hay and the run of the barnyard, or feed oats on a clean feeding floor and they will develop bone and muscle. We feed oats to colts to develop bone and muscle, why not to hogs for same reason, unless the oat are too high in price. In that event, something cheaper can be substituted.

Handling of the Brood Animals.

Guard against too many brood animals crowding in their sleeping quarters. Feed no corn just before farrowing, or immediately after. At this time have a dry, warm place for each animal, provide fenders around three sides of her house to protect the pigs. Always handle the brood animals quietly and kindly. After farrowing, feed lightly, gradually in-

creasing the feed to all she will relish. Keep her house dry and clean also the feeding floors. Keep the ground around floors or pens from becoming foul. A little air-slacked lime, or disinfectant, sprinkled around will keep them pure. See that the pigs get out on the ground in this sooner than anything else. I prefer soaked corn for young pigs beginning to eat, as it is more easily masticated. When they are two and one-half months of age, and are eating well and growing nicely, add middlings to milk to make a thick slop at feeding time. In the event you



Some of the Young Stock of R. E. Roberts.

good weather, as they are animals that keep close to nature. We should then have provided plenty of grass, as it is a great help in producing milk. If too early for grass, nothing is better than a liberal feeding of middlings, bran and a little oil meal, unless it is sweet, skim milk.

Care of the Young.

As soon as the young pigs require feed, provide a creep for them, put there in a shallow trough some sweet, skim milk and soaked shelled corn, as in my experience they will eat

wish to raise fall pigs, they could then be weaned, being started to eat in this manner and fed judiciously they will not have that lean lank look or set-back so common at weaning as those that have depended solely upon their mother for sustenance.

I prefer to have the pigs all as near the same age as practicable. This will insure the same system of feeding and a drove of even-sized hogs in the fall.

From this time on they should be kept growing steadily, never permitting them to become stunted through lack of feed, or press of work

interfere with their regular feeding, as they require too much extra feed to get them started up again. It is much easier to keep a moving car in motion than to be compelled to start it at short intervals. Just so with the growing pig, and they are just so much behind what they would have been had this set-back not occurred.

The Best Ration for Economical Growth.

To produce cheapest feeds so as to get the largest profit from swine growing is the vital question. A full grain ration is not a proper way for economical growth. In my experience the best plan to make cheap growth is to provide early grass pasture and to continue it throughout the season. The farmer who attempts to grow swine without pasture or succulent food is certainly up against a hard proposition, as grass or green food does not only cheapen the ration by reason of its being able to produce growth at a smaller cost, but for its benefit to their health and condition. In the early part of the season we can have a mixture of grasses and clover, then later peas and oats, followed with sweet corn, and for late pasture dwarf essex rape, which I have found very beneficial as a succulent food. Some might say, why not grow swine on grass alone? This will not work for best results. While we want to get all the growth and gain from grass we can, more is gotten out of the grain and the grass when combined than either alone. The succulent grasses aid in the digestion of the grain, so as to convert all into growth and flesh. Grass is a great equalizer and a cheap balancer.

Regularity in Feeding Important.

Another important detail in growing and fattening a crop of pigs is regularity in feeding. We should be regular as to time and manner of feeding, always giving their slop food first and their dry food last on a clean feeding floor. I want them to come up hungry when feeding time arrives, and feed them just what they will eat with a relish and be satisfied. I find that to keep this condition requires daily attention, not occasionally or once a week. Fed and handled through the season in this manner, the pigs should have made such growth that when old enough to sell and finished they will look their best and easily bring the top price, leaving a good margin of profit for the feeder. Yet we occasionally find a drove of pigs, fed in the same manner in which another drove had formerly been fed and grown to perfection, that will not always do as well as we expect. Something is lacking, to find what it is is the feeder's art. The old adage says, "The eye of the feeder fatteneth." This being true, to attain best results a watchful eye and willing hand, directed by skilled judgment, must be constantly on duty.

The Conclusion of the Whole Matter.

In closing, to sum up the few essential elements involved in profitable pork production are, good quality in the breeding stock, as the pure bred sire is the farmer's best friend in all live stock breeding, although some do not realize this fact and think that a common bred sire will do as well. The pure bred sire is prepotent and will have a uniform class of offspring, possessing quality, while the other will impress or intensify upon his offspring lack of quality or perfection and the difference in the price of the two will not justify the results. Provide range, an abundance of grass and succulent feed, a well balanced ration regularly

fed, also charcoal, ashes and salt and an abundance of pure water. If not blessed with natural shade in summer, provide it. Have dry, clean, comfortable pens, with abundance of sunlight, stock kept free from vermin, good troughs and clean feeding floors and success invariably will be the reward.

DISCUSSION.

The Chairman—Mr. Martiny will answer questions on the breeding side and Mr. Roberts on the feeding, more particularly.

A Member—At what age do you finish the Poland China for market?

Mr. Martiny—I do not finish very many for market, but if I were growing Poland Chinas for market, I would have them ready to go to market at about six or seven months old, weighing from 200 to 225. When we were raising more hogs for pork, we always raised two crops a year.

Mr. Jacobs—Mr. Martiny, you insist on having a fine ear with very fine hair. Has the quality of the hair anything to do with the ear?

Mr. Martiny—I am not talking from the standpoint of curing pork, but breeding hogs. We want hogs that are large; there is not much danger of getting them too big or too heavy in bone, but a great many farmers think they must have them coarse. I have seen little hogs not weighing 200 pounds that were very coarse and they were not good feeders. We would like to have draft horses that would weigh a ton, but we want them of fine quality, not big and coarse. I do not think you can tell much about the strength of a hog's legs by its size, and that is the way men usually judge, by its appearance as they see it. If you will stop to think a minute, if you have a hog that has a coarse conformation, that hog usually has a coarse growth of hair and sometimes curly, it is always coarser on the legs anyway. If you take that kind of a hog and clip the hair off of the legs, you will find it has not so much leg after all. If it has coarse hair on the legs, there is always a thick skin, and there is always some meat in it, so if you skin off the hair and the skin and the meat, there isn't so much bone there. First, I want a hog covered with a fine, nice, thick, silky growth of hair, that feels as if it was all bone and not any meat. Many hogs appear to have big legs, but they are thick in the joints, great, big, round joints, not tapering at all. A hog of that kind is always weak in his legs, no matter how big he is.

Mr. Irmie—When these men write about having a coarse hog, they mean they want a large, meaty hog, and if you send them one you call fine, but a large, growthy hog, they will be satisfied.

Mr. Martiny—Yes, that is right.

Mr. Scribner—Is not the quality of the bone influenced by the feed when they are young?

Mr. Martiny—I think so, to a certain extent. I think we can feed our hogs so they will have a lack of development in bone, but I do not think we can feed them so there will be an over-development in the same proportion. We can feed them too much corn.

Mr. Goodrich—What is your opinion about crossing breeds? I have heard men talk about crossing Berkshire with Poland China and the result they got was better hogs than with either breed.

Mr. Mariny—I never practiced that, but I have heard that same thing, and I think it is true. I did not mention that in my paper because a man to have success in doing that has got to be a pretty good breeder, and if you give out that idea to an ordinary audience, they would think that was true always and would go to trying

it, and they would have poor results. You want to understand breeding principles pretty well if you are going to do that kind of thing with good success.

Mr. Jacobs—Wouldn't the good results cease with the first cross?

Mr. Martiny—I think they would. If I was going to raise only pork, I would select pure bred Berkshire sows and cross with a pure bred Poland China male.

Mr. Roethel—I had experience in doing that kind of thing and at first I got larger hogs, but afterwards I failed, they got smaller and smaller.

The Chairman—You kept crossing and they grew smaller and smaller?

Mr. Roethel—Not very long; I gave it up. I made more than one cross.

Mr. Martiny—Coming back to this subject of the silky ear, the ear is composed largely of skin and cartilage and a thin ear indicates a thin skin, and if you have a thin ear and a thin skin you have a thin hide all over your hog, which is one of the very best features in a hog. With such a skin, they are also finer in the texture of the bone.

A Member—How would you like middlings for the small pig?

Mr. Roberts—Middlings are not as good for young pigs when they are just weaned; skim milk is better. They cannot digest the middlings as well until they are two or two and a half months of age, then you can add the middlings.

A Member—I tried starting at about three or four weeks, a couple of years ago, and had good results. I got them up to 200 and 225 pounds inside of six months. I agree with the gentleman that the coarse pigs do not do as well.

Mr. Roethel—What ration do you feed a breeding sow right after farrowing?

Mr. Roberts—I feed them nothing for the first day more than about two quarts of warm water, then add a handful of bran in this warm water and gradually increase to a full ration, on same kind of food as before farrowing. If you give too much feed at that time, you will start such a flow of milk that the little pigs cannot take care of it, that will bring on fever, the dam will have a caked udder and you may lose the litter of pigs.

Supt. McKerrow—Do you continue that bran all the time?

Mr. Roberts—No, I gradually increase to middlings and ground oats and a little oil meal and after the pigs are about three weeks of age, we begin feeding corn with this feed. I wouldn't feed corn too soon after farrowing, because you would get sows in a feverish condition and start the pigs to scouring.

A Member—What do you feed before farrowing?

Mr. Roberts—Oats, corn, middlings, oil meal, a little bran and just about a week before farrowing I would cut all the corn out, which would consist of about one-third of their ration. I cut the corn out for the reason that I want to get the animal's system cooled out nicely, feed her some laxative food, a little oil meal or roots for about a week.

Mr. Roethel—Do you feed your swill warm in the winter, or cold?

Mr. Roberts—I always feed it warm in the winter.

Mr. Roethel—Doesn't it get cold before it is fed?

Mr. Roberts—Oh, no; you can warm your swill the evening before in a large kettle and it will be warm enough in the morning.

Mr. Roethel—So you do not have to get up early to warm it? I use steam. It would be impracticable to have that warm all night, therefore I prefer to feed something dry in the morning. The German farmer wom-

en prefer their soup before anything else; perhaps you got your recipe from them.

Mr. Roberts—I got it from actual experience feeding the hog.

Mr. Imrie—How many times a day do you feed this swill?

Mr. Roberts—Twice a day in the winter. A horse fed in the morning a full feed of oats, four or six quarts, and then filled up with water, I believe will not get all the goodness of those oats. I have practiced that same idea with my hogs; if you always feed them the slop first and the dry feed afterwards, they will do better than to reverse it.

Mr. Roethel—I find my hogs do best where I feed swill and I have fed three times a day.

Mr. Roberts—I find I can satisfy the hogs with drink twice a day during the winter, and that is all they need of the sloppy food. During six months of the season, my hogs are provided with one of these automatic hog waterers attached to a barrel, in addition to good slop three times a day during the warm weather.

Mr. Roethel—My hogs do not care for water; they get all the skim milk they want.

Supt. McKerrow—How do you start your pigs?

Mr. Roberts—Before the sow farrows, I feed her so as to keep her in condition, so there is no danger of fever at all. I never start to feed young pigs until they commence to come around the trough where I feed the old sow. A few years ago I used to try to encourage them to eat and get them started as well as I could, but I prefer to leave it to the pig. They will be strong and vigorous and they will get to eating too young and eat too much, and you will have trouble with scouring if you get in a hurry. I have changed my practice, I do not try to encourage them to eat too young, but feed the breeding sow heavily; in that way I can feed my pigs just about as cheaply as I can by feeding direct and I have found by experience that the old sows know more about feedings pigs than I do.

A Member—If you had a sow that became feverish after farrowing, what would you do?

Mr. Roberts—I would feed her some raw potatoes or roots, they are laxative, and if it was a real bad case of caked udder, so the pigs couldn't nurse, I would rub a little kerosene in the udder; that is recommended.

Mr. Scribner—Prevention would be better than cure.

The Chairman—If potatoes were cheap, wouldn't there be a tendency to feed too much?

Mr. Roberts—I never had any experience feeding too much. The feeder must exercise judgment for best results.

Mr. Imrie—I wrote to Theodore Lewis about these congested udders and he told me about the kerosene. You should take it in a spring bottom can, spray a little on the udder and then knead the udder, work it, till you find that there is milk coming, and you will usually find one application will cure it.

SHEEP GROWING.

E. Nordman, Polar, Wis.

Mr. Nordman.

As to whether sheep growing can be made profitable or not depends, first, upon the locality, and second, upon the man. So far as the locality is concerned, I believe that the state of Wisconsin, and especially the northern part, is as well adapted to the raising of sheep as any place in the world. The feeds that sheep thrive on grow here in great abundance; the climate is cool in the summer and dry in the winter, while the water for purity and wholesomeness is unsurpassed. The objection is sometimes made that the winters in Wisconsin are too long and cold for profitable sheep growing, or, for that matter, stock raising of any kind. This objection might have been well founded at a time when farmers used primitive methods in their seeding and reaping operations, but since farm machinery and improved methods in farming have so materially cheapened the cost of growing the feed that is necessary to carry sheep through the winter, it no longer holds good. As to the man and his chances for success in this field, it all depends upon the judgment and the intelligent labor that he can and will devote to the industry.

Regularity in Care and Feeding of Prime Importance.

While sheep require very little work and attention as compared with other lines of live stock, that little they must have with regularity and precision, otherwise the business is sure to be a failure. Sheep respond to good feed and careful treatment more readily I think than any other animal on the farm, but on the other hand they are the first to get out of condition and become unprofitable if they are neglected. This matter of care and feed is really of the greatest importance, for it is money thrown away to invest in fine breeding stock unless one has the facilities and the disposition to keep that stock in a thriving condition. I speak of this because there are many people who seem to have a notion that to succeed in the sheep business all that is necessary is to get a flock of registered ewes to begin with. My advice to beginners would be to look first to their facilities for caring for sheep. These being in a satisfactory condition, they should then get the very best foundation flock that can be afforded, and in addition to this the kind of pure bred ram should be kept that conforms most nearly to the

type of sheep which in the locality are likely to be the most profitable.

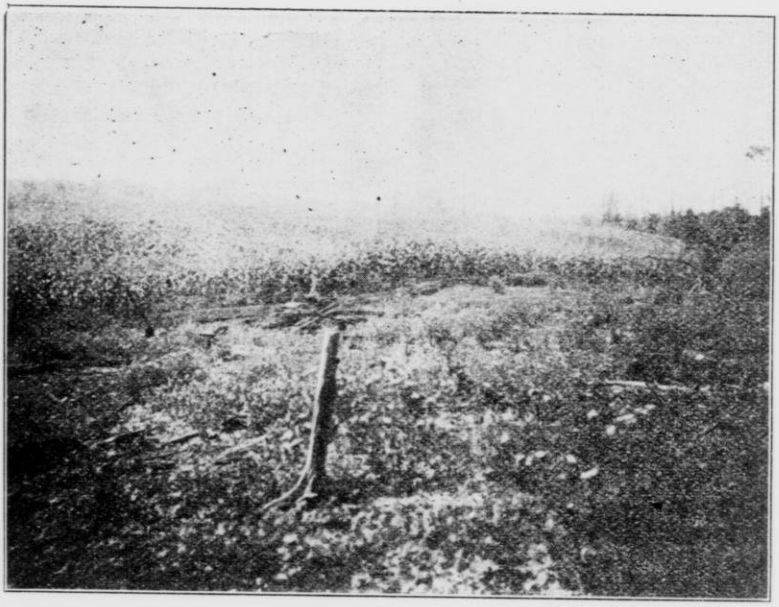
The Sheep Stable.

As regards the housing of sheep, their quarters need not be an expensive affair. They should, however, be constructed in such a way that the sheep may be kept dry under foot and well sheltered from storms overhead. If it is the plan to raise lambs for the early spring market, then the stable must be so built that the temperature can be kept under control. A necessary arrangement in a sheep stable is an opportunity for placing a row of pens about four feet square around the outer edge of the stable next to the wall. These are for the purpose of confining each of the ewes with their new born lambs for a short time, or until the mother takes readily to the lambs and the lambs are strong enough to get along without assistance. Of course every sheep stable should be well lighted and well ventilated.

Care of the Flock.

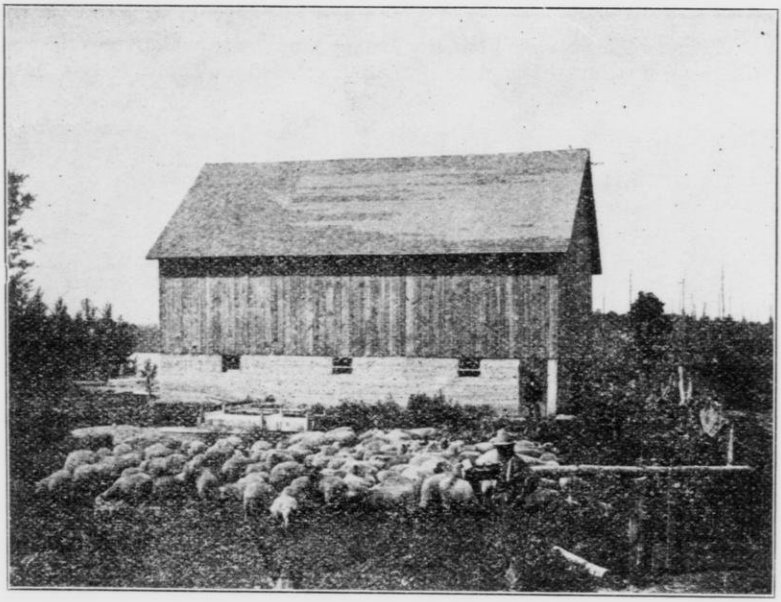
As regards their care, beginning with the fall season it should be the sheep raiser's aim to get his flock into winter quarters in good condition. To this end the lambs should be weaned at least one month before grass stops growing. During this period the flock should be provided with good pasture and when the frost begins to affect the quality of the grass other feed should be provided to give the ewes proper nourishment and to keep their system in good condition.

For winter feed their is nothing bet



Part of Brush Pasture and Cornfield o n Farm of E. Nordman, Polar, Wis.

ter for a flock of breeding ewes than early cut and well cured clover hay, supplemented with good corn silage. This should be fed at the rate of about three pounds of hay per day for each sheep, divided into two feeds and given regularly morning and evening, with about two pounds



Flock of Grade Sheep and Sheep Barn on New Farm of E. Nordman, Polar.

of silage each day at noon. If these feeds are not in first-class condition, it pays to feed grain in addition to the hay and silage.

If the lambing season occurs before the sheep get out to pasture, the ewes should be fed bran about three weeks before the lambs begin to arrive. This is to induce a good milk flow and generally to get the ewes in the proper condition for maternity.

Sheep should have access to water and some salt every day in the year. If salt is fed at irregular intervals, the sheep will frequently eat too much and get out of condition as a result.

Breeding ewes should be fed and managed in such a way that they will take plenty of exercise during the period of gestation. This is easily accomplished by feeding according to some such plan as I have outlined. The purpose should be to feed such quantities as to get the ewes in good flesh, but not so fat as to induce a logy, sluggish condition.

If the flock be large and of uneven size and strength, it is necessary that it be divided; the strong and the weak ones each being kept in separate quarters and each bunch handled according to its needs.

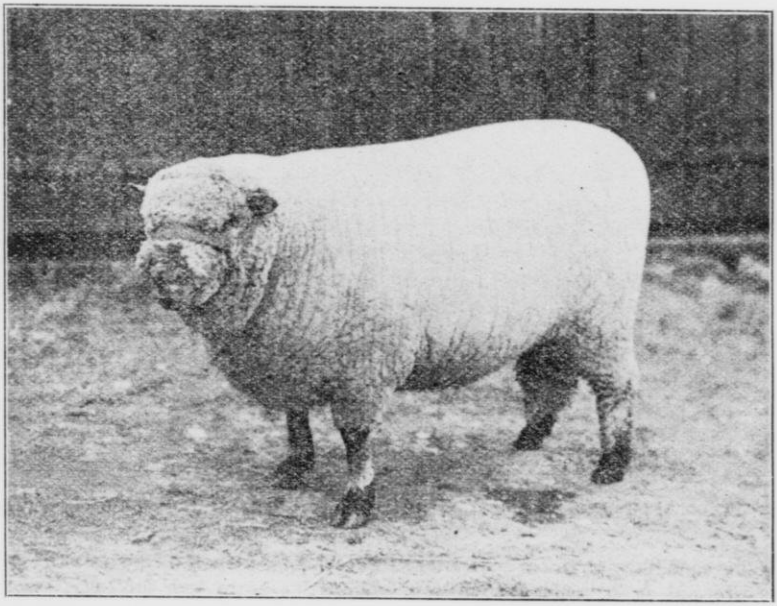
Caring for the Young.

This way of caring for the ewes insures a crop of strong, hearty

lambs that are easy to raise. Even so, it is nevertheless necessary to keep close watch over the flock at lambing time, for there are always some lambs that require assistance, no matter how well the old ewes have been cared for. It is always well when the lambs are dropped in cold weather to confine the old and young together for a few days and for this purpose I know of nothing handier than the pens already referred to.

her own, the ewe and the lamb are confined in a pen together. The lamb is helped to get nourishment four or five times daily and it has never taken me longer than four days to completely reconcile the old ewe to the lamb.

In every well ordered flock, a place should be provided where lambs can help themselves to oats or grain of some kind from which the old ones are excluded. There is no animal



First Prize Two-year-old Shropshire Ram at Royal Show, Derby, England. 1906.

Usually if the lambs are assisted in getting their first meal, they are ready after that to help themselves and in a few days fit to run in the stable or yard by the side of their mother with the other sheep. Sometimes it happens that the old ewe refuses to own her little one and in that case, as also where we wish to get the ewe to adopt a lamb that is not

on the farm that will pay a better price for oats than a suckling lamb.

I believe after lambs are strong enough to get along without help, the sooner they are docked and castrated the better. If these operations are performed after the blow-flies are out, the wound should be thoroughly saturated with powdered blue stone.

Vermin.

Sheep ticks and other vermin should not be permitted to infest the flock, as they are liable to take most of the profits when they get numerous. They can easily be kept under control by dipping the lambs in some of the patent sheep dips a few days after the old ones are shorn. In my flock I find that this is all that is necessary to keep the ticks down, but if dipping the lambs alone does not suffice, it does not cost much to extend the operation to the whole flock.

Shearing.

Just one more remark and I will close this paper. In my experience I have found that a shearing machine is greatly to be preferred to the old method of hand shearing. The operator may find some difficulty in getting started, but if he will have a little patience and carefully follow the directions that come with each machine, he will soon be able to do better and quicker work than he can do with his hand shears.

DISCUSSION.

A Member—Do you feed your sheep out of doors or in the stable?

First Prize Oxford Yearling Ram at Royal Show, Derby, England, 1906.

Mr. Nordman—We feed them out of doors, we have a rack in front of the sheep pen which is all right when the weather is good. In stormy weather, I would like to have a place to feed them inside. I am going to build a sheep stable next summer and I will have a movable rack, one of those wide on the bottom and narrow at the top, to prevent the waste of hay. I will build it in such a way that the sheep are excluded from the feeding place.

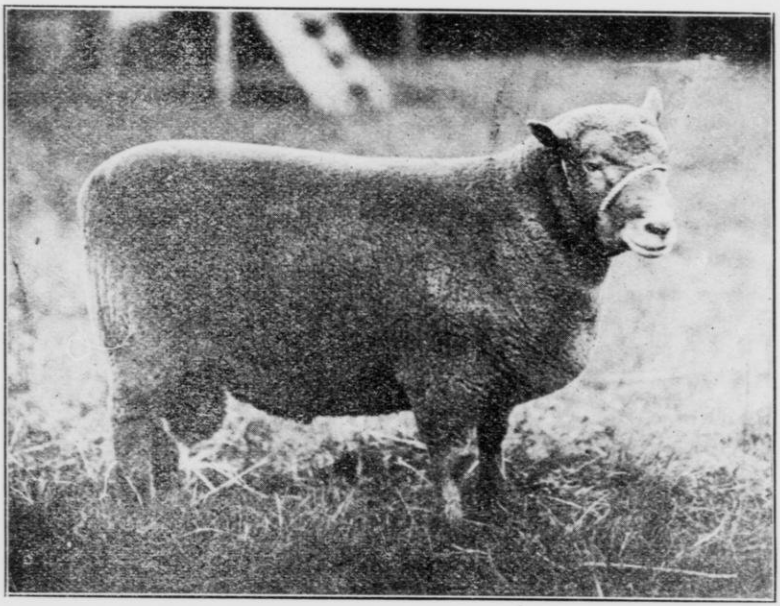
A Member—When the ground is dry, I think there is no better way than throwing the feed right on the ground, and in that way the sheep get their exercise. Of course, when it is wet and muddy, then you need a rack.

Supt. McKerrow—Most of the time you prefer to feed in the rack?

Mr. Nordman—Yes, most of the time we do.

Mr. Goodrich—Doesn't it require some care and watchfulness to prevent disease getting amongst the sheep, such as scab and foot rot and so on, and to cure it?

Mr. Nordman—We never have had scab in our flock. We have been very careful about the people from whom we have bought sheep, all except the first time, and as a result we have kept free from that disease. We had foot rot among the goats when we had Angora goats, but I cured that by applying a good strong dose of carbolic acid to the feet.



First Prize Yearling Southdown Ram, at Royal Show, Derby, England, 1906.

WISCONSIN'S SHEEP PROSPECTS.

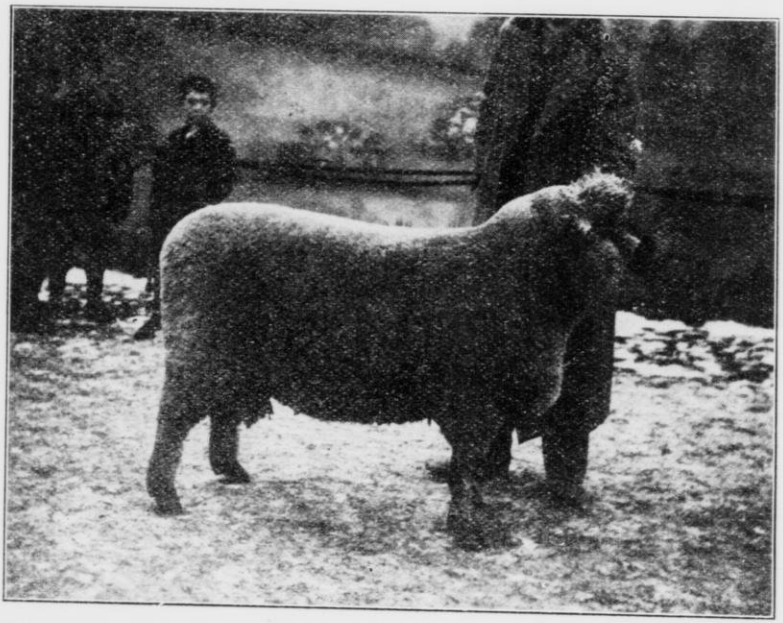
Supt. Geo. McKerrow, Madison, Wis.

The prospects for the sheep industry in Wisconsin is the subject I am supposed to talk about; I may get away from it. If I talk too far away from my text just pull me back with your questions.

The prospect of the sheep business all over the world to my mind is the best that it has been since I have been in the business, and that is a good many years. The reason for this belief is that in 1903 the sheep population of the world was 72,000,000 short as compared with that population 15 years ago. The wool product that same year was 500,000,000 pounds short, as compared with 15 years ago.

In Canada, our chief competitor in high class mutton markets of the world, there had been a decrease in sheep of 17½ per cent. In our own country, the decrease in the past 15 years has been very large.

On the other hand, the demand, both for mutton and wool, has been on the increase. People, in the United States especially, have been learning to eat mutton. Why, it has grown so scarce that it was even cut



A Wisconsin Oxford Down sold to an Illinois Breeder Dec. 1905 for $100.00; March, 1906 sold at Administrator's Sale for $200.00

off from our hotel bills of fare half the time this winter; it was printed there and then a pencil drawn through it.

To show you that the United States is consuming more mutton than formerly, I will say that during the past fiscal year, as compared with five years ago, in the four leading mutton killing markets of the country, Chicago, South Omaha, Kansas City and St. Joseph, the killing and selling of mutton for consumption through the country has increased 300 per cent. Five years ago less than two million sheep were killed at these markets and disposed of by the killers; this past year nearly six millions were killed and disposed of in the same markets an increase of something over 300 per cent. This is encouraging to the business, not only in Wisconsin, but the world, wherever sheep can be produced. You may ask in your own mind, what is the reason for this, and briefly I ill state some of the reasons.

A Brief Resume of the Situation.

In Australia and Argentina, where for a few years the business boomed rabbits increased enormously and intestinal worms got into the sheep patures where sheep ranged year after year, and they could not turn them over with the plow. The rabbits took the herbage, then the drought came on, and many sheep in Australia starved to death; then the intestinal worms, the lung worm, liver worm, stomach and tape worm, got into these flocks and cut them down. They are recovering somewhat, but they will be some time in getting back to their old standard.

In our own land, the great irrigation districts that are being opened up are driving flocks of cattle and sheep back, a great many herds are coming into conflict, and the cattle men, being more warlike, are killing the sheep out. So we in Wisconsin do not have the competition that we had a few years ago.

Wisconsin's Qualifications as a Sheep Producing State.

Now, are prospects any better for Wisconsin than for other parts of the United States? I say I believe they are, because we have in Wisconsin better natural conditions for the production of high class mutton than they have in most parts of this country; we have better commercial conditions for the production of high class mutton than they have in other parts of America.

First, as to the natural conditions. Our soil, climate, grasses and food stuffs that we can grow are all well suited to sheep. We have within a few years made a reputation for Wisconsin for high class mutton. If you will read the records of the great shows where Wisconsin sheep have been brought forward, you will know that Wisconsin has been at the front.

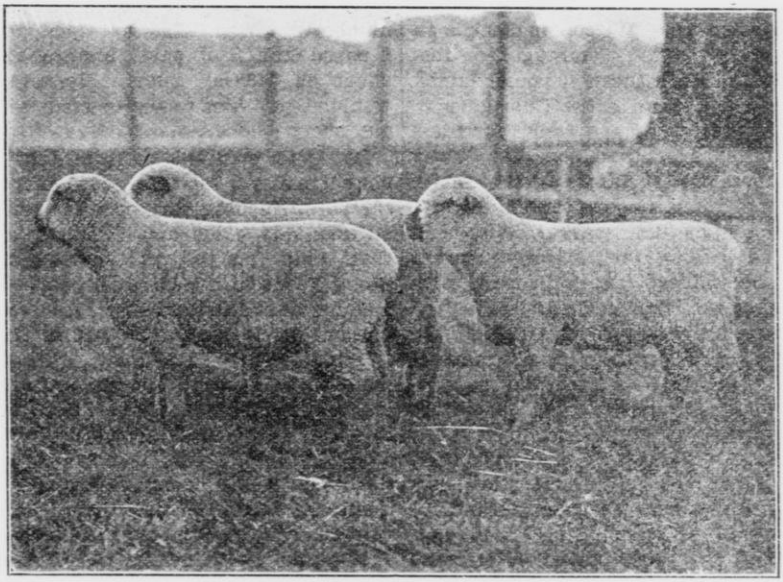
Wisconsin's Record at the Shows.

During the five International Fat Stock Shows at Chicago, every year Wisconsin has been in the first place with pens of five grade yearlings wethers, we have not missed it once. Three out of the five years, Wisconsin has won both first and second in those pens of five. In the case of the pens of five wether lambs, grades—and very strong classes—Wisconsin has only missed the prize once and Wiconsin has at every one of these shows competed not only with a dozen states in the Union, but with Ontario, and other provinces of Canada—and in Canada they have been having fat stock shows for 25

or 30 years, which have developed breeders and feeders far better than they have been developed across the line in the United States, so they have had that advantage. Three times out of five the champion carcass prize on the block has come to Wisconsin sheep.

At the last International show, sheep, because Wisconsin had won first on both lamb and yearling.

Less than a month ago, four 40-pound lambs, the product of two grade Wisconsin ewes (these lambs were about two months old) were sold in Chicago market at $9.00 per head, $18.00 for the product of each individual ewe.



Three First Prize Shropshire Ram Lambs at Royal Show, York, England, 1900.

while our Canadian friends were there in large numbers, the first and second prizes in pens of five wethers came to Wisconsin, the first prize in the pen of lambs came to Wisconsin, and the first prize yearling wether carcass and third and fourth prizes came to Wisconsin. The first, second, third and fourth prizes in lamb carcass shows came to Wisconsin; only the second prize in the yearling wether passed out of our hands in Wisconsin, and the grand champion carcass had to come to a Wisconsin

You may say, but 40-pound lambs this winter have sold in the New York market at $10.00 each. Yes, we admit that, but $9.00 is a pretty good price for 40-pound lambs. If a Wisconsin ewe can produce two $9.00 lambs, others can be found to produce 40 or 400. Of course I only give you this as an illustration.

Wisconsin Favorably Located for Marketing.

Now, our location is favorable for the future. We admit we have made

our reputation for high class mutton, and I think the mutton markets admit that. The Wisconsin flocks have the easiest access to the Chicago market of any district where high class mutton can be produced. While Minnesota, especially the northern half of Minnesota, may produce just as good mutton as we do, we are much nearer the Chicago market, the greatest mutton market in the world. This being true, Wisconsin flock masters should take advantage of that market. With these 40-pound lambs, we can get them to the Chicago market in better shape and for less freight charges than our far away neighbors. With lambs in the month of June, when western lambs are not coming upon the market, Wisconsin can be feeding the Chicago market and the Chicago mutton eater with the choicest lamb and mutton.

There are several times during the year when Wisconsin flock masters should be ready for this market, having their lambs in good condition from the time they are born until they are ready to go upon the market. Any day we can get the daily reports from the Chicago market, we can have our commission men post us, they can even call us up by telephone, and by watching that market, we can put our products into the market when there is a shortage of the product from far away districts where mutton is grown cheaper than we can grow it.

Sheep on High Priced Lands.

I wonder how many of you in your minds are raising this objection to the prospects for the mutton business in Wisconsin, are saying to yourselves that lands worth $100 an acre and more are too high priced to raise mutton?

I notice when I go to Great Britian that I find the very best flocks in the districts where land is highest. I spent two days with a gentleman who is recognized probably to be the best sheep man in Great Britain, Mr. George Adams, at Faringdon, in the county of Berkshire, where land is worth $400.00 an acre. Mr. Adams has bought and paid for about 2,000 acres in that county. He rents considerably more than that, he has a farm of 4,500 acres all told, and he owns 2,000. He has a flock of sheep numbering from 1,500 to 2,500, and I asked him if it paid him to keep sheep on $400.00 land. He said it wouldn't pay him to try to farm without sheep.

Mr. Utter said this morning that he bought manure for his garden from the sheep feeding yards south of him between his place and Chicago, and that could not be gotten from the Stock Yards in the cities, because the manure was dried and sold as commercial fertilizers, and that is true. I think there is no doubt that the manure from sheep is the best centralized, quickly available fertilizer that can be secured. Mr. Adams, instead of buying this manure to fertilize his fields, keeps his flocks in them; he feeds them certain crops which he grows on purpose to feed sheep, and they fertilize this land as they take off the crop. He also feeds some grain when necessary if he is fattening for market, and then the land they have passed over consuming that summer's feed is put into the growing of high priced crops. He produces a great many seeds on his farm for the leading seed houses in Great Britain, and he must have very fertile land to do this. He grows these seeds on that fertile land over which these flocks have passed by the hurdle process. It costs something to hurdle, it costs a great deal less in labor to pasture, but what you lose in labor you make up in the saving of acreage on your land. We are coming to it in Wisconsin on

$100.00, $150.00 and $200.00 land. Those of you who are growing sheep will take to the hurdling process, we will grow high priced crops, strawberries and melons, raspberries and sugar beets, although Mr. Adams grows some of the regular crops on his high priced land and claims it pays to fertilize them in the way he does.

Wisconsin Flocks Making Rapid Improvement.

Another good omen for Wisconsin is the fact that flock masters are working to improve their flocks, I believe faster than are the breeders of any other class of stock. That is, they are grading up by pure bred sires, by better breeding all along the line. The men in the sheep business in Wisconsin who are sticking to the old scrub lines are getting fewer and fewer, more scarce every year, and that is a good omen. And while they are breeding up and improving in blood lines, they are also improving in feeding lines, and the business is getting upon a good foundation in Wisconsin.

I am not here to advise all dairymen to go home and sell their cows because the prospects are good in the sheep business and go into the sheep business; I am not here to advise men in any line to take this up and drop their own line of business. I am only here to say that the man whose farm is suited to sheep husbandry and who likes the business and whose boys like it, that individual can go on in the business with a good deal of confidence and if he follows it right, I am here to say that there is profit in it for him. Of course, I do not promise to pay the profits, you have to get them for yourselves by skillful breeding and feeding.

DISCUSSION.

Mr. Scott—At what age were those 40-pound lambs sold?

Supt. McKerrow—I do not know the exact date of their birth, but I think they were born the middle of December and they were sold the 17th day of February.

Mr. Scott—How much food did they get besides what they got from their mothers?

Supt. McKerrow—I couldn't tell just how much, but they got a little grain after they were three or four weeks old, it didn't amount to much. I expect that 25 to 40 cents would pay for all the grain each lamb ate.

Mr. Imrie—Were these lambs grade lambs?

Supt. McKerrow—Yes, their dams were grade Dorset ewes. I do not know just how high grades, they were white-faced ewes, and I think the lambs were sired by a Southdown or Shropshire ram, I am not sure which.

Mr. Eastman—The sheep are the horned Dorsets.

Supt. McKerrow—But the ewes didn't have horns to amount to anything.

Mr. Eastman—Oh, yes, quite large horns.

The Chairman—Mr. McKerrow didn't have his spectacles on.

Supt. McKerrow—I saw the ewes and know they did not have the horns of pure bred Dorset ewes.

A Member—I tell you the gentleman that raised those lambs understood his business.

Mr. Eastman—I tell you when Wisconsin gets a man that feeds lambs better than those, he has got to be a good one.

Supt. McKerrow—You refer to the Experiment Station shepherd?

Mr. Eastman—Yes, he is very good.

Supt. McKerrow—Yes, he is, but Wisconsin will produce more like him as well as more good lambs.

A Member—Do you think it takes an expert to raise lambs to 40 pounds at two months old?

Supt. McKerrow—Yes and no. One gentleman over in Ohio sent one-third of his lambs to market weighing 40 pounds at two months old.

A Member—Is that the man who fed the lambs that won in Chicago?

Supt. McKerrow—No; the champion wethers at Chicago on the block were not fed by him, but by Wisconsin feeders.

The Chairman—I think McKerrow fed that champion wether, or saw that he was properly fed.

The Member—The gentleman that fed the other one would be pretty hard to beat, too.

Mr. Geo. Hill—You spoke about the demand for mutton increasing and the price going up. Don't you think the higher the price the more you eat, you think it is better?

Supt. McKerrow—I think likely that has something to do with it.

Mr. Hill—When mutton gets down to two or three cents a pound, nobody wants it. When it gets up to 10 or 12, 15, 18, 19, everybody wants a piece. A few years ago they sold sheep here in Plymouth for 50 cents apiece.

Supt. McKerrow—I wish I had been up here. I have bought at three times in my life pretty good sheep at a dollar a head and had my pick of flocks at that, but in all those three experiences I didn't have to wait more than 12 to 18 months before I could sell the same class of sheep for $3.00 to $4.00 per head. They didn't stay down very long I want to say one reason why people are eating more mutton is that the quality of mutton in this country is growing better.

Mr. Scott—Why is it that Chicago is such a good mutton market; why better than New York?

Supt. McKerrow—It is not better, the mutton consumed in New York, most of it, goes through Chicago to New York, but it is a larger market.

A Member—Is it a good idea to sow rape and kale for sheep pasture?

Supt. McKerrow—Yes, if you have land that will be idle so you can put in rape as a supplementary crop. I would not sow rape to feed breeding stock on, but if you are going to put your lambs in the market late in the fall, it is very good to flesh them up very quick. Their mutton will be soft and flabby, it won't win at the Chicago show, but it will give it the weight to make it sell in the Chicago market. If the rape is well matured and they have their stomachs full and it is not wet at the time, it is safe to turn them on. If their stomachs are empty, or your rape is wet or not well matured, it is very unsafe to turn them on, for they will bloat.

Mr. Eastman—Where will I look on a sheep to decide the quality of mutton it will make?

Supt. McKerrow—The term "quality" is comparative, although in a general way it applies to all breeds, and yet we use the term quality for each breed and use it in characterizing the quality of carcass, the quality of wool, the quality of the whole sheep. In a general way, when we look at a mutton sheep for quality, we want to see the mutton quality well indicated in its form, a wide back made by well sprung ribs, which means a chance to put a good deal of meat along that rib; a wide loin, which means the same thing. A full, deep leg; and so the first thought is to get the form that indicates quality; width of back and depth and fullness of leg. Then lack of offal or cheap quality of meat is along the same line, so we do not

want to see a too low, drooping brisket. We want a trim, slick carcass, and we want to find this smooth form, we want a firmness of flesh that indicates lean meat rather than tallow.

Mr. Roberts—I wish to say that last year, in 1905, there were 4,735,000 sheep sold in the Chicago yards, according to their records. Now, where you have such a large number of sheep coming into the yards, 50 to 60 thousand a day, and they were disposed of easily, if they did not possess good mutton qualities, the prices would not have ruled as they have during the past year, that is, from $6.00 to $8.00 a hundred. It was quality that sold them.

Supt. McKerrow—But there is lots of chance to improve the quality yet.

The Chairman—There was one statement made by Mr. Nordman that seemed to me was rather harsh treatment, where he spoke of using blue stone or blue vitriol on the wound.

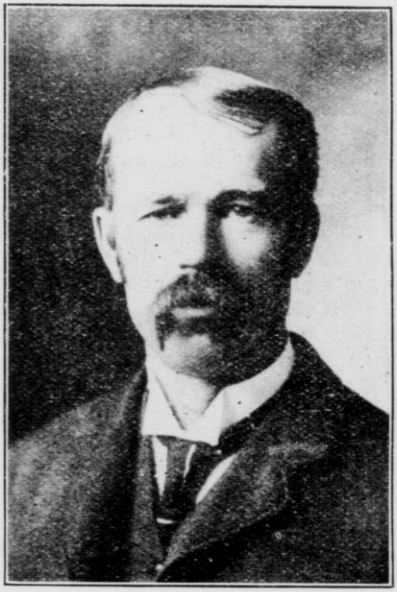
Supt. McKerrow—There are a few cases where we use blue stone to destroy germs. I would prefer to use a carbolic solution or a solution of bacterol, zenoleum or kreso, or any of the carbolic sheep dips, although if you use the blue stone sparingly it would not do much damage.

A Member—At what age would you recommend selling lambs?

Supt. McKerrow—At any age when they will bring the most money. I happened to be in Dean Henry's office when Sheperd Kleinheinz and Prof. Humphrey came in and said they had these lambs weighing 40 pounds; they thought they were pretty young to sell and yet they had an offer of $9.00 apiece. Dean Henry turned to me and asked me about it, and I said, "If they were mine, I would sell them. If you keep them until they weigh 60 pounds, maybe the price will be less." Whenever they will bring the most is the time to sell them. Sometimes it is when eight to 10 weeks old, and with others eight to 10 months old, according to breed, feed, care, size and condition.

THE DAI RY BULL.

E. C. Jacobs, Menomonie, Wis.



Mr. Jacobs.

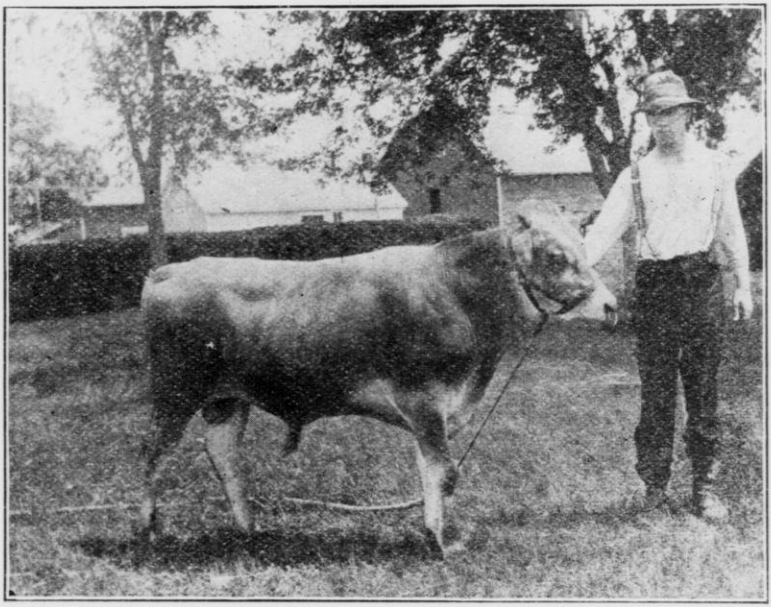
A very casual observation will reveal the fact that for the lack of proper sires having been provided the producers of milk in Wisconsin are losing annually a sum much larger than would be required to supply them all with pure bred bulls. As it is not to be expected that money enough will be made from the dairy in a short time to retire from business on, it will be necessary to anticipate the future and provide for renewing the herd and improving their quality. If the right kind of sires are used, the raising of heifer calves may be made a profitable adjunct to the dairy, and it should be considered as important to produce the right kind of cows as it is to produce milk and butter. It is not essential to their profit in the dairy that they be eligible to registry, but they should be milk and butter bred and capable of qualifying as butter producers. How often do we see calves raised just because they have come into the herd as a necessary condition of fresh cows, with no pride of ancestry or promise of future usefulness; not having any particular value they are cared for accordingly, and to feed and care for such cows as are produced in this way many farmers in Wisconsin are working hard, "without money and without price," their families being denied the comforts that the profits from good cows would secure.

With most dairymen it is not a question whether they shall raise their cows or not, but whether they shall raise good ones or poor ones, and it is often determined by the selection of a sire. I do not wish to be understood as claiming that a good sire or good breeding is all that is necessary in producing good cows, but it is the first step and without it failure is almost sure to result.

A Lesson in Mathematics.

Presuming it costs $26.00 to feed a cow and $12.00 to care for her and she gives 200 pounds of butter per year, which, sold at 20 cents per pound, leaves a net profit of $2.00, if she is sold when past her usefulness as a milker for enough, together with the value of her calves, to replace her with another cow as good, she would be worth $33.33, for at 6 per cent interest that sum of money will yield the same income. Judged by the same rule and allowing $4.00 more,

or $30.00 per year for feed, the cow that produces 300 pounds of butter per year will return a net profit of $18.00 and be worth $300.00. I will leave it to some one more expert in mathematics to determine what the difference in value will be between the sires of the two different classes of cows, but I am sure it is enough so that no man who is raising cows need hesitate to pay the price of a good bull to head his herd.



Loretta King 72,771, Jersey Bull owned by E. C. Jacobs, Menomonie.

Chosing the Sire.

As to the breed—if you are in the dairy business, choose a sire from the dairy breed you like best, but do not let your fancy for a large, smooth animal lead you to select a bull from one of the beef breeds, or any breed that is trying to flirt with the beef business, no matter what strain he is from. For in a grade herd not having the dairy tendency well developed and having others that it will be necessary to overcome, it is very essential that in the breeding of the sire no lines of beef breeding appear to weaken his prepotency as a dairy sire.

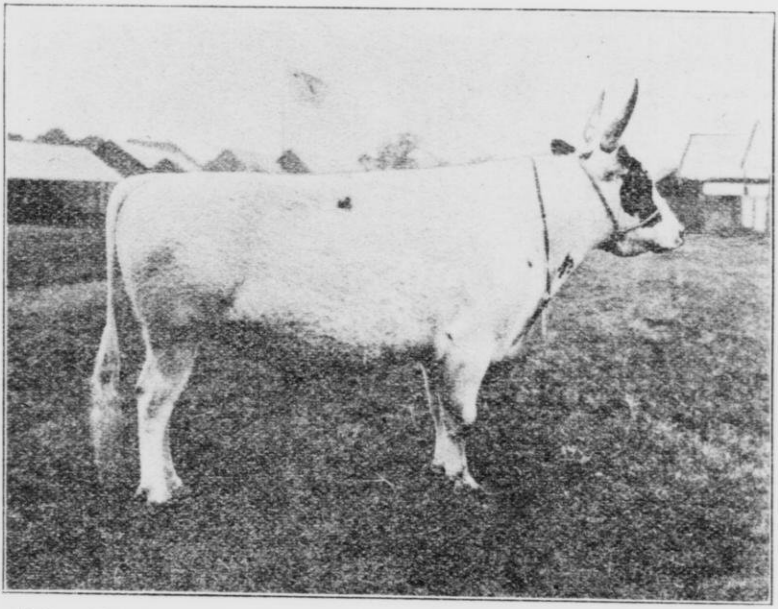
The registry number of an animal does not necessarily guarantee excellence, but it does have the backing of the breed association that the breeding is as represented and should show the records of his ancestors as dairy animals, from which we may judge the value of his blood inheritance.

First, and most important, a bull should be from a good dam, one of great dairy ability and the kind of a cow we would select as a model, for he is more likely to transmit the qualities of his dam than those of his

sire. As the son of an honest farmer may turn out to be a poet or a politician, so a well bred bull may prove a failure if he does not have the individuality to guarantee that he has inherited the good qualities of his ancestors and has the ability to transmit them to his offspring.

In the second and subsequent selections of a sire, it is important that they be made from the same breed, for if it is not done much of the breeding value of the daughters of the previous sire will be lost when mated with a sire of another breed. If the selection is made from the same family, as well as from the same breed, it will intensify the breeding and still further increase the power to transmit inherited qualities.

As the true value of a sire can only be told by the quality of his get, it is advisable, when possible, to secure one that has proven his worth. The practice of breeding continually from immature sires should be discouraged as their stock will have a tendency to deteriorate in size and constitution, and by continually changing a sire of great merit will often be slaughtered before his value is known.



Wynflette, First Prize Aryshire Bull at Royal Show, Derby, England, 1906.

Proper Treatment for The Lord of the Herd.

When the bull is obtained, treat him as the importance of his position as lord of the herd demands. If you get him as a calf, feed him liberally, not on corn, but on a ration containing plenty of protein, and do not take the skim milk away from him before he is a year old.

Always give him dry, comfortable quarters and plenty of exercise. He

can be staked out to grass with a long rope in summer and in winter can be hitched to a ring or an overhead wire that is stretched between two tall posts, or can be made use of to separate the milk by working in a tread power. I do not favor letting him run with the herd, or run loose in a yard, as I think he is easier kept in subjection if he does not have his liberty. Break him to lead when a calf, keep him accustomed to being handled, and always handle him gently, but never allow him to be familiar. Have a ring in his nose and do not take any chances with him, no matter how gentle he may seem. Bulls are like revolvers, it is always the ones that are not supposed to be loaded that do the mischief.

DISCUSSION.

Mr. Scott—What are some of the points in selecting a bull?

Mr. Jacobs—I understand I am speaking from the standpoint of the dairyman, not to give advice to breeders.

Mr. Scott—Give us some of the most important points.

Mr. Scribner—And take a small breed to start with.

Mr. Jacobs—We will assume that the breed we want has been selected. I think, however, that the selection of the sire would depend somewhat on the man. If I considered myself a first-class judge of dairy stock and dairy bulls, I should use my own judgment, considering the individuality of the animal, his breeding and the records of his ancestors. If I didn't know much about it, I might think it would be well to depend on the judgment of some breeder in whom I had confidence to select the sire for me.

Mr. Scott—Can you tell anything from the conformation of the sire?

Mr. Jacobs—Yes, I think I can tell much.

Mr. Scott—Would you depend altogether on the breeding?

Mr. Jacobs—I would not depend altogether on any one thing. I would insist on good breeding, I would not accept an animal, no matter how good he might be individually, that I did not have reason to think was well bred in the lines that I wanted to perpetuate, (in dairy lines). But if his breeding was satisfactory, I would put great emphasis on the kind of a dam he was from, and less as to the dam of his sire. If his breeding along that line was right, I would say I would accept him on his breeding. Then to come to individuality—I would want him to have a form as near a good dairy cow as I could, and still with a strong masculinity.

I would like to emphasize the fact of handling the bull gently a little more. I didn't know as much about handling bulls years ago as I do now, and the more experience I have the more I see the importance of handling him gently, not merely from a humanitarian view, but as the old man advised his son that honesty is the best policy, as I have tried both ways, I say gentleness is the best policy.

Mr. Utter—Would you have your bull examined for tuberculosis?

Mr. Jacobs—I should want to know he was free from it.

Mr. Utter—Isn't that a very important matter in connection with producing healthy stock, to see that they are absolutely free from the disease?

Mr. Jacobs—Yes, it is.

Mr. Roberts—Would you want to see a butter test of the milk production of his dam and grand dam?

Mr. Jacobs—Yes, that would be what I should look for in his breeding, the production of the dams in his pedigree.

A Member—Would you like to get large sized individuals of the different breeds?

Mr. Jacobs—I wouldn't like to place too much stress on the size of the dairy animal. If they were of medium size for the breed, why, it would suit me perhaps all right, but I wouldn't like one that was small for the breed, I would much prefer having the dairy animals large of the breed than small, but not particularly large.

Mr. Scribner—You would rather consider that an extremely large animal was objectionable rather than an advantage?

Mr. Jacobs—Yes, I think extreme size would be against him, but I want him to show good health and vigor.

Mr. Chas. Hill—And doesn't that question of vigor depend very largely on his breeding?

A Member—Isn't it true that from infanthood up, if his immediate ancestors and himself have been given right treatment, he will be all right?

Mr. Jacobs—I think that has a great deal to do with it. I think even the raising of the calf itself will have a great deal to do with the kind of vigor he will show. If he is fed liberally on a protein diet and plenty of skim milk up to the time he is a year old, he is a pretty poor calf if he does not show considerable vigor when he is a year old.

A Member—And I don't believe skim milk would hurt him after he is a year old.

THE DIFFERENCE IN COWS.

A. J. Glover, Ft. Atkinson, Wis.

At a sale that was recently held near Fort Atkinson, there were over 80 head of grade Holstein cows sold at an average price of about $55 00 apiece. The yearlings and two-year-olds brought from $25.00 to $45.00 each. There were cows of no particular breeding in the same community that could be purchased for $30.00 to $40.00 apiece. Why did these men pay this extra price for cows when they could have secured other animals for less money? Because farmers of understanding are rapidly learning there are great differences in cows and that it is better to own a few good cows than a large number of poor animals. In other words, this thinking, planning and studious farmer is seeking dairy breeding for milking purposes and finds it more profitable to pay extra money for this kind of stock than to purchase animals for less money that have been raised for no particular purpose.

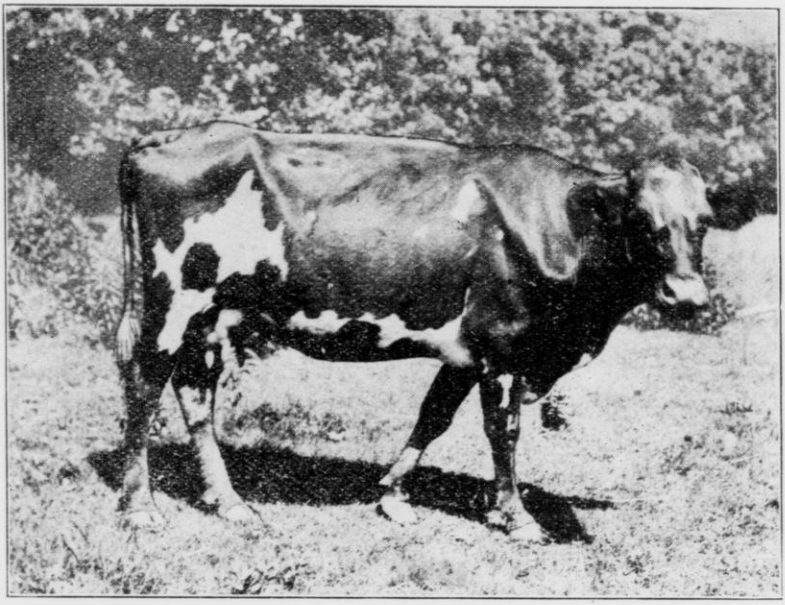
But we find among the dairy bred cows considerable differences, and they are by no means free from poor producing and inferior animals, but on the whole they produce more milk and butter fat than does the scrub that is bred for no special purpose.

The Illinois Experiment Station has tested many herds and in each one there has been a wide difference in the production of cows, as well as a wide difference in the herds. We find in one herd that the poorest cow averaged for two years but 110 pounds of fat, while the best cow averaged 245 pounds and the herd averaged 171 pounds. In another

herd the poorest cow averaged for two years 251 pounds of fat, the best cow 342 pounds and the herd 269 pounds fat, which is equivalent to 313 pounds of butter. The net profit from this herd was about $35.00 per cow per year. A herd of such cows will return their owner $1,750.00, be-

a little application of business sense will save it.

To show what possible results can be obtained, we compare average yield of 10 of the best cows, out of the 145 tested, with 10 of the poorest. The following table shows the great difference:



Grade Shorthorn. Year's work: First, 5,958 lbs. Milk; 3.86 per cent Butter Fat; 286 lbs. Butter. Second, 5,896 lbs. Milk; 4.20 per cent Butter Fat; 289 lbs. Butter.

sides the skim milk and much good fertility, while 50 cows like those producing 171 pounds of fat apiece would barely pay for the feed consumed.

No intelligent dairyman will remain satisfied with a herd of cows that only produce 171 pounds of fat per cow when it is possible to have one that will make 300 pounds. The sum of $1,750.00 is too much to lose each year on a herd of 50 cows when

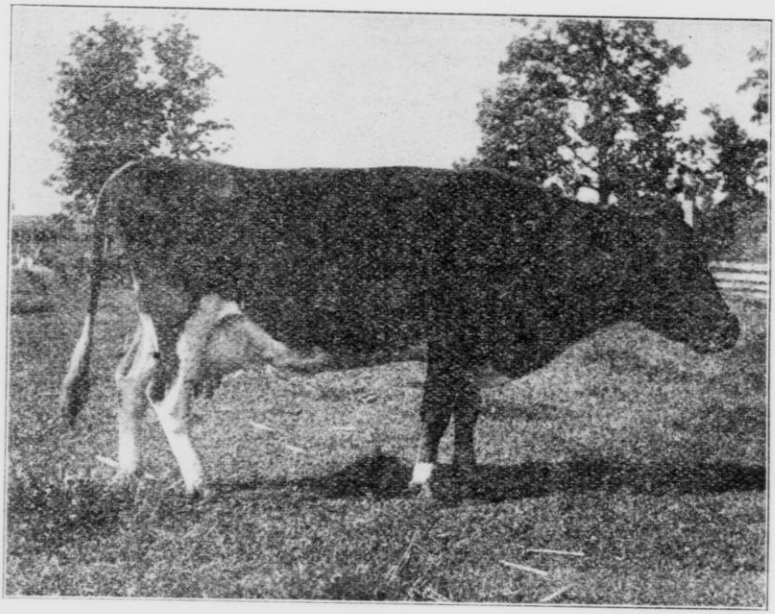
	Milk, lbs.	Fat, lbs.	Butter, lbs.
Best 10 cows	7,425	336	392
Poorest 10 cows	3,841	144	168

The average production of the 10 best cows was 3,584 pounds more milk and 194 pounds more fat per year than the average production of the poorest 10 cows. While the average yield of fat by the best cows is about two and one-fourth times greater than the yield of butter fat

by the poorest, yet the net profit is many times larger. For instance, if it costs $40.00 each to pay for the best cow's keep, it would take $400.00 worth of feed to support the best 10 cows. They produced 3,360 pounds of fat, which, at 22 cents, is worth $739.20. Subtracting the cost of feed, which is $400.00, we find that the best cows give a profit of $339.20. If the best 10 cows charged $40.00 each per year for their keep, it is fair to assume that the poorest cows charged $30.00 each, or for the 10 $300.00 for their feed. These cows produced 1,440 pounds of fat, which, at 22 cents a pound, amounts to $316.80. Subtracting the cost of feed, which is $300.00, we have left $16.80 profit from 10 cows, or $1.68 per cow, as against $33.92 from each of the best cows, which we assumed ate $10.00 more feed. The 10 best cows produced only two and one-fourth times as much fat, yet the net profit was only twenty times greater.

Even Among the Best Cows there is a Great Difference.

There seems to be a great lack of understanding among farmers in regard to the difference between the good and the poor cow. The facts which have been gathered by the different experiment stations have turned a strong ray of light upon this subject. The St. Louis Cow Demonstration has added weight to every argument that has been made in favor of keeping better cows and discarding those that are not capable of paying more than their board. Here are a few figures from this Demonstration that show the great



A Grade Jersey. Produced in one year 5,498 lbs. Milk; 4.48 per cent Butter Fat; 287 lbs. Butter; Profit $34.77.

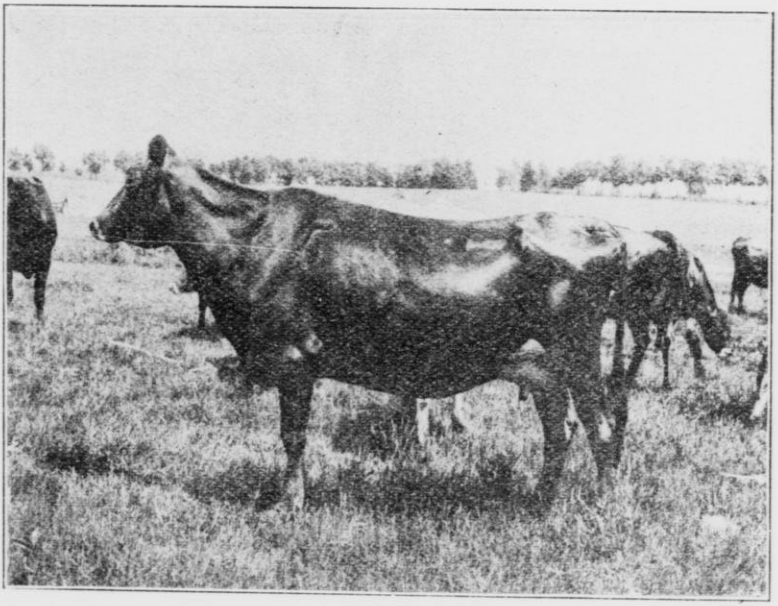
difference, even among high class dairy cows:

In Class A.

	Cost of food.	Profit above cost of food
Best Jersey	$31.99	$50.50
Poorest Jersey	30.23	26.72
Difference	$1.76	$23.80

How many farmers consider the difference of profit between their best and poorest cows!

Let us consider these figures for a moment. The poorest Jersey charged within $1.76 as much for her feed as the best, and returned a profit of only $26.72, while the best Jersey gave a profit of $50.50,



Flint: A Jersey Cow. Year's work: First, 2,871 lbs. Milk; 5.09 per cent Butter Fat; 170 lbs. Butter. Second, 3,467 lbs. Milk; 5.34 per cent Butter Fat; 216 lbs. Butter.

Best Holstein	$36.57	$46.02
Poorest Holstein	34.68	18.03
Difference	$1.89	$27.99
Best Shorthorn	$28.57	$32.56
Poorest Shorthorn	27.69	1.95
Difference	$ .88	$30.61
Best Brown Swiss	$33.49	$27.77
Poorest B. Swiss	33.21	19.75
Difference	$1.28	$ 8.02

a difference of $23.80. The poorest Holstein charged within $1.89 as much for her feed as the best and returned a profit of only $18.03, while the best Holstein gave a profit of $46.02. There was a difference of only 88 cents between the cost of feed of the poorest and best Shorthorn and a difference of $27.99 in profit. There was a difference of $1.28 between the cost of feed between the poorest and best Brown

Swiss and a difference of $8.02 in profit.

If there is such a difference between selected cows, what must the difference be in the average dairy herd where no attention is paid to selection? And, moreover, these figures show that it costs nearly as much to support the inferior cow as it does the good one.

good milking cows. Good animals cost more than scrubs, and consequently farmers do not think there is enough difference in bulls to pay the extra cost for a good sire. But let me give you a practical example from a practical breeder.

Mr. W. J. Gillett, of Rosendale, Wis., a prominent Holstein breeder, says about the purchase of a high

Holstein and Ayrshire. Year's work: First, 7,855 lbs. Milk; 3.55 per cent Butter Fat; 333 lbs. Butter. Second, 7,569 lbs. Milk; 3.55 per cent Butter Fat; 314 lbs. Butter.

A Difference in Bulls.

But few men appreciate the wonderful difference in bulls, and probably one of the greatest hindrances to the development of a good dairy herd is the indifference which is paid to the selection of a sire. There is no surer or quicker way of building up a dairy herd than the use of a strong, vigorous and prepotent bull which comes from a family of

priced bull: "The hardest battle ever fought was years ago to lead myself to pay the sum of $300.00 for a bull calf for use on our pure bred herd, but I can now say, had I paid $3,000 for this same sire, the sum would not have equalled his worth, nor been commensurate, in value, to the great dairy characteristics he stamped upon his offspring."

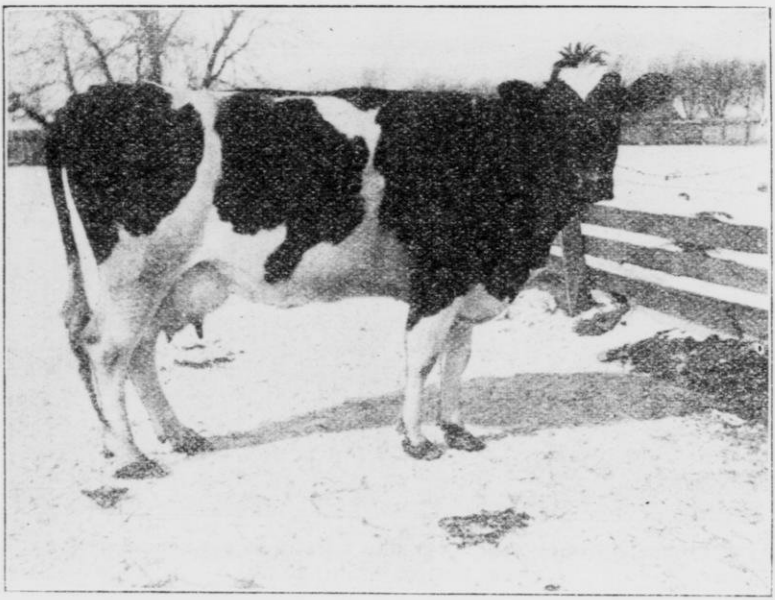
Of course there are men who will

not give their cows dairy care, and under such circumstances the scrub bull will be quite as serviceable to them as the most highly developed dairy sire. The dairymen who are taking the proper care of their herds cannot afford to use scrub bulls.

What Dairy Breed of Cows Shall I Choose?

This is a question that is so often asked, and, in a way, never answered: for it is impossible for anyone to state what breed of cattle is the best for some other man to choose. There is a personal factor which enters into the choosing of all classes of things, cattle not excepted.

There are four distinct dairy breeds of cattle, namely, the Holstein, Jersey, Guernsey and Ayrshire, and good cows can be selected from any one of these breeds. It should be borne in mind that it is not alone the breed that makes good dairy cows, but judicious selection and breeding of the individual animals are equally necessary. In other words, the pure breds must be selected and culled if a strong, vigorous, large producing and profitable herd is to be maintained and developed. It is not enough to say that an animal is a pure bred, but it is quite as important to add what she is capable of doing.



Grade Holstein. Produced in one year 4,887 lbs Milk; 4.04 per cent Butter Fat; 230 lbs. Butter; Profit $18.99.

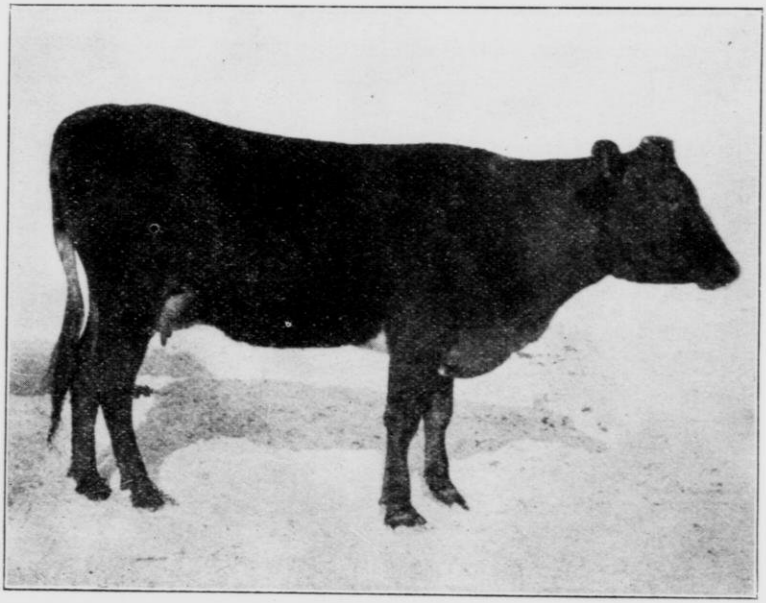
A monkey faced dude was visiting in the country, and fell into conversation with a farmer's daughter. He informed the young lady that he was descended from families of the revolution and that he was a graduate from college knew a great deal

about modern fiction, etc. After he had finished bragging, she looked at him a moment and said: "What can you do?"

This was a pertinent question to ask this young man who had pedigree, and it is one that is being asked constantly, not only of persons, but of all classes of animals, whether they be pedigreed or not. The mindful dairyman and breeder is seeking performance.

Each dairy breed of cattle has its particular characteristics, and before a person chooses any one of the breeds he should study the temperament, disposition and chief characteristics of each one. There are very few men who have studied carefully the different traits of the dairy breeds who have not formed a personal preference, and, in most cases, would not be satisfied with any of the other breeds because their temperaments do not harmonize with his. The selection of a breed must, therefore, be left entirely to the individual, and it is my suggestion that you study carefully each breed before any one is selected.

It would be a difficult task, if not impossible, for me to write in detail the characteristics of the dairy breeds so that a person could decide from reading the description of each which breed he would prefer. I can say, however, that the Holsteins are noted for their large flow of milk, which is moderately rich in fat; the Jerseys and Guernseys for a medium flow of milk, which is rich in fat, and the Ayrshire, standing between the Holstein and Jersey and Guernsey, giving not as large a flow of milk as the Holsteins and not as rich as the Jerseys or Guernseys.



Native. Produced in one year 3,443 lbs. milk, 4.6 per cent butter fat; 179 lbs. Butter; Profit. $2.52.

The Importance of Testing Cows.

The question is often asked, Does it pay to take time to weigh and test milk? If an increased production of milk is not obtained by keeping a record of the herd, certainly it does not pay to bother with the scale and tester. But what do the facts say? We find in studying data upon this subject that the average yearly production has been materially increased by knowing exactly what each cow is doing.

In a certain herd, where the milk was weighed and tested for three years, the average production was raised from 194 pounds of butter fat per year to 289 pounds, or an increase of 95 pounds of fat per cow per year. For the past few years, butter fat has been worth, on an average, about 22 cents a pound which would make the 95 pounds of fat worth $20.90. It cost in the neighborhood of $5.00 more per year to board each cow in the third year than it did in the first, by subtracting this from the $20.90, we have $15.90 profit. There were 17 cows in the herd, so the total net profit was $277.30 greater in the third year than in the first.

By knowing what each cow is doing, it was found that a little more grain was needed than was given in the first year to produce a larger and more economical flow of milk; the test showed that some of the cows were unprofitable, and they were sold and a few better cows were put in their places.

It did not take $25.00 worth of time a year to test this herd, and the return for the time spent was $277.30, which was exceptionally large profit on so small an investment.

Another herd on which the scale and the test were used averaged 141 pounds of fat the first year, and the second 201. This was a gain of 60 pounds of fat per cow. There are not many cases where such a large increase could be made, without selling and purchasing some animals, but in this instance only a few cows were sold, none purchased, but by a better system of feeding and by disposing of a few cows, this wonderful increase of fat was made. The owner was delighted and surprised to know that a better system of feeding and closer attention to his herd would make such a great difference. He expressed himself thus: "The result of testing has been a great revelation to me."

It is interesting to note the extra care that some persons will give their cows when they begin to keep a record of their herds. At the close of a second year's test, the owner of a herd of which records had been kept for two years was asked why his cows made such a large increase, for but few cows were sold and but few added to the herd, yet there was a large increase. The reply was: "I take better care of my herd since I have begun to test; I do not permit them to remain out on cold and stormy days, and I see that they are milked and fed regularly." Ah! therein lies the secret of successful dairying, close attention to the wants and requirements of the herd.

The first year that this herd was tested, the average production was 157 pounds of fat; in the second year, the average production was 207 pounds—a gain of 50 pounds of fat per cow per year—made almost entirely by giving the herd better care. While there are great differences in cows, there are just as great differences in men and the man who adopts the system of keeping a record of each cow in his herd, not only finds the poor and unprofitable cows, but he finds also what kind of a dairyman he is. In other words, testing gives him an opportunity to eliminate the poor cows, select the

calves from the best and to find his short-comings as a dairyman.

DISCUSSION.

Mr. Michels—Will you tell us how they managed to raise that herd of cows from 200 to 325 pounds of butter in two years? What changes did they make in the feeding and care?

Mr. Glover—It took three years to increase the herd from 225 pounds of butter to 336 pounds. Fortunately, the cows were divided, when the man had the one year's record of his herd. In dividing, he selected cows that yielded him the most, and at the end of the second year the herd averaged 275 pounds of butter. At the end of the second year, he found he could eliminate a few of the others, and he did so and went out and bought in two or three that proved good individuals, so that with the elimination and the buying in and close observation, he increased that herd from 225 to 336 pounds of butter per cow per year.

Supt. McKerrow—Is elimination the same thing as culling?

Mr. Glover—I presume it is.

Mr. Hill—Don't let anybody know it. We have always been taught we must not cull out our herds and sell to somebody else, but if we can do it by elimination, it is all right.

Mr. Goodrich—Whom should the man sell his poorest cows to because they do not pay him and be honest?

Mr. Glover—He can be honest and sell them, to about a $50.00 person. There are lots of men looking for poor, cheap cows, and we want to satisfy them.

Mr. Goodrich—You are not doing that man any good to sell him a poor cow that won't pay for her keep.

Mr. Glover—I know it, but you can't do him any good if you sell him a good cow.

Mr. Goodrich—I wanted to bring out a very important fact, and that is, that it is the man more than the cow every time.

Mr. Scribner—Isn't it a fact that sometimes breeders have their ideals of what a good cow should be and they might sell some of their poorer cows, and they would be better cows than the other fellow would have?

Mr. Glover—That is all right; I will state, however, that in this herd there was one cow retained that did not average but 158 pounds of butter for three years, and yet her bulls were sold for $50.00 apiece. I think in the interest of breeders, that that cow should be eliminated and culled.

Mr. Scribner—Was she of a dairy breed?

Mr. Glover—Yes, a pure bred registered animal.

Mr. Michels—What about these test organiaztions that they have started in some parts of the country? Tell us something about those.

Mr. Glover—In Michigan they have started test associations, organized by some farmers that wish to have this sort of work done. They employ a man who makes the rounds once a month, spending a day with each farmer. He watches the milking at night, weighs the milk and takes samples, and the same thing is done in the morning, then he makes the tests. This method gives a one day record. The tester is then taken by the farmer to the next place and there he repeats his operation, and he visits each place every 30 days. Now, from those 12 day records which he gets by these visits, a yearly record of each cow is made, and it will be very close to the cow's exact yield of milk and fat, because we all know that the cow does not go up and then down, but if she is well cared for, there is a gradual

decline after say the fifth month. I have known many a good cow to give just as good milk in the fifth as in the first month of lactation.

Mr. Michels—Can you tell us about the cost of carrying on this work?

Mr. Glover—I cannot exactly.

Mr. Michels—I have been carrying on tests for about 200 patrons for the last two years, free of charge as you have done in the state of Illinois, and I find now that I cannot continue the work and I was thinking that probably it would be a good time to start a test association.

Mr. Glover—I think it is a dollar per cow that they pay, but I am not exactly prepared to say.

Mr. Michels—Mr. Glover's talk may seem rather wide to some of you, but I have known it to run wider than the figures he gives. I have known cows that would run from 29 to 97.

A Member—Would it be possible for the farmer to get an accurate test with the facilities he generally has?

Mr. Glover—I believe that any farmer owning any number of cows could afford to buy a Babcock tester. You can buy them I guess from $3.00 up. I would advise you to buy an $8.00 or $10.00 tester, for it will last you a lifetime. You will get full directions how to run it with the tester, and if it is possible I would advise you to go to the Farmers' Short Course held each winter at our Agricultural College. Men are admitted there who can only get away from home a short time and they receive instruction upon the different branches of farming, and included in this course is the testing of milk. Your creamery man can show you how to run a tester, and he will be perfectly willing to test your milk and show you how; it is a very simple operation. There are a few rules which must be learned.

Mr. Scott—Doesn't that gentleman look as though he could run a tester?

Mr. Glover—I believe any man in the hall could do it.

A Member—In regard to having the tester in the factory, where I take milk, we are selling it on the test plan and I notice our milk varies from one month to the other.

Mr. Glover—I should be suspicious if the milk did not vary somewhat.

Mr. Jacobs—I think it is more important that the weighing be done continually and regularly than the testing. In our work we weigh one day in each week throughout the year and we are not so particular about the testing. We aim to test at least twice a year and I notice that when you get two or three good composite samples and tests of a cow at different periods of lactation, you have established her natural limit of butter fat, and if you keep your records right, I think you have a very fair estimate of what she will do. But I think it very important that we weigh oftener than once a month.

Mr. Utter—Isn't there more difficulty in getting a proper sample than there is in the testing?

Mr. Glover—I rather think that the greatest errors are made in not properly sampling, not having the milk thoroughly mixed. The pipette may not be the proper size.

Mr. Utter—At what temperature do you sample the milk?

Mr. Glover—I prefer to have it about 90 degrees F., especially in the winter time, in the summer time whatever the temperature of the day is. The fat in grass milk mixes better than milk made in the winter.

A Member—Couldn't you take a sample immediately after milking?

Mr. Glover—Yes.

Mr. Goodrich—It is important that the acid should be warm, too.

Mr. Glover—Yes, it should be kept in a warm place, if not, set it in warm water for a little while before it is needed.

A Member—Do you think the even stirring of the milk is an advantage in getting a good sample?

Mr. Glover—I do, because it will become more or less leathery. Of course, the samples of milk should be covered. The operator at the factory should stir it thoroughly before he samples the patron's milk.

A Member—Should it be stirred before it is taken to the factory?

Mr. Glover—Oh, I don't think that is necessary, unless you keep it three or four days.

A Member—You don't think frequent stirring of the milk has anything to do with getting a fair sample?

Mr. Glover—No, I don't, because milk 12 hours old that is emptied into the weigh can and stirred properly, a very accurate sample can be taken.

A Member—Suppose a cow is giving 10,000 pounds of milk a year what should her milk test be to be profitable?

Mr. Glover—A cow that produces 300 pounds of butter fat per year is a profitable animal. She may cost you $50.00 a year to board her, and of course that would be very high in Wisconsin.

Mr. Hill—If they will weigh their milk every day they will do much better. The boys will become interested in seeing who gets the biggest mess of milk from the cows and I believe each cow will go down less during the period of lactation.

Mr. Glover—That is very true, but if you talk to the men about doing it once a month, perhaps you can get them started when you could not by asking them to do it every day.

A Member—There was a man down in this county who wanted to have his cows tested by his creamery man and he took his two samples and the creamery man told him that they tested three and four per cent. The truth was that milk was all out of one pail and from one cow.

Mr. Glover—That would seem on the face of it as not being an accurate test, but did the man that took those samples understand just how to do it?

The Member—He took one sample just like the other. He wanted to test the creamery man, not the cow.

Mr. Glover—Of course the Babcock test does not make honest men, it cannot do that.

A Member—If that man knew his business, he would say those two cows test just alike, but he didn't understand his business and I believe there are a lot of them that do not.

Supt. McKerrow—Maybe the man that took the sample didn't know his business. If he drew one sample from the top of his pail and the other from the bottom, there would be that difference.

Mr. Goodrich—He doesn't have to do that; he can take one sample, then let the milk stand 15 minutes and take another and there will be that difference. I have tried it.

Mr. Glover—There is no excuse, farmers, why you should not know how to test your milk. It is a simple operation. Why should you, in this age of advancement, with agricultural schools all about you, and you having young men in your families that you can send to these schools, not have your milk tested? When the tests have been made, then you can say: "Gentlemen, I know what my cows test, because my boy has tested them." We hear men say, when you ask them: "Do you know what your cows test?" "No, but I think so-and-so." Stop thinking and

go to doing. It is a business proposition to have a thorough understanding of what each of your cows tests and what your average test is. Farmers should be business men, the same as men who make their livings by buying and selling.

Committees.

Supt. McKerrow—I will appoint, as a committee on resolutions, Mr. L. E. Scott, Chippewa county; Mr. George Church, Winnebago county, and Mr. E. C. Jacobs, Dunn county.

The local committee asked me to select judges of the products on exhibition and I will give you this list and these judges will commence their work tomorrow at the noon hour.

Corn—Mr. Delbert Utter.

Small Grains—Mr. Geo. C. Hill.

Potatoes and Roots—Mr. L. E. Scott.

Hay and Ensilage—Mr. C. P. Goodrich.

Butter—Mr. Thos. Convey.

Cheese—Mr. M. Michels.

Cows—Mr. F. H. Scribner.

Horses—Mr. David Imrie.

Adjourned to 7:30 p. m.

EVENING SESSION.

Convention met at 7:30 p. m. Supt. McKerrow in the Chair. Music by Orchestra and Ladies' Chorus.

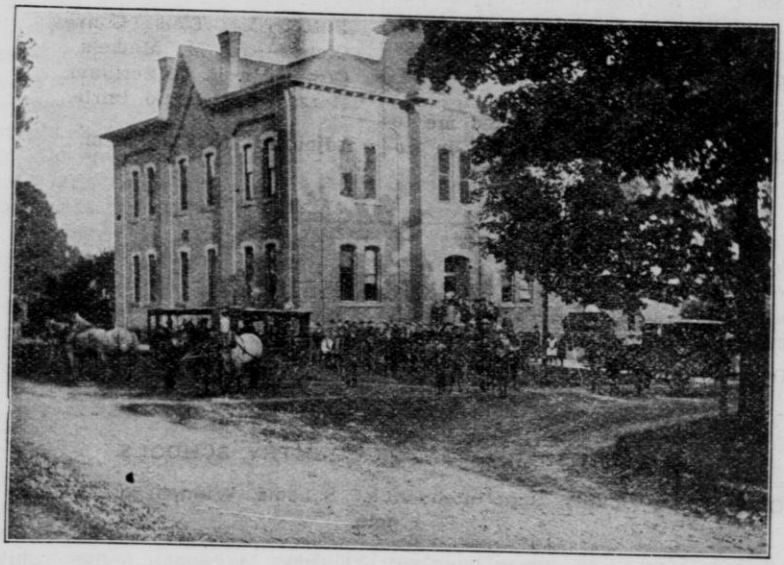
CONSOLIDATION OF COUNTRY SCHOOLS.

O. J. Kern, County Superintendent of Schools, Winnebago County, Illinois.

The last 15 or 20 years have witnessed great advancement in the educational interests of the towns and cities. Large sums of money have been expended for material equipment in the way of better buildings, laboratories, libraries, manual training, etc.; superintendents and teachers in cities have become more efficient and better paid; a strong effort has been made to adjust the course of study to practical conditions of life; business courses have been introduced into high schools and the general public seems to manifest a deeper interest in the entire educational machinery. The growth of towns and cities has been phenomenal and the resources of the people have been taxed to the utmost at times, to enable every child to have at least a common school education.

Many farmers feeling that the district school did not furnish sufficient training for their children have moved to the cities, to be under the influence of better schools. Some of them have complained that the city school has educated their children away from the farm. A moment's reflection is sufficient to see that the city school is for the city child, with a course of study suited for conditions in which the city child must earn a living. It is not to be expected that a high school in the city will teach country children about things relating to farm life. The city child, who, after leaving school,

works in a counting room, store or factory does not need to know about the care and composition of soil, rotation of crops, breeding and selection of animals, feeding standards for stock, etc., but the country boy who expects to remain on the farm should know about these things if he expects to be numbered among the successful farmers of his day.



Kingsville, Ohio, Where Consolidation of Country Schools Started in 1893.

Time to Improve the Country School.

The serious attention required by the new conditions of life is now being bestowed upon the improvement of the country school. There is a greater public interest in this part of the educational field, much of which has too long been neglected. This public interest must increase, and two factors that may operate powerfully to quicken this interest are the county superintendent of schools and the Farmers' Institute.

I have said that the public interest in the improvement of the educational facilities for the country child must increase. This is inevitable because of changing conditions of country life. The telephone, free delivery of mail and the trolley line must touch the educational interests as well as the financial and social interests of the farmer. Better schools will be required in this our period of settling down in the country after the country has been settled. A writer in the November 1903 "World's Work," says:

"In a sense we have settled the country; and now we are beginning to settle down. We are reaching a period of an equilibrium of opportunity.

This large fact explains many changes in the direction of our activities and a corresponding change that is taking place in our national

character; for what we do makes what we are. It is a key to the right reading of the larger tendencies in present American life.

The difference between a period of settling and a period of settling down is the difference between adventure and development. It is expressing itself in a hundred ways—in intensive farming instead of extensive; in the concentration of industry instead of duplicating it; in building better homes instead of seeking other homes; in doing the jobs we have in hand better rather than in seeking other jobs. All this means greater efficiency. It means sticking closer to business. It has much to do with the production of great wealth which makes the last decade a period in our history that stands out by itself. It has much to do with the great movement to consolidate industry. It brings us back to all kinds of home problems—to the proper building and government of our cities and to the almost universal tendency to improve country life."

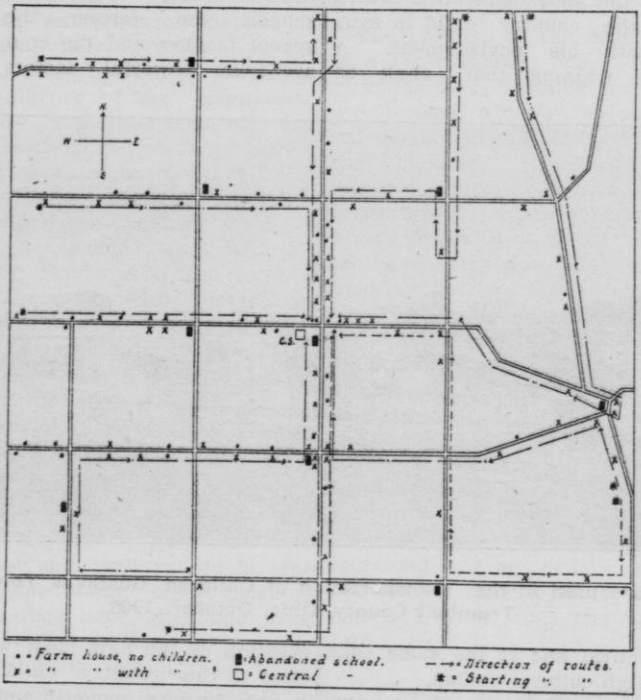


Diagram Showing Transportation Routes, Gustavus Township, Trumbull County, Ohio, October, 1900.

Forward Movements in Country School Education.

In harmony with the "almost universal tendency to improve country life" are three clearly defined movements to improve the country school conditions to meet the requirements of a more complex civilization. They are as follows:

First—Better material environment

for the pupil in the country school. This is seen in the tendency to plant trees and flowers in the school grounds; to improve the school house; the out-door and in-door art movement; libraries, etc.

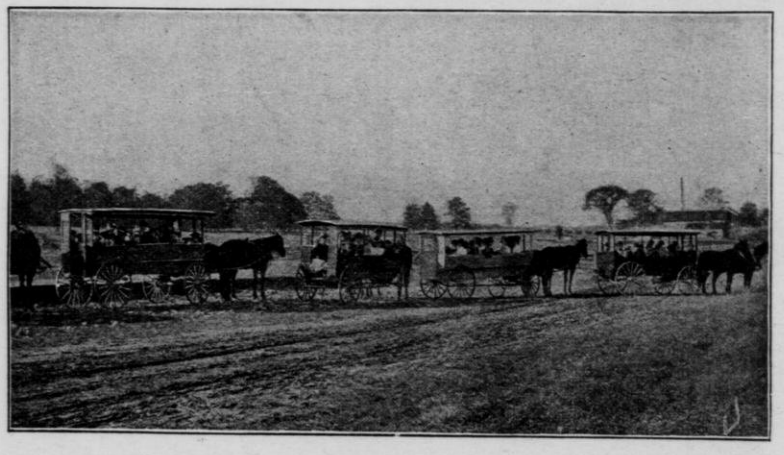
Second—Enrichment of the course of study, the new education which shall put the country child in sympathy with his environment. A course of training that shall be more practical and at the same time possess high cultural value.

Third—Consolidation of country schools. This is a union of several small, poorly taught schools, to secure greater efficiency in school administration; a more economical use of public money; and a more effective teaching force for country children. This third movement will bring greater things with reference to the first two movements than is possible under the single district system. The problem is to get the great body of farmers to realize this.

A New Educational Ideal.

It is very difficult to attract the average farmer and genuinely enlist his active cooperation for the betterment of school facilities for his children. There must some how be created a new educational ideal. The farmer must be met on his own ground. The reason must appeal to him from his own point of view.

The county superintendent of schools, the farmer, the district school teacher and the country child are four powerful factors in the creation of the new ideal with reference to the country child. I take it the county superintendent, the chief administrative school officer for the country schools, is an earnest student of the changing conditions of country life and is ready to direct the educational agencies at his command in such a way as will make the country school of most service.



Wagons used in the Transportation of Children Gustavus Township, Trumbull County, Ohio, October, 1900

Educational Agencies.

Among the agencies that are helpful in creating a new sentiment with reference to country life are,

1. The daily and weekly press.
2. Illustrated printed matter from the county superintendents office distributed through the schools.

3. Close cooperation of the country school and the Farmers' Institutes.

4. Organizations of young people, such as boys' experiment club and girls' home culture club.

5. Educational excursions to the State College of Agriculture.

There is not time here to go into detail with reference to the use of these educational agencies. In my judgment, there is nothing so potent as the influence of the newspaper. The county superintendent who can write a thoroughly readable article on things relating to the many and varied interests affecting the farm the home and the country school is exerting an influence that will tell for better things. If the articles can be illustrated with pictures of actual conditions, so much the better. To get the attention of country people and set them to doing things for the improvement of the district school requires some earnest thought and work.

A New Age.

Give the district school all the credit for the great work it has done in the past and will yet do in the future. The same credit must be given the reap hook, the hand loom and the ox-cart. But no sensible farmer will make use of them today simply because his fathers used them and people were happy then. This is a new age. The future will be characterized by fierce competition in which technical skill and a high degree of training will be necessary qualifications for success. Industrial organizations, with facilities for transportation never dreamed of, will yet be attained. The farmer is beginning to realize that he must know something of the scientific basis upon which success in farming depends. He must be a thinker along the economic lines likely to be affected by legislation, and if country life shall be estimated at its proper value, if labor on the farm shall receive its just reward, the country school must be improved to furnish the training demanded by the times.

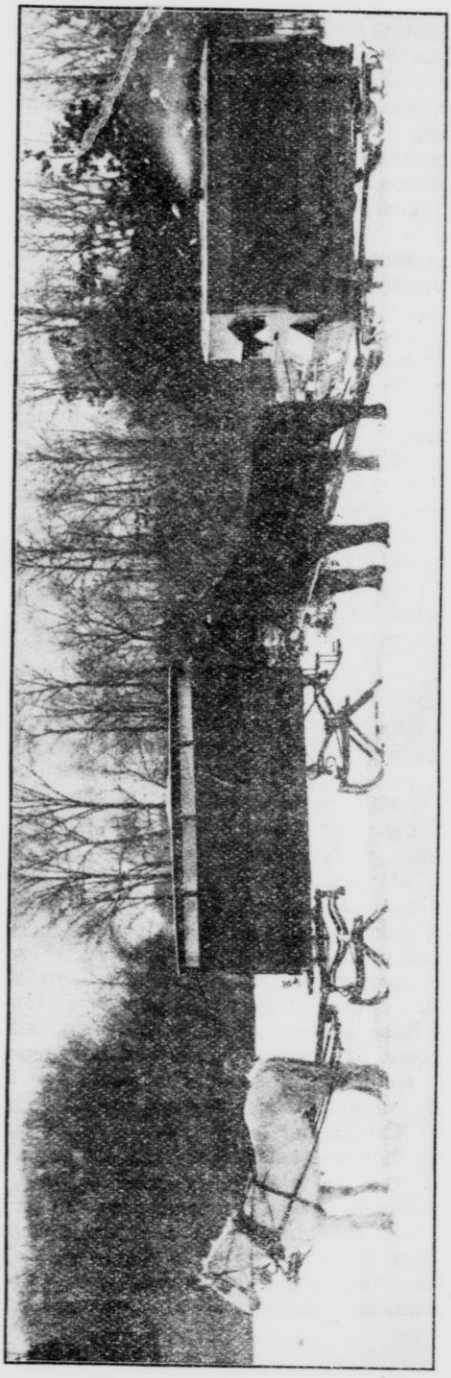
Movements Towards the Centers of Population.

The problem of the country school is a far reaching one. If the instruction and training are all that are desired, why are so many farmers moving to the cities to educate their children? Is this tendency to desert the farm one that should be encouraged? It is imperative that a certain per cent of the fresh blood of the country flow into the city to quicken its wasted energies, but there are many in the cities today who should remain on the farm.

By the federal census of 1900, 10 of the 16 townships (more correctly civil towns) of Winnebago county show an actual decrease in population over the census of 1890, while four other townships (towns) were practically at a standstill. On the contrary, the city of Rockford had increased 32 per cent. Today 70 per cent of the people in Winnebago county live in the city of Rockford.

Problem of the Small School.

The decrease of population in the country districts weakens the district school. In a country school of 10 pupils or fewer, of ages from six to 16 years, with children of all degrees of advancement, it is impossible almost to have strong and vigorous work. The classes consist of one, to or possibly three pupils each and the number of recitations vary from 21 to 35. Irregular attendance on the part of the pupils increases the difficulty of the teachers to have the children maintain their grades and decrease the number of recitations, thus enabling the



Transportation in Indiana. Children Comfortable. See Smoke Coming Out of Stove.

teacher to give more time to a single recitation.

The time of the average recitation is about 10 minutes, which is entirely inadequate to enable the teacher to know what the pupil has mastered or to assist the pupils to form correct habits of study.

During October 1903, I took the enrollment of every country school in Winnebago county. There are 106 one-room district schools. Of these 106 schools, only 30 had an enrollment of over 20; 48 schools had an enrollment of 14 or fewer; 14 school and there may be two or fewer; while two schools had an enrollment of five or fewer. What is the remedy for the small school?

The ordinary way. Going home from school, Winnebago County, Illinois, February, 1904. Thermometer 12 degrees below zero and a stiff gale blowing.

What is Centralization of Schools?

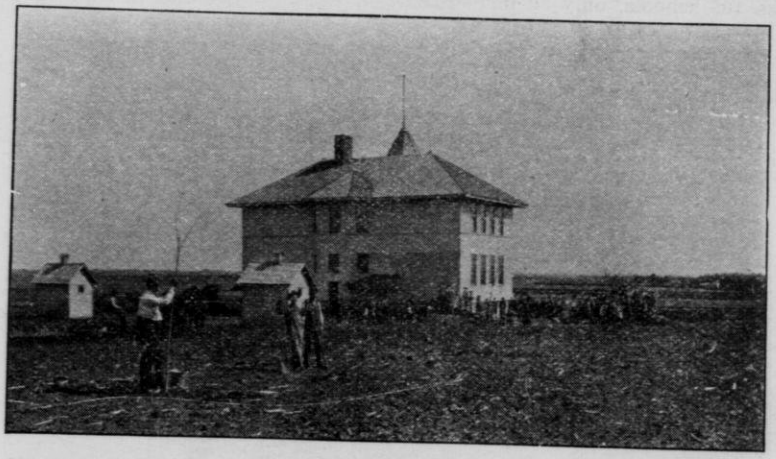
Centralization or consolidation of schools does not necessarily mean that all of the schools of a township must be combined into one school at the geographical center of the township, regardless of local conditions. There may be a union of three or four districts, making a two-room school, and there may be two or more of such schools in a township. Also small schools may be consolidated with a graded school already established, where conditions are favorable. Complete consolidation of country schools means the union of all the schools of a township into a central graded school. There may be consolidation of schools of two or more townships, as there are now union districts.

I visited both kinds in Ohio in October 1900. The trip was made in company with State Superintendent Bayliss and Mr. John Black, chairman of the Committee of Education of the Winnebago county Board of Supervisors. There is not time here to go into detail concerning our visit. That you may get from my printed report. I will only briefly give some facts with reference to two townships.

Madison Township, Lake County, Ohio.

Madison township represents an excellent illustration of what may

be called partial centralization, that is, a grouping of two, three or four country schools into one without attempting to take all the schools of the geographical center of the township. This method would not be practical because of the shape of Madison township. It is one of the townships along the coast of Lake Erie and is nine miles long and five miles wide. Most of the townships of the Western Reserve are five miles square, while in other parts of the state where centralization is a success, the townships are more than six miles square.



Improving Grounds of First Consolidated Country School in Illinios, Seward Township, Winnebago County, April, 1904. Building Cost $6,000.00 and the Grounds, 3.6 Acres in Extent, Cost $1,000.00 More.

Consolidation has been in operation in Madison township since 1895. We visited the schools at Unionville and North Madison. Supt. J. R. Adams, principal of the Unionville school and superintendent of Madison township, sent me the following data with reference to comparative cost.

1. The total cost for the township for educational purposes in 1896 was $7,555.00; for 1901 the cost was $7,243.00, a saving of $312.00 in one year.

2. Cost of transportation in 1896 was $332.00; for 1901 the cost was $1,618.00.

3. Incidental expenses for the township in 1896 were $2,509.00; for 1901 the incidentals were only $902.00.

4. Total enrollment in township for 1896 was 390; for 1901 it was 411.

5. Per capita cost for education in township in 1896 was, based on the total enrollment for the year, $19.36; for 1901 the per capita was $17.50.

Green and Gustavus Townships, Trumbull Co., Ohio.

Our visit to Gustavus and Green townships are fully described in the printed pamphlet. Here we found complete abandonment of the district schools of the townships and the union of all in one building geographically located at the center of the township. Nine wagons are employed to collect the children in each township, which is five miles square.

The schools of Gustavus were centralized in 1898, when a four room frame central building was erected at a cost of $3,500.00. The schools in Green township were centralized in 1900, when a $6,000.00 brick building was erected, the people being fully satisfied with the experiment in the adjoining township of Gustavus. In Gustavus the average price paid for transportation was $1.25 per day and the longest route was three and three-fourths miles. The number of children enrolled under the district plan was about 150 and had increased to 186 in 1900. In paying the bonds for building purposes and all transportation expenses and maintaining a four-room school, the total expense had increased only $256 00 annually. So fully are these schools described in the report that I shall dwell no longer on them here.

Consolidation in Illinois.

Consolidation of country schools has begun in Illinois. Winnebago county has the first one in the state. Last April districts 90, 91 and 93 of Seward township (town) on petition to the school trustees, were consolidated. A few days later by a vote of 38 for and 15 against, the people of this consolidated district voted to bond this district for $7,000 on 10 years time at four per cent to erect a modern school house on a central site. By a vote of 47 for and one against, the people authorized the directors to purchase a site of 3.6 acres of some of the finest farming land in Northern Illinois. The price paid was $1,000.00.

A central two-story building has been erected at a cost of $6,000.00 including all furnishings. School began in this new building January 15, 1904. There is a basement under the entire buiding, thus affording space for the fuel and furnace rooms, a boys' work shop, and a girls' gymnasium and domestic science room. The first floor has two up-to-date school rooms with cloak rooms and hall way. The second floor has a school room, a laboratory and an assembly room. This latter room may be utilized for a school room when other districts join. The people are building for the future, for it is only a question of time when other districts will abandon the small, unsatisfactory country schools and send their children to this central school, which will attempt to do at least two years of high school work.

The grounds have been planned by Prof. J. C. Blair, Chief of Horticulture of the Illinois College of Agriculture at Urbana. The scheme makes provision for a boys' play ground, girls' play ground, little folks' play ground, and experimental plots of ground for the entire school. It provides also for the planting of many varieties of trees, shrubs and flowers. Here is an ideal showing the possibilities of country life.

The Consolidated District.

The consolidated district is exactly one-third of a township which is six miles square. It contains, therefore, 12 sections of land, or 7 680 acres. The assessed valuation of districts made in 1902 is as follows:

District 90	$58,390
District 91	52,790
District 93	35,126

This represents one-fifth of the fair cash value by the Illinois revenue law. But as some of the land cannot be bought for $150.00 per acre, it is no exaggeration, perhaps, to claim one million dollars as the real value of this consolidated district.

School Levy.

The school tax levied for 1903-1904 for all purposes was $2,800. This is a rate of nearly two per cent for building and operating expenses. The

school law permits a maximum levy of five per cent annually for both purposes. Of this sum of $2,800.00 the amount of $1,000.00 is for the first payment of building bonds of $700.00 and $280.00 interest on the full account. This levy of $1,000.00 for building purposes amounts to only about 13 cents per acre annually on $7,680.00, and if the entire amount of $7,000.00 were paid in a single year, it would amount to about 92 cents per acre. And it is not too much to claim that this new school adds at least 92 cents per acre. Offers have been made recently for farms of several dollars increase per acre by outside parties who wished to move into this district and educate their children. The offers in every case have been refused.

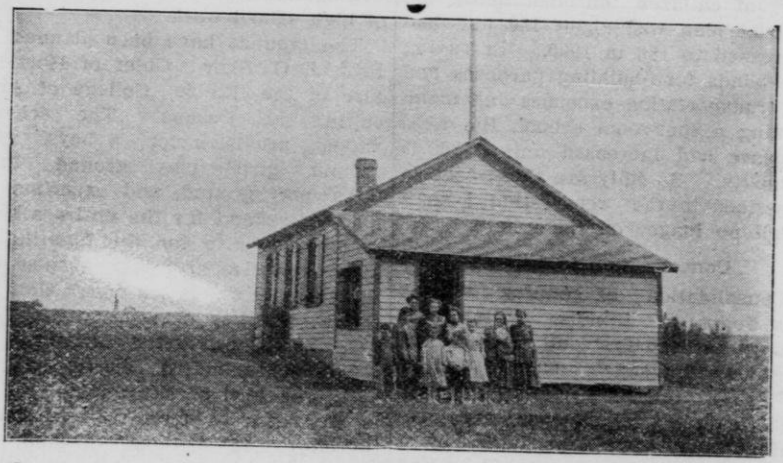
Suppose the operating expenses are a little more in total during the school year, will there not be better returns for all grades with an added possibility of at least two years high school work? Longer school years, better teachers, more regular attendance will give better results if more money is expended. Seward is not trying to do the cheapest, but the best thing for the children, and the best is the cheapest in the long run.

Advantages of Consolidation.

1. There will result that inspiration and interest that always comes from numbers. A school of eight or 10 pupils is not calculated to stimulate a boy or girl to do the best work. With only one in the class, there is not that competition and rivalry which calls forth all the powers of the child, that preparation for the real struggle of life.

2. Stronger classes may be formed, giving the teacher more time for the recitation and the necessary instruction.

3. It will result in greater economy in school buildings and equipment. It will cost less to keep one central building than several scattered school houses. The children



One of the Three Abandoned Buildings at Seward, to Make Way for the Consolidated School Building as Shown in Preceding Cut. This Abandoned School Building is a Type of too Many Country School Buildings Still Used for School Purposes. Not a Square Deal for Country Children.

will have the educational influence of a modern, sanitary, well-ventilated, well lighted and well heated building, instead of present conditions. The first cost of such a building is not as great as the first cost of the school houses of a single township.

4. There will be better teachers with better salaries.

5. The school year for the country child will be lengthened. The attendance will be more regular. More pupils will be found getting the benefit of the money expended for education and the per capita will be decreased.

6. A centralized school will afford time and opportunity for systematic instruction in the elementary principles of agriculture throughout the grades. With trained teachers working under the direction of the college of agriculture, such a school will be able to meet the demand for instruction in things relating to the farm. Here can be taught something with reference to feeding standards and selection of stock; fruit growing; constituents of plants; rotation of crops, and composition and care of the soil. The centralized school may become in effect an experiment station, working under the direction of the expert investigators of the state college of agriculture.

7. Consolidation will help to bring better roads. As it is now, the farmers of northern Illinois always manage to get a load of milk to the central creamery if it takes four horses. Is not a child deserving as much consideration as a can of milk?

Difficulties.

The problem is how to get the country people to see the advantages The difficulties are many, but not insurmountable. The time has come for the improvement of the country school. To my mind this can best be done by consolidation. How shall I make others see the matter in the same way? A thorough study of consolidation; an earnest appreciation of the difficulties; a practical knowledge of farm life; a continual study of the advanced methods of farming, and the results of scientific investigations with reference to agriculture; a steadfast devotion to duty; courage, sympathy, tact, enthusiasm, a tireless energy and a hope that never flags are some of the things necessary for the county superintendent who wishes to create a new educational ideal with reference to the country school and the country child.

Mistaken Zeal.

Much mistaken zeal is being manifested in this matter of consolidation. It is mistaken to urge it upon the people on the plea of being cheaper. It has resulted in less money being expended in many places, while the almost universal experience is that the per capita expense has been reduced, but let us not cheapen education for the country child. It is the right of the country child to have just as good educational opportunities as are now enjoyed by the city child. Economy and cheap are not always synonymous terms. Considering the conditions of many small schools and the results being attained, it would be economy for more money to be expended in total for a good central school than is now being expended under the present plan. The reasons are obvious.

The conservatism and prejudice of the people must be reckoned with. A mistake is made when consolidation is urged with an entire disregard of geographical conditions and local sentiment. Some have the idea that all of the country schools must be taken to the geographical center of the township. Others urge too long

transportation routes. In my humble judgment, it is not for the best that children be taken to a town or city. We need, it seems to me, schools in the country for country people, suited to country conditions.

Some Objections.

1. Impracticable because of bad roads.
2. It will cost too much.
3. People don't like the idea of giving up the home school.
4. Fear that land in abandoned districts will depreciate in value.
5. Teachers will be thrown out of employment.
6. Fear that children will freeze on the way to school.

These objections must be met in the proper spirit. Country people are demanding the telephone, free delivery of mail, the daily paper, electric lines and better roads. Consolidation of schools will help to bring better roads. Better educational facilities for the country children must keep pace with improvement of country life.

AGRICULTURAL EDUCATION.

Prof. W. M. Hays, Ass't Secretary of Agriculture, Washington, D. C.

I am glad I am here. I am glad these little folks are here, and I am immensely glad that our friend from Illinois has told us what he has about these schools.

If we look back at education, we see how free education started in the old world and in the new; we see many of the movements as they have come forward and we see how they are taking root. We see that education nowadays is not simply for the few, but it is for everybody. The schools, for a long time, were promoted only by religious organizations; they did their pioneer work well and when we began to have public schools, we followed their plans. We educated our children in the three "R's" and then we went on and educated them in the higher studies, so called. After a long while, somebody found that we could educate them in the practical things of life, such as we have heard Prof. Kern talk about tonight.

I have lately come to know something of the great body of our national law-makers, the congress of the United States, and I want to call your attention tonight to the fact that in the strenuous times of the Civil war there were a few men in that great body who thought that farmers needed not only the general education of the schools, but an education that would teach the farmers how to farm, how to make homes and how to live in the country, and they passed a bill giving to each state a lot of land and forced the states, practically "Carnegized" them, giving them money with which they must put other money, to establish agricultural colleges, and this was the beginning of agricultural education for both the farmers and the farmers' wives of this country. These men built wiser than they knew. They did not understand that they were building a cluster of colleges that would build up a body of thought supplemented by Experiment Stations, for which congress has provided and which the congress practically pushed upon the states by an appropriation so large that they could not refuse it.

I have been looking at this matter in the last few years from the na-

Prof. Hays.

tional side, from a local standpoint, to see how we are going to meet the situation. We all remember when the first sewing machine was put on the market; the self binders and the self reapers were largely purchased, though the farmers hadn't much money, and now we have come to the time when we have invented a great instrumentality, a great educational machine, if you please, and we are up squarely against the people, against the proposition of paying for it and having it. At Madison, at St. Anthony Park, at Ames, Iowa, at the Illinois Agricultural College, and at others of the 50 agricultural colleges of this country, have been wrought out some of the principles and the factors that go to make the agricultural collegiate education successful. Over at Menomonie and at your other agricultural high schools, at St. Anthony Park, where there is the first and largest agricultural high school, at all these places they are trying to find out the elements which will properly weld together and correlate all these influences in building up agricultural education in this country. Men are trying to work out a course of study that will give technical education on agricultural subjects. There will be hundreds of thousands who will go into the agricultural high schools soon to be built up, and these, in connection with our experiment stations, our county agricultural departments, our great agricultural department in Washington and similar institutions in all sections of the world, in course of time are bound to give us a body of thought and practical men like Mr. McKerrow, which is bound to be put into practical form and sent out for the benefit of those needing it. It is not to be simply a study of how to make more money, but will cover other subjects of greater educational value, which, combined with the common school studies, will make a far broader course than the old course of study, with its narrow curriculum, devoted only to thought written by men one or two generations ago. The broadest people that ever lived live now; the greatest body of thought ever built up is being built now, and why should we teach only ancient things? The most important history is the history of the day; the most important science is the science of today; the most important education is the education of today.

Question of Ways and Means.

But the question that is interesting me now is, how are we going to buy the machine? How are we going to raise money for schools of this kind? In every district five miles square in all parts of the country, where land is worth $50.00 or more, these schools are needed. Our ideas are changing as to the kind of education needed. We are coming to see that to run a 160-acre farm right requires far better all-around executive ability than to run an ordinary bank, and there is every reason for taking this matter up, preparing a scheme of education and developing a new system. We want to give both the boys and girls a chance to prepare for country life and give them a splendid education along those lines at relatively small cost.

Now, how are we going to do this? How are we going to get the necessary money to pay for it? Are the farmers going to pay the cost of these schools, these agricultural high schools and educational colleges?

What Congress Has Done.

Congress established the right principle, when, in 1862, it appropriated a million dollars a year to the agricultural colleges, and the states did the right thing when they more than doubled that amount by

putting state money with it to build buildings and help hire teachers. Then in 1887, congress put three-quarters of a million into the state experiment stations. In 1900, it put in a million and a quarter by giving to each state $25,000.00 cash out of the National Treasury to help further build up the agricultural colleges, and just yesterday it did another spendid thing, and United States Congressman Adams has his name on the bill that gives another three-quarters of a million for additional equipment to the experiment stations of this country, and there is another movement, not only to duplicate the $15,000.00 that congress gave in 1887 by making it $30,000.00, but to duplicate the $25,000.0 by giving each college $50,000.00, and I have no doubt but that will go through.

Congress is the great source of money for these expenditures as between the government and the state, because the government has an indirect way of raising taxes and can raise taxes more easily than the state. The national government raises expenses for all government purposes of about $10.00 a head for all of us, or $800,000,000 on a population of 80 million.

The Duty of the States.

Now, the national government is, through its Department of Agriculture, doing to or three times as much as it has done through all these agricultural colleges combined. It is spending more than six millions yearly in the Department of Agriculture itself. That Department has men investigating and building up agriculture all over this country; it sends men abroad to get new seeds and even helps bring in new animals. but the states are doing a great deal for themselves. Now, what the government did for the states was to furnish the place to build these institutions and the states can do the same thing for the agricultural high schools. That work has been begun in some of our states, you know what Minnesota has done; she already has two such schools, and I believe the time will come soon when Minnesota will have eight or nine of these agricultural high schools.

The local people must pay in the end most of the expense for the consolidated schools, but the state can go this far, and every state should go this far where it has any adequate means, to the extent of raising money to pay for the industrial education, and also pay something toward the buildings; the people in the neighborhood should be induced to vote the necessary additional expense for the buildings and grounds of the consolidated schools and should receive from the state a portion of the added current expense of the school which continues from year to year. The state legislators are wiser in these matters than the people of the district, because you know we send to our legislatures some of our brightest men, and of course we have a clear right to assume that a congressman is even more wise than the average state legislator, because we pick out of our state legislature some of our best men to go to congress.

We have got to get the money from the top to promote this work, and we at the bottom have got to pay more expense toward these schools.

Some Vital Statistics.

Let me give you just a few figures. There are something like nine million little school children in this country who are going to school about 40 per cent of the full school year, or not more than that. There are altogether nine million children on the farms who should be going to school, between the ages of five and 20, there is only about an equivalent of 3,600,000 that are going

to school. The schools cost probably about $60,000,000, and we ought to put in double that amount to secure our agricultural high schools and colleges, we ought to run it up to $120,000,000. This would cost each farmer probably six, eight or 10 dollars more than he is now paying; we have in this country six million farmers. These farms produce annually six billions of money, one thousand dollars per farm averaging 146 acres. As Prof. Kern has said, the children of these farmers are not having a square deal. The doctor, the lawyer, most of the professions, can receive a technical education that costs very little. They demanded it, and they got it.

We firmly believe that if this 60 million dollars were added to our whole cost of education in training these children for country life, that it would increase the annual income from our farms by easily five times that amount, or three hundred million; in other words, I believe that one dollar will easily produce five if put into this industrial education. If we can organize our people to be more efficient in their plans, in their daily work, it will pay all it costs, and there is no agency sufficient to meet these money demands to build up our country schools, except as I have suggested. Such a system would, I believe, not only result in this added money value, but we would have in addition a great body of young men who have received this technical training who would go into the communities and by working out better methods would greatly add to the wealth and civilization of that community.

Music—Vocal solo and male chorus.

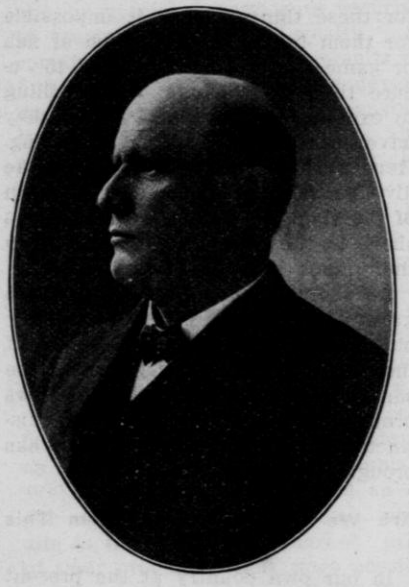
Adjourned till 9:00 o'clock next day.

SECOND DAY.

The Institute met at 9:00 o'clock a. m., March 14, 1906. Mr. David Imrie in the Chair.

TOWN MUTUAL INSURANCE.

W. A. McEwan, Milton, Wis.



Mr. McEwan.

In considering the subject assigned me, it will be from the standpoint that "life is more than meat and the body more than raiment."

However much we may delight to acquire the dollars, or become possessed of the things they will buy, we should not forget that this is not the chief end of human existence. Every institution or class of institutions organized under the laws of our country should fill a place in harmony with the principle of "the greatest good to the greatest number;" therefore in seeking to advance the interests of any business, it is well to determine whether it is in harmony with the principle just stated.

It is my intention, in presenting this subject, to direct your thoughts to the fundamental principles which underlie our town company mutuals. The purpose of this is that we may get a clearer vision of our relationship one to another and to those things which should be ours by common inheritance.

The Term Mutual Defined.

Webster defines the word mutual as "given and received, or that which belongs alike or in common to the parties." If we bear in mind the significance of this definition, and then consider in contrast the facts brought to light by the late investigation of the Mutual Life and other Life Insurance Companies of New York, we will observe that the name mutual may frequently be misapplied; therefore we must use intelligent discrimination.

Mutuality is the broad principle upon which all social relationships should rest and those which do not rest upon this foundation are the fields in which flourish the parasites which prey upon society. We do not claim that mutuality should be the highest motive of human action, but we do assert that without it as a foundation the higher ornaments of Christian character are barren and fruitless.

Our Nation Founded on Principle of Mutuality.

At the beginning of the life of our nation, this principle was recognized and the government was organized as a great mutual insurance company. Listen to the words with which the framers of that inspired document, the Constitution of the United States, announced to the world the reasons for its adoption. "We, the people of the United States, in order to form a perfect union, establish justice, insure domestic tranquility, provide for the common defense, promote the general welfare, and secure the blessings of liberty to ourselves and our posterity, do ordain and establish this constitution for the United States of America." To me these words seem like a grand anthem of liberty and equality which must find an answering chord in the heart of every patriotic citizen.

In proportion as the mutual principle has predominated in the various departments of our national life, have we, as a people, been blessed. On the other hand, where selfish interests have prevailed, we have been cursed; therefore, it follows logically that he who opposes those things that are mutual in their nature and seeks to advance the selfish interests of certain classes to the detriment of the common good, is a traitor to his country.

To illustrate and make this matter a little more practical let us go back to the beginning of social life in the first settlements of our country. Our present social relationships are so complicated that we lose sight of the fact that each should do his share in producing the things required to supply our common needs and that each should receive such a part as his service merits. When the first settlers found themselves upon our shores and until such time as agricultural pursuits were established, they must subsist largely upon the game and fish which nature had provided. In order to be successful in securing the game and fish, boats and other implements were required. Very soon some person developed special skill in making boats. Another had skill in making bows and arrows. Soon the demand upon these persons for these things made it impossible for them to go out in search of fish or game, but those who wish to secure these implements were willing to exchange the product which they have secured by hunting or fishing. Here we have the beginning of the division of labor and the recognition of the right of these workmen to a share in the common supply which their labor has helped to increase.

As the community or communities grow, the divisions of labor multiply, but the righteousness and justice of the principle of mutuality remain the same. The violation of this law has brought to some men wealth and distinction, while to others it has brought want and misery.

Are We Growing Away From This Principle?

In our own country at the present time, it seems as though the greed for gain has completely blinded men to this principle, which is the foundation of the national life. I would not wish to convey the impression that our institutions are all bad, but I will assert that where evil does exist it is because the mutual relationship which should exist has been discarded and that selfish interest has usurped its place.

If we scan the whole field of political and industrial activity, we find this tendency is very marked. In political life the official elected by the people is most likely to give his allegiance, not to the people who

elected him, but first to his party, then to his own interests and those of his friends. Nor does this disregard for the righteous law of mutual responsibility confine itself to political life, but we find among the different classes and industrial pursuits a desire by organized effort to secure for themselves that which in justice and equity belongs to others, the rich and powerful often invoking the law and by special enactments securing to themselves ill-gotten wealth. In commercial and industrial pursuits we find capital, by every known device, endeavoring to avoid the responsibility of open competition and by this means securing more than their rightful share of the wealth produced. In retaliation the various classes of labor unions organize, not simply to protect themselves against the agressions of capital and to secure that which shall be shared in common by all, but rather to secure for themselves a larger slice than those who labor in some other branch of industry.

This is fighting an evil by creating another evil of the same nature as the one of which they complain. We have at the present time an organization of farmers whose chief aim is to control the market price of their product. If it were possible to thoroughly organize all the farmers of this country into such a society, it would be as vicious a piece of business as the beef trust, of which we hear so much.

Town Insurance Companies.

After considering in contrast the things which human selfishness and avarice have created, it should be with pleasure that we contemplate the Farmers' Mutual Insurance Companies, which our law designates as "Town Companies."

The law authorizing these companies was enacted by the legislature of 1872. I am very glad to be able to say that the framing of this law and presenting it to the legislature was the work of two former members of our own local fire insurance company. These men were John Stockman and Hon. Andrew Barlass, both of whom have now gone to their reward.

With the plan upon which these companies operate, most of you no doubt are familiar. It consists in simply pooling our misfortunes caused by fire or lightning. It is the fulfilling of the command, "bear ye one another burdens." One of the factors which has made these companies so great a success, is that those chosen for officers and directors are men selected by the policy holders and who are therefore persons in whom confidence is placed. These men are usually those whose bread and butter is already provided for; therefore they are not hungry grafters.

Another factor of great importance is the matter of moral hazard, which cuts a large figure with the business of the stock companies. By the town company method, this matter of moral hazard has almost entirely disappeared. One of the strongest desires in human nature is to stand well in the estimation of one's neighbors and as neighbors must help to pay any loss that may occur to property insured in the company, the property is not likely to be burned in order to secure the insurance. In the report of the town companies of Minnesota for 1902, Elmer Dearth, Insurance Commissioner, after showing the average rate for the year to be 19 cents per $100, said: "This is an exceedingly small cost. It shows that the matter of moral hazard has been entirely eliminated from the town company business." The average cost in Wisconsin by report of 1905 was 18 cents per $100. Our town companies are a bright spot in

the activities of our state. Their greatest value is not in the amount of money saved the policy holder (although this matter is worth considering), but in the fact that it cultivates a spirit of mutual helpfulness and develops the democratic principle whereby men are able by organized effort to secure a common good in which all share.

Let us look at this subject from the dollar standpoint. It has been said "By their fruits ye shall know them," therefore we shall exhibit some of the fruit.

The official report for 1905 shows that there were 200 town companies in the state and that they were carrying risks to the amount of $263,440,846. They paid losses during the year amounting to $403,661.15; the expense of management was $79,767.86; therefore the total cost was $483,629.31. The story these figures tell is that the policy holders received back in the payment of their losses 83.5 cents of each dollar paid in, and that only 16½ cents of each dollar was used in the expense of management, the annual average rate of cost being 18 cents per $100.

We learn the value of things largely by comparison, for this very reason our agricultural fairs are maintained, therefore I do not see why we should not apply this same principle to the insurance business. I hesitate only on account of the feelings of the representatives of the old line stock companies.

Stock Versus Town Companies.

We will take the official figures of the report of 1905 for the Fire and Marine Insurance of Wisconsin. Amount written during year, $407,053,326.38; amount paid as premiums, $7,594,189.77; paid for losses, $2,598,019.70. Ratio paid for losses to premiums received, 34.21 per cent. In other words, the policy holders received back in the payment of their losses only 34.21 cents of each dollar paid for their insurance. The companies received 65.79 cents of each dollar as their share, 38.86 per cent was paid for expenses, leaving them a profit of 28.93 per cent in addition to interest during the life of the policies on that portion of the premiums paid in to the company. It will be impossible to make any just comparison between the rate charged by the stock and town companies, for the reason that they are insuring different classes of risks, but we can say this, that although the average rate charged (as shown by the foregoing figures) is more than 10 times as great as the town companies, yet it required nearly 37 per cent of these large premiums to pay expenses, to say nothing of the profits, while the town company business shows an average cost for expenses of only 16½ per cent of an exceedingly small premium.

At the present time our farmers' town companies are saving annually to the citizens of the state (basing our estimate upon the rate charged by stock companies for farm insurance) about $500,000. If it were possible that the whole insurance business of the state could be done upon the same economical plan, it would represent a saving to our citizens of several millions of dollars annually. We have now compared the stock and the mutual companies from the dollar point of view, let us now compare them from the moral side of the question.

The stock company contract is the gambler's proposition. When they insure the dwelling of a person, they say in effect we will bet you $1,000 against $10 that you do not have a loss in three years. Their experience shows them that they shall win by a good margin. It is my opinion

that the time will come when our business men will demand a better method of insurance than this, and when that time comes they may turn to the farmers' companies and seek to learn about insurance which is mutual in fact as well as in name. We do not believe that we have reached the climax of perfection in the farmers' insurance business, but we are at least on the right road.

Some of the Benefits Derived From Mutual Companies.

In the early days of the town companies, there were many difficulties to overcome. The details of the business had to be acquired largely by experience and when legislation was needed to foster the interests of these, they found that acting separately they could not expect to accomplish much, therefore a movement, led by Wm. Greverus, of New Holstein, was made, which resulted in uniting the town companies in an organization now known as the Wisconsin Association of Mutual Insurance Companies.

The aim of this association is to promote mutual insurance and especially the interests of the town companies. It has been a source of much value to its members by increasing their knowledge of the insurance business. In addition to the educational feature of the association, which comes from a free discussion of the details of business, it has helped to secure some good laws and prevented the enactment of some bad ones. One of the recent matters for discussion in our association was storm insurance.

Although the town companies had been so satisfactory in providing insurance against losses from the effects of fire and lightning, yet no satisfactory insurance had been provided against loss by tornado. The statute under which these town companies were organized provided that each company might issue such policies, but this plan had been almost unanimously rejected by the companies as unsafe, for the reason that each company insures nearly all the property in its comparatively small territory and should a severe storm pass through this territory the loss might be so heavy as to prove disastrous to the company. Therefore the only feasible plan was to scatter such risks over a large territory. We found by investigation that the mutual companies in some of the states around us were very successful in providing satisfactory insurance of this kind at a small cost.

But there were difficulties for us to face and one of these was that (judging from the figures in the official report) the companies operating as "Hail and Cyclone" companies were not satisfactory and that any company in this line must rest under this shadow until it proved itself to be better than others of its kind.

The plan proposed was to select nine members of the association to organize a Tornado Insurance Company, no two of whom were to be from the same town company. It was also the aim in selecting the directors of the proposed company that they should be located in different parts of the state, that losses might be economically adjusted by some director located near the scene of loss. In accordance with this plan, a company was duly organized and is now in sucessful operation. It is our expectation that this child of our State Association will live to be a credit to the town companies, and to the state, long after those who organized it have passed away.

It might be well for those who are enjoying the benefits of our town mutuals at the present time to remember that these companies did

not come into existence full grown, but that during their infancy the necessary care and thought given them, represented (at least in part) the self sacrifice of some one. Whether our state shall be blessed in the future with more of this class of institutions depends upon the support given them by our citizens.

DISCUSSION.

Senator Wolf—I would like to ask Mr. McEwan how far, from his experience, this system of insurance reaches the tendency toward dishonest claims?

Mr. McEwan—It is the force of the influence of neighbor upon neighbor that cuts that out of the business. The fact that his neighbors surrounding him are in the same company puts a natural check upon the desire to burn property to secure the insurance, because he would come under a cloud at once in his neighborhood

Supt. McKerrow—He naturally feels there is an investigating committee all around him instead of in front of him only.

Mr. McEwan—In our local company we have had some 34 years' experience and we know certain parties that are good people to let alone and they are let alone.

Senator Wolf—Did you find that out?

Mr. McEwan—It cost us something to find it out.

Mr. Convey—In our local companies, most of the parties take out two or three hundred dollars' worth of insurance on live stock, which practically covers all their property of this class. Is it customary for mutual companies to take risks in that way? The old line companies would not do it.

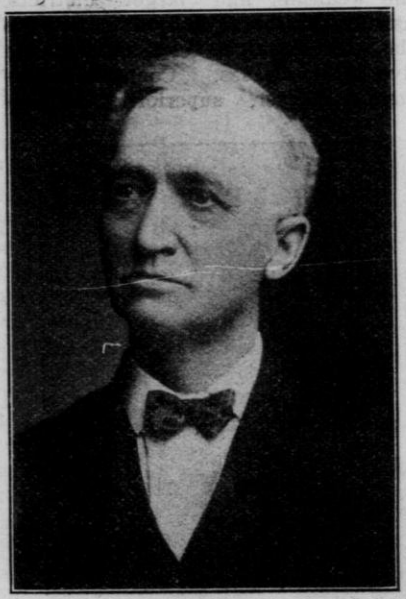
Mr. McEwan—It is not a wise plan, nor just. We recognize that fact and we hope sometime that will be remedied. There should be a certain percentage of value put upon a herd of cattle in proportion to the number, but that is not the practice.

Mr. Convey—It seems to me that is a weak element in mutual insurance business. Most of our losses are lightning loses on stock, and practically all the stock within the territory are covered by insurance to a certain extent.

Mr. McEwan—The remedy for this weakness is within the reach of each company. It consists simply in the adoption of a by-law at the annual meeting of the company.

THE EDUCATIONAL VALUE OF FAIRS.

John M. True, Sec. State Board of Agriculture, Madison, Wis.



Mr. True.

Ours is an age of specialties. The time when a single individual could be supposed to know pretty much all that was knowable is passed. In the trades, one man is no longer master of the complete processes of construction, but even simple pieces of mechanism pass through several hands in manufacture. In the learned professions, the general field is too broad for individual work, and it is divided into special departments, in each of which the specialist finds ample employment.

In the schools, teachers are selected with reference to their special ability to teach the subjects assigned them, while pupils elect special courses of study with direct reference to the special work they intend to follow.

The Growth of Agricultural Education.

It has been comparatively a short time since the term "Agricultural Education" was coined, and the meaning is still indefinite to a large portion of our farmers; many of whom not only fail to comprehend what agricultural education means, but have conceived a pronounced hostility to any idea that recognizes the necessity of any education for the farmer beyond a tolerable acquaintance with the elementary branches taught in our rural schools. I am aware that public sentiment has changed somewhat of late years, though in the early days of the Farmers' Institute work in many parts of our state, the bitterest opposition to it came from farmers who scouted the idea that they needed special instruction in their work, and Institute workers were met at many opening sessions with evidences of prejudice or open hostility.

Twenty years ago, Plymouth would hardly have asked for the Closing Farmers' Institute. The Farmers' Institute and the Agricultural College have very largely been the means through which the seed has been sown that has wrought the mighty change of the past decade in agricultural and kindred thought and method. No agricultural enterprise has received special attention that has not rapidly forged to the front and demonstrated the possibilities of Wisconsin as a field of operation. Wisconsin butter, Wisconsin cheese, Wisconsin horses, cattle, sheep and swine rank among the very best

products of the world, and promoters of these enterprises are still not satisfied, but year after year are reaching out for higher honors.

The Scope of Agricultural Fairs.

I have been asked to call your attention to another factor in the promotion of agricultural and business education that is too seldom thought of in this connection,—the Agricultural Fairs of the country. It is true that at many of our smaller fairs the benefits derived from attendance are largely social; the exhibits are few and their character is not high, but they generally represent the best obtainable in the limited district of the fair and the farmers are enabled to compare the results of their best efforts in crop productions with those of their neighbors; while the better specimens of live stock, though not the highest type of the breeds they claim to represent, are conclusively in evidence against the scrub, and prepare the observer for better things.

The larger the fair, representing the wealthier and larger districts, usually the larger and better will be the exhibits, most especially in the live stock classes. Competition becomes sharper, superiority of individuals is more closely scrutinized, and breed characteristics are more definitely considered. Here the educational advantages to the looker-on are upon a higher plane than those of the smaller fairs.

Scene on Sheboygan County Fair Grounds.

The educational benefits of a first-class fair are all important to the exhibitor. All things are good or bad by comparison. That which seems in the eye of interested ownership to approach perfection as seen by itself, when brought into competition with superior quality in the show

ring, frequently becomes plain and unsatisfactory, and the defeated exhibitor is brought to see what constitute necessary characteristics for a winner.

The great object lessons given at our best live stock exhibits do more to fix high and correct ideals in the minds of interested observers than all other means in use, the written or verbal description of perfection in animal form, the pictured excellencies of famous prize winners, as shown in our illustrated stock journals, fall so far short of the satisfaction of actual critical inspection of some living, moving type of his breed.

To the novice, the great fair brings the best of opportunities to become familiar with breed characteristics. The peculiar color, form and other distinctive traits or markings of the different breeds of horses, cattle, sheep, swine and poultry can here be studied from representative selections, and by watching the work of the judge in charge, he may also learn what constitute points of excellence in the various breeds under consideration.

I have met people who could see little or no good in fairs. They considered them simply places of amusement of a questionable character. Horse racing, balloon ascensions, acrobatic performances, and the like seemed to be all they saw, and these they condemned. Well—I don't consider horse racing, balloon ascensions and feats of human strength or agility the most important things to be seen at a fair, and still very much worse things might be witnessed by almost anyone without visiting a fair, and this, too, under the protection of well regulated city governments. An honest horse race, conducted under Wisconsin laws, is in no sense disreputable or demoralizing. The same may be said for many other special attractions popular at leading fairs. There is a class of shows sometimes seen at fairs, though now ruled out by all well regulated associations, that has no moral right anywhere and cannot be too strongly condemned.

The Wisconsin State Fair.

In most particulars, the last Wisconsin State Fair was an admirable illustration of a first-class educational fair. Not only were the exhibits for which premiums were offered of a high character, but classes were well filled.

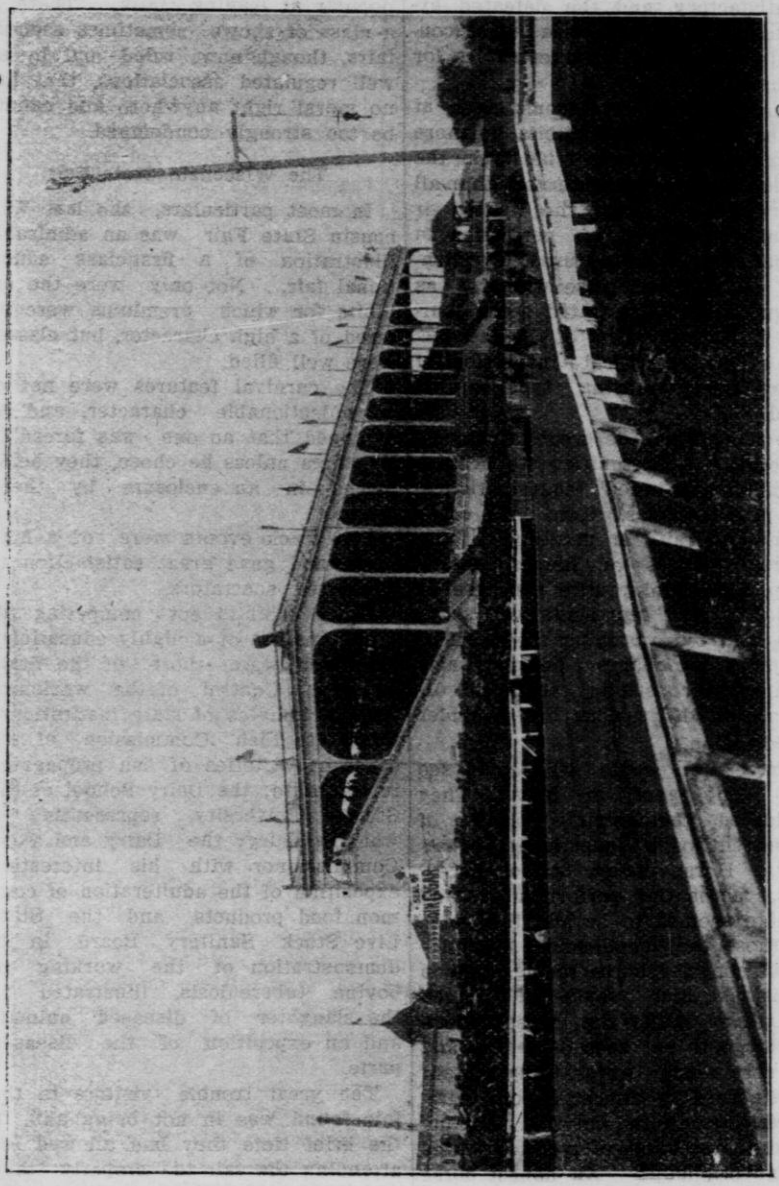
The carnival features were not of an objectionable character, and so arranged that no one was forced to see them unless he chose, they being placed in an enclosure by themselves.

The track events were of a high grade and gave great satisfaction to interested spectators.

Other exhibits not competing for premiums but of a highly educational character, were those of the State Board of Control of the workmanship of inmates of state institutions; the State Fish Commission of the different varieties of fish propagated in the state; the Dairy School of the State University, representing a working dairy; the Dairy and Food Commissioner with his interesting exposition of the adulteration of common food products, and the State Live Stock Sanitary Board in its demonstration of the working of bovine tuberculosis, illustrated by the slaughter of diseased animals and an exposition of the diseased parts.

The great trouble visitors to the fair found was in not being able in the brief time they had allowed for attending the fair to properly take advantage of the many interesting and instructive features presented.

Another important educational fac-



At the Start, Wisconsin State Fair Grounds.

tor to be considered at the State Fair is the character of the judges selected. No trouble or expense is spared to secure judges of recognized ability and fairness, whose general reputation renders their work of special value in determining the equality of exhibits upon which they pass. As an illustration, take Mr. Sharp Butterfield, of Canada, who for years has scored the birds in our poultry department. He is in constant demand as a judge in all parts of the country, and his work is in itself an education to breeders whose birds pass under his inspection.

Recent improvements upon our state fair grounds will render the means of gaining important information in the future much pleasanter and more profitable. The erection of the live stock judging amphitheater will enable the public to witness the judging of animals in the horse and cattle departments without exposure to heat or storm, its seating capacity being 4 000. This is one of the best buildings of its kind in the country.

In closing I wish to urge upon you to interest yourselves in your fairs, both local and state. Under the present state law there is little chance for demoralizing influences without endangering the procuring of state aid. Fairs are made successful only by the active and loyal support of the people they represent. Show me a successful county fair in Wisconsin, and I will call your attention to the fact that the people of that county or district lose no chance to speak well of their fair. Their criticisms are not given to the public. When one thousand people come to their grounds, I am quite sure they will claim there are two thousand present; if anything is not first-class they do not call attention to it, but steer you around to something better. This is loyalty that is infectious, and it means popular support; hence more money, hence larger premiums and a better fair.

Perhaps I may be allowed to say that arrangements for our next state fair have already progressed far enough to warrant me in saying that no fair in the country will be of a higher order, stronger in points of educational interest and profit than our own—to be held in Milwaukee, September 10-14.

DISCUSSION.

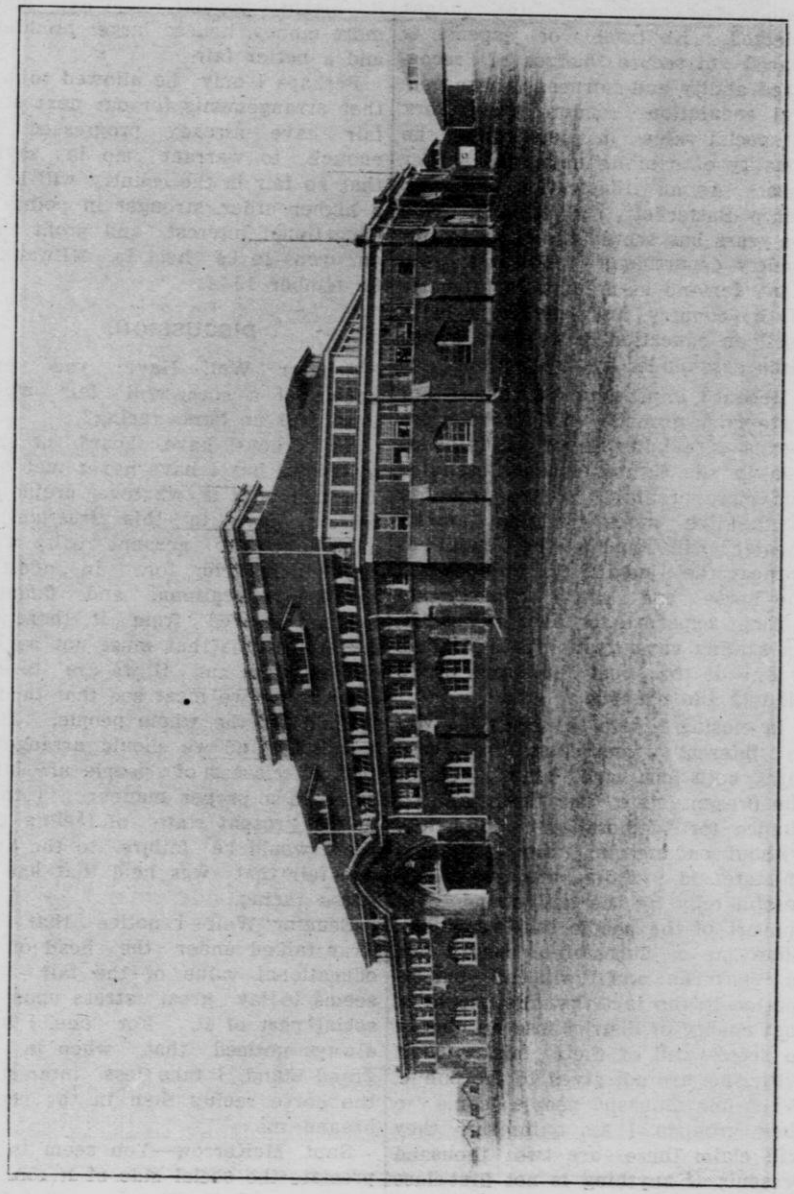
Senator Wolf—Have you ever known of a successful fair where there was no horse racing?

Mr. True—I have heard of such instances, but I have never met one. The fact of it is, whatever prejudices we may have in this direction, we must take into account really what the fair is held for. In addition to the educational and financial benefits derived from it, there are social features that must not be left out of mind, and if we are to consider these we must see that the fair is held for the whole people. It is a holiday and we should arrange so that all classes of people are interested in a proper manner. I think in the present state of feeling that there would be failure to the average fair that was held that had no horse racing.

Senator Wolf—I notice that Mr. True talked under the head of the educational value of the fair. He seems to lay great stress upon the social part of it. For one, I have always noticed that, when in the grand stand, I take less interest in the horse racing than in the people around me.

Supt. McKerrow—You seem to appreciate the social side of it too.

Senator Wolf—That is what I go there for.



Live Stock Judging Pavilion on Wisconsin State Fair Grounds.

Supt. McKerrow—Mr. True, judging of fairs of all kinds as you have seen them, do you think undue stress has been put upon the side of agriculture and live stock production, or too much stress upon the side of entertainment—features like horse racing, acrobatic feats, etc., or has it been evenly balanced in general—not talking about one fair, but all fairs. We are citizens of the state and interested in all fairs.

Mr. True—I think in the past that too much attention has been given to amusement features, which seems to be a necessity to a certain extent in the early days of any fair. Now a fair that does not pay its premiums and expenses in full, soon comes to be regarded with very little interest, and in order to do this, you have got to enlist the interest of the people, you have got to get the people there, you have got to draw all kinds. I think perhaps in the past there has been a little too much tendency to run amusement features, perhaps too much horse racing. As fairs become stronger, more wealthy, I think this will be regulated to a certain extent. My idea would be that the state should stand more fully back of fairs, so as to enable them to be independent to a certain extent; they can then pay their premiums and expenses, and this question of entertainment will not be so much to the front. The law passed in the last legislature regulates this matter somewhat; under the law now, no fair can receive state aid upon a larger amount paid for races and attractions of that kind than that paid for cattle, live stock and agricultural premiums. This is going to have a tendency to bring the educational features, the substantial features, more to the front, and to serve as a sort of gauge upon the amusements.

Mr. Convey—Is the racing feature of the fair as expensive as people think it is to the fair management?

Mr. True—No, not by any means. The state fair has been severely criticised in some quarters, even by some of the stock papers of Chicago, for the amount of money offered in race purses last year at the state fair. The fact is, we paid out about $26,500 for first-class racing. I was a little interested to follow this up to see what the races actually cost us, and it was less than $5,000. No, races well conducted are not expensive. Men that enter for purses very largely pay their own money in and draw it back again.

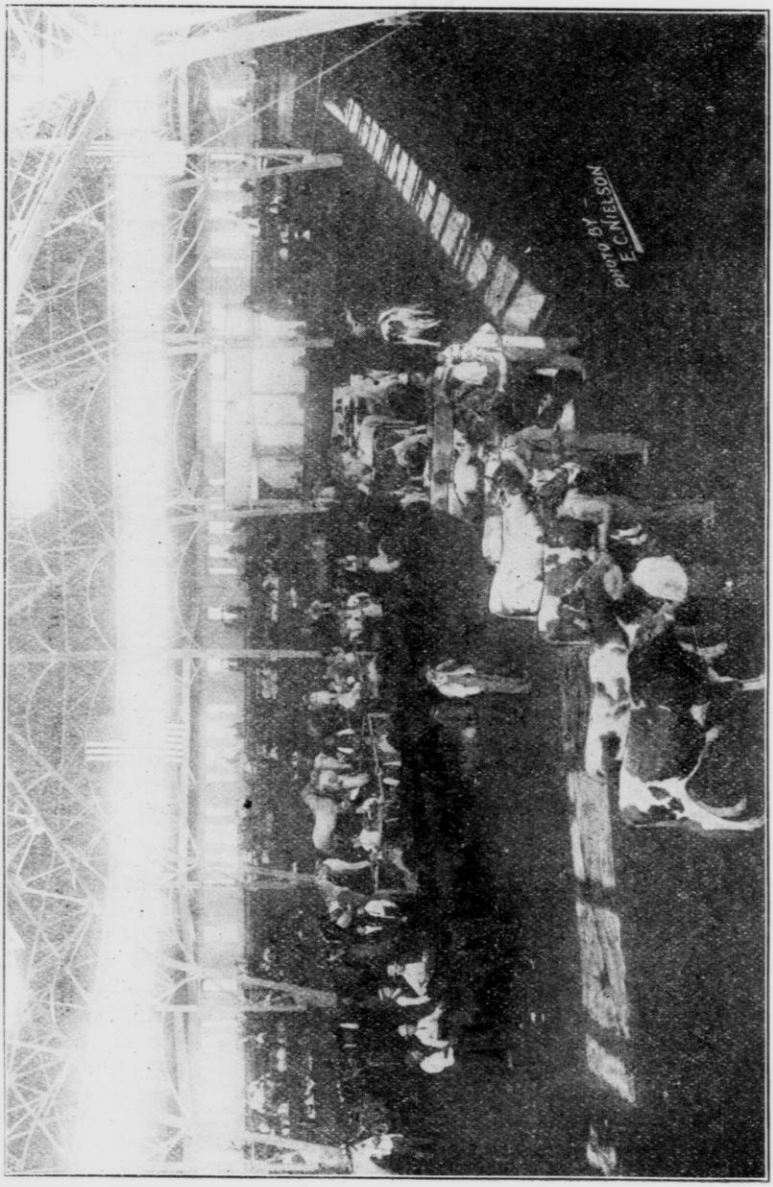
Mr. Jacobs—Under this law, what do you think of the policy adopted by some fairs of doubling their premiums, and then charging an entry fee equal to the premiums, to bring their premiums up on the racing alone?

Supt. McKerrow—You mean where they deduct 25 or 50 per cent after the premiums are won?

Mr. Jacobs—Yes, they put it in that they charge that, but in reality they simply deduct it.

Mr. True—I think they are not going to beat the state by any such subterfuge as that. The Auditor of the state in passing upon those accounts, reduces them strictly to a cash basis. The premium list is required and the premiums paid must correspond with those advertised in the list.

Mr. Jacobs—There is another point that has troubled us somewhat; perhaps it would not if we lived in some other county, but we have had to come in contact with counties that were holding an inter-state fair and were receiving a great deal more state aid than the direct county fairs. Now, don't you believe it would be better to put the counties all on an



Judging in the Live Stock Pavilion at Wisconsin State Fair, 1906.

equal footing, all fairs on an equal footing, except the state fair?

Mr. True—I woud say, put the fairs all on an equal footing, do not even except the state fair. The state fair does not ask special favors. The fact of it is, we are not treated as well as the other fairs. The other fairs get 40 per cent of their premiums, while this year we received $10,000, but at 40 per cent of the premiums, etc., we would have received $16,000.

Mr. Utter—Isn't it true that the location of our fair has something to do with this question of attractions, situated as it is near a large city and dependent upon the patronage of that large city, rather than upon the agricultural patronage, as in other places?

Mr. True—Yes, that has been considered. It has been thought that that was fair to all interests, although I think our Board has really given that up quite largely, and has come to prepare its premiums now with reference to the interests of the state. You cannot cater in an agricultural fair to the wishes of a city population. It is better to take the ground that you are working for the agricultural interests of the state and stand right by it. Get up a good, strong, broad program, suitable alike to city and country.

Mrs. Howie—Don't you think it is about time the city people were educated up a little more to farm life and farm conditions, and that the fair is a very good means of bringing about these results?

Mr. True—I am confident that you are correct and that the educational process is going on. We notice that from year to year, in meeting the city people who are interested.

Mr. West—Is it true that 10-day or two weeks fairs are as profitable as five-day fairs from a financial standpoint?

Mr. True—That requires a peculiar location. It comes to be more in the nature of an exposition and it may be possible in some cases, as they are carried on in some of the larger cities, but I do not believe it would be feasible for us in this state. You cannot get the farmers to attend more than about two or three days at the fair, it is all the time they really think they can give to it, and I am inclined to think that one week is all the time we can safely devote to it.

Sut. McKerrow—A few of our state fairs have tried 10 days and two weeks,—tried that plan, notably the Ohio state fair two weeks, the Illinois state fair 10 days at one time, and two or three others that I have in mind, but they have all dropped back to a week; their experience has not been satisfactory.

Mr. Bergeman—Would you recommend the assistance of the county board being given to the county fair?

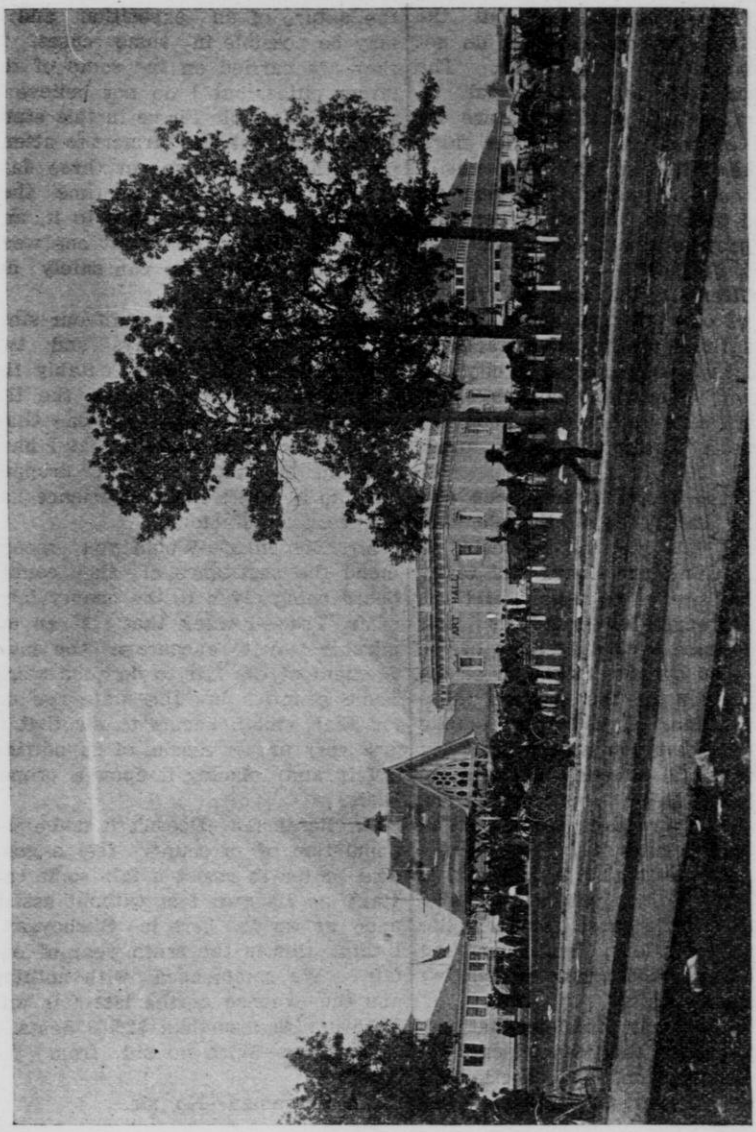
Mr. True—I think that is an admirable way to encourage the management of the fair to do good work. Some counties in the state are doing that, and it seems to me that it is a very proper means of supporting a fair and placing it upon a proper basis.

Mr. Bergeman—Doesn't it make the population of a county feel a good deal better to assist a fair so it can stand on its own feet without assistance as we do here in Sheboygan? I think this is the tenth year of our fair. We commenced with nothing and the expense of the last fair was $20,000 with less than $2,000 debts.

Mr. True—With no aid from the county?

Mr. Bergeman—No, sir.

Mr. True—You have made a remarkably good showing. In my county, Sauk, the county board has never gone beyond giving a certain amount for an educational exhibit.



Scene on State Fair Grounds.

The county superintendent is allowed to offer $100 each year in premiums for an educational exhibit. I think the Northern Wisconsin State Fair has aid from its counties in the maintenance of its fair. I see no objection to counties doing it, if they choose to, but certainly you have demonstrated that Sheboygan does not need any help.

TURKEYS.

Mrs. Clara I. Ransom, Endeavor, Wis.

Mrs. Ransom.

When I look over the program of this, the Twentieth Closing Farmers' Institute of the great and glorious state of Wisconsin, and see the helpful topics to be discussed and the intelligent people appointed to handle them, and find my name attached to "Turkeys," I think that is the right combination, as a turkey has the smallest brain in proportion to her size of any creature. The simplest person and the simplest subject. It does not take any brains to talk turkeys, but it takes brains to raise them. But Mr. McKerrow is looking far ahead, he knows the day is coming when she will be a national topic; she will be on every tongue, and not our hearts but our mouths will be too full for utterance.

Some of the Characteristics of the Turkey.

The turkey is called a domestic fowl, but she is not; she never will be more than semi-domestic when compared with other fowls. In the poultry yard she is the simplest and most foolish of all fowls, but let her get away in the fields (it is generally your neighbor's field and he hates turkeys) then all the craftiness and the cunning of her wild nature come to her, and how carefully she hides her nest; you know and I know and the crow knows where, as he generally gets too many of the eggs.

Turkeys More Profitable than Chickens.

I have always found turkeys much more profitable to raise than chickens. It takes less food to raise one turkey than it does one chicken, if they have a tolerably wide range, as a turkey is a seed and insect eating fowl, and I find the turkey has fewer diseases and is more capable of protecting herself and young against her enemies. She is hardier than a chicken after the first six weeks growth.

Buying.

Do not buy any wild, old hens, but buy eggs of some reliable poultry raiser and raise them with a chicken mother.

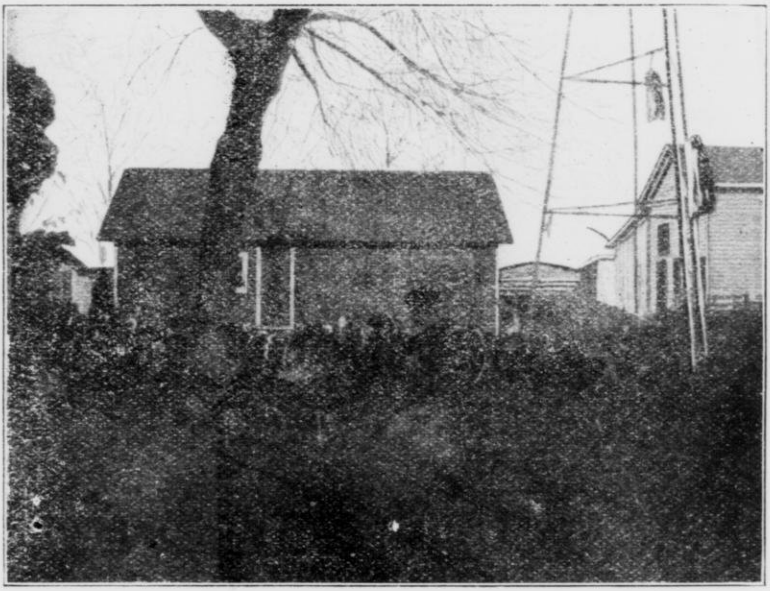
What to Keep.

I know I should tell you to keep two year old hens, but I will not. A young hen remembers her poult days and your kindness to her and will not wander so far from home. An old hen will each year widen her circle and go farther from home. You will always find it is the old hens that lead the flock away.

Now, don't understand me to say, keep the culls of your flock, keep the very largest and best marked hens you have. Sell the little hens, they are excellent for broilers, have the flavor of wild game and are used as such in large hotels. Keep good-sized hens, as the poults get the size from the mother.

Marking the Flock.

I put a copper band on their leg with their weight and my initial on and set down in a book any special marking of the fowl, so I can find her easily if she does stray away. I have known of small bells being fastened around the neck of the turkey for the same purpose.



Turkeys Raised by Mrs. Ransom.

My Kind.

I have always found the black turkeys the tamest, the hardiest when young, more active and less liable to get on their backs. They will get 12 or 15 pounds growth in less time than the bronze. The bronze is a grand show bird, but a little slow in coming to maturity. Too large a

turkey does not bring so good a price in the market.

Eggs.

I always try to secure one, two or three settings of eggs from each hen turkey. My young hens often begin laying in the poultry house with the chicken hens and never wander away.

I put the eggs in a cool place and each day turn them partly over so the yolk will not settle on one side.

Setting.

When I have about 30, I take some chicken hens, put a box where there is no danger from vermin, put about nine eggs under each hen. I dampen the eggs with lukewarm water about twice a week, as it is natural for them to be hatched on the damp ground and we must imitate nature as nearly as possible. Each day I turn the eggs partly over; if they were hen's eggs the hen would turn them, but she does not like to turn the large eggs. If the eggs lie constantly on one side during incubation, the turkeys will have crippled feet.

Hatching.

After 26 days they will begin to pip and they are usually all fertile. I generally have one hen turkey that has set on a few eggs a week or 10 days and I give her the pipped eggs and let her hatch as many as possible, to avoid the chicken lice, which are a poult's worst enemy.

Pens.

Leave the young turks in the nest as long as they will stay, as they have the yolk of the egg in their system for nutriment, but when you find them creeping from the nest, put them in a board pen where there is plenty of shade, as the heat of the sun is destructive to them.

Do not confine the hen, let her jump out and in as she chooses, and it will help to exercise the little turks to search for her.

I dust the mother and young with road dust and the least dash of sulphur and I do this every day until the little poults will dust themselves. Then I give them clean water and grit.

Feeding.

Now comes a little careful work if you expect success. It is natural for the hen turkey to take the food in her mouth and feed her young, and the poults expect to find bugs on the leaves. A poult always looks up and never down for its food until taught to do so. Take the food between your thumb and finger and hold it patiently in line with the turkey's eye until it sees and pecks at it, then you will find him very greedy.

Best Kind of Food.

Boiled eggs, dutch cheese, bread and milk squeezed out dry is the best for the first few days, then table oat meal scalded up dry and wheat and buckwheat screenings is the steady diet when older. The poults grow so fast and feather so rapidly, that they need food often until thoroughly feathered, then I give them very little care.

I feed them when small, chopped, cooked meat or süet once a day; it makes the feathers bright and glossy, and give them plenty of grit and clean water; never give them sour, sloppy, or unclean food; never dope them with black pepper and do not daub them with grease, as nothing discourages a young turkey like uncleanness of any sort.

After the first six weeks I allow them to care for themselves, giving them grit, water and feed three times a day and see that they are home at night.

Diseases.

Turkeys are subject to diseases and ailments which affect fowls, most of which may be prevented if proper care is given to feeding and attention given to sanitary conditions.

DISCUSSION.

A Member—The lady claims the young turkeys had crooked legs because the eggs were not turned. Do you know that it was not on account of their being on a smooth floor and the legs simply slipped out? I have seen that, where they didn't have any more trouble after they remedied that condition and they didn't talk about its being a poor incubator, either.

Mr. Matteson—As I understood you, you refer to crooked toes.

Mrs. Ransom—No, the foot and the leg would be crooked.

Mrs. Howie—I have noticed my little chicks would fall from the shelf to the nursery below and the legs would spread and it would always be the heaviest of the chicks. After that, I folded a towel and laid it along the floor where they dropped and I have never had any trouble since.

A Member—I put in some straw and there was no more trouble.

Mrs. Ransom—I have always found where a turkey cripples up that it doesn't pay to bother with him. The best thing is to wring its neck.

Mr. Matteson—Don't you think this weakness comes from the parent stock?

Mrs. Ransom—That is what they accused me of, but I would have turkeys by the hundreds and no cripples, and others who had purchased eggs of me would have their young turkeys crippled up where I had none.

Mr. Matteson—I have had experience in putting them both in the same machine, my own hens' eggs, as well as eggs that I had of the neighbors. I was very particular with the turkey stock, not overfeeding it during the winter time, whereas these others in the same machine and given identically the same care were more or less weak and sprawling. I think the strength of the parent stock has something to do with the strength of your young stock.

Mr. Scott—A lady said to me this week that she had been using an incubator for the last three years and she found that fault with incubator chickens, that a large percentage had crooked legs. Now, I would ask Mr. Matteson if there are not incubators where the chickens fall below to the lower part and others where they do not. Your young incubator chickens are not allowed in the lower part, are they?

Mr. Matteson—Decidedly not.

Mr. Scott—As I understand, that is where the trouble is, in the lower part, and she had paper in there which was smooth.

Mr. Matteson—A great deal of this weakness is by absorbing too much moisture. A great many have the idea that a certain amount of moisture must be used. If there is too much moisture, it goes into their bodies and they are not strong enough to grow right.

Mr. Herbst—I believe a good deal of this trouble about weak legs comes originally from not handling the eggs right at the time they are laid. Of course, the stock must be right, but an egg, from the time it is laid until it is hatched, should be turned. If you will notice the hen, who presumably understands her business, while she is setting, you will see that every time she goes back on the eggs those eggs are turned. That hen handles those eggs sometimes more roughly than we would and I believe

good, strong chicks can be produced by giving the eggs good air and turning them. In Mr. Matteson's machine there is no place for the chicks to fall after they are hatched out, but if a cloth is in the bottom then they have a chance to catch hold and give the legs some exercise, which gives them a chance to strengthen, but on a smooth floor they do not have that chance for exercise.

A Member—A friend had an incubator and a brooder at the same time and when he put the chicks in the brooder, they got crooked legs, and he claimed it was because the heat came from the bottom, but at the same time he had paper in the brooder because he didn't want it dirty, and he thought that the trouble came from the fact that the paper got muddy on the bottom.

Mrs. Lehmann—Do you confine your turkey hen?

Mrs. Ransom—I allow my hen her freedom, I let her jump in and out, but I confine the young ones.

Mrs. Lehmann—Have you had any experience as to whether apples are bad for turkeys after they are almost grown?

Mrs. Ransom—I never heard of it.

Mr. Matteson—I do not believe there is anything in that. I have raised a great many turkeys in my life. Of course I always aim to keep them away from my own apples, but I know they get some of my neighbors' apples and I never knew them to hurt them.

Mrs. Lehmann—Don't you think it is advisable to mark turkeys the day they come from the shell, so as to keep a record and know them from your neighbors, to mark them in the web of the foot?

Mrs. Ransom—I never tried that. I thought so much of them I couldn't bear to hurt them.

Mrs. Lehmann—It is only a minute's work, and it pays.

Mrs. Ransom—I have always found a good copper band all right.

Mrs. Lehmann—You want to do it of course when they are real young and then you can identify them if they wander away.

Mrs. Ransom—I have mine at home, I know where they are all the time.

Mrs. Lehmann—But if your neighbors do steal your turkeys, they can get those copper bands off.

Mrs. Ransom—You see I have a record in a book besides.

Mr. Herbst—The marking of the whole foot is a good thing, to my mind, not only for the reason that you can keep track of them if they get away, but for this reason, you have a record of the turkey hens, or a record of the poultry, a number, and if the bird turns out to be an exceptional bird of its breed, you want to breed from it the following year. I believe you should keep a record in this way of every bird in the flock and breed from the very best each year. In regard to the band, of course the other party can take that off, and I do not think the band would be proof against anybody getting your bird. What I advise is the sealed band, but of course that can be removed by fire.

Mr. Matteson—You spoke of keeping the eggs cool. How cool?

Mrs. Ransom—I always put them in the cellar where the temperature is quite even, about 65 or 70.

Mr. Matteson—I would hardly dare to keep eggs that high. I think 50 or 60 is plenty high enough.

Mrs. Howie—How long would you keep them to get the best results, before setting?

Mrs. Ransom—There are very few unfertile eggs in turkeys' eggs. I would keep them till I had about 30 then I would set them. I wouldn't

keep them over 10 days. I keep from 10 to 15 hens and it wouldn't take me long to get a setting.

Mrs. Lehmann—Don't you think, Mr. Matteson, that we have to be more careful about the eggs we put into the incubator?

Mr. Matteson—Yes, I always think so. You can tell by an examination of the air sac of the egg. If you have an egg tester, it is very easy to know whether you are right or wrong. Examine the air sac and if that is all right there is no danger of crooked legs. If your test shows the air sac occupying about one-fifth on about the eighteenth, say, for turkey eggs, or about the fourteenth day for hens' eggs, from that time on the turkey grows and occupies a certain portion of the air space, so you have got to use that for your guide. I never have had any trouble in getting too much moisture.

Mr. Herbst—Are you required to use artificial moisture where the eggs are being incubated?

Mr. Matteson—No, under normal conditions there is no necessity for that. I wouldn't care to take the risk with a turkey hen, I would use a common hen afterwards.

Mrs. Lehmann—I have found a great deal of difficulty in putting eggs under the turkey hen as they were piped. I will tell the way I think is preferable. I take them from the incubator, after they are pipped, and then slip them under the turkey hen.

Mr. Matteson—In my practice, I have found it far better not to set eggs as fast as they are laid. We hatch them all at once, and when we have a whole lot, we can plan better for them, and our practice is to leave them all in the machine until they strengthen up nicely.

THE STATE'S WORK WITH TUBERCULOSIS.

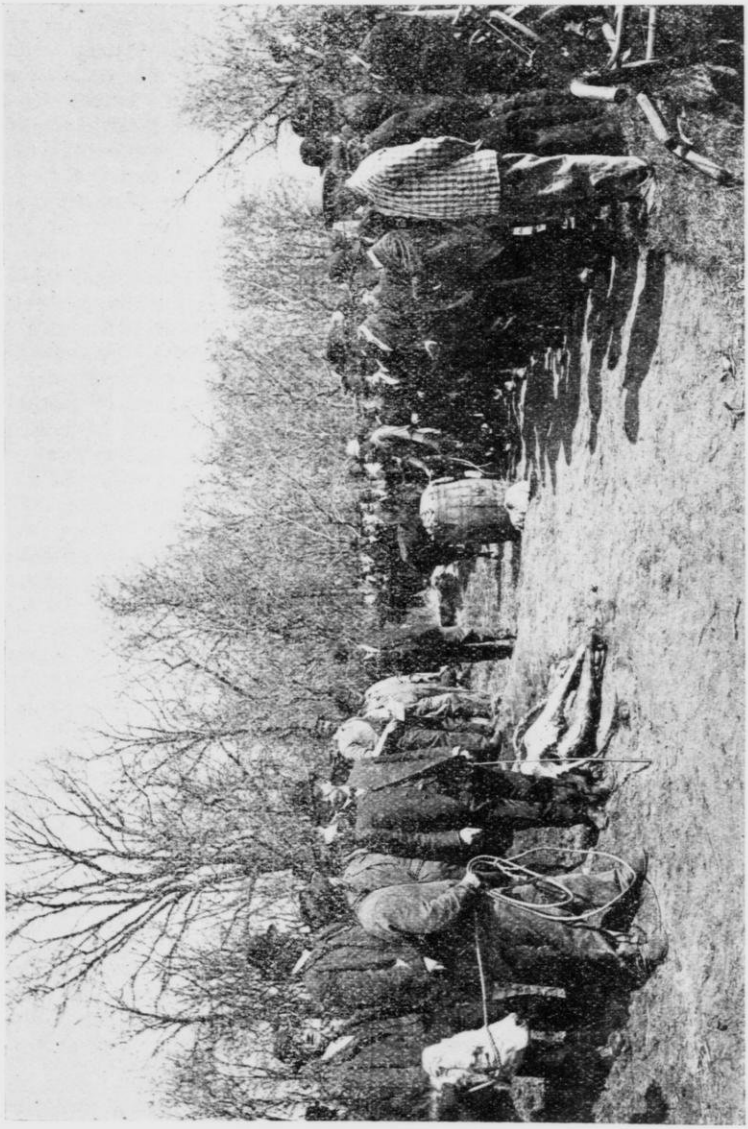
Supt. Geo. McKerrow, Madison, Wis.

This question of tuberculosis in cattle is one of the questions that is keeping Dr. Roberts, who should have been present with us and talked to us on this subject, very, very busy, because the dairymen and cattle owners of Wisconsin are waking up very much over this question.

Organization and Work of the Sanitary Board.

Some five years ago our state legislature provided for a Live Stock Sanitary Board, to be composed of three members selected from the State Board of Agriculture, the Bacteriologist of the State University, Dr. Russell; and the State Veterinarian, Dr. Roberts. I was selected by the Board as one of its members, and finally elected president of that organization.

Our work was new, we studied the work of the Danish government and the work of Pennsylvania and the work that had been started in some of the eastern states and fallen through; also the work in Illinois, and we outlined our plans. One of the first things that our Board did was to delegate me to go to the city of Chicago and investigate the question of killing tubercular cattle under government inspection at the slaughter houses in Chicago, as Illinois had previously done to some extent. I went down there, talked with the representative of the gov-



Post Mortem of Tubercular Cattle on a Wisconsin Farm with Farmers in Attendance.

ernment, the inspectors and the Chicago city inspectors, watched the work of killing in the abattoirs, with the Live Stock Exchange representative, and we decided to ship cattle that had responded in Wisconsin to Chicago to be killed under government inspection. These cattle were shipped there, some of them passed inspection; many of them did not.

Later we have shipped to slaughter houses in our own state at Milwaukee and Eau Claire, and these cattle have been killed under government inspection. Those that are fit for food are saved for that purpose, and those that are condemned go into the tank. The hides, of course, are all available.

While I was in Chicago discussing the question, the government inspectors told me they found very little tuberculosis among the fat steers that came from the southwest, the cattle feeding districts of the country, and they credited it very much to the fact that these cattle were raised out of doors, never housed, but as the cattle came from more northern sections, they found more of this disease, while the cattle coming from the dairy districts of Wisconsin, Minnesota and Michigan showed a much higher percentage of it, especially the dairy cows that were sent in and killed as canners; the inference being that cows in these northern latitudes had developed the disease to a considerable extent, not produced but helped along in its development by being kept in stable air germ-laden with the bacteria, the germs that produce tuberculosis.

We have been testing herds in Wisconsin for some five years under this latter plan and management. The farmers have been educated; where we find a herd in which the animals show that the disease has been working pretty strongly upon them and where the chances are that only a few will be passed at the slaughter house, we kill them upon the ground. We have the farmers come in and see the work; many of them come to scoff, but remain to be converted and go home and test their herds, so that now, during the past winter, at nearly every Institute that I have attended in the state of Wisconsin, I have had one, two, five or 10 farmers come to me to make inquiry about the matter of testing their herds for this disease and many of them tell me also that they have had their herds tested. The students in the Agricultural College have learned the art of testing and have tested their home herds. Many farmers in Wisconsin have tested herds very satisfactorily, we have seen their charts and we know that the work has been well done. The farmers are becoming educated and waked up and it is well that they should be. This disease should be wiped out from the herds of Wisconsin. If we started to wipe it out as they did in some of the eastern states, by wholesale inspection and slaughter and wholesale payment from the state treasury, we would be in the same fix that they were in those eastern states, the legislature would refuse to appropriate any more money along that line, because the bill was so heavy that the tax payers would not stand it.

But by educating them up gradually, we believe we have got the people now where they will take the matter in their own hands and will all make the effort to clean up their herds.

I am not the state veterinarian, but I know something of the work that is being done, and will be glad to answer any questions.

DISCUSSION.

Prof. Hays—Do you pay any of the cost?

Supt. McKerrow—The state of Wisconsin, through its Sanitary Board, has adopted three plans, or options, for the farmer whose cattle may be affected. First, we give him the privilege of keeping his cattle in quarantine, not to be sold, but to be closely quarantined under the direction of the Board; the milk, if sold for use, must be pasteurized. The young calf can be raised healthy on pasteurized milk. That is the only object of the quarantine, and it is only on a farm where the farmer has pure bred cattle and he wishes to save something from the herd that this will pay. The animal, of course when sold, is sold under the direction of the Commission.

The second option given is that of shipping the cattle to one of the abattoirs and they can take the returns from the cattle and in that way the state has no responsibility, other than seeing them killed, and sometimes it is better for the party to have that option. A case in point is a farmer near Whitewater who had a very large, fleshy, Shorthorn bull weighing over a ton. This was the only animal in the herd that responded, he was killed under inspection and passed, bringing the owner $85, whereas the state could only have paid him $33.

The third option is the option of turning it over to the state and getting two-thirds of the valuation, and the law says that no appraiser shall appraise an animal for more than $50, so this man with his 2,000-pound Shorthorn bull, would simply get $33.33. He concluded he would have his bull shipped to the city of Milwaukee, he only showed the disease in one spot, and was passed by the inspectors of meat, was wholly fit for food, and this bull brought $85 to the owner, whereas if he had sold him to the state, he would only have had $33.33.

The third plan is having appraisers appointed to appraise these cattle at two-thirds of the value, the amount to be paid by the state, when the proper officer sends in an attested statement that the premises have been thoroughly cleaned up and disinfected, and the state pays no money until they have that assurance. The disinfection must be carried on under the plan outlined in the bulletin that our Board sends out. If this party had turned this animal over under this option, he would have been the loser of over $50. Then if the member of the Board who inspected the animal thought he was worth shipping, he would ship him; otherwise we kill them on the ground, advertise it in the neighborhood, hire parties to skin them or sell the skins, and the carcasses are buried.

Mr. Scribner—Are there any outward appearances by which you can detect the disease?

Supt. McKerrow—As a rule, no. Of course, if the animal is coughing and emaciated it looks like it.

Mr. Goodrich—I have been an appraiser in such cases. The veterinarian had said they were tuberculous, and if they are, they are not worth anything, unless for meat. It was hard to know how to appraise them, it puzzled me.

Supt. McKerrow—Such appraisers must be men of good judgment. Knowing that those animals were tubercular, what would you pay for them, honestly?

Mr. Goodrich—I wouldn't pay anything.

Supt. McKerrow—Then, I suppose you would appraise them at nothing. Did you appraise them at nothing?

Mr. Goodrich—No, I didn't.

Mr. Utter—If you hadn't had to

have those slaughtered, they could have kept them perhaps a year or two and got some value from them, so they would have some value besides the value of the beef.

Supt. McKerrow—They would have the value that they would have under quarantine conditions.

Mr. Utter—But suppose it was kept secret, they would have had a value, and very many herds are in that condition where the owners do not know they are diseased.

Mr. Aderhold—It would be unlawful to sell the milk.

Supt. McKerrow—But when the owner does know that the animals are diseased, he is laying himself liable and he does know it after they are tested, and the appraisers know it.

Mr. Aderhold—The question has been asked as to whether there are any outward signs of the disease. Last week I was talking to Prof. Hastings, who is in the Bacteriological Department at Madison, and has had considerable experience with the results of testing herds in this state, and he told me that during the months of January and February, this winter, in the towns of Deerfield and Marshall, Dane county, 10 herds were tested for tuberculosis. There were 234 cows in those 10 herds, there was no reason to suspect that the disease was present in any herd, and out of those 234 cows, 58 were found to be tuberculous, which is 25 per cent.

Supt. McKerrow—I do not wish to contradict what Mr. Aderhold has said, but there was a good, substantial reason to believe that tuberculosis might be in those herds, because it had been found in several herds in the vicinity of Deerfield before these were tested. From physical appearance, there was no reason to suspect them.

Mr. Utter—If, after these animals had been appraised, it was shown that they did not have tuberculosis, would the state then have paid the full value of those cows? That is, if the cow responded to the test, but upon the post mortem did not show tuberculosis?

Supt. McKerrow—Well, I think of all the cattle that the state has killed, we haven't had a half of one per cent come out in that condition, so that is hardly a practical question.

Mr. Jacobs—Under what conditions does this testing have to be done to obtain state aid? Who is authorized to do this testing?

Supt. McKerrow—The State Veterinarian is authorized to do the testing, and he can appoint veterinarians as his assistants to do it. The Board has been honoring the testing where everything showed it was properly done, that has been done by students and farmers in the state. Where government tuberculin has been secured through the Experiment Station and the official report returned back, that has been made official by the department; that is, when the charts are properly made and everything shows that the test has been properly done, some of these herds, in fact, all of them, as far as I know, that have been turned over to the state, have been taken hold of and killed just the same as if the veterinarian had tested them, and the post mortem has shown a correct test in every case, so far as I know.

A Member—That rule didn't hold good a few years ago.

Supt. McKerrow—No, that is the ruling we have worked on more recently.

Mr. Imrie—A neighbor of mine had his herd tested a year ago and they found three in the herd had tuberculosis. They were not very bad, perhaps too bad for use, but instead of burying these, he cooked the meat

and fed it to the hogs. Is there any danger in doing that?

Supt. McKerrow—There is no danger if the meat is thoroughly cooked; that is the decision of the scientists, both in this country and in other countries. It would not be dangerous for human food when thoroughly cooked, yet the government inspectors do not pass it.

Mr. Scott—To what extent are hogs subject to this disease?

Supt. McKerrow—In Chicago they report quite a percentage and the percentage much on the increase in hogs. Up at Eau Claire, Mr. Drummond, one of the gentlemen who runs the packing house there, told me a year ago now that unless something was done to stop the effects of tuberculosis in hogs that they were handling, they would soon have to cut the price in a general way 25 per cent, or quit packing, because for several years it has been right on the increase, and he held the same opinion that many of us do, that this was due very largely to the skim milk that was fed these hogs coming from herds that were affected.

Mr. Scribner—That is one thing in favor of the farm separator, we can feed our own skim milk from our cows if we know our own cows are all right; whereas, if we have to take the skim milk from the factory, where there is a mixture of all kinds of diseases from all kinds of herds, it makes a lot of trouble.

Mr. Convey—Would you introduce new stock without having it tested?

Supt. McKerrow—No, sir; I do not think I would. My own son has tested our herd of cattle and found some responses and we have decided not to bring any cattle onto the farm from this on until they are tested. We are planning to test everything that we buy and bring on to the farm. We prefer to test it before if possible.

Mr. Matteson—Isn't there a chance for fraud where people test their own herds?

Supt. McKerrow—If they have been tested within 30 days previous to your making the test, the chances are they will not respond. You know the United States government demands that a health certificate shall come with every animal imported into the country, and yet there have been cases of valuable Shorthorn cattle that came with a certificate of health from Canada and also the old country, that have responded in three or four months, after they have been in the United States, and it is said that some of our honest Canadian neighbors and English neighbors have actually tested these cattle just before they were tested by the veterinarian, so that they did not respond. You can cheat in almost anything, I suppose.

Mr. Loomis—Isn't it a fact that cattle that are diseased often do not respond?

Supt. McKerrow—Not often. Occasionally an animal that is badly diseased will not respond, and yet they will show it on the post mortem. I have talked that over with Dr. Roberts and I understand such cases will not exceed one or two per cent of the diseased animals.

Mr. Convey—With regard to tuberculosis in hogs, in the last report by the Department of Agriculture, they reported over 30,000 tuberculous hogs in the Chicago market for the year previous.

Supt. McKerrow—Yes, it is increasing very rapidly in Chicago.

Prof. Hays—I heard Dr. Reynolds make the statement recently at the American Breeders' Association that as to the matter of ventilation and light, it was becoming clear from ex-

periments at his station that abundance of light is of even more importance than an abundance of air for cattle in the barn, and I daresay something of that kind may be true in hogs. I wish further to say I am fully convinced that with a comprehensive system of animal breeding we can greatly increase the ability of our cattle and hogs to resist tuberculosis, and you all know that there are some families that now resist better than others. There are some of our human families espcially subject to tuberculosis, while there are some people that are so constituted that they throw off disease. There are other families that become weakened in certain organs, for instance, the lungs, and allow these germs to get a foothold and produce the disease.

Supt. McKerrow—That is true. If you will look up in the bulletins the experiment tried in Pennsylvania, you will see an experiment right along that line. In Pennsylvania the Sanitary Board, in connection with the Experiment Station, tried putting diseased animals with the healthy animals; they divided a bunch of cattle and put a lot of healthy and diseased animals into a dark barn; then they put the same proportion of diseased and healthy animals into a light, airy barn, especially well lighted so that the sunlight fell all over the inside of the barn, and we all know that sunlight kills the germs. I have seen Dr. Russel kill a lot of these germs by putting them under the light for a few hours, while those kept in the dark remained alive. Now, that experiment proved that there was a great difference between a light, airy barn and a dark, close barn, because in a year's time, I think it was, all the healthy cattle put in with the diseased cattle in the dark barn were diseased, while only about half of the healthy cattle put in with the diseased cattle into the light, airy barn, were diseased. The disease worked freely in the dark barn and captured them all, while in the light barn half of them were able to resist the disease, and I presume it was because the sunlight had killed most of the germs, at least there were not so many to be taken up.

A Member—Are not cattle that are shut up in the stable most of the time more susceptible to the disease?

Supt. McKerrow—That depends on the condition of the stable.

The Member—If it is light and airy, well ventilated?

Supt. McKerrow—It wouldn't make so much difference then. If there is no diseased animal in the herd, they are safe, but if there is a diseased animal, they are not as subject to the disease as if it was dark and badly ventilated, but probably they would be better, when the weather was suitable, to get more fresh air.

Mr. Imrie—Suppose that in testing a herd, the veterinarian had found that an animal brought from another herd was infected, and he also found that the same man had sold into another herd that was infected. Is there any law by which you could keep that man from selling diseased animals all around the country? Dr. Reynolds told me he knew one full-blooded herd in Minnesota that had tuberculosis and he said the man was constantly selling all around the state.

Supt. McKerrow—In Wisconsin the Live Stock Sanitary Board has power, where they have evidence like that good, strong, substantial evidence, which is better than circumstantial evidence, they have the power to test that herd and would do so.

Mr. Scott—I know of one herd, a portion of which were found to be tuberculous a year ago; 28 cattle did not respond to the test made in March.

They were turned out to pasture in May and they were found to be tuberculous in October.

Supt. McKerrow—Well, the seeds were well started before they went out, probably, though they were not in shape to respond.

Mr. Utter—Do you think the State Board of Control would have the power under the law to make a ruling that every public institution where they keep a herd of dairy cows must have them examined for tuberculosis? And if so, don't you think they should do it?

Supt. McKerrow—Yes, the Board of Control I should think would do it, I think they do have them tested as a rule.

Mr. Utter—I know at our asylum in Racine county, they were buying tuberculous cows at auction sales of one or two herds.

Supt. McKerrow—It is a dangerous plan.

Prof. Hays—I just want to call your attention to a new organization, the American Breeders' Association, that had its preliminary meeting two years ago last fall in St. Louis, had its first annual meeting a year ago in Champaign, Ill, and this last January had its second meeting at Lincoln, Neb. It is a fully launched organization which is trying to unite in one body plant and animal breeders, to study general principles and facts and the business of breeding. It is not a commercial organization, as that is covered by the National Live Stock Association. This organization has nearly 40 committees and it is hoped that a monthly magazine may be published a little later on. I happen to be secretary of the organization. You can easily find my address and we would like to have you members of that Association. The membership fee is $1.00 and there are some seven or eight hundred members. The requirements for membership are simply interest in that subject.

THE DAIRYMAN.

C. P. Goodrich, Ft. Atkinson, Wis.

There has been a great deal of time and breath and talk spent on the dairy cow, to try to improve her and to induce men to feed her and care for her better, so that she may be able to bring more profitable results.

Now this is all right; there has been none too much said or done in this line. At the same time, I will say there has not been enough said about the dairyman. It is necessary that both should be of the right type to insure success. One can accomplish nothing without the other. Good dairy cows will bring no profit unless handled by a good dairyman; and a good dairyman can make no profit unless he has good dairy cows.

Dairymen Born, Not Made.

Some years ago I attended the meeting of the Indiana State Dairymen's Association. I talked about the cow, the breeding, feeding and care of her that would insure profitable returns. The audience were all strangers to me. I was unable to arouse much enthusiasm. They seemed—with two or three exceptions—to be cold-hearted on this subject. When I sat down, after talking an hour, I felt discouraged, felt

as though my efforts were wasted, and that it would have been better for all parties concerned if I had stayed at home. After I had finished my speech, a gentleman in the audience arose and said:

"Mr. Goodrich does not understand the situation here. Now, he is a dairyman. I know it; otherwise he could not talk in such a way about the cow. I have no doubt his father was a dairyman before him and quite likely his grandfather. And I will still further venture the guess that he and his people came from the state of New York, or some other eastern state where they have been dairying for generations."

He was guessing just right all the time. Continuing he said:

"But we Hoosiers are different. We hate the sight of a dairy cow. I tell you, Mr. President, the man must be bred right as well as the cow. It would take 200 years to breed us Hoosiers up so that we could love the dairy cow as Mr. Goodrich does."

I have thought of what this man said many, many times, and the longer I live the more I am impressed with the truth of what he said. For many years I have made a study of the cow. Studied how to provide her with the proper feed to enable her to do her best in giving milk; studied her likes and dislikes; observed how she craves a variety of food; how she likes a good, clean, healthy stable, and how she enjoys a good bed. I have studied the form of the best producers by the hour in my own stable and at every other place where I had opportunity. The cow stable is a delightful place for the true dairyman.

Of late years I have been studying men as well as cows, and I find that the man who dislikes the dairy cow and spends as little time as possible in her society at the cow stable will not succeed well with her. If he hates the cow, she will hate him and will not do well for him. If he loves his cow, she will come to him when he returns home from a few days' absence to be petted and talked kindly to. It reminds me of that verse in "Mary's Little Lamb:"

"'What makes the lamb love Mary so?'
The eager children cried:
'Why, Mary loves the lamb, you know,'
The teacher she replied."

While farming is the best business in the world, and dairying, for the man who by nature and education is adapted to it, is the most profitable and surest of bringing good returns of any branch of farming, there are many farmers who may do well with most kinds of live stock, always fail in dairying to get returns enough to pay for the feed their cows eat.

Some Pointed Illustrations.

In every place where I have taken a cow census of the patrons of a creamery, I have found such men. In a recent census I took in this state, I found two neighbors, one of whom received in returns from the creamery $66 per year per cow, while the other got only $22 per cow—one-third as much. The one got $2 from each dollar's worth of feed his cows ate; while the other got 85 cents. The one loved his cows, took pride in them, studied them, studied how to feed and care for them, so as to give them the most comfort and make them produce the most. He liked his business and it made him a happy man. The other took no pride in his cows. He kept them, he said, because he knew that to keep his farm up he must keep some kind of stock to eat up at least part of the products of the land to keep up the fertility. But he spent just as little time with his cows as possible and was never satisfied with them. In looking his

cows over, I thought I saw symptoms of Jersey blood and said so. "Yes," he said, "I had a Jersey bull once." Then I noticed some that showed a little mixture of Ayrshire blood. He said, "I had an Ayrshire once." Then as I spoke of some that had the look of Galloways, he said: "I had a Galloway once and they are the best of all." Now, if that man was fitted to keep any kind of live stock at all, it surely was not dairy stock.

Another farmer I visited while taking this census I must tell you about. He had a large farm, good buildings, good horses, a fine flock of Shropshire sheep and good hogs.

When I came to look at his cows, I saw they were blocky, broad backed, beefy cows. I said to him: "You don't like dairy cows?"

He said emphatically: "I have no love for a dairy cow." When he saw I was about to write down what he said, he modified it a little by saying: "Say I have not much love for them."

As I looked around, I saw off at the further end of the row of cows a grade Guernsey, a fine looking dairy cow. I said, "What have you there?"

"Oh!" he replied, "The old woman claims her. She milks her and feeds her pets her and thinks the world of her and so I keep her, but I hate her, she looks so like the devil!"

The returns from the creamery showed that this herd barely paid for the feed they ate. Now does anybody suppose that this man could ever succeed with a dairy herd? If he were given the best herd of dairy cows in the state, they would rapidly deteriorate as dairy animals, because his breeding, selection and feeding would all tend toward making a beef herd.

When I was attending Farmers' Institutes in the state of Michigan a few years ago, I talked at a meeting where there were but a very few dairymen, but I talked about the dairy cow as well as I could; told how prosperous the Wisconsin dairymen were; how rich their land was and how high it sold, and so on. After the meeting adjourned, a bright, intelligent looking man came to me and said: "I have a large farm, have been in the beef business for many years, but for the past few years there is very little profit in it. Would you advise me to go into the dairy business?"

I looked at the man and saw that he was probably 60 years of age. I was in doubt as to what I ought to say. Before saying anything. I put my hand in my pocket and drew out a picture of Brown Bessie, (I always carry the picture of some famous cow) and held that before his eyes. I watched his countenance, but I did not see his eye kindle with delight, and a glow of enthusiasm overspread his face as would have been the case had he been a lover of the dairy cow. I think Brown Bessie was the most perfect type of a dairy cow that I ever saw, and I cannot even look at her picture without a quickening of the pulse. I said to him: "What do you think of that picture?" He said: "Oh, I suppose she is very good for milk." "Do you not think she is the most beautiful cow you ever looked at?" "Oh, no," he replied, almost in tones of disgust. "Why?" I asked. "She is too scrawney, too bony," he replied. Then I said: "Don't you go into the dairy business; you are too old to learn to love a dairy cow after having spent your life so far in caring for and admiring beef animals."

I still believe my advice was right. I have seen other men who were past middle age make the change this man contemplated and, in almost every instance, it proved a losing business .

It will be seen that although I

think dairying the most delightful, as well as profitable business, I do not believe in all farmers trying to be dairymen, for they cannot all succeed at it.

Consumption of Dairy Products Increasing.

We are sometimes told that we ought not to talk and preach so much in favor of dairying, because if we induce everybody to keep more cows the business will be overdone and prices go down so low that no one can make it pay. But we need not be alarmed. The consumers of dairy products in cities and manufacturing districts are increasing faster than are good dairymen and good dairy cows.

My conclusion is this: All good dairymen who love the dairy cow should increase the number and improve the quality of their cows, and they will increase their profits as the years go by; while the men who hate dairy cows and are consequently making no profit out of them, had better quit pretending to be dairymen and if there is any decent, honorable business that they are fitted for they had better do that.

DISCUSSION.

Mrs. Howie—Mr. Goodrich, like wine, improves with age. Years ago I went to an Institute and Mr. Goodrich rose up and said, "I never put any sentiment into my business; it is all dollars and cents." Today he recognizes the fact that love is all important, even as a factor in success in dairying.

Mr. Goodrich—I am of the same mind I always was. It was always because there is money in it.

Mr. Jacobs—What do you think would be the result of applying the same test to the dairyman that we do to the cow, eliminate culls that do not come up to the standard?

Mr. Goodrich—That is what I believe in, I believe in their quitting the business, not pretending to be dairymen, and if they would only take the trouble for a little while to keep accurate accounts of their expenses and receipts, most of them would quit.

Supt. McKerrow—When you go around and meet parties who admit they have no love for cows, what do you think about them?

Mr. Goodrich—I can tell them by their looks.

Mr. Convey—Wouldn't the dual purpose dairyman do for the dual purpose cow?

Mr. Goodrich—Yes, that might work. I like dairymen. I think the great majority of them are superior. I think the higher a man stands in the scale of civilization, the better he is adapted for dairying, and that is true the world over. Over the whole continent of Africa those savages do not milk as many cows as are milked in Wisconsin.

Supt. McKerrow—Why don't you say that they are next to the sheep men?

Mr. Goodrich—Oh, well, there are some men that are not fitted for keeping cows, or for keeping sheep. When this continent of America was first discovered, there wasn't a dairy cow on it. The trouble with our American Indians is that they are not civilized enough to keep cows. We had a Farmers' Institute on an Indian Reservation. I was sent up there to attend that Institute. That Reservation is a tract of land eight miles by 12 and the number of inhabitants was 600. No white man was allowed in business there, but there is a white man there who is a missionary and he had got it into his head that if we could ever get the Indians to keep cows they could have a creamery there and no white man could interfere with them, there would be no competition and they

could make money. I talked with him about it and he wanted I should talk dairying to them, and I talked and talked to them, and they listened respectfully, and those young fellows were bright, they were pretty well educated, they have got a good school there, but I didn't get a question out of them about cows, and I don't believe they are capable of handling cows. The thermometer was 18 degrees below zero when we went in there and there are not a half a dozen cows on that reservation, except those that the missionary had, and every one of those was out of doors that night. I asked this missionary how many cows he had and he said he had eight. I asked him who milked them, and he said Indians, "but they are not giving much of any now, the cows are dry," and he said they were dry most of the time, and I told him, "I don't believe that a cow will give down her milk for an Indian," and I don't believe she will. A man to get milk has got to love the cow, or the cow has got to love him, and she won't love him unless he loves her.

Mrs. Howie—And there is some more sentiment.

Mr. Scott—I suppose she loves him for the money there is in it, the same as he loves her.

Mr. Goodrich—She loves him because she doesn't know any better.

Mrs. Howie—There is one thing I disagree with Mr. Goodrich about. He doesn't believe in allowing the sheep men to come in and be dairymen. Two weeks ago I heard one of the nicest dairy talks, it was from a prominent sheep man, he had gone out and bought a separator. Let him come into the fold, Mr. Goodrich, do not keep him out.

Mr. Goodrich—I know whom you are talking about, and he has inherited that from his grandfather and his father, they were both dairy men.

If nobody objects, I feel almost inclined to say something about milking machines.

The Chairman—Let us have it, Mr. Goodrich.

Mr. Goodrich—The first milking machine I ever knew of was invented about 60 years ago, and it was a failure. There have been a great many invented since, there is the Thistle, the De Laval Lactater and a great many others that claim that they do the mechanical work, but none of them get hold of the affections of the cow, and without that they never can work as well as some living creature. I do not doubt there are some that will do better work than some men, but there never is a better milker than the calf is. Did you ever know of a cow holding up her milk from her calf? Down in Missouri, where I go sometimes, they let the calf take hold and milk first, then a woman slips in and takes the calf's place. We must never forget that milk is a product of nature whereby the mother feeds her offspring, and the maternal love goes with it, and so if the milker could in some measure get the affections of the cow just as the calf does, then he would be a success in milking every time. I always thought I could do milking pretty well, but I had a heifer once that I thought a great deal of, her mother and her grandmother, her ancestors for several generations had been excellent cows, and she was a beauty. When she came in I thought she was going to be a better cow than I had ever had before. I let her have her own calf for four days and she was so very much attached to it that when I took it away from her I couldn't get the milk. She was gentle enough because she had been handled right, but I couldn't get the

milk. It kept on that way, I would go to milk her, her udder would be large, filled full, and hard. but I could not get the milk. I knew I had to do something, so I let her have her calf on one side and I was on the other, and it was a race between us who got the most, but we got it. I had to run the business in partnership with that calf for several days.

Supt. McKerrow—She thought she had twins, I suppose.

Mr. Goodrich—I don't pay any attention to that kind of talk. I finally crowded the calf out, but it was never satisfactory, she was never just satisfied, so that at times I could not get all the milk, and the consequence was she dried up earlier than she ought to have done. Still I kept her year after year, for I really believed that she was an excellent cow. She looked something like Brown Bessie and we called her "Brownie." I hired a German boy 17 or 18 years old to work for me, and from the very first Brownie fell in love with that German boy; I don't know why, I don't believe he was any better looking than I was. Anyway she gave down her milk to him. He stayed with me two years and she was the best producing cow I ever had. Then he went away and stayed nine months and Brownie did not give down her milk good to any one else. He was homesick all the time, and he told me afterwards how he wanted to see those cows and Brownie especially, so he came back. He came out nine miles to my house. His father and sisters were right near there, but he didn't stop to see them, he just kissed my grandchildren and shook hands with my daughter-in-law and rushed out to where Brownie was, and you ought to have seen the tears run down that German boy's face, he came back crying, "She knows she knows me," and from the day he came back she let down her milk as she did before. Now, when I see a milking machine like that, a milking machine that the cow will follow around and lick it and snuggle up to it and fairly ask it to milk her, then I will believe in it.

Mr. Everett—They had a milking machine down at the National Dairy Show a few weeks ago invented by a Virginia farmer. I paid a good deal of attention to it and asked a good many questions, and to illustrate what Mr. Goodrich has said about the affection of the cow for the milker and for the calf, I will relate what the inventor of this machine told me. The pail that contains the milk stands near the cow's head while she is being milked, and he says that the cows have invariably adopted that machine, and will stand and lick that pail during the entire process of milking.

The Chairman—Perhaps they salted the machine.

Mr. Goodrich—I think I will have to tell you that the German afterwards got married and he didn't care nearly so much about cows after that and he wasn't near as much of a success in milking cows.

I think I will have to tell you another thing. Near the close of a beautiful June day, I was riding on the plains out west with a young man Off to the west of us on a rising ground was a large herd of cattle, five or six hundred of them. As we were riding by a sod house there was a girl of 16 or 17 summers came out with a bright tin pail in her hand. She was neatly dressed in a calico dress and looked nice and tidy, although she was bare-footed. She looked off toward that herd of cattle. and she called out in a sweet, musical voice, "Come Sookey, come Sookey," I saw a Jersey cow raise up her head and come walking toward that girl as rapidly as she could. I said to the young man who

was riding with me, "Hold on, we will see something." We drove under the shade of a cottonwood tree and I took out a map, pretending to be looking at it, I didn't want to attract the attention of the girl. But the cow came up to the girl, and she mooed and acted just as a cow does that is loving her calf and she wants to feed it, and the girl patted her and she said, "Oh, Sookey, you beautiful thing, you good Sookey." Pretty soon the cow squared herself around and fixed herself in position to be milked, and the girl set herself to milking and pretty soon it went ting-a-ling, a silver stream into the pail, and it wasn't long before the foam was up to the top of the pail. The girl got up, patted the cow, the cow went off and the girl said, "Goodby, Sookey," and the cow went off with the rest of the herd. I said to that young man, "There is a dairy maid for you." He said, "you bet," and I heard a sort of choke in his voice, and I looked and saw the tears running down his face. That was several years ago and that girl and that young man are now married and have some sweet children and the best dairy cows in the state where they live.

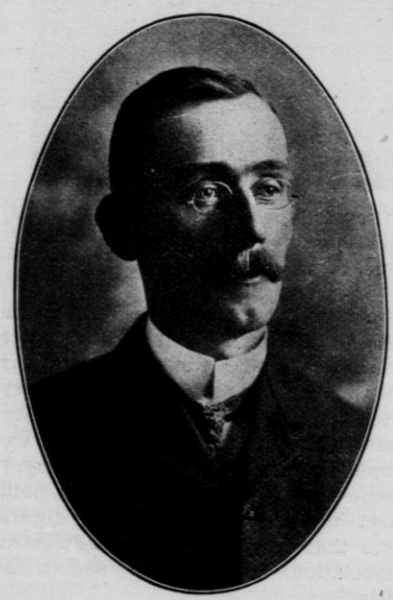
Adjourned to 1:30 p. m.

AFTERNOON SESSION.

Convention met at 1:30 p. m. Mr. L. E. Scott in the Chair.

OFFICIAL TESTS OF DAIRY COWS.

Prof. F. W. Woll, Chemist, Wisconsin Experiment Station.

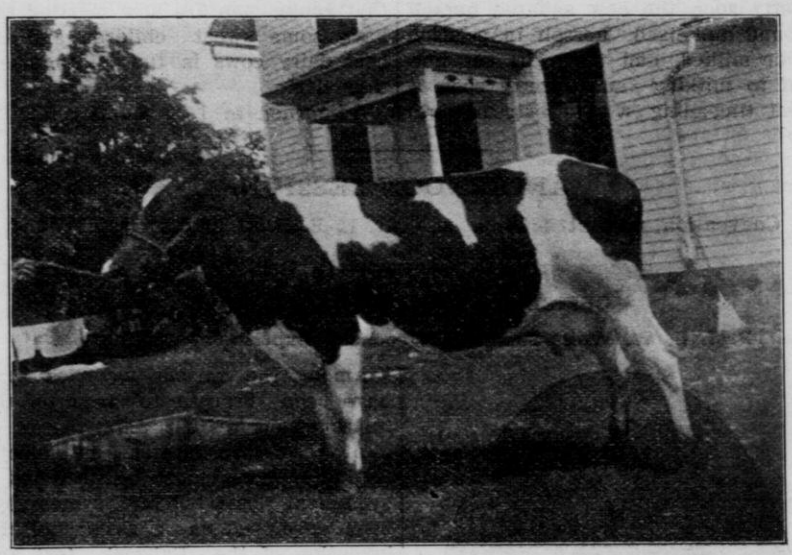


Prof. Woll.

Among the various agencies that have been brought to bear on the improvement of our dairy herds of late years, the system of official testing of cows must be accorded a prominent place. This system has been developed as a result of the invention of the Babcock test and the rapid adoption of this test in creameries and among progressive dairy farmers in all parts of the country. Until cow owners learned to appreciate the great difference in the quality of milk from different cows and herds, and found out that this difference could be accurately established on their own farms by a practical and simple method of determining the fat in the milk, like the Babcock test, it could not be expected that they would be particularly interested in finding out the capacity of their cows for dairy production. But from the beginning of the nineties, we find this interest

constantly increasing; a sentiment also soon became general that the work of determining the productive capacity of dairy cows should be done by an outside party, since both the breeder himself, and the particular breed association to which he belongs, are directly interested in making a creditable showing. This was especially brought home to the dairy public through the incredible tests of Jersey cows during the eighties, which tests were called offiical and were made by authorized supervisors, acting under the authority of the Jersey Cattle Club. Since the money value of not only the cows themselves, but of their progeny and relatives, depends to a large extent on the results of the official tests, it is plainly seen that the conduct of these tests should be in the hands of some disinterested third party, and the parties to whom the breed associations naturally looked for assistance along this line were "officers or assistants of an Agricultural Experiment Station or Agricultural College, or persons whose integrity and ability are vouched for by the director or the professor of dairy husbandry of such institutions."

A great deal of credit is due to the Holstein-Friesian Association for the pioneer work done in the line of official testing. The system of Advanced Registry established by that association in 1894 was the beginning of a work which has since grown to large proportions and has been of the highest value to our dairy interests. The American Guernsey Cattle Club in 1901 followed the example set and the American Jersey Cattle Club in 1903, although in both cases their system of testing differs from that of the Holstein-Friesian Association, as we shall see presently.



De Kol Mechthilde Longfield (No. 53 97) owned by E. C. Petrie, Elkhorn, Wis. Production of butter fat during seven days at 4 years old, 20.154 lbs., equivalent to about 23½ lbs. commercial butter.

To show the growing importance of

official tests, I give the number of tests of Holstein cows conducted annually since the beginning of the Advanced Registry system of this association in 1894; 35, 60, 56, 68, 200, 255, 328, 663, 732 and 1157; a total of 3,554 cows of the Holstein breed alone tested during the ten-year period ending May, 1905. The Guernsey Cattle Club can show a similar rapid increase in the number of cows tested for their Advanced Register.

Methods of Testing Cows.

A brief explanation of the various methods of testing dairy cows in which our Experiment Station is now engaged will be of interest at this point. We are prepared to conduct so-called official tests and semi-official tests of dairy cows; the former are conducted by regular supervisors appointed by our station, who are on duty at the farm during the entire time of the test; each and every milking of the cows is watched, weighed and sampled, and the amount of butter fat in each milking is accurately determined by the Babcock test. The work of the supervisors is further checked by tests made at the station of composite samples of all milkings during the progress of the test, and all records made are certified to under oath by the supervisor, the owner, the milker, and the feeder of the cow. It is gratifying to find that, as a result of all precautions taken, the general public accept the records made on these tests without a question. This holds good as regards farmers or breeders directly interested in the production of cattle of a certain breed, as well as partisans of other breeds. While the latter may criticize the tests on account of their briefness or the special conditions under which they are conducted, the results obtained are considered above suspicion and are generally accepted on their face value.

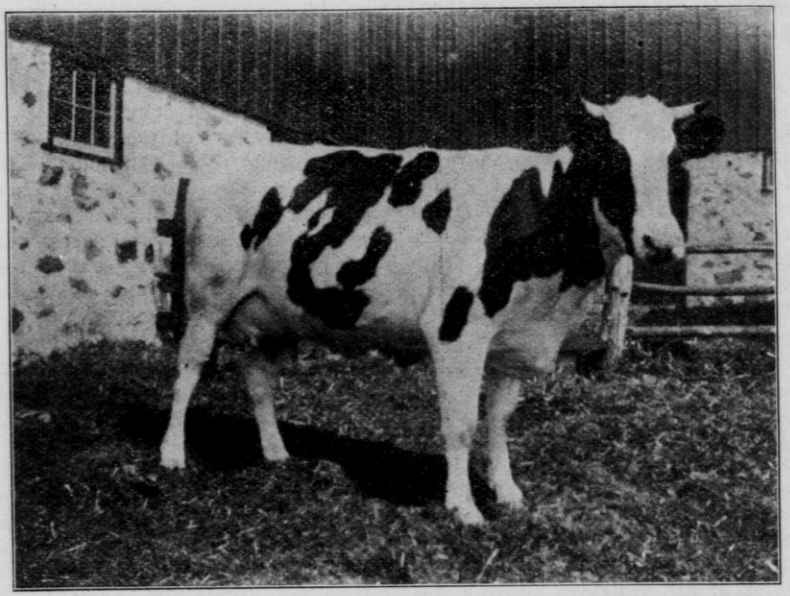
Most of the official dairy tests conducted by our station are for Holstein breeders and for a period of seven or 30 days, by far the greater number of tests being conducted for seven days only, at the time of the maximum production of the cows, shortly after calving. Two years ago the Holstein-Friesian Association also arranged for tests of cows far advanced in their lactation, viz., at least eight months from calving, for the purpose of demonstrating the "staying quality" of their cows, i. e., their capacity for continued dairy production. By providing for such tests one of the main criticisms of brief official tests was partly done away with; still it is easily seen that there is a chance for misleading results also by this system, and it is very likely that the other kind of dairy tests mentioned a while ago, semi-official tests, will gradually take the place of the official tests considered so far.

On the so-called semi-official tests, one of our regular supervisors of dairy tests visits the farms of the breeders who have entered cows for yearly records, once every month, at a time not previously known to the owner, and conducts a test for one or two full days, one-day tests being made for the Guernsey Cattle Club, and two-day tests for the Jersey Cattle Club, as well as on the yearly tests conducted under the direction of our station. The average per cent of fat in the milk for the one or two days is taken to show the average quality of the milk yielded by the cow during the month; at the end of each month the owner furnishes a sworn statement of the milk yield of the cow for the month, and by multiplying this figure by the average per cent of fat found on the monthly

test, the production of butter fat for the month is found.

The weak point in this system lies in the fact that the owner himself furnishes the figures for the milk production of the cows on yearly tests, but these figures are checked up in several ways:

First, the milk yield on the day or days of testing must correspond with the figures reported by our supervisor. Second, the time of the monthly test is not known beforehand to the owner and only shortly beforehand to the supervisor. A comparison between the yields on the days directly preceding the testing days and those obtained on the latter by our men, would at once show whether the owner was in the habit of crediting his cows with more milk than they actually produced. Third, our men copy from the milk record sheet in the stable the weights of scattered days' milkings and these figures must correspond with those furnished by the owner at the close of the month. Fourth, as in the case of the official tests, our supervisors send in a composite sample to the station for analysis, as a check on their tests at the farm, and fifth, our supervisors, as well as the farmers themselves, are required to make an affidavit as to the correctness of the figures which they report on yearly or on brief official tests.



Lilly Gewina 2nd (No. 67090), owned by R. C. Luedke, Watertown, Wis. Production of butter fat during seven days at 2 yrs. old, 13,087 lbs., equivalent to about 15¼ lbs. commercial butter.

I think it will be granted that the safeguards thrown around the semi-official tests render these practically above suspicion. It cannot be claimed that the figures for annual production of butter fat obtained by this system of testing, are absolutely

correct, from the fact that the average quality of the milk on only one or two days during the month is taken to represent the quality of the milk for the entire month, but comparisons with other methods of arriving at the annual production of the cows have shown that the records thus made are, at any rate, within one or two per cent of the correct figures; that is, if a cow is credited by this system of semi-official testing, with an annual production of, say 360 pounds of butter fat, she may have actually produced somewhere between 355 and 365 pounds, and she is as likely to have reached the higher figure as the lower. This is as close as we can hope to get at it by any method, except by an official test covering the entire year, which is impracticable, on account of the large expense connected with such a test.

The general trend of opinion among breeders and writers on dairy topics of late seems to be that tests conducted for a relatively brief period of seven or even thirty days are not as valuable for the purpose of showing the capacity of cows for dairy production as are one or two-day tests conducted at intervals throughout the entire year or lactation period. Realizing this fact, our station last fall arranged to conduct semi-official tests of Wisconsin cows under similar rules as those governing the yearly tests of Jersey cows, and during the past four months about a dozen cows, all of the Holstein-Friesian breed, have been tested by us for yearly records. These tests bid fair to become quite general in the future among our progressive breeders, and the opinion has been expressed by excellent authorities that tests of this kind will be likely in time to largely replace brief official tests, since they furnish the only certain method of determining the value of a cow for continued dairy production.

The Cost of the Tests.

A few words will suffice in regard to the expenses and other facts in connection with the tests. The expenses of the tests amount to $2.00 per day and the necessary traveling expenses in seven-day or longer tests, $3.00 per day for one-day tests, and $5 for two-day tests. These expenses are borne by the breeders whose cows are tested and are paid by them to the Experiment Station; we credit the supervisors conducting the tests with these amounts on our monthly station pay roll. The supervisors are in the employ of the state while conducting the tests and are responsible to the station for the correctness of their work. According to a recent ruling, these positions are included under the civil-service law and appointments are made on basis of the standing of applicants in special examinations held by the Civil Service Commission, thus giving further assurance, if need be, that the work done in this line will be done in a careful, just and efficient manner.

The Scope of the Work of Testing Cows.

To give an idea of the extent of the work done by our station during the past year, I may say that we conducted last year 864 tests in all, of 356 different cows. During the twelve years up to October last year, we conducted tests of 1684 cows, the breeds being represented as follows: Holstein, 1,243; Guernsey, 248; Jersey, 108; Red Polled, 34; Grades, 30, Shorthorn, 12, and Brown Swiss 9.

As an illustration of the method of yearly testing of cows done by our station, I have prepared a chart of the results obtained last year on the test of the champion Guernsey cow,

"Yeksa Sunbeam." This, as most of you are aware, is the cow that produced an equivalent of 1,000 pounds of butter during the year, at least five times more than the average annual production by cows in our state. The figures given on the chart are reproduced below:

Yeksa Sunbeam (A. G. C. C. No. 15439).

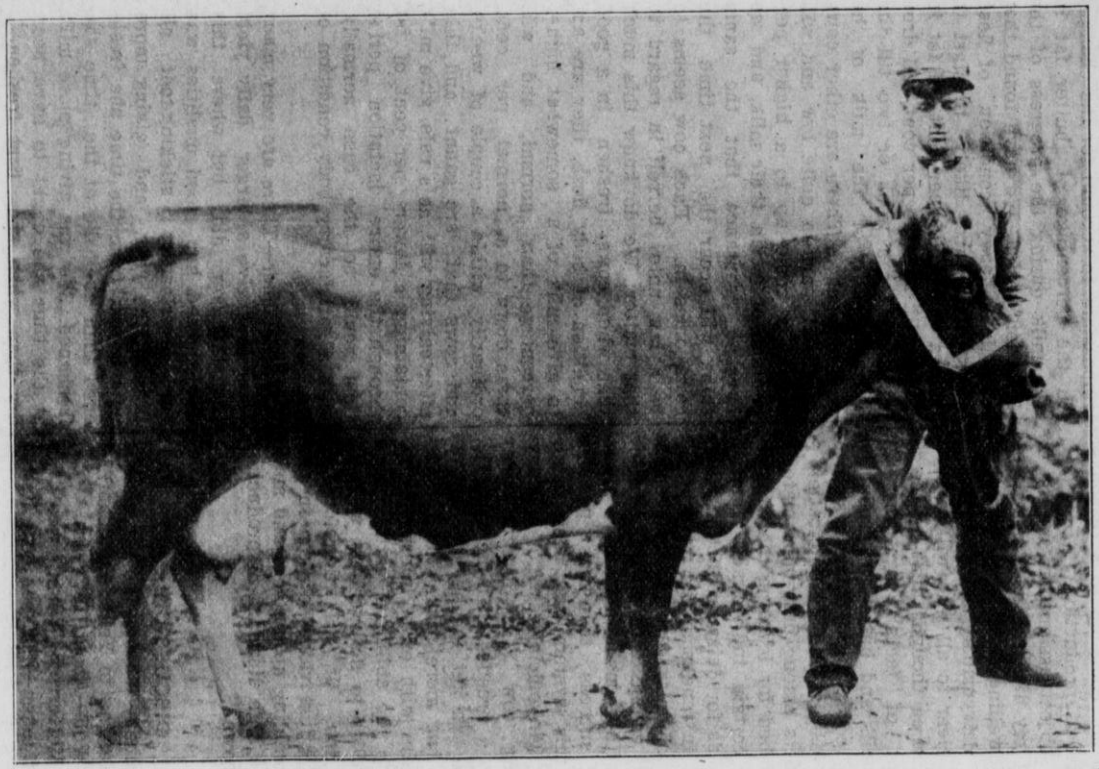
Dropped April 2, 1895; Calved Sept. 11, 1904.

Yearly Test, Oct. 1, 1904-Sept. 30, 1905.

Month.	Station Tests.			Production.	
	Milk lbs.	Fat per cent.	Fat lbs.	Milk lbs.	Fat lbs.
Sept., '04	36.2	4.09	1.479	.....	.....
Oct., '04	43.8	5.69	2.494	1428.2	81.26
Nov., '04	45.1	5.62	2.536	1322.5	74.32
Dec., '04	40.7	6.08	2.475	1294.4	78.70
Jan., '05	39.5	6.04	2.389	1217.0	73.51
Feb., '05	38.4	5.75	2.208	1060.8	61.00
Mar., '05	36.7	6.05	2.222	1185.1	71.70
Apr., '05	37.3	5.79	2.159	1089.6	63.09
May, '05	37.4	5.75	2.153	1127.5	64.83
June, '05	41.1	5.25	2.156	1158.4	60.82
July, '05	39.0	5.88	2.292	1266.0	74.44
Aug., '05	42.7	5.42	2.316	1463.8	79.34
Sept., '05	43.3	5.67	2.453	1307.5	74.14
Total	.....	Ave. 5.74	.....	14920.8	857.15

The cow was served June 12th and is believed to be due to calve by the end of this month. She was, therefore, six months from the time of calving at the end of the testing year and this fact renders her production during the month of August, about 11 months from calving, still more wonderful, viz., 47 pounds of milk and 2.56 pounds of fat per day (equivalent to three pounds of commercial butter), with an average test of 5.42 per cent.

The remarkable record of this cow will be likely to stand for years to come as the highest authenticated production of butter fat by a cow for a year. By way of contrast, it suggests what can be done with other cows when intelligent methods of breeding, rearing, handling and feeding enter into the management of the dairy herd. Systematic, liberal feeding is a most potent factor in bringing forward the latent capacity of a cow for dairy production, but it is important to have good material to work with,—to use a good pure-bred bull, of a strain that has proved capable of creditable milk production, to



Yeksa Sunbeam (A. G. C. C. No. 15439, Adv R. No. 331), owned by Fred Rietbrock, Milwaukee, Wis. Production for one year, 14,920.8 lbs. milk, 857.15 lbs. butter fat (equivalent to 1,000.01 lbs. butter), average per cent fat, 5.74. Reproduction of a photograph taken on the last day of the test, at 384 days from calving.

give the young stock their start along dairy lines, and then to be on constant watch and cull out animals that do not come up to a reasonable standard of production.

The subject assigned to me, or the time at my disposal, does not permit of my dwelling further on this phase of the dairyman's business, but it will be clear to all who will give the matter some thought, that by the attainment of facts regarding the actual milk and butter fat production of dairy cows, through this system of official testing, and by publication of these facts among dairymen, material is furnished for learning the capabilities of certain individuals, families and breeds for dairy production which will aid in rendering the work of the breeder of dairy cattle less uncertain and will enable him to improve his herd with considerable more assurance of success than was possible before this system had been established. An official test of a heavy-producing cow is of direct money value to a breeder, as it increases the price he can get for her or her offspring; but more than this, it furnishes him with exact information in regard to the ability of certain cows and families to do excellent work in a dairy line. It will therefore be of the highest value to him in this line of building up his herd and maintaining a high standard of production by his cows.

DISCUSSION.

A Member—What is the age of that cow (referring to Yeksa Sunbeam)?

Prof. Woll—About 10 years.

Supt. McKerrow—When was the first test taken—4.09 per cent butter fat?

Prof. Woll—About 10 days after freshening; the 20th of September, as I remember.

A Member—How do you explain the variations in the tests made the different months?

Prof. Woll—It is difficult yes often impossible, to account for the changes in the percentage of butter fat in the milk during the progress of the lactation period. We have found that cows in a heavy condition of flesh after calving are likely to start in with a very high per cent of fat in their milk and the per cent will drop regularly for a week or two till the normal quality of the milk of the cow is reached. There are other cows that will start in quite low and will gradually come up to a higher percentage of fat in their milk, and we have no assurance that the same thing will occur the next time the cow comes in. Each cow seems to be a law unto herself in regard to that matter. We do know this much that when cows freshen in a good condition of body flesh, they are apt to give milk of a somewhat higher percentage than normal, and will come down to a normal per cent, ordinarily, within a couple of weeks, and cows that are gaunt and thin after calving will, as a rule, give milk containing a lower per cent of fat through the entire lactation period than would be the case normally, with a satisfactory body condition of the cow.

Mr. Scribner—There are very many cows that give a larger daily yield than this cow did, but where this cow showed her good qualities was her everlasting sticking-to-it all through the year, and giving more milk a year from the time she freshened than she did at the time she freshened. She was giving more milk at the time she ought to have been dry than when she first freshened. This is a remarkable case.

Supt. McKerrow—Is that cow a farrow cow?

Prof. Woll—She is believed to be

in calf and due to calf about the end of the month, but it is not certain.

Mr. Scribner—When she first came in, she gave 32 pounds of milk a day, and in a year from that time she gave 43 pounds a day.

Prof. Woll—This ought to be remembered in regard to the figures in the table, that the weight of milk produced by a cow will vary considerable from day to day. The figures given in the table show the quantities of milk produced on some one day during each month; supposing, for instance, that our man, instead of coming to the farm the 12th of January, when she gave 39.5 pounds of milk, had come the following day she might have given 38 or 40 pounds, and the test of the milk might also have been different. The figures in the first part of the table, therefore, show only in a general way the daily production of the cow from month to month, on account of the natural variations in the daily production of a cow. To arrive at the true average daily milk yield, the total credits for the month are divided by the number of days in the month.

The Chairman—Isn't it a fact that she gave more milk the last fifteen days than she did the first fifteen days; that is, counting from September 15th to October 1st, 1904, she did give not as much milk from September 15, 1905 to October 1, 1905?

Prof. Woll—Yes, that is true; the breeder naturally wishes to make the best showing for the cow he can, and therefore selects the twelve consecutive months during which the highest production occurred. The cow did not do as well in the nineteen days that were left of September 1904 as in the corresponding days of the following year, so her record began on the 1st of October, 1904 and ended on the 30th of September, 1905. The actual quantities of milk produced per day for different months may, of course, be found by dividing this amount by 30 or 31, as the case may be, and you notice she had the highest production for any one month during the month of August, when she was 11 months from calving.

Mr. Goodrich—Doesn't this indicate that nothing short of a yearly test proves the value of a cow for dairy work? We know that the one day's test is of scarcely any value, and that a weekly test is not of much value, and even a test taken at the middle of the period of lactation, say, four or five months from the time of calving, doesn't tell a good many things, when made by the average man. Some cows start in with a heavy flow and begin to dry up much earlier than others. This is one of the kind that keeps right on, her last month is just as good as the first month.

Prof. Woll—I agree with you that the true criterion of the value of a cow for dairy production is to make the test throughout the year. This system of semi-official testing for yearly records that we have established at our station is, in my opinion superior to anything else in that line

Mr. Goodrich—I commenced years ago to test my own cows, and the cow that for the first month produced more than any other cow, for the whole year couldn't pay for her feed, did not produce anywhere near as much as some other cow that did a great deal poorer to start on. It is the cow that keeps on steadily through the year that pays.

A Member—How does the milk of a heifer compare in quality with the milk from older cows?

Prof. Woll—It is hardly safe to lay down general rules in regard to cows, for there are so many exceptions; but we find when we consider the averages for a large number of

animals, that heifers give a little richer milk than older cows and that the quality decreases slightly with later lactation periods, but the difference is not large enough to be worth considering. A difference of one or two tenths of a per cent is all that could be expected on the average, and there are a good many cases that go the other way, so that if you take a small number of cows you can prove almost any proposition; if you take a sufficiently large number of cows, you will find it to be the rule, however, that heifers will test slightly higher than older cows.

Mr. Jacobs—From what was brought out here of the value of the yearly test and the uncertainty of this cow being in calf at this time, I think it will indicate the necessity not only of yearly tests, but of tests being taken continually year after year. Now, it is quite possible that if this cow is farrow at this time, the next year's test would be very much against her; that is, if she had a calf once a year, that she could not make a good test. Another point, don't you think, Professor, that she has shown her inherent ability to produce milk of that percentage, but the weight of the milk is something that might vary very much from year to year; that she might give milk of very much less quantity another year, but the quality would probably be about the same?

Prof. Woll—Yes, the per cent of fat in her milk would not be likely to vary materially from year to year; that is, if she is in fairly good condition of flesh all the time.

Prof. Hays—If you had the tests of the cows in a herd for their second, third or fourth periods of lactation for the entire period, wouldn't that be sufficient to give you the practical valuation of the different cows? The question is, if we could carry those tests along in the life of each cow for three consecutive periods of lactation, the second, third and fourth periods, and then get an average of the three years, wouldn't that be a sufficient test for practical purposes of our best herds to give, for instance to a prospective buyer of a cow, so far as her individuality is concerned?

Prof. Woll—Yes, I think it would be, and I think for practical purposes it would not be necessary to go as far as that. My experience leads me to believe that, as a rule, it is only in exceptional cases that you find a cow in an ordinary dairy herd that will do very well one year and poorly the next year, so if you have one year's thorough test of a dairy cow, it seems to me that we have gotten material that is very valuable and sufficiently accurate to enable one to judge whether that cow is a good one to breed from.

Prof. Hays—Could that not be abused by breeders making records for their cows which might not hold another year?

Prof. Woll—Yes, certainly. It is a point for the farmer to inquire into, the exact conditions under which a test was made. I take it there is no excuse for a man to buy a cow on the strength of the results of a test that he does not look into.

Prof. Hays—How many herds of 20 cows each could one inspector handle? Could he handle 20 herds?

Prof. Woll—Yes, he could in the state of Wisconsin; he probably could not in Texas.

Mr. Convey—I would like to ask the professor about the test where they tested Shorthorns for three consecutive years and kept getting better results. Was it because that cow was maturing, or that you got her well started?

Prof. Woll—We have had cows that did their best work the first year and gradually came down, and we

have had other cows that have kept improving for several years. From our records, I could give you illustrations of all possible experiences in that line. You have to consider a large number of tests in order to draw any general conclusions or rules as to changes in the production of cows under different conditions.

Supt. McKerrow—Isn't it possible that in this case the system of feeding, the feeder and the milker has something to do with it?

Prof. Woll—That certainly is true; those factors very likely were of the utmost importance in bringing about the yearly record of Yeksa Sunbeam. I think it only fair to say that the results obtained on this test could never have been obtained except under approximately ideal conditions; they were as nearly ideal as can ever be hoped to be reached. The cow had alfalfa and clover pasture in abundance throughout the season, and with other test cows she was taken from one pasture to another every couple of weeks, and the clover pastures, at least in the month of August, at the time of my visit there, were as rich as any I have seen for years. Furthermore, only the best of feeds were given the cow throughout the year, so she was placed under very nearly ideal conditions in the feed line.

Mr. Scott—Don't you think the superiority of the northern Wisconsin grasses had a good deal to do with the record made by the cow?

Prof. Woll—You have the right to draw that conclusion.

Mrs. Lehmann—What is the average expense of testing a cow?

Prof. Woll—On the Guernsey tests. our men are at the farm one day each month and they are only allowed to test 10 cows at a time. The expenses amount to $3 and traveling expenses. We make these tests in a circuit, add up all the traveling expenses for each month and divide the total expense by the number of herds in which tests are made and charge each breeder an equivalent for the traveling expenses. That will amount to between $2 and $3 a month, so you can test 10 cows for $3; that is, $36 for the year, and say $2.50 for traveling expenses; that will make the expense of testing ten cows a year less than $70, or about $7 a head.

Mrs. Lehmann—And it will cost about the same to test one cow in one herd?

Prof. Woll—Yes; our man is there and he can just as well test ten cows as one; in fact, he had better test a larger number than one, so he may be kept occupied and interested in the work.

A Member—How often should milk be tested at the cheese factory and creamery?

Prof. Woll—Once every week, ten days or two weeks, as agreed upon; but that is another question.

Mr. Nordman—This cow whose picture is before us is now credited with being the best cow in the world for butter fat production, though we know that there are other cows that did as well, but those cows are with calf surely, so the comparison is not quite fair, is it?

Prof. Woll—No; we all understand that.

Mr. Convey—What do you consider to be the best condition for a cow at calving time, one in plump or thin condition?

Prof. Woll—At the present time, after the use of the bicycle pump has become quite well known as a remedy for milk fever, there is not so much danger in having the cows in a fleshy condition at calving time, as was formerly the case; now we rather prefer to have them in rather good body condition, it is apt to increase the per cent of fat during the following lac-

tation period. Previously, there was danger of milk fever if cows were fed much grain directly before calving; now that danger is largely removed.

A Member—How many cows can be tested at a time on the official seven or thirty day tests?

Prof. Woll—Six cows. A good many of the cows placed on official tests are milked four times a day, and nearly all the others are milked three times a day, for at least seven days. We have found that six cows are as many as one man can take care of under these conditions and keep his records up to date.

A Member—Then the expense would be the same for testing one cow as it would on six?

Prof. Woll—Yes, sir.

Mrs. Howie—What difference do you find in the yield of cows per year whether they come in in the fall or in the spring?

Prof. Woll—We have not obtained any data on that point in this work, but it is generally conceded that fall cows will do best. You have all the conditions better in hand during the fall than you have during the summer months, and especially during the latter part of the summer; flytime is the hardest time of the year for the cows, and if they are nearly fresh during the latter part of the summer, their flow of milk will be likely to be decreased for the whole remaining part of their lactation period. The hot weather cannot do so much harm in the case of fall-calving cows whose production at this time of the year is low anyway. The best results may therefore be expected from cows that calve in the fall, because the highest production then comes at a time when the cows can be kept comfortable and fed such combinations of feeds that will be likely to produce the maximum yields of milk and butter fat of which the cows are capable. Besides, under this system of dairying, the highest production comes at the time of the year when the highest prices are paid for dairy products.

The Chairman—This Round-up Institute is highly favored over some of our previous Institutes, from the fact of the valuable help we are getting from the Department of Agriculture at Washington, and we are happy in hearing again from Professor Hays at this time.

PLANT AND ANIMAL IMPROVEMENT.

Prof. W. M. Hays, Ass't Secretary of Agriculture, Washington, D. C.

Never in the world was there such a time for the organization of an industry as we now have in American agriculture. These are piping times of peace. We are producing annually six billions worth of farm products. Statistics produced in the last five years from 45,000 farmers, show that the selling value of the farm lands of this country has increased more than 33 per cent. The next census four years hence will no doubt show that instead of 20 billion dollars worth of farm property, we shall run up somewhere between 25 and 30 billions.

Out of the six billion dollars worth of farm products produced by our people, there are fully five-sixths of that which are subject to the operation of the breeder, the plant breeder and the animal breeder. In individual cases as, for instance, with dairy cattle, wheat, sugar beets, potatoes and a great lot of other plants and animals, it has been definitely proven

just as sure as any fact has been proven in any experiment station, that we can increase these values by breeding, at a relatively small expense, 10, 15, 20 and 25 per cent, and I stand here to go on record as believing that with a relatively small expenditure in American agriculture through the National Department of Agriculture, the experiment stations, the co-operative associations, corporations, firms and individual effort, that we can in a relatively short number of years, say 10 to 20 years, increase the value of our products 10 per cent more than they would otherwise be, by this breeding, and that this breeding need not cost one per cent of that 10 per cent.

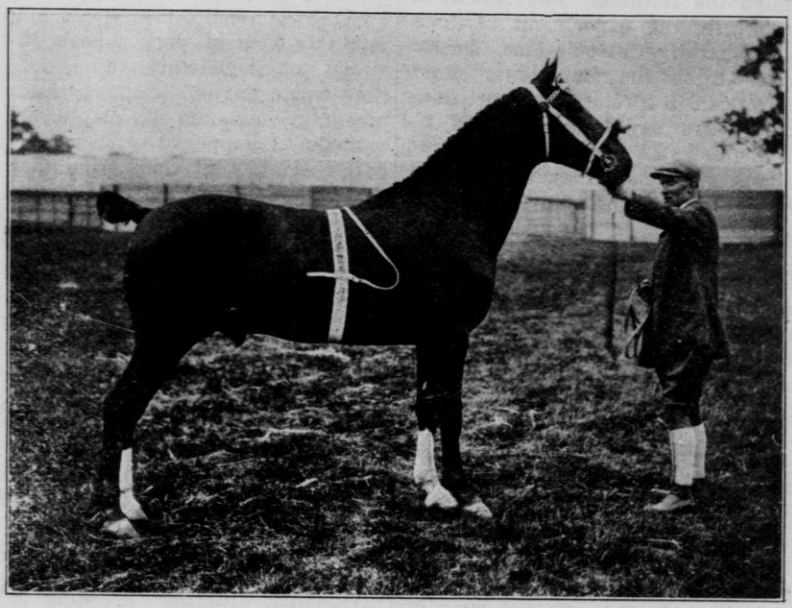
In my own experience with wheat and corn breeding, this statement is amply justified. It is much more justified in Mr. Burbank's work with fruit, vegetables and flowers in California. It is substantiated with a lot of your dairy breeding. You have shown that you can produce a cow that will give one-half more than that same cow formerly gave at a reasonable expense for the feed, at comparatively little increase of expense. It is a business proposition, Mr. McKerrow, that we get busy on this thing. Ten per cent of five billion dollars means 50 million dollars annually, and in 20 years that means a lot of money added to the wealth of this country.

A Course of Action Outlined.

The elements of a business plan are being worked out. Some of them are shown right here in your own Experiment Station work, showing how to use the Babcock test and the scale in getting at the valuation of your cows. Twenty years ago I was teaching animal breeding; I saw the weakness of the body of thought given out in the books on animal breeding, and that this subject was not being treated in anything like an adequate way. I started to try some experiments, but in those days there wasn't much money for these things. I started in with hogs, thinking I could use large numbers, but I soon saw that that was very expensive, so I took up plants and began the study of the principles of this subject, hoping I might get results that would help to give this kind of work a basis in the minds of legislators, a belief so they would put public money into the breeding, not only of plants, but of animals. I happened to be nearly the only one at that time who thought seriously of the unity of principle in animal and plant breeding. We are all coming to recognize those principles now. There is not much difference in breeding corn and wheat on the one hand, as compared with breeding animals, no more than there is in breeding two species of animals. You cannot use the same manner of testing or figuring out your results in breeding swine that you can in breeding corn, but the general principles are the same, and the broadest generalization I can bring to it is this, that there is one in many, in thousands, that has remarkable individuality with the breeding power to work it into a new and valuable strain or breed. That is true in corn, it is true in wheat, it is true in flowers, and it is true in cattle, it is true in all classes of animals and plants. If we will once get thoroughly in our minds that great fact and will then reorganize breeding on a basis where large numbers can be handled under a system, so that the breeding power of our different parent animals are brought into comparison and then brought together, fluxes of blood, if you please, are produced by welding together these best blood lines into families and fused; if we will do that in a large, systematic way, with the results of

comparison and with what has been done in plant breeding along this line, we will have gained one point we will have learned how.

This great American people is coming to the front, and it can afford to put up the necessary one per cent to gain an actual 10 per cent increase in our animal and plant products.



Copmanthorpe Performer, First Prize and Champion Hackney Stallion at Royal Show, Derby, England, 1906.

Requires Systematic, Concerted Action.

We have been working in an individual way. We believe in giving every man a chance to do his own business and to build up his own family on his own farm in his own home, so that we will grow a great people; and our agriculture is built on that plan. Our forefathers had the good sense to build on the 160-acre homestead plan, and it was almost the greatest thing in the formation of our government to build up the farm and the family home, the best institution in our land, and I certainly do not believe in treading that down. We have seen, however, in great industries, the great transportation, mechanical and commercial industries, that they are becoming merged, they are taking away the individuality of the workers in that line and merging them, making them only cogs in a wheel. I am not here to defend anything of that kind in agriculture: I do not believe we want to merge our great interests so as to destroy our individuality; the greatest God-given right to this country is to own a farm and raise a family, as it cannot be raised anywhere else, if you are within reach of the right kind of schools, in the country.

In 1899 I had figured out some

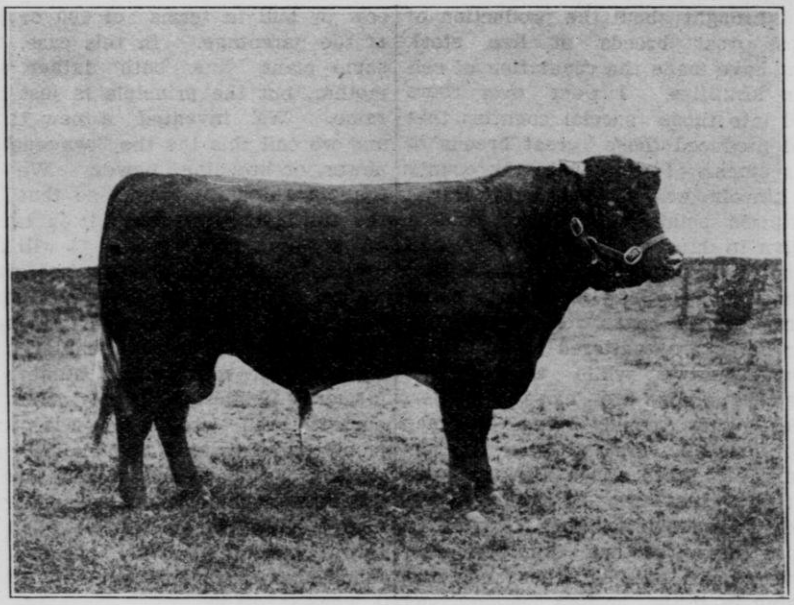
things in this plant breeding industry. I was using thousands of individual wheat plants and clover plants and timothy plants, planting one seed in a hill and keeping a record of every part of the process, working up the experiment as systematically as you do with your dairy cows. For years I had been wanting to look through the British Islands and see what forces were at work that brought about the production of those great breeds of live stock that have made the reputation of certain localities. I went over there and into those special counties that had produced those great breeds of live stock. I went into the county of Lincoln, was at the county fair, I gathered points about there, and it began to dawn on me how they had handled the breeding business in that county. They had used large numbers. So I began to realize that our herds are scattered all over this great country, while there their basic grounds are close together. There they could bring together enormous numbers and make comparisons. If there was a ram that produced a great crop of lambs, everybody knew about it and followed up those things, so that the best ones were chosen out of thousands and taking in three or four generations in connection with their fairs and exhibits and shows, right there one could learn to do as we do with corn, to take a large number of plants, give the same apportunity to each by planting one seed in a hill; then out of say, 10,000 plants, we throw out nearly all of them, saving only the best plants. Then we harvest those by themselves, we shell out those ears picked out from one or two hundred of the very best plants, we mark those one hundred plants and we will make each one another plant. Wheat is a self-pollenating plant, so it is easy to experiment with it in that respect. We give each one of these plants a little plat three feet square with hills four inches apart each way, we harvest the plants and thresh them out with a little machine we invented, they have been harvested in a little bunch, and then we sort the grain, numbering the plants.

In the case of the dairy animal, we had the breeding power of the cow or bull in terms of 100 or 150 of the parentage. In this case, the same plant was both father and mother, but the principle is just the same. We invented a new term, and we call this the the "cyngenetic" power, or breeding power. We did that again and again, so that at the third year we had it in terms of 300, the mother plant. I will not go into details, but you can see that we got in two or three years some remarkable varieties, which we sent out to the farmers, sending four bushels each to a certain number of farmers, asking each to plant it opposite the wheat he was commonly growing and to make comparisons. One year we sent out to 400 farmers and we got reports from nearly all of them, but we had to throw out all but 87, because we found some flaws in them.

A Plan for Localizing Breeding Interests.

Now, the question comes as to how we can adopt this business plan of making comparisons in a broad way in large numbers with our dairy cattle. Mr. Glover, now with "Hoard's Dairyman," did a lot of work down in Illinois, and your people at this Experiment Station have done a lot of work; Mr. Haecker, of Minnesota, has done a lot of work along that line, and found out how simply and cheaply to make tests as to the value of the invididual cow. The test is pretty nearly worked out. If Prof.

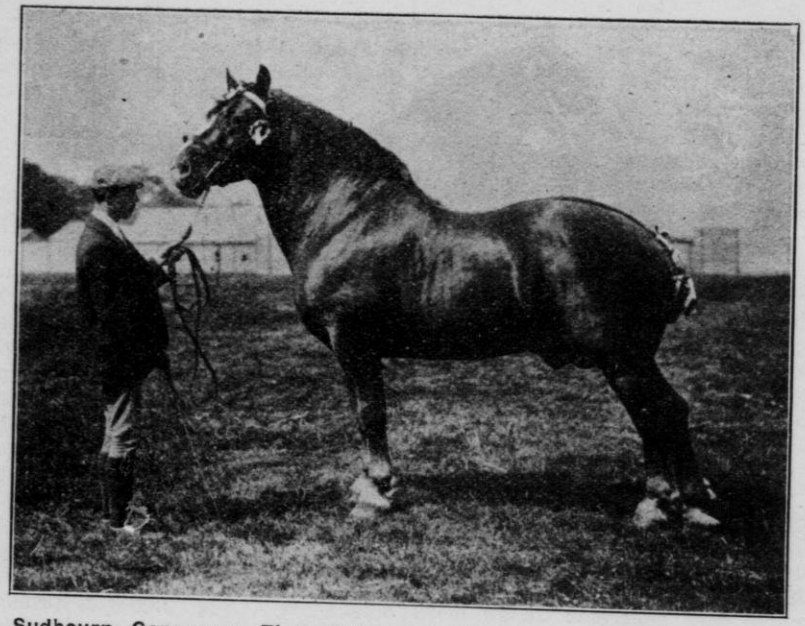
Woll had his herds in close proximity, so that it would be practicable to apply these tests to every cow in the herd for three years during her lifetime, he could in that way establish a record of the individual value of that cow—this is the point I want to come to: I believe we want a little evolution in breeding our live stock. We have begun with an experiment to try to localize this matter, just as the breeders in England localize their breeding. We are about ready to undertake it in 10 counties surrounding the Experiment Station of Minnesota. Our plan will be to take up some of the lines we recognize as important, for instance, milking Shorthorns. We will let some officer of the Experiment Station undertake the promotion of associations of at least 20 farmers each, who will agree to produce at least five milking Shorthorns to be approved by the committee. Let this Association be formed and appoint one man to represent it, let the Experiment Station appoint a second man and the National Department of Agriculture a third man, let these three men be the council who shall govern certain things concerning this breeding. Let public money from the national government and the state Experiment Station be used to find our cows, or to bring them into that Association, not confine that to this country, but find them anywhere they can, England, Austria, or anywhere they can find this kind of stock; let the government go to the expense of finding out those animals and then let these individuals put up the money for the purchase of them, or use public money to pay for them and let the



Bapton Viceroy, First Prize Yearling Shorthorn Bull at Royal Show, Derby, England, 1906.

public funds be used to pay a man to work under this council of three men to superintend this breeding. Then have certain rules; divide the cattle into three classes; let this council have an option on all animals that it may use, certain animals that cannot be sold out of the association, but must be kept in the association to breed from, keep all the best animals there.

Then, a second class allowing the association to sell to whoever wants



Sudbourn Conqueror, First Prize and Champion Suffolk Stallion at Royal Show, Derby, England, 1906,

milking Shorthorns for breeding purposes, or any other purpose.

Then, the third class, not to be allowed to be sold or used at all.

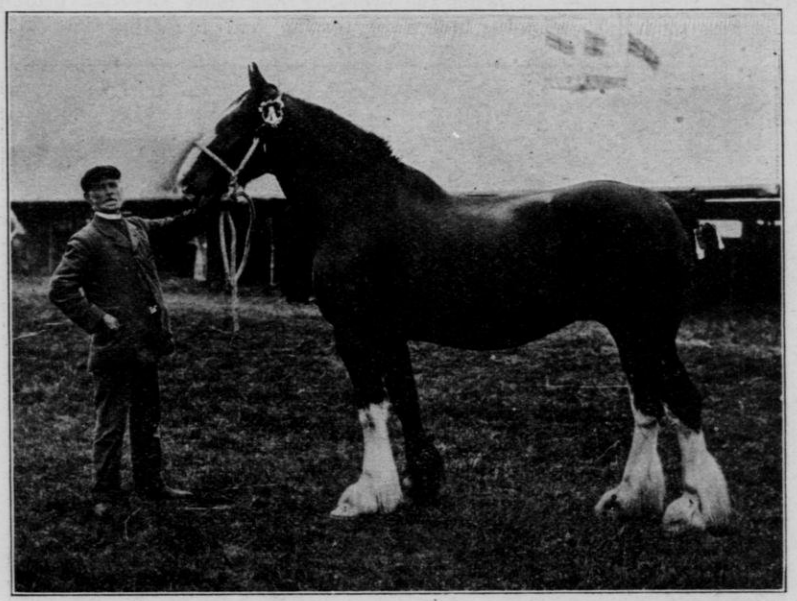
This plan can be applied not only to milking Shorthorns and all kinds of dairy cattle, but horses and swine for general pork production, bacon hogs, any class of the larger animals

I am simply giving you suggestions of the things that can be accomplished, but we must remember al ways that it requires a large number of any specific kind of animals. As you all know, fine work along this line has been done in corn breeding by the Funk Bros., in Illinois. As to dairy animals, I might say we do not have enough of the kind of testing that has been talked about, and you dairymen deserve credit, you are working out more of that principle of testing and breeding than all of the beef men. It is along these lines that we shall arrive at the values of individuals, thus enabling us to tell which family, which flux of blood, would be the most profitable in the end. In this case we have spoken of where we take the milking Shorthorns, we would soon learn which flux of blood it was, whether one that leaned always toward the

dairy type, or whether one that leaned always over to the beef type. Those things would take care of themselves, we will get over the idea of theorizing and taking sides, saying the dairy cattle are all right or the beef cattle are all right, instead of saying that, we would say, here is the stuff that does the business and we want some of that kind of cattle.

I might say that some one recently made the suggestion for a name for this plan of organization for breeding, by calling it the "Circuit System," I suppose because the man handles the business on a circuit, and I believe that public money can be used in this way, not only legally, but with great advantage to the great people. We are pushing the agricultural idea through the State Stations and Agricultural High Schools and this is simply another suggestion. Do not get the idea that I am advocating this to discourage the great work of the breeding of animals in America by private individuals, farmers and corporations.

We believe this association would help the business of every breeder and farmer, just as the Island of Jersey and other local governments have helped breeders. I believe that the business of breeding is to be built up all along the line.



Cedric Princess, First Prize and Champion Clydesdale Mare at Royal Show, Derby, England, 1906.

The organization for plant breeding is going along in a different way; it does not need to be gotten at in just this circuit way of breeding live stock; there is some of that work that can best be done at the state experiment station; others can best be done by large city firms and other lines by private individuals, but all this work is along on a line with the same principles. This matter may branch out on many lines. I worked all of 10 or 12 years on the

breeding of wheat and got very important results, so that some of those new varieties cover now 10 or 15 million acres. Of course these matters must be worked on long lines. You must be patient. As the lady said, it takes 21 years to grow a boy, and it takes patience for the development of any good thing.

DISCUSSION.

A Member—Would you expect to establish a new breed of cows by this plan?

Prof. Hays—We might call it a breed, or a sub-breed, or a family. There are many cases where new breeds ought to be established and this work may ramify into many lines. For instance the zebras recently brought into this country could be bred to ordinary donkeys, such as we use in making mules, and those in turn bred to our horses would produce a new species of American animal that would be as large as our largest mules and as long lived, with as good feet and legs and requiring as little food and as little veterinarian service. Since I have seen what Luther Burbank has done in breeding two genera together and producing a new species, I have no aversion to taking Shorthorns and Jersey cattle and breeding them together for hundreds of years, even if it costs a hundred million dollars; it might pay. We should not be afraid to branch out in the direction of producing better crops and of the two great ways to produce better crops, one is to produce better conditions for the crops and one is to produce better breeding power. If you can increase the producing power of wheat so as to raise the amount of crops from 20 to 25 bushels yearly, in 10 generations you can increase it a thousandfold. So far as heredity is concerned, it was all wrapped up in that first germ and you simply produce this remarkable result by selection. I offer that illustration, not perhaps as anything practical, but to try to realize that here is a great force in nature that we have not so far been properly organized to work out. Why should we go on developing electricity, engineering, everything along the line of science, and not developing the inherent forces that nature has given us to use in our line of business. Take the very best foundation you can get to breed from.

The Chairman—I understand that this government has taken up the matter of developing a class of carriage horse from the American bred roadster.

Supt. McKerrow—I understand one of the professors from the Wyoming College that they had hope of entering into an arrangement with the government by which they are going to develop breeds of sheep for range conditions in the west.

Prof. Hays—Yes, that is true.

Supt. McKerrow—And your plan would go still farther, to start the development of certain breeds of cattle, breeds of grains, etc., in different localities throughout the United States.

Prof. Hays—Yes; we find in grains, for instance, that there is one grain that suits about half a dozen states. For instance, the Red Fife, or Blue Stem wheat, flourishes from Wisconsin westward to the mountains, and that is about as large an area as any one variety will succeed in. You all know various apples are restricted in their area of production. Some of our breeds of live stock have a wide range, but if varieties sprang up in Jersey cattle, there would be varieties suited to Alabama, to northern Wisconsin, to the dry ranges out west, as well as the varieties suited to the Island of Jersey. We are now all breeding cattle that we got from

the Island of Jersey, but there is no reason why Wisconsin could not produce more from cattle bred specifically for our class of foods and climate, so that we will have families of live stock for each agricultural region, just as we are getting varieties of apples and fruit crops for each agricultural region.

Mr. Convey—I am afraid some of these people will take a lot of satisfaction in your talk in a direction which you would not wish. In this state we have been trying to develop a new breed of cattle and there seems to be great danger that some will get clear out of the way over into the beef line if they follow your teaching, and if they follow along that line they will soon be in the ditch.

Prof. Hays—Pretty near, but you put Uncle Sam behind the breeding proposition and he does not change with every wind. You will get a continuous plan.

Supt. McKerrow—I want to give you some experience. A good many years ago I noted in the agricultural papers that they had a species of wheat that was giving wonderful yields in the state of New York. I sent and secured some of that wheat for seed. We were growing a very fair variety of winter wheat, but we sowed these two kinds in the same field. The new wheat, the Clawsen wheat, yielded 45 bushels per acre; the old variety on the same soil yielded 22 bushels per acre; that would mean, if it was applied to a million acres, a good deal of money. A little later I sent to the Ohio Station for the Velvet Chaff winter wheat, which beat the old variety ten bushels an acre. Still later I sent to Guelph, Ontario and secured still another variety of winter wheat, called Dawson's Golden Chaff, which I understand, started from one farm, the farmer having grown it from one plant, and that outdid the old variety some 12 bushels the first year. So I am satisfied from that and from other grains I have used that the Professor is on the right track for improvement and the only question is whether he has the best plan to back it up by the government. Uncle Sam has backed up a good many good plans. I have seen something of the unity of effort that he speaks of among the breeders of Lincolnshire, Oxfordshire, Shropshire and other counties of England, Scotland and France, so there is no question but what if you can bring several good breeders together, in the same locality and follow the same line up to success, you will advance the cause of breeding as a whole. The only question is the working out of the plan, professor, and that is what we hire you for, I suppose.

Mr. Convey—I have been in Minnesota and Dakota and I know there is no man in the northwest that the people have more regard for than Prof. Hays, because he has developed a strain of wheat that they are all anxious to get, and they speak very gratefully of him there. I have tested some of the new grains introduced by the Department of Agriculture and I know they have done real good, so I would not have you think I desire to reflect on the professor's plan at all. I only wanted to call your attention to the fact that we have followed a lot of promiscuous breeding which has cost us more money than we can ever catch up with.

Prof. Hays—I want to put myself right. The plan that I have talked about is not a plan to start in and produce new crosses year by year by producers of live stock; I am talking about a class of professional breeders who can stand 30 years in this work. It is absolutely wrong to cross breeds, except once in a while for a given purpose, but ordinarily

it is apt to do as much harm as good, or a good deal more, and we should avoid it. What I am talking about is a well considered plan, followed up to the fifth or twentieth generation.

Now, in this plan of circuit breeding you can see that in assembling these animals from all over the earth as the years go on, you would have great deal better herds, and even the fact that the government has put upon it the stamp of its approval would help bring a big price. Once let the people see that there is profit to the farmer generally in this plan and they will want to help it along, that will help to accredit the scheme to all the people.

LAWFUL MILK.

E. L. Aderhold, Neenah, Wis.

Mr. Aderhold.

The dairy industry of the Badger state has grown so large that in point of production, it is equalled by only one state in the union and exceeded by none. It is fortunate for us that such is the case, because prosperity goes hand and hand with intense dairying. It would be disastrious if the growth of this industry should discontinue, because we have the right climate and the grasses and water in abundance suitable for the production of high-grade dairy products. This industry keeps our soil rich and brings us in money—fifty million dollars a year. We can double this income without having approached our capacity for production.

Over Production.

Fifteen years ago there was much talk about over-production. Today we hear little of that, for we have come to believe that the increase in the population of this country will take care of the increase in the production. Yet there is over-production, but it consists solely of low grade goods, the kind that leaves a bad taste in the mouth of the consumer. This inferior stuff, in my estimation, constitutes the only serious menace to the welfare of Wisconsin dairying.

Where the Menace Originates.

Ask me where this menace originates and I will answer by taking you to a promiscuous lot of cow stables, where we will find some pretty decent, clean stables. At most of them, however, we will find a lack of fresh air and sunlight; we will find some leaky gutters, some unsound floors and a lack of absorbents; strong

odors, filthy cows, and, perchance, diseased cows.

Then I will take you to a promiscuous lot of cheese factories and creameries. Some of them we will find above criticism, but at others we may find strong odors and unclean utensils, and the chances are two to one at each factory that for every vat full of milk taken in the operator takes in a few cans of downright dirty milk, or milk in unclean cans.

By this time, the question "Where does this menace originate?" will be answered to your satisfaction and you will be convinced that it is largely the result of indifference and neglect.

The State's Work One of Prevention.

It is clearly the duty of the state to safeguard this great industry by the enactment and enforcement of such laws as will make this indifference punishable. It may be argued that such laws restrict personal liberty, which is true. They restrict the liberty of the few to the benefit of the many. Every good law does that, if enforced. There is so much at stake that we cannot afford to drift in this matter. Milk is never clean unless efforts were made to have it so. The majority of dairymen are willing to make the necessary efforts, but there is a sprinkling of them nearly everywhere who will not unless compelled to by law.

The state should protect the following two parties: The producers of clean milk and the consumers of all dairy products.

The Work of the Dairy and Food Commission.

Mainly through the efforts of our present Dairy and Food Commissioner, Mr. J. Q. Emery, our dairy laws were made more perfect and workable and the last legislature wisely provided for an increase in the force of the commission of ten dairy inspectors. The efforts of these ten men will be directed to the enforcement of our dairy laws with special reference to the sanitary aspect, they having the right to enter and inspect any premises or buildings where milk is produced, or where dairy products are manufactured or handled for sale.

These ten men were appointed in the month of July last and a campaign was at once begun on factory inspection, the individual inspectors working by counties, locating the factories, obtaining names and post-office addresses of the operators and makers, acquainting them with the laws and with the purpose of the commissioner to enforce the same; a report of the sanitary conditions was also made and, in case they were bad, the operator was informed that a second inspection would be made, following which prosecution would follow unless conditions had been greatly improved.

By Christmas time this inspection had been extended over the entire state and reports were sent in of some 2,850 factories.

The second inspection of the majority of unclean factories was postponed, because winter had set in. In a few counties, however, the second inspection was made last fall and where little or no improvement was noticeable, prosecutions were promptly made.

It was realized that above all the milk supply should be clean and pure, but we knew that some factories were very unclean and we could not consistently ask a patron to furnish clean milk to a dirty factory. That is why the factory inspection was made first.

Since January 1st, a campaign of city milk inspection has been in progress and the work of purifying the milk supply at factories is due

to begin before long. This will include stable inspection.

I might add that it is the purpose of the chief commissioner to be aggressive in this work, but not oppressive, to secure a general compliance with the dairy laws as soon as possible with no more prosecution than necessary to secure the desired results. In following out this spirit, he has detailed two of his men to attend all the Farmers' Institutes this winter, there to discuss the subject of "Lawful Milk."

Dairy Laws of Wisconsin.

Dairy and Food Commissioner; Access to buildings, etc.; stencils for cheese. [Section 1410 b, Statutes of 1898.] The commissioner, his agent or assistant shall have free access to any barn or stable where any cow is kept or milked, or to any factory, building, dairy or premises where any dairy product is manufactured, handled or stored, when the milk from such cow or such product is to be sold or shipped, and may enforce such measures as are necessary to secure perfect cleanliness in and around the same and of any utensil used therein, and to prevent the sale of milk from cows diseased or fed upon unwholesome food . . . . Said commissioner shall adopt a uniform stencil, bearing a suitable device or motto, a number and the words "Wisconsin full cream cheese" and a space for a number, and upon proper application therefore and under such regulations as to the custody and use thereof as he may prescribe, issue the same, with the proper number inserted, to the proprietor or manager of any cheese factory in this state; he shall enter in a book kept for that purpose the name, location and number of each factory using such stencil, no number being duplicated, and the name of the person thereat authorized to use the same.

Sale of Impure Milk and Cream; Penalty for. [Section 4607, Statutes of 1898, as amended by ch. 138, laws of 1905.] Any person who shall sell or offer for sale, furnish or deliver, or have in his possession with intent to sell or offer for sale or furnish or deliver to any creamery, cheese factory, corporation or person, any adulterated milk or any adulterated cream shall be guilty of a misdemeanor, and upon conviction thereof, shall be punished by a fine of not less than twenty-five dollars nor more than one hundred dollars or be imprisoned in the county jail not less than thirty days nor more than sixty days.

Standard for pure; evidence. [Section 4607a, Statute of 1898, as amended by ch. 138, laws of 1905.] In all prosecutions under the preceding section, or any other section of these statutes, or laws amendatory thereof or supplementary thereto, relating to the sale of adulterated milk or adulterated cream, the term adulterated milk shall mean: Milk containing less than three percentum of milk fat, or milk containing less than eight and one-half percentum of milk solids not fat, or milk drawn from cows within eight days before or four days after parturition, or milk from which any part of the cream has been removed, or milk which has been diluted with water or any other fluid, or milk to which has been added or into which has been introduced any coloring matter or chemical or preservative or deleterious or filthy substance or any foreign substance whatsoever, or milk drawn from cows kept in a filthy or unhealthy condition, or milk drawn from any sick or diseased cow or cows having ulcers or other running sores, or milk drawn from cows fed unwholesome food, or milk in any

stage of putrefaction, or milk contaminated by being kept in stables containing cattle or other animals. The term adulterated cream shall mean cream containing less than eighteen percentum of milk fat, or cream taken from milk drawn from cows within eight days before or four days after parturition, or cream from milk to which has been added or introduced any coloring matter or chemical or preservative or deleterious or filthy substance or any foreign substance whatsoever, or cream from milk drawn from cows kept in a filthy or unhealthy condition, or cream from milk drawn from any sick or diseased cow or cows having ulcers or other running sores, or cream from milk drawn from cows fed unwholesome food, or cream contaminated by being kept in stables containing cattle or other animals, or cream to which has been added or into which has been introduced any coloring matter or chemical or preservative or deleterious or filthy substance or any foreign substance whatsoever, or cream in any stage of putrefaction; provided, that nothing in this act shall be construed to prohibit the sale of pasteurized milk or cream to which viscogen or sucrate of lime has been added solely for the purpose of restoring the viscosity, if the same be distinctly labeled in such manner as to advise the purchaser of its true character; and providing that nothing in this act shall be construed as prohibiting the sale of milk commonly known as "skimmed milk," when the same is sold as and for "skimmed milk." Milk drawn from cows within eight days before or four days after parturition, or milk to which has been added or into which has been introduced any coloring matter or chemical or preservative or deleterious or filthy substance or milk drawn from cows kept in a filthy or unclean condition, or milk drawn from any sick or diseased cow or cow having ulcers or other running sores, or milk drawn from cows fed unwholesome food, or milk contaminated by being kept in stables containing cattle or other animals and cream from any such milk, or cream in any stage of putrefaction are hereby declared to be unclean and unsanitary milk or unclean and unsanitary cream, as the case may be.

Unclean and Unsanitary milk.

Unclean and unsanitary milk. [Section 1, chapter 67, laws of 1903.] Milk which shall be drawn from cows that are kept in barns or stables which are not well lighted and ventilated or that are filthy from an accumulation of animal refuse or from any other cause, or from cows which are themselves in a filthy condition, and milk in or from cans or other utensils that are not kept in a clean and sanitary condition, or milk to which has been added any unclean or unsanitary foreign substance, is hereby declared to be unclean and unsanitary milk; provided, that nothing in this act shall be construed to prohibit the sale of pasteurized milk or cream to which viscogen or sucrate of lime has been added solely for the purpose of restoring the viscosity, if the same be distinctly labeled in such manner as to advise the purchaser of its true character.

Sale of. [Section 2, chapter 67, laws of 1903.] No person, firm or corporation shall knowingly offer or expose for sale, or sell, or deliver for sale or consumption, or to any creamery or cheese factory or milk condensing factory, or have in his possession with intent to sell any unclean or unsanitary milk.

Manufacture of food from. [Section 3, chapter 67, laws of 1903.] No person, firm or corporation shall knowingly manufacture for sale any

article of food from unclean or unsanitary milk or from cream from the same.

Premises and utensils to be kept clean. [Section 4, chapter 67, laws of 1903.] All premises and utensils employed for the manufacture or sale or offering for sale of food products from milk or cream from the same which shall not be kept in clean and good sanitary condition are hereby declared to be unclean and unsanitary. Any milk dealer or any person, firm or corporation furnishing milk or cream to such dealer, or the employe of such person, firm or corporation, who operates a creamery, cheese factory or milk condensing factory, or manufactures, reworks or packs butter for sale as a food product, shall maintain his premises and utensils in a clean and sanitary condition.

Cans, bottles or vessels to be washed. [Section 5, chapter 67, laws of 1903.] Any person, firm or corporation, who receives any milk or cream in cans, bottles or vessels, which has been transported over any railroad, or boat line, where such cans, bottles or vessels are to be returned, shall cause the said cans, bottles or vessels to be emptied before the said milk or cream contained therein shall become sour, and shall cause said cans, bottles and vessels to be immediately washed and thoroughly cleansed and aired.

Penalty for violating either of the preceding five sections. [Section 6, chapter 67, laws of 1903, as amended by ch. 154, laws of 1905.] Whoever violates any provision of this act shall, upon conviction thereof, be punished by a fine of not less than twenty-five dollars nor more than one hundred dollars for each and every offense, or shall be imprisoned in the county jail not less than thirty days nor more than sixty days.

Sale of Imitation Cheese and Butter.

Filled cheese; oleomargarine; penalties. [Section 4607c of the Statutes of 1898, as amended by chapter 151, laws of 1901.] Any person who shall by himself, his agent or servant manufacture, buy, sell, offer, ship, consign, expose or have in possession for sale, any cheese manufactured from or by the use of skim milk to which there has been added any fat which is foreign to such milk, or who shall by himself, his agent or servant manufacture, buy, sell, offer, ship, consign, expose or have in possession for sale, within this state, any skimmed-milk cheese or cheese manufactured from milk from which any of the fat originally contained therein has been removed, except such last mentioned cheese is ten inches in diameter and nine inches in height, or who shall, by himself, his agent or servant, render or manufacture, sell or solicit or accept orders for, ship, consign, offer or expose for sale or have in possession, with intent to sell, any article, product or compound made wholly or partly out of any fat, oil or oleaginous substance or compound thereof, not produced from unadulterated milk or cream from the same, and without the admixture or addition of any fat foreign to said milk or cream, which shall be an imitation of yellow butter produced from such milk or cream with or without coloring matter, shall for the first offense be punished by fine of not more than five hundred dollars, nor less than fifty dollars and for each subsequent offense, by imprisonment in the county jail not to exceed sixty days nor less than ten days, or by fine of not more than five hundred dollars nor less than one hundred dollars, or by both such fine and imprisonment. Nothing in this section shall be construed to prohibit the manufacture or sale of oleomargarine in a separate

and distinct form and in such manner as will advise the consumer of its real character, and free from coloration or ingredient that causes it to look like butter.

Fraud in Labeling Cheese.

Penalty for. [Section 4438g, Statutes of 1898]. Any person who shall sell, offer for sale, ship or consign cheese labeled with a false brand or label as to the quality of the article, or shall use any stencil or label furnished by the dairy and food commissioner of this state and bearing the words "Wisconsin full cream cheese" otherwise than upon the bandage on the side of full cream cheese and upon the package containing the same, shall be punished by a fine of not more than fifty dollars nor less than twenty-five dollars.

Fraud in Dairy Manufactories.

Wrongful use of milk, etc.; fraudulent accounts. [Section 1494a, Statutes of 1898.] Any butter or cheese manufacturer who shall knowingly use or allow any other person to use for the benefit of himself or any other person than he who is entitled to the benefit thereof any milk or cream from the milk brought to him, without the consent of the owner thereof, or who shall refuse or neglect to keep or cause to be kept a correct account (which shall be open to the inspection of any person furnishing milk to him) of the amount of milk daily received, or of the number of pounds of butter, and the number and aggregate weight of cheese made by him each day, or of the number of cheese cut or otherwise disposed of and the weight of each, shall for each and every offense forfeit not less than twenty-five nor more than one hundred dollars, one-half of which shall be paid to the person upon whom any such fraud has been committed and who first made complaint thereof; the remainder shall be paid to the school fund.

Standard measures adopted for Babcock test. [Section 1, chapter 43, laws of 1903.] In the use of the Babcock test, the standard milk measures or pipettes shall have a capacity of 17.6 cubic centimeters, and the standard test tubes or bottles for milk shall have a capacity of 2 cubic centimeters for each 10 per cent, marked on the necks thereof; cream shall be tested by weight and the standard unit for testing shall be 18 grams, and it is hereby made a misdemeanor to use any other standards of milk or cream measure where milk or cream is purchased by or furnished to creameries or cheese factories and where the value of said milk or cream is determined by the per cent of butter fat contained in the same, or wherever the value of milk or cream is determined by the per cent of butter fat contained in the same by the Babcock test.

Sale of false measure a misdemeanor. [Section 2, chapter 3, laws of 1903.] Any manufacturer, merchant, dealer or agent in this state who shall offer for sale or sell a milk pipette or measure, test tube or bottle which is not correctly marked or graduated as herein provided shall be guilty of a misdemeanor, and upon conviction thereof shall be punished as provided in section 4 of this act.

To under-read or over-read unlawful. [Section 3, chapter 43, laws of 1903, as amended by ch. 99, laws of 1905.] It shall be unlawful for the owner, manager, agent or any employe of a cheese factory, creamery, or condensed milk factory to falsely manipulate or under-read or over-read the Babcock test or any other contrivance used for determining the quality or value of milk or cream or to make any false determin-

ation by said Babcock test or otherwise.

Penalty for violating either of the preceding sections. [Section 4, chapter 43, laws of 1903, as amended by chapter 99, laws of 1905.] Whoever shall violate any of the provisions of this act shall be guilty of a misdemeanor and upon conviction thereof shall be punished by a fine of not less than twenty-five dollars nor more than one hundred dollars for each and every offense, or be imprisoned in the county jail not less than thirty days nor more than sixty days.

DISCUSSION.

Supt. McKerrow—I understand you to make the point that this law is for the protection of the consumer. Does it protect any of the producers in saving their reputation and the reputation of clean milk?

Mr. Aderhold—It will, when it is generally enforced. It is a crime to offer unclean or impure milk at factories; it is a crime to accept it when it is offered and when this law is enforced, of course it will necessarily be separated, kept apart from the other. When we make these inspections on unclean milk and unclean cans at the factories, which campaign will soon be begun, we will keep watch of what a man accepts at the factory as well as of what is offered. We can obtain a compliance with this law probably quicker through the factories than we can by going to every farmer. I was at two factories in one week last fall and in one of them there was a very large number of unclean cans. In the next factory there was not a single unclean can, they were all in good condition, simply because the factoryman insisted that they should be so and milk was not accepted unless it was all clean. That was the difference in the management of those two factories. In the one instance it was more the fault of the factoryman in my estimation than of the farmers that used those cans, because they would not have been used had they known that milk would not have been accepted in them. They were simply drifting, and the factoryman was drifting also.

Prof. Hays—Do you think this rather extreme way of making your dairy products sanitary is going to give you an increased price for your goods?

Mr. Aderhold—Certainly, it will increase the consumption. There is no question but what we are wasting four or five millions of dollars a year now on account of imperfect dairy productions. That is not all, but it has a great bearing on the development of this industry. Our reputation for butter, for instance, is not as it should be, not as good as that of Minnesota, and not as good as the reputation of Wisconsin butter was five years ago. It is getting worse every year on account of the abuse of the hand separator system.

Mrs. Lehmann—Your report goes all over the state of Wisconsin. In many places the milk that goes into cheese factories is below three per cent and they don't know it. All that is asked of those patrons is quantity, not quality. Can't you say something in this report that will suggest to our dairymen that they must produce a better quality? In these factories all the milk is pooled. These men do not intend to be dishonest, it is partly a matter of careless breeding, and I ask this question in the interest of the men who are trying to get the best results for the work they do. What I say is true in Dodge county and many other counties.

Mr. Aderhold—I do not think there is as much of that as the lady seems to think there is. I think you will find most of the milk testing three

per cent or a little better, if it has not been tampered with. Another thing in your Dodge county factories, the factorymen do not, all of them, know how to test milk, so you cannot lay it to the cows in all instances. The farmers do not expect that their milk is going to be tested at all, and it may be that there is a heavy dew very frequently.

A Member—Can you bring a criminal prosecution against a man who delivers milk from his cows just as they give it?

Mr. Aderhold—If it is below three per cent, I think you can. We have certainly got to have a standard.

Mrs. Howie—Would you prosecute the owner of that cow?

Mr. Aderhold—The cow is never to blame, Mrs. Howie. The trouble is that those people pool their milk instead of paying by the test. Those cows that give thin milk are all right, but the milk ought to be paid for by the test. In this county, Sheboygan, just one-third of the money paid out at cheese factories is divided by the test. I inspected factories here last summer and I know. You have 114 factories in Sheboygan county, or had in operation last summer. Two of them were making butter exclusively, the rest of them were making cheese and a few of them butter also, but just one-third of the cheese factories were using the Babcock test and dividing the money. Many of these people have the idea that if cows give rather thin milk that it should not be paid for by the test, but that is radically wrong. These Holstein cows produce just as much butter fat per cow as any other breed, but they have got that fat mixed up in a larger amount of milk, but that doesn't make a bit of difference, the cow gives 300 pounds of butter fat a year, whether she mixes it with 5,000 or 7,000 pounds of milk, so long as she gives the necessary amount of it.

Prof. Hays—Don't 7,000 pounds make a good deal more cheese?

Mr. Aderhold—No, not a good deal more.

A Member—Has a case ever been tried in the courts where a man's cow gave milk testing only 2.8, where it was bought on the test?

Mr. Aderhold—Not to my knowledge.

A Member—Those fellows that pay by the test ought to do better than any factory that does not go by the test; that is what a good many people say, but I don't see any difference. They have to work just as hard anyway. You know of factories that have paid by the test around here and gave it up, and I don't see any good in it. Of course the cheese factory man ought to test twice a month, or at least every month, but at the same time the value that you put in the test is not in there.

Mr. Aderhold—I will tell you what is the matter with Sheboygan county farmers on this question of paying by the test. They pick all the flaws they can on the test system and overlook the disadvantages of the pooling system. At the Experiment Station at Michigan, Prof. Michels did some work in order to determine which was the more just, the test system or paying by the 100 pounds in making cheese, and he used milk testing as low as three per cent and as high as five per cent. He compared the weight of the cheese with the weight of the butter fat and he found there was a variation of six per cent on a range of from three to five per cent milks. Then he compared the weight of the cheese with the weight of the milk and the variation was 35 per cent. Now, then, it was six times as near just and fair to pay by the test as to pay by the weight of the milk, but you

fellows never think how wrong it is to pay by the weight of milk. You keep harping on the fact that you do not think it is quite right to pay by the test.

Mr. Dassow—Would the professor have the same results if he had compared four per cent and five per cent milk?

Mr. Aderhold—He wanted to be fair, so he took a very wide range.

The Chairman—Is there any difference in the quality of this cheese made from five per cent milk and four per cent milk?

Mr. Aderhold—The man that buys cheese will not notice any difference. There is a little difference in the richness of it, but it is not recognized by the buyers.

Mr. Nordman—In this county, or anywhere else, where they sell by weight, wouldn't a man be a fool to get anything but these big milkers, the big Holstein cows?

Mr. Aderhold—That is the only way they can compete, because the man who furnishes the thinnest milk gets the biggest profit.

Mr. Nordman—How much percentage of butter fat can you get into cheese?

Mr. Aderhold—You can get all of it into cheese, except about three-tenths of a per cent, and the whey from rich milk does not contain any more fat than the whey from thin milk.

Adjourned to 7:30 p. m.

EVENING SESSION.

The Convention met at 7:30 p. m. Mr. Delbert Utter in the Chair.

Music by Quartette.

WOMEN IN AGRICULTURE.

Mrs. Adda F. Howie, Elm Grove, Wis.

It is no modern innovation that has given women an active and prominent place in this pleasant and lucrative occupation, for if we are to rely on a carefully compiled history, according to Prof. Mason, of the Smithsonian Institute, women were the first to engage in this fruitful calling, and any biblical student who has thoroughly investigated the subject will readily recall a regretable incident of an early day that unquestionably credits woman's influence with the hasty abandonment of Adam's earliest horticultural operations. In short, the ancient and later days history of both the old and new worlds are so replete with pleasing examples of the powerful sway of women in this field of labor that it woud be difficult to find a single age or country where land or cattle have not been benefitted by her subtle wisdom and tireless efforts ,so that it will be needless to turn so far back in the annals of agriculture as to the days of Ruth with her garnered sheaves and wifely devotion to substantiate a claim for her salutary effect on every branch of this inspiring and intricate business. And while little credit has been accorded to the women who have been instrumental in developing the dairy herds of the old world, the assuring stamp of her successful efforts are

plainly mainfest in each breed that has ever attained a prominent standard of excellence.

The charms of the dairy maid have been for centuries an inspiring theme for both poet and painter, and the beneficial results of tenderness and love have worked so potent a spell upon the characteristics of foreign cattle, that shrewd American buyers are eager to exchange their clanking dollars for the perfection of outline and quality that has been faithfully transmitted for hundreds of years in a blessed atmosphere of love and gentleness.

The refining instincts of woman have loyally guarded as a heaven blessed gift the finer qualities and she, by solicitous care, has striven in every possible way to preserve the graceful types and valuable characteristics, in order to perpetuate these virtues in future generations. The result of such earnest endeavor is so plainly evident that comments are unnecessary, even to convince some of the most skeptical.

Some Royal Examples.

Yes, women have ever been conspicuously present during the plodding march of agricultural improvement, and if we choose to turn so far back in the world's record as to the seventeenth century, we will find one of the most pitiable examples of womanly longing for a simple life in the gruesome story of Marie Antoinette, who found relief from the political intrigues and formal state restrictions among the dainty appointments of a tiny dairy that had been erected in the palace grounds. History does not name the breed of cattle that supplied the Delf jars with their precious offering, but it requires no great flight of a practical imagination to assume that the little Isle in the English channel near the coast of France was drawn upon for a type of kine so pleasing as to find favor in the royal stables. And one can fancy a queen's delight when she walked among her cattle. A stony-hearted recorder of facts reveals that the lower ranks of her subjects scorned

Queen Marie Antoinette's Dairy, Photo taken by Mrs. Howie.

the unfathomable nature of a royal lineage that would revert, even for recreation, to so humble an occupation; still others of broader conception felt a thrill of genuine admiration and pity for one, who dwelling among many that outwardy gave her homage, should turn to her barn and dairy to satisfy a longing for a quiet, simple life and sincere affection. And while the humiliating sorrows and tragic death of the unhappy queen are now no more than faint echoes in a turbulent passage in French history, the picturesque little dairy with its stone walls, thatched roof and self-same shelving of glass, still stands in the palace grounds of little Trianon, a pathetic monument to the sweeter nature and nobler impulses of a victim of vicious persecution.

Mrs. Howie at the Agricultural School at Penrith, Cumberland Co., England.

And yet, a later period in our civilization reveals the fact that women are still taking an active part in tilling the soil and propagating the stock. Not alone the sturdy peasant of a foreign birth, whose skillful labor wrenches from the miserly earth a more abundant crop and whose gentle and sympathetic methods have exerted so beneficial an influence in the development of flocks and herds, but women of wealth and rank, with refinement and culture, have personally added material of value to a world's agricultural record.

England's dearly beloved and revered Victoria—The Good—took pride and pleasure in well tilled fields and living creatures that added beauty and value to the royal farms, and the women of America who seek so closely to imitate foreign customs, need feel no hesitancy or belittlement of station, in giving personal supervision for the certain betterment of both land and stock.

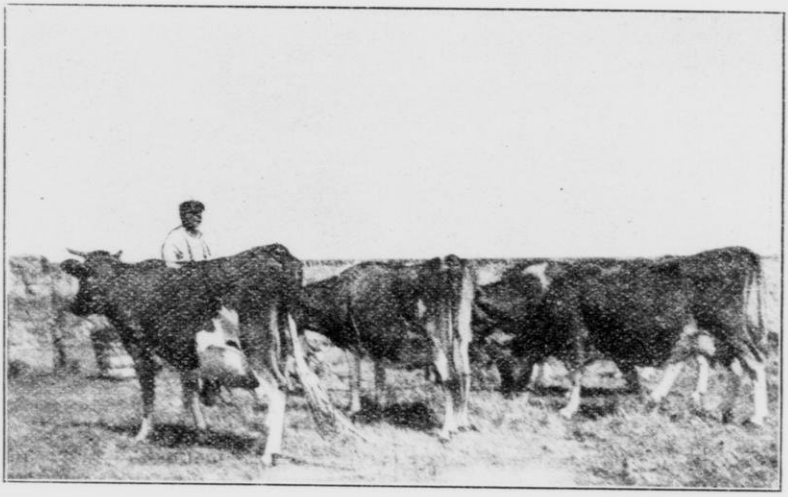
Another noteworthy example of regal affection for this calling, brings us to the present time and is that of the Queen of Holland, who but a few months ago added thirty cows to the royal stables, we are informed for the purpose of taking commercial advantage of her agricultural pursuits, but one may read between the

lines and attribute a more subtle motive in a natural craving for a simple, wholesome occupation that might serve in a measure to stifle the grievous disappointment of a blasted ambition for an ideal home life, where the sweeter ties of wife and mother-hood would mitigate the more irksome obligations of even an idolized sovereign.

A Calling Especially Adapted to Women.

Women in our own land and in the present day have, for various reasons, turned confidently to the allurements of this noble pursuit. Among them may be noted women whose education and refinement would give them ready entrance to any social or business world. That a sincere love of nature and creditable achievement has prompted the selection of this wholesome and fascinating occupation, cannot be questioned when one observes the absorbing interest taken in the work. And while a goodly number that have been reared in cities and whose artificial lives have grown distasteful, have gained money, health and prominence by striving for success, there are yet many others eager to exchange methodical drudgery for a life of freedom and independence.

Any woman with inherent ability to intelligently act and who possesses a real love for nature, will find ample encouragement and assistance to enter this profession. Our Agricultural colleges fling wide their doors to admit women as well as men, and to the enquiring mind and industrious spirit there is ready opportunity to become familiar with every phase and contingency of the business, so that with a preparation of this kind, a woman may buckle on her armor and set out with a certain confidence of winning an enviable position, and with this equipment of knowledge, a definite purpose, and the courage to toil inceasingly, the American woman may ably compete in all branches of



Some Guernseys in their Native Land Photographed by Mrs. Adda F. Howie.

this work with every district and province of the old world.

Our rich lands and vast holdings have in the past been the means of encouraging a reckless waste and a hurried over-sight of the seemingly trifles that are such mighty factors in the improvement of land or stock. The crudely prepared many acres rather than the carefully cultivated few, wield a powerful influence in

The Dairy School at Kilmarnock, Scotland.

the loss or gain of a single crop, and when the life-long efforts of any farmer are measured in proportion to slovenly habits or painstaking methods, the progress of a calling may be noted in a like ratio.

The average woman has no ambition to be burdened with lands beyond her ability to thoroughly and systematically cultivate, and while her artistic tastes may lean to more aesthetic commodities than corn or swine, a crop of carefully tended violets, luscious berries or a skillfully handled flock of early broilers, when grown on a far less acreage, may yield a profit that would push into the background of insignificance the more prosaic crops that usually satisfy the ambition of even an up-to-date husbandman.

"The Voiceless Who Have Known the Cross Without the Crown of Glory."

Yes, there have been many gratifying examples of woman's efficiency and perservance to mark every stage in the annals of this great work; women, who single-handed and alone, have successfully battled with every problem of the art. In many cases they have received their full mead of praise and honor, for a restless public, ever striving for the unique, have singled them out as objects deserving of special commendation, and the ever ready press has generously taken up the hue and cry and as

eagerly held them aloft to a wide world admiration as models of wisdom and courage.

And yet, throughout our land, there are hundreds upon hundreds of farmborn women whose greater deeds have passed unnoted, whose persistent efforts, devotion and success have entitled them to more than a local praise. The farm-wife, who perhaps has been shielded from care, or relegated to a place of thankless toil and subjection, who, when an All-wise Providence has suddenly bereft or released her from the object of her love or fear, finds it necessary to cope with the bread winning problem, and the first gush of her widowhood tears moistens into active life an understanding of the dormant energies she must put forth in order to surmount the appalling obstacles that rise before her, the sight of her fatherless little ones is a potent inspiration and spur. She stolidly dons the sombre emblem of her bereavement and bravely steps into the clouded or brightened pathway of the future.

Her first thought and act seeks to perpetuate the memory of her dead, for what farm woman ever permitted the grave of her mate to go unmarked? If not by a modest slab commemorative of his many virtues, by the more pretentious block of granite that might serve to hold him firmly in his proper place, while she, uncomplainingly, took up the burden of mortgage and debt, with perhaps the additional load of his death bed expenses to swell the amount. What if her lips are a little more tightly drawn when the last straw is laid upon her wifely devotion by the methodically drawn will that plainly states the grudging amount she is to receive "so long as she remains a widow?" She has no time for tears or resentment, but valiantly shoulders the cross and sets out to fulfill her life's mission.

In our own state may be found many such women, who have not only succeeded in cancelling both mortgage and debt, but have also provided the means for a superior education for the children who were dependent upon their efforts for support.

And last, but by no means least, for she outranks them all, standing from time immemorial in the very vanguard of agricultural progression, the farm woman, who unassumingly and without thought or wish for public recognition, joyfully takes her place beside the man whom she has pledged to love and honor, bending every energy of supporting influence and endeavor towards an ultimate success. This is the real one who should be rightfully extolled by the sweetest sentiment of a world-wide gratitude and admiration. She whose hair has whitened and whose sinews have weakened in a lifelong struggle for the advancement of her husband's calling and the betterment of her loved ones. The cheerful wife and mother, whose courageous efforts and sunny nature, whose God-loving faith and whose patient endurance, whose heroic victory over poverty and discouragement, should have lifted her step by step into a realm of glorified prominence. She whose purity of purpose has made her self-sacrificing, Christian life an everlasting beacon to all coming generations. The gentle, refined, dignified type of a noble womanhood, whose husband exalteth her and whose children rise up to call her blessed. The annals of the past have boasted many such women and the present comes eagerly forward to do them justice. Thrice blessed is every land or nation that can claim them. These are the women who have honestly earned distinction. They have toiled unceasingly and

graciously accepted every burden that has been laid upon them and by a faithful adherence to duty have stamped such resultant effects of an elevating character upon their life work that "honorable achievement" should be indelibly traced beneath each jewel emblazoned name throughout the pages of a sublime history that could be most tenderly and reverently written as a fitting tribute to women in agriculture.

SOME PHASES OF THE WORK OF THE DAIRY DIVISION, UNITED STATES DEPARTMENT OF AGRICULTURE.

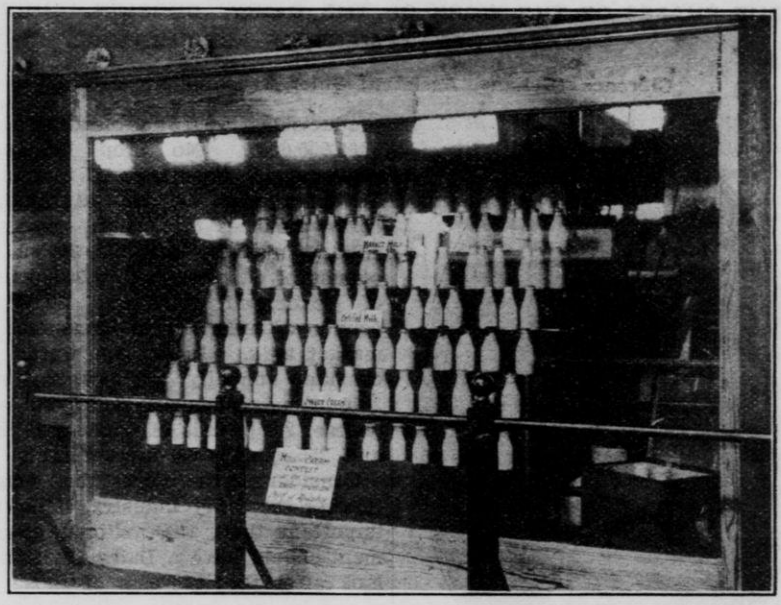
Clarence B. Lane, Assistant Chief, Washington, D. C.

Mr. Lane.

I am very glad to have this opportunity to talk to you for a little while about an industry which sometimes seems commonplace and unimportant, but which in reality is one of our most important industries. Almost every person of our population of over 81 million is dependent upon it, because they consume dairy products in some form. The value of the products last year was estimated at $665,000,000. No crop but corn produces an income equal to that of the dairy cow. About 19 millions corn produces for us in one year 1,650,000 pounds of butter, 300,000,000 pounds of cheese, 250,000,000 pounds of condensed milk and 20,000,000 pounds of milk to be consumed as market milk. In other words, we consume annually per capita about 20½ pounds of butter, 3.72 pounds of cheese, 2.3 pounds of condensed milk and 255 pounds of market milk.

Considering therefore the magnitude of the dairy industry, it is very important that the national government should have a Dairy Division to look after the interests of those engaged in this work. The Division was organized as most of you know in July, 1895; at that time the appropriations for the work were small and it was not possible for the few men employed to cover a very large field. The work was largely collecting and disseminating information and statistics and answering correspondence relating to a great variety of topics. The small number of men employed and the lack of funds did not permit original scientific investigations. The few early bulletins published, however, were very popular and some of them have had a circulation of over 300,000 copies. The work of the Division

has steadily grown and at the present time there are 20 men on the force, most of whom are trained scientists. The policy of the Division now is to show dairymen modern methods by means of object lessons and practical work, rather than tell them how through bulletins and circulars, which, of course, did not appeal as strongly to the ordinary dairyman. I shall only be able in the short time I have to mention briefly some of the branches of the dairy industry which are under investigation.



Samples of Milk and Cream in Contest, National Dairy Show.

Work of the Division at the National Dairy Show.

The most recent work taken up was the inauguration of a milk and cream exhibit at the National Dairy Show in Chicago. This attracted much attention from dairymen throughout the country.

For a number of years the National Creamery Buttermakers' Association has offered prizes to butter makers receiving highest scores for their product, but for some reason the milk producer has never had an opportunity to exhibit his product, which is fully as important as that of the butter or cheese maker. The Dairy Division had hoped for some time to give an opportunity to milk producers to exhibit their product and have it scored for flavor, commercial qualities, keeping qualities, etc., and to award medals and diplomas for the best product.

The National Dairy Show at Chicago seemed to offer just the opportunity for such an exhibit. A press bulletin was therefore prepared, setting forth the nature of the exhibit and the conditions for entry, and sent broadcast over the country. Most of the advertising was done, however,

through the dairy papers and periodicals, as it was impossible to communicate with five million milk producers direct.

It was arranged to have exhibits in three classes: Class I, Certified milk —that is milk sold under a guarantee as to its percentage of fat and solids and the number of bacteria contained; Class II, Market milk, or milk that is sold without any guarantee and without any special standard; and Class III, Cream—it was specified in this class that it should be up to the standard of 18 per cent fat.

A great deal of interest was manifested in this contest from the start and responses came from all parts of the country—13 different states being represented, some samples coming from as far east as Boston, from the south as far as Maryland, and from Kansas on the west.

The principal condition of entry was that the milk and cream should all be produced on February 12th, packed in ice, and sent to a cold storage house in Chicago, where it remained until scored. The scoring was done by three experts of the dairy industry, and careful analysis was made of the milk and the kind and quantity of bacteria. So many samples have probably never been brought together at one time and place and subjected to such a thorough examination. Much less difficulty was experienced in scoring the product and awarding the medals than was anticipated. By heating the milk to a temperature of 100 degrees, any taints in the flavor could readily be detected, and the quality of the flavor determined. Many thought that such a test would be impossible, owing to the difficulty of shipping cream such long distances and putting it upon a fair basis in regard to the time it was produced. The results, however, demonstrated that it is possible to score milk and cream as accurately as butter and cheese, or any other product. The exhibit in detail will be of some interest.

Certified Milk.

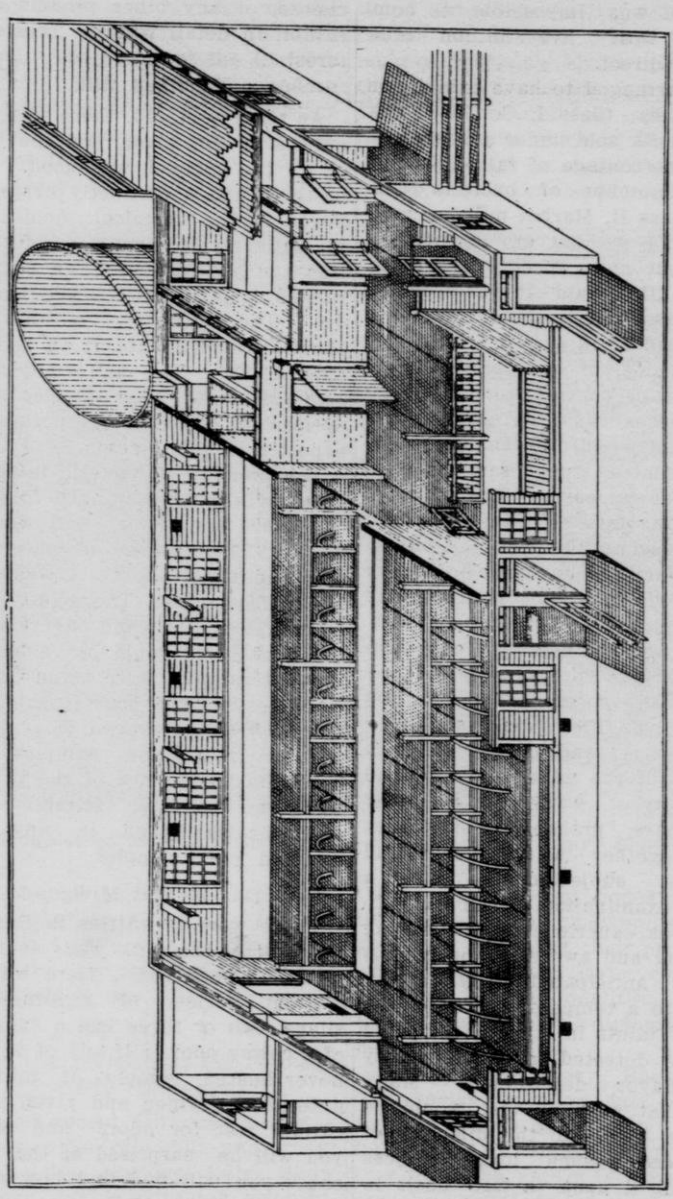
As already stated, there were eight entries in this class, and the quality of all the samples was good. None of them had a distinctly disagreeable flavor. The chemical qualities of the milk received most careful attention and the percentage of butter fat ranged from 3.8 to 5.3 and averaged 4.5. The percentage of total solids ranged from 12.40 to 13.94 and averaged 13.33. The uniformity of the composition of these samples is very noticeable and would naturally be expected in this class.

The number of bacteria in the certified milk samples ranged from none to 51,000 per c. c. and averaged 7,877. The absence of putrefactive and undesirable bacteria was noticeable in most cases. The acidity varied from .171 to .198 and averaged .186 per cent. It should be remembered that all samples were three days old when tested. The scores varied from 87 to 98 and averaged 96. As you will see from a few samples I have here, the appearance of the packages was very neat and attractive. No sediment was found in any of the certified milk samples.

Market Milk.

There were 23 entries in this class and all of the milk was sound and sweet when tested. Here we found a great variety of flavors—one of silage, two or three had a suggestion of a cowey odor. If any of you have never heated samples of milk from different dairymen and given them a careful test for odors and flavors, you will be surprised at the differences you will find and how easy it is to detect any off flavors.

The composition of this milk ranged from 2.6 to 6.0 in percentage of fat



General view of Interior of a Modern Dairy Barn Furnished by U. S. Dep't of Agriculture.

and averaged 4.5. All but two samples passed the standard of 3.25 per cent which was used in this test. The total solids ranged from 11.42 to 15.36 and averaged 13.57 per cent. All but two of these passed the standard of 12 per cent. The acidity ranged from .171 to .258 per cent and averaged .204. All but three passed the standard of .225 per cent. The total score ranged from 71 to 96 and averaged 90. Five samples contained sediment. There is absolutely no excuse for having sediment of any character in the milk and we had to condemn it; six points were taken off from every package containing it. Sediment in the milk indicates great carelessness on the part of the producer. This is one of the first things the consumer should look for and if it is found it indicates a dirty dairy. The total bacteria ranged from 400 to 21,000,000 and averaged 952,273, or leaving out the highest (21,000,000) the average is 39,273. The liquefying bacteria ranged from none to 710,000 and averaged 41,177.

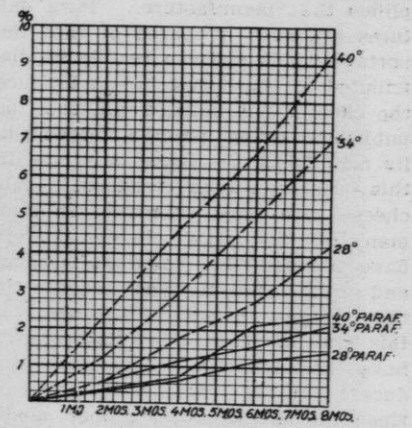
Cream.

The cream samples were of a very fine character, two or three of them particularly so, considering they were three days old and some had traveled a thousand miles. They ranged in percentage of fat from 17 to 44. The acidity ranged from .171 to .270. All but two passed the standard of .25 per cent. The total bacteria ranged from 1,200 to 2,800,000. The total scores ranged from 86 to 98 and averaged 93.6.

Other Lines of Work now Under Way.

The Dairy Division has a number of lines of work under way, including the study of the problems in butter making, water content, flavors and storage. Large quantities of butter have been made and placed in storage in Chicago by experts of the Division. Such questions as quality, salt, pasteurization, temperature, storage, quality of cream, and time of storage are under investigation. The important subject of fishy flavors in storage butters has received careful attention. Problems of churning and working, and the important problem of hand separated cream and its treatment are also being investigated. This work is being done in co-operation with the Experiment Station at Ames, Iowa, and reports are being prepared and will soon be published.

Problems in cheese making have also been taken up, including making, curing, storing and paraffining cheese, and its digestibility at different stages of ripening. Several thousand pounds of cheese are now in storage at Plymouth, Wisconsin, and it is expected the results will be of much interest and value to cheese men.



Per cent loss in weight in "Young America" cheese stored at different temperatures.

For over two years investigations have been under way in the manufacture of Camembert cheese in co-operation with the Eperiment Station at Storrs, Connecticut. The work was taken up in hope that a product could be produced in this country

which would rival the French article and thus give the farmers and dairymen an opportunity to produce the million pounds or more of this kind of cheese which is now imported. The results have been fully up to our expectations. Three experts have been at work upon the bacteriological, mycological and chemical phases of the subject, and they have found out of one hundred or more varieties of mold and bacteria studied, only two are required to produce the proper flavor and to carry on the ripening. This greatly simplifies the manufacture. Pure cultures are now prepared of the important molds and can readily be distributed to those desiring to produce the cheese. A bulletin will soon be published giving practical methods in its manufacture. Some dairymen in this country have produced this cheese with great success. In fact, many of the large cheese dealers have handled the American product and pronounced it even superior to the foreign cheese. Producers of this kind of cheese in this country have the advantage of foreign producers, for the reason that they can ripen the cheese under proper conditions and put it on the market quickly, while the foreign product has to be shipped green and thus ripen under unfavorable conditions.

Another subject that has been taken up by the Division is that of dairy development in the south. One man has been constantly engaged during the past year in studying the dairy problems of the south, with a view to assisting in the development of the dairy industry in that part of the country. Much interest has already been manifested and there is constant inquiry for suggestions along dairy lines from this section of the country. The force will soon be increased and it is hoped to establish demonstration farms in the different sections to be used as headquarters for object lessons and disseminating information in modern dairy practices.

Another prominent feature of the work of the Division is that of preparing plans for farm buildings. Dairy inspectors who travel about the country will tell you that most of the barns are dark and damp, poorly lighted and poorly ventilated, resulting not only in the cows being unhealthy, but in poor dairy products, including not only milk, but butter and cheese as well. There is room for much improvement along this line and dairymen from all parts of the country have made application for plans for new barns and for remodeling old ones. The work thus far has been greatly appreciated by dairymen who want to be up-to-date in this respect. It is proposed, later, to study problems connected with construction of creameries and cheese factories. The inspection of renovated butter factories is delegated to the Dairy Division by the Secretary of Agriculture, and six inspectors are kept busy visiting the 70 or more renovated butter factories every month, and also many of the markets where the products are sold. A careful supervision is therefore maintained over the manufacture and sale of renovated butter. Certificates are issued for the renovated butter exported. The production of this product throughout the country last year was 60 million pounds.

The study of milk and cream in its various phases has already been referred to. A number of other investigations bearing on the subject have been under way during the past year, and as funds allow this work will be extended. The milk supply of several cities has been carefully studied and some work has been done along the line of dairy machinery and appliances, methods of handling and

pasteurizing milk, and other problems entering into the production of first-class milk.

Some Plans for the Future.

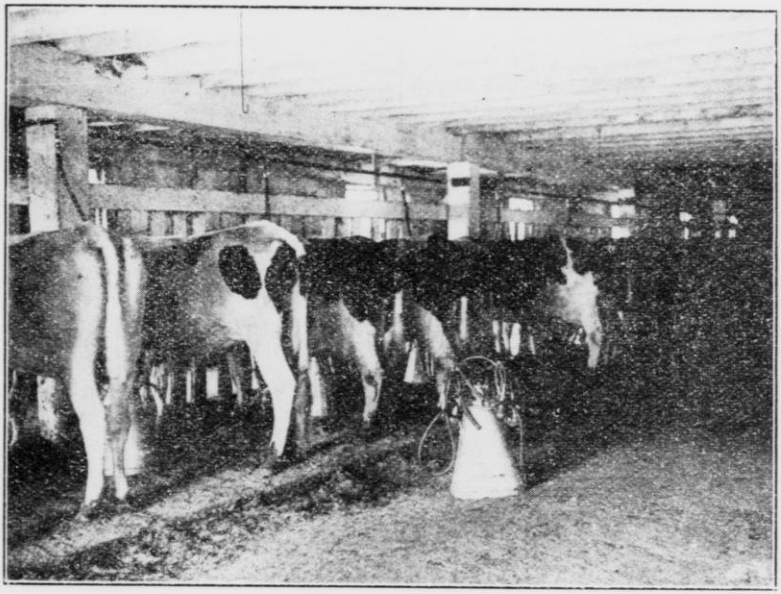
It is hoped later to do some work along the line of creamery and cheese factory management and problems connected with these. There are problems in such management that are not understood by most owners and managers in a degree sufficient to insure best results in quality of product and in profits realized.

The Division contemplates doing some work soon along the line of dairy farm and stock management. The cow test associations in Europe have been a great benefit to dairymen, and equal rewards are promised in this country if this idea is adopted.

One of the weakest points in American dairying is the low production of our cows, and any effort made to raise the standard of production by culling out the poor cows or by breeding or feeding will result in adding many millions of dollars to the dairymen's profit. The Dairy Division expects soon to assist in establishing Cow Test Associations.

The Advent of the Milking Machine.

These are times of great progress in many of our industries and the dairy industry is keeping pace with others. The dairy farmer in many of our country towns now has the trolley, the rural delivery and telephone which keeps him in touch with his markets. Some one has said that only a few years ago you could always tell the dairyman in an audience by his dress, appearance and actions, but today it is very difficult to pick him out.



Milking Machine at Work.

The progressive dairyman is a business man who conducts all branches of his work on a business basis. He know what it costs him per hundred pounds to produce his milk, what it costs him to produce a pound of butter, what it costs to keep each cow in his herd per year, what it costs to raise crops, in fact, he is a first-class business man. The progressive dairyman is ever ready to adopt any improved machinery. One of the most recent machines to which his attention is being called is the cow milker. For more than a quarter of a century, machinery has been successfully used in separating the cream from the milk and churning it into butter, but a machine for milking cows has been most difficult to supply. It has long been realized that a successful and practical cow milker would be a revolution of the dairy industry, as it would render the work of milking much easier and reduce the necessity for the hired help, thus making the dairyman more independent. Because of the necessity of having a milking machine, science has lavished its most inventive genius upon its development. The reports of the United States Commissioner of Patents show that during the period of 34 years, from 1872 to 1905, inclusive, 127 patents were taken out in this country for milking machines or separate parts of them. A number of machines have been successful in extracting the milk from the cow, either by pressure or suction, or the two combined, but have fallen short of being practical in some vital point. After many years of waiting and many disappointments, recent improvements have been perfected in these machines which make them simple in construction and, so far as the investigations of the Dairy Division have gone, thoroughly harmless and rapid in their work. This will be welcome news to all who have considerable interest in the dairy business.

Perhaps one caution should be thrown out, and that is that the machine should be kept absolutely clean, otherwise the sanitary condition of the milk will be inferior to that from hand milking. Experiments thus far show that it is not a very difficult matter to keep all parts of the machine reasonably sterile. Where the machines are properly handled and care is taken to adjust the teat cups to suit the requirements of the individual animals, the yield of milk compares favorably with hand milking, but where dairymen are careless in handling the machine, it is doubtful whether the yield secured would be as high as where good hand milkers are employed. Only about one-half of the help is required where machines are used in comparison with hand milking.

It is the object of the Dairy Division to be of the greatest possible assistance to dairymen along all lines, and the co-operation of individual dairymen and dairy associations will assist in accomplishing this result.

Adjourned to Thursday, March 15, 1906, at 9:00 a. m.

THIRD DAY.

The Institute met at 9:00 o'clock a. m., March 15, 1906. Mr. R. E. Roberts in the Chair.

FARM BUILDINGS.

Geo. C. Hill, Rosendale, Wis.

The evolution of farm buildings in the older sections of Wisconsin during the last 50 or 60 years is quite remarkable. All about are seen new modern farm dwellings; many of them of good size and attractive in finish, and the fine, large barns looming up, ornamented with numerous cupolas and gables, cause one to wonder if there is a big premium offered for the finest barn.

The few old farmers left call to mind the conditions of a half century ago; a log or block house of one to three rooms,with an airy loft, curtained or partitioned into two rooms for the boys and girls. The occupants of this attic were no hot-house plants. There was plenty of ventilation, and the beds occasionally were spread with a pure white coverlet of sifted snow. The barn was a log or straw stable for the horses. The oxen and cows had the warm side of a straw stack by day and into which they burrowed by night. The sheep and colts took to the brush. There was no tuberculosis under those conditions. The wood house, tool house and wagon shed were out under the big blue. The scythes and grain cradles hung in the oak tree, the plow and harrow were turned up against the rail fence, and the wagon stood by the roadside.

After a few years, pine lumber and shingles were plentiful and cheap and the farmer improved his conditions by building a frame addition to the house, and one after another, small one story buildings to house stock or store crops and tools as they increased, until on many farms were little villages of buildings. These are now being superseded by larger buildings, fewer in number, more artistic in finish, more compactly located, and supplied with modern conveniences.

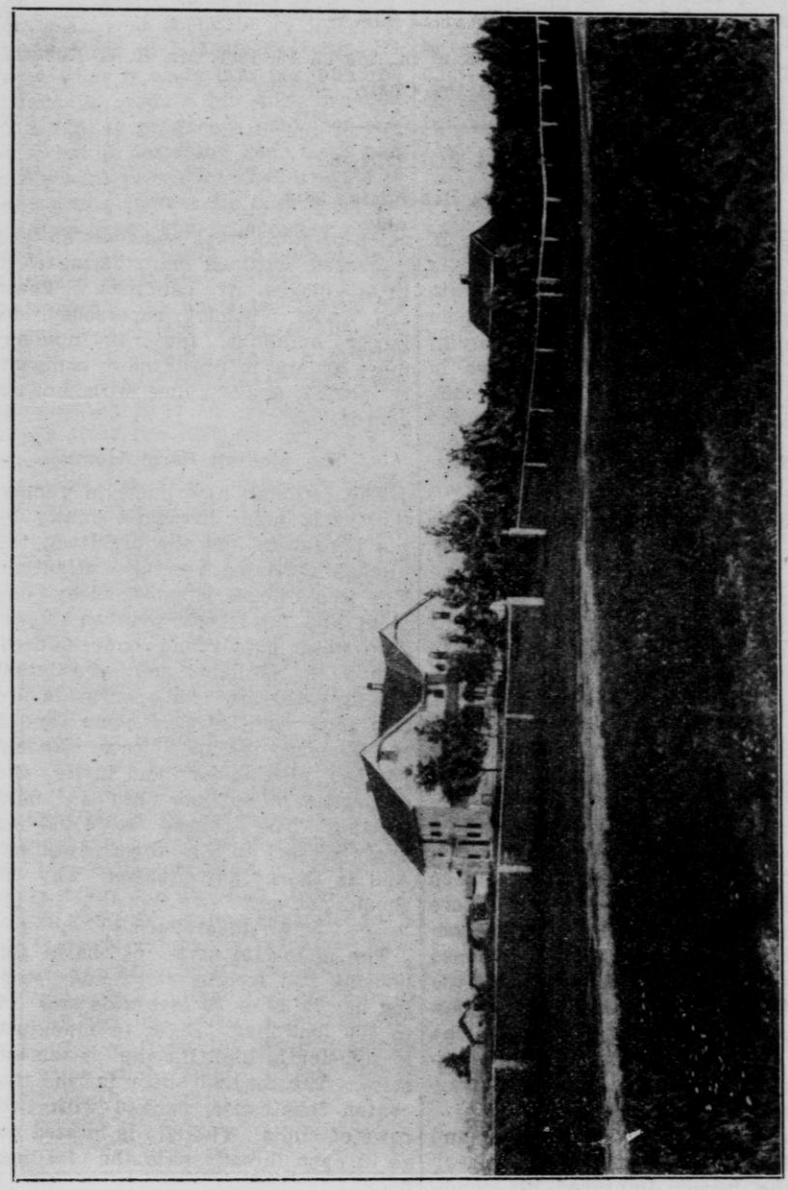
The Modern Farm Home.

The farmer's new home is roomy, the inside being arranged jointly by the housewife and the architect, the kitchen receiving special attention. The whole house is warmed by one plant and furnished with an up-to-date water supply and conveniences. Plenty of sunlight and ventilation are provided for. An open grate fire is a good ventilating scheme and a capital place to pop corn. Roomy porches provide for and invite the enjoyment of out-door life in mild weather. The house is equal in every respect to the town dwelling. And is there any reason why it should not be?

An Ideal Barn.

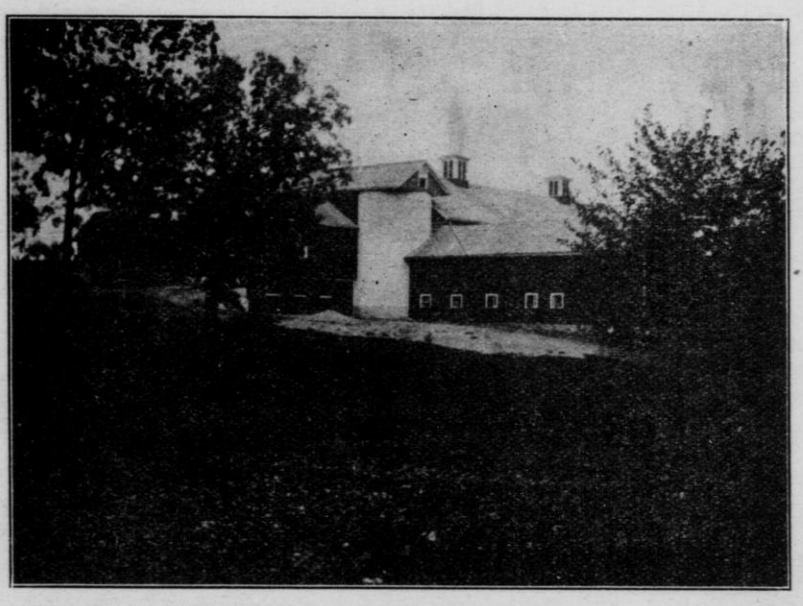
The up-to-date style of barn for housing and feeding stock and storing hay is 34 or 36 feet wide and 54 to 100 feet long. Eight to nine feet is sufficiently high for the basement story. The feeding floor is in the center, lengthwise, flanked with two rows of stalls. The silo is located so as to open directly onto the feeding floor.

The superstructure rises 18 to 20 feet above and is topped with a gambrel roof. A bank basement has



Farm Buildings on the Northern Wisconsin Farm of A. G. Beebe, Bruce, Wis.

some advantages, if the bank is on the north or west side. In such case, there is a stone wall on the bank side, otherwise the stone wall basement is a great mistake. It is more expensive than wood, is a conductor of cold and heat, is a waste of room, but mainly is more difficult to construct with sufficient windows. Even with an equal number of windows in a 24 inch stone wall as in a 10 inch double board wall, they are far less effective.



Twin Brick Silos, 34 feet in Depth, Capacity 300 Tons, opening into the Basement Stable 34x96 feet, with Wing 26x56 feet, on Farm of Geo. C. Hill, Rosendale, Wis.

If the stable is for dairy cows, the ceiling and sides are tight to retain the animal heat, and smooth to prevent dust from collecting, and to facilitate cleaning and whitewashing. The outside walls are insulated by a dead air space, and in frosty weather the doors and windows are doubled for insultation and to prevent condensation. Mr. H. E. Cook's rule for windows is, four square feet of glass for each animal. The stable must be supplied with a good system of ventilation. The air-tight construction is a different proposition from the old, loose-jointed, self-ventilating barn. Foul, damp air must be gotten out and pure, dry air supplied, remembering that a 1000-pound animal throws off seven pounds of water in 24 hours. This must be gotten out and not suffered to condense on the walls.

I have recently visited two new barns, samples of scores of Wisconsin barns, with stonewall basements, containing two or three small half-sash windows. The owners showed with much pride and satisfaction the warm, air-tight construction. There was no ventilation, except by opening the windows, and the ceiling and walls reeked with condensed mois-

ture. Such stables are disease breeding establishments. The animals kept in them would be better off hibernating in the straw stack, as of yore.

The basement story, if constructed with large rolling doors on the south or east side, makes an ideal sheep house. If there are two or more barns, it is best to locate them at right angles, forming two or more sides of a hollow square for a protected stock yard. One of these buildings may be the horse barn and carriage house, conveniently facing the house yard, and opening in the rear into the barnyard.

All the stables have concrete floors and possibly cement may be the coming material for the entire structure.

The Other Buildings.

Large, expensive hog houses are of doubtful utility. Several such buildings in our county have been remodeled into calf barns.

The granary should be made vermin in proof by lining with sheet metal. If raised on piers two feet high, there will be a saving of labor in loading and unloading grain.

The corn house is a double one, with a driveway between, all roofed over. The driveway is a handy place for driving to shelter, to hitch a team, or leave a loaded wagon.

Shelter Belt of Hard Maples, Planted 35 Years ago by Geo. C. Hill, Protecting the Orchard and Farm Buildings.

There is a separate building for the poultry. The location may depend on who is to care for the flock; however I would not plant it in the garden.

An ice house is a necessity, and on the dairy farm may be under the same roof with the milk room. If located so that the water supply of the barn passes through the milk room, it will be a convenience.

Ample room for housing tools may

be provided for in the barn; also a work and repair shop. These may be on the first floor of the bank barn, conveniently opening out on a level with the ground above. A room eight feet high is sufficient, the space above used for storing hay.

With an experience of over 30 years, we have come to prize a four or five room cottage occupied by farm help. In several cases the house has been the means of retaining good help six to eight years, besides relieving the farmer's family of work in boarding the help.

Shingled roofs should not be less than one-third pitch. A half pitch shingled roof will out last two quarter pitch roofs, besides affording double the storage room. All the main buildings are supplied with eave troughs and leaders, and kept well painted.

The average farmer should not himself build any large building. Because he may have put up a pig-pen or smoke house, does not prove his ability to properly construct a house or barn. He may have a correct idea of what he wants, then let him employ a good builder and have the building properly constructed.

DISCUSSION,

Mr. Jacobs—You seem to dislike a stone basement. In our section it is quite common to build the first story of the barn out of stone, on account of its being more durable and warmer, and I have observed and been of the opinion sometimes that the best construction was a stone construction up to the level of the window sill, then either frame work or brick from there up between the windows. What do you think of that kind of construction?

Mr. Hill—Of course we have got to have a stone foundation somewhere below, but I do not see the necessity of running it up. Some of the objections to putting it up higher are that there would be trouble with that solid construction, it would be a conductor of cold and heat and a great place for the condensation of moisture. I do not think I have given any valuable hints, except in that stone wall basement matter, and I want to emphasize that as the most important thing in the subject given to me. Since this paper was written, I came over 40 miles of road and looking out the window, especially this side of Fond du Lac, it is a universal practice among the people in this section to build stone wall basements, even where there is no bank, and I believe it is the greatest mistake that can be made by a builder. You seldom see more than one or two small half windows in a side and it is not a fit place for the housing and feeding of stock.

Mr. Nordman—When those basements are properly lighted and ventilated, I cannot see that there is any greater objection to them than there would be to wood.

Mr. Hill—I never have seen one yet with a stone wall that had sufficient windows, while I have seen a number of new barns with wooden walls that were well supplied with windows. It is very difficult to construct a stone wall with the proper amount of light. It is impossible to put four square feet of glass into a stone wall for each cow that is in that stable, as there should be in every stable. More than that, it is difficult to insulate them; that is, it is difficult to make a double stone wall and without a dead air space in there, it is a very imperfect construction.

Mr. Goodrich—I agree with Mr. Hill about the stone wall basement. This winter, in the prosecution of my business, I have gone into the barns of every patron of a certain creamery and almost every barn has a

stone wall basement, either stone wall all around, or on three sides, and I did not find but one that was well lighted. There was no wall on one side of that barn and that was one continuous window clear through, and of course the stable was well lighted, and it had a good system of ventilation. The stone wall basements are not healthy, they are damp and cold and almost always dark.

Mr. Scott—Was the wall in that one stable you speak of dry?

Mr. Goodrich—That wall was dry. There was a good system of ventilation and a good, big shaft, so there was a good circulation of air; it was the healthiest and the best producing herd of cows amongst all the patrons of that creamery. He was a good man, he knew how to build barns, although it was in a side hill where he had a wall on one side.

Mr Convey—We realize that in order to have a substantial building we have got to have a good foundation. We cannot afford to put a farm building anywhere near the ground, even if it is within a foot of the ground, it is liable to decay. It is difficult to get good light in a stone wall. In many barns the light only comes in when the sun is exactly opposite the window. We run our windows in sections to the sills. My idea of a perfect barn would be to build as high up as you wish to and allow room for full windows. In our case, we only put in half windows. If we had stopped in time to put in full windows and had them in sections, say, three windows in the place and those pillars between—we use an 8 by 8 post for each separate window—it would have been better. In that way you can have light and good ventilation and a good foundation, too. The ventilation is entirely independent of the walls. People build their stone basements entirely too low. They think that seven or eight feet is sufficient for cattle, but it is a rank mistake. I think a 12-foot wall is none too high, and I think it is better to have it that way nine months of the year when you are milking every day in the barn than to just plan for the three months of extremely cold weather. You cannot let light in there if your wall is only seven or eight feet high. You want plenty of head room, just as you do in a school or in church or a hall, and lots of opportunity to have fresh air and you never can get it in a low basement. Another mistake that many of us make is to build a straw shed on one side of our basement and shut off the light. We need all the windows we can get in on both ends and on the sides, too.

Mr. Scott—In this Farmers' Insititute work through the winter, we have sat in halls shivering throughout the entire forenoon, waiting for the space above us to heat up. As the warm air rises, of course, you have to heat the top of the building first, and that is true of the stable, the lower part of it is the last to get warm. We used to think we had to have those great high ceilings, but under the King system of ventilation there is no need of building a stable higher than nine feet and it seems to me that a stable of any ordinary width, you can get the light in in that height and we have to consider those things, because we have long, cold winters in Wisconsin, especially in the northern part of the state. I have in mind a basement that was built 15 feet high and I have seen it covered with ice on the sides and on the top ceiling, and it is well built, too.

Mr. Hill—How do you get up that 12 feet to whitewash it?

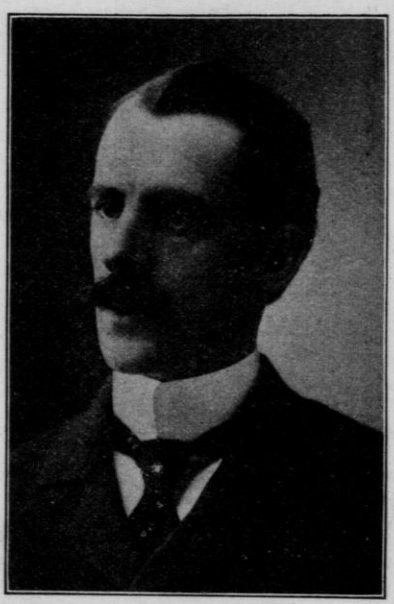
Mr. Convey—We have a spray pump.

Mr. Hill—We want to remember that this stable is warmed up with

animal heat and we can hardly afford to warm up 12 feet with animal heat. So far as the summer season is concerned, all the windows open, we have them covered with netting and have plenty of fresh air in the summer time without having the high ceiling. My advice to the farmers is to use the stone for paving the barnyard, or to grind up and put on your roads.

SMALL FRUIT FOR FARMERS.

J. L. Herbst, Sparta, Wis.



Mr. Herbst.

Farmers in general throughout our state are beginning to see the advantages of a small fruit garden, and yet a goodly number of those who are interested in agricultural pursuits give but little thought to the raising of enough fruit for the family use, and it seems to me that still more care and attention should be given to this subject of supplying our own tables with fresh fruit throughout the season. We not only supply our families with the product of the small fruit garden, but there are other advantages to be derived.

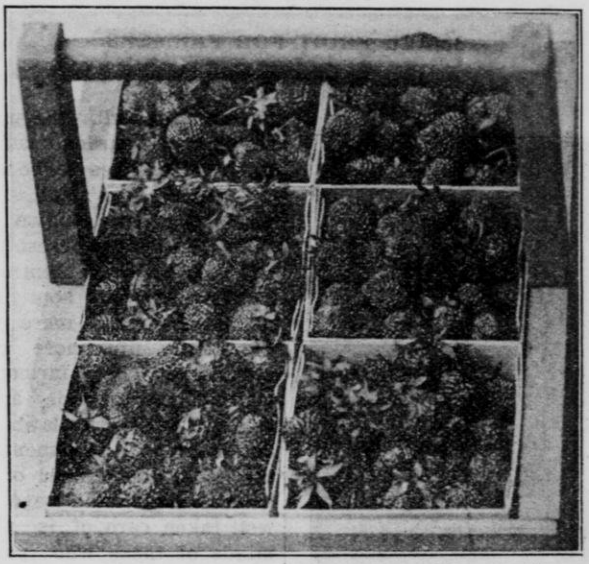
I believe in a small fruit garden, well taken care of, we have something that will interest the children and help to keep them on the farm. I believe a well kept fruit garden makes the farm more valuable and the home life more pleasant and attractive. The farmer of today whose home grounds are kept neat and attractive, the lawn dotted here and there with ornamental shrubbery, the back yard devoid of rubbish and a small fruit and vegetable garden well taken care of, is placed in the minds of those who pass by as the successful farmer and one who is taking an interest in the welfare of his family and his home surroundings.

There is no reason why each and every farmer of our state should not raise enough fruit for his or her use. The impression that most of us carry is that a special location as regards soil and slope is necessary and special cultivations and extra work must be done in order to get the required results. Any one that understands the preparations of soils for the different farm products and the cultivations to bring them to maturity can grow small fruits. So much is written now days in our various agricultural papers on the care and cultivation of small fruits that there ought not to be any trouble for one to care for

the small plot of ground devoted to fruit for the home use. The proper varieties, properly set out, given clean and thorough cultivations and winter protection, are all that is necessary for the success of growing our small fruits.

Avoid the traveling tree agent who has something new with a high price attached to it. Your local nurseryman can tell you best what varieties will do well with you.

In making our selections, we should aim to have early and late



"Tardy" Strawberry.

Varieties Should be Adapted to Soil and Location.

In choosing our varieties, we should aim to get those that are adapted to our particular soil and location. It is a great mistake to purchase plants from a section where soil, climate and conditions are much different than ours. Besides plants purchased from a distance invariably get dried out in transit and are less liable to stand transplanting, the freight or express charges are much more and they stand a greater chance of being on the road much longer than if purchased near at home.

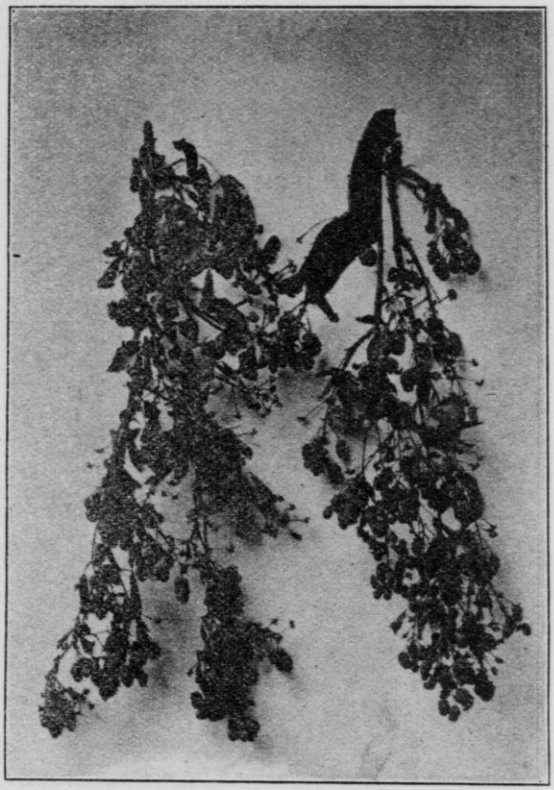
varieties of each sort we plant out. In strawberries we should select an early, medium and late variety, so as to extend the period of having ripe strawberries as long as we possibly can. The same selections should be made with all of the other fruits which we plant. By the proper selections of varieties we will have a succession of fresh fruit for our tables from the first week in June until the middle of September.

Give the Plants an Early Start.

The best results can be obtained in getting a good stand of vines by planting early. The mistake too of-

ten made is not getting the plants set early enough in the spring. Too many of us make the mistake of waiting until the spring crops are in before setting out the fruit garden. All trees, plants and vines stand transplanting, are more liable to live

All of our fruits, such as red raspberries, blackberries, currants, gooseberries and grapes, can be planted in the fall with as good results as if they were put out in the spring, if a good fork full of coarse manure or mulch of some kind is thrown over



Eldorado Blackberry. A Good Early Variety.

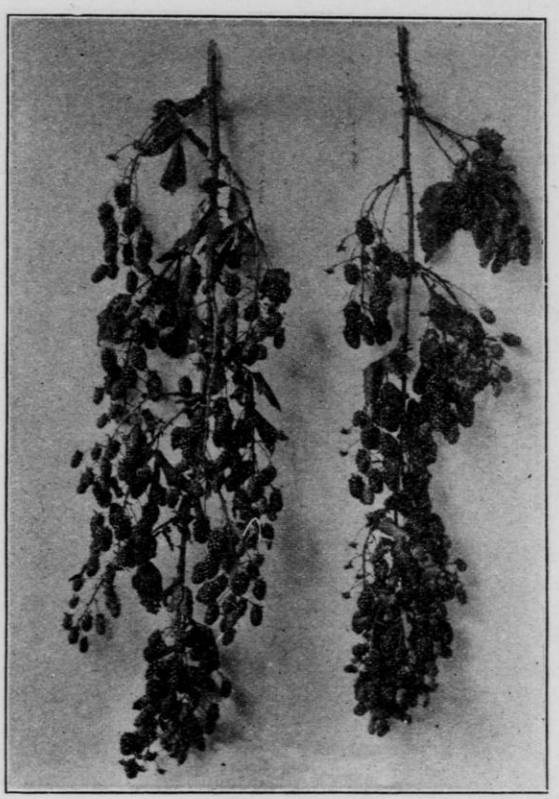
and make a better growth if planted in a dormant condition, or before they have started new growth in the spring. We should, therefore, get our plants as early as possible and set them as soon as they arrive. To the one who cannot attend to this in the spring, I would say do it in the fall, just before the ground freezes.

each plant after it is set out. Black raspberries and strawberries are best set in the spring.

Preparing the Soil.

In preparing the soil for the setting of plants, see that it has been well enriched with barnyard manure. Plow and harrow, making the soil

fine and mellow. Mark off in rows rather long, as cultivating can be done easier than if in short rows. Set the strawberries in rows 3½ or four feet apart and place the plants about two feet apart in the rows. All the cane fruits should be in rows seven or eight feet apart and plants about three or four feet apart in the rows. Grapes should not be set closer than eight feet apart. If plants are set late in the fall, mulch as stated above; if set in in the spring, cultivate immediately after and continue frequently throughout the season. Hoe often to keep down the weeds between the plants in the row. Do not let your work stop as soon as the plants are set. The man who plants his corn and potatoes and expects the crop to grow and produce abundantly without cultivation or hoeing does not have to look for a place to store his corn in the fall, and we cannot expect the fruit garden to thrive and produce if it is allowed to shift for itself.



Ancient Briton Blackberry.
A Good Late Variety.

Winter Protection.

The cane fruits, the raspberries, blackberries and grapes, should be given winter protection by laying

them down and covering with dirt. Do not cover with straw or stalks, as mice will harbor in them and girdle the cane, which destroys them for fruiting the following year. Strawberry beds should be given a good coating of straw or any coarse litter for winter protection. Remove the covering in the spring as soon as growth starts. The mulch which was on the strawberry beds can be placed between the rows to act as a protection to the fruit in wet weather.

The Results.

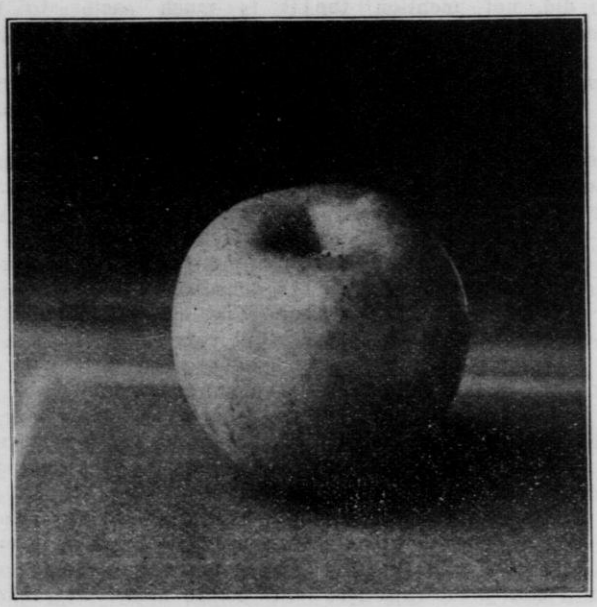
A good sized fruit garden for the average farmer is about a quarter of an acre. The plants to set this out should not cost over $15.00 and possibly can be bought for less money. This fruit garden if properly taken care of will produce between 40 and 50 bushels of fruit when plants are in their prime, and I consider this an ample supply for the average family for the year round.

Some Good Varieties.

The varieties which I would recommend for general planting are:

Strawberries: Excelsior, Dunlap Lovette and Gandy.

Blackberries: Eldorado and Ancient Briton.



Northwestern Greening Apple.

Black raspberries: Conrath, Columbian and Nemaha.

Red raspberries: Marlboro and Cuthbert.

Currants: Victoria and White Grape.

Gooseberries: Houghton and Downing.

Grapes: Moore's Early, Delaware and Niagara.

DISCUSSION.

Mr. Matteson—I understand that the manure you apply must be pretty

well rotted. Now in applying a heavy coat of that, are you not likely to be troubled with the large white grub in your strawberries?

Mr. Herbst—Well, I prefer the well rotted manure to use for fruit garden, the plants get the benefit of it much more quickly than if it is put on fresh.

Mr. Matteson—In your list of raspberries, you did not mention the Older raspberry. Did you ever use that?

Mr. Herbst—Yes; I believe the Conrath is better; it has a larger berry and a little better flavor.

Mr. Matteson—Is it as hardy for cold dry weather as the Older?

Mr. Herbst—Yes. I think so.

Mr. Scott—That has not been my experience. We have found the Older the most hardy with us up a little further north. Oftentimes the snow will cover it, because it is a low bush.

Mr. Herbst—You must understand that the list I gave you will not hold in all sections of the state. There are sections where certain varieties do a great deal better than others, and very likely in Mr. Scott's locality or in Mr. Matteson's locality the Older would do better than the Conrath. They are both good varieties.

Mr. Matteson—I wasn't saying anything against the varieties recommended but I do wish to speak particularly in favor af the Older as an early variety, and with us a very fine market berry.

Mr. Goodrich—I understood Mr. Herbst to advise one planting a fruit garden to get plants adapted to his locality and his soil.

Mr. Hill—You recommend a quarter of an acre producing 40 or 50 bushels of small fruits for the average farmer. What do you mean by the average farmer?

Mr. Herbst—Why the average farmer's family throughout the state.

Supt. McKerrow—Would Mr. Convey's family be a fair sample, 14?

Mr. Herbst—I think that sized fruit garden would supply even Mr. Convey's family.

Mr. Convey—I object to the reporter taking down anything that is not facts. My family is large in number, but small in size.

Mr. Whiffin—I have often noticed it is much easier to recommend things at Institutes than it is to folrow the recommendations. It would take just about half the time of one man at present high prices to take care of that garden and I think it is rather large for the average farmer.

Mr. Herbst—I cannot see where you can put in so much time on a quarter of an acre, if it is planted in rows. A good deal of this work can be done with the horse cultivator, and that cultivation doesn't amount to but very little. It can be done whenever you are out cultivating your potatoes and corn. But very little hoeing is necessary, about all that is necessary is to keep it free from weeds, well cultivated.

Mr. Scott—Mr. Herbst is right. We have laid out our garden so we can cultivate nearly everything before going out in the corn field or the potato field, we take perhaps half an hour and run through the garden, reducing the amount of hoeing to the minimum, and it is time well expended. Now, about our bush fruit. I would advise planting that a little farther apart than Mr. Herbst does. Of course, seven feet looks a good way apart, when the bushes are small, but when they grow up, you do not have more room than you want between them. I would plant them not nearer than eight feet apart in the rows.

A Member—Why do you not recommend the Warfield?

Mr. Herbst—Because it is a pistillate variety and you have to plant

something with it, the Dunlap or the Lovette, I would recommend.

A Member—Do you know anything about the McKinley?

Mr. Herbst—The McKinley has not been tested enough to know.

A Member—Will you get more berries by hill culture?

Mr. Herbst—I wouldn't plant by hill culture. There is a little more work on that and on the farm we want to get all the berries we can with the least work. You will get better berries by hill culture, and they will be liable to be a little larger, but on account of the extra work I do not want to advise the farmer to grow them that way.

Mr. Matteson—How wide would you have these matted rows?

Mr. Herbst—Not over 16 or 18 inches wide. Some varieties being very strong, the plants will stand in the row very thick, and if the row is too wide and too thick and it happens to come a little dry weather, there is not enough moisture there to mature the crop, so I would not advise too wide a row.

Mr. Matteson—The soil I grow fruit on is different from yours; that might have something to do with the width of the row. I used to grow them 16 or 18 inches wide, but I have narrowed them down to eight or 10 inches wide.

Mr. Herbst—The heavier your soil, the more plants you can leave in the row.

Mr. Matteson—But if it comes on a dry season with the heavy clay soil that we have, it is not as liable to mature the fruit in the center of the row.

Mr. Eastman—I want a row 30 inches wide; I am doing business for money, not for the farm. Of course, I handle them according to the plants, sometimes I find them getting a little too thick, then I go across and break every plant, thin them down.

Mr. Matteson—Warfields are very liable to be too thick, to grow too many plants.

Mr. Eastman—In our country we have got to have the Warfield. The gentleman spoke about his raspberries getting too high. Why not take off the tops about 18 inches high? The gentleman also spoke about putting straw around them. If we did that, the mice would eat them all up.

Mr. Herbst—When you set your plants out in the fall, there is no growth for the mice to disturb. Only that little stub sticks up above the ground of the blackberry cane and the berries will not send out any growth or mature any till the next year. My idea of putting coarse manure on top of that plant was to keep it from heaving out in the spring. That stub is dead in the spring.

Mr. Scott—I advise this gentleman to get some cats. I was going to commend Mr. Matteson for reducing the width of his rows of strawberries. I believe he will get more strawberries. We do this by using running cutters, they are really rolling coulters. Another method is to take a hoe and stop all further running.

Mr. Matteson—The gentleman speaks of mice troubling his raspberries. Do you follow cultivation?

Mr. Eastman—Yes.

Mr. Matteson—I do not see why you should have trouble with the mice then; we have no trouble at all with that method.

Mr. Eastman—I would like to know why Mr. Scott wants his strawberries in such narrow rows?

Mr. Scott—I think it is a recognized fact that the plants to do their best should be about 15 inches apart, not less than that. As a mat-

ter of fact, we have our rows on the average 14 inches in width, and from center to center three and a half feet apart.

Mr. Herbst—I supposed we were to discuss this from the point of the farmer and not for commercial purposes. If you want to discuss it from the commercial standpoint, I will talk with you after the meeting.

Mr. Eastman—I wish you would tell us what your strawberries brought last summer by the case of 16 quarts.

Mr. Herbst—We shipped about 250,000 cases of berries during the season, very fine, large strawberries, and the price ranged from $1.00 to $1.65; the average was about $1.10. It has been an unusually good year for high prices.

Mr. Eastman—Yes, it has been the best year we have ever had. A house in Milwaukee offered me $1.45 for what berries I had, and that pays very well.

WHAT A WOMAN CAN DO WITH BEES.

Mrs. Clara I. Ransom, Endeavor, Wis.

I wish I had the power and the eloquence to persuade all farmers wives to keep a few colonies of bees. They require very little care and give one large returns for the money and time invested.

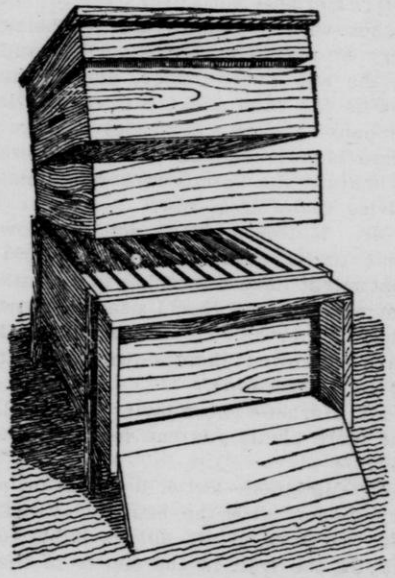
Starting In.

If you are contemplating buying a few colonies, buy of some reliable man a good, heavy colony. Do not think it exorbitant if he asks you double the price in the spring that he offered them to you for the fall before, as a good, strong, wintered over colony is a valuable thing. Learn to handle them. As knowledge is gained, the apiary can be enlarged to profitable size.

Do not buy bees in old boxes or home-made hives, but buy them in good Langstroth hives, with about nine or 10 frames to the hive, that can be easily lifted out and examined.

The Make up of a Colony.

In each hive there should be three kinds of bees, the queen, of which there should be only one, the drones or male bee, of which you need only a few, and the worker or neuter, of which you cannot have too many.



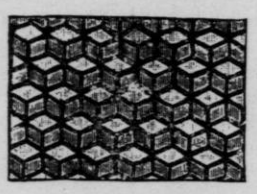
Langstroth hive with two half-depth supers for surplus honey.

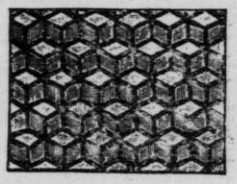
The sex of the bee is determined by the kind of comb you have in the hive. Be sure to have nothing

but worker comb. In the worker comb, each cell should be about the size of the ordinary comb honey cells. In these, beginning in the early spring, the queen lays an egg, the workers put in some pollen for food, seal them and then they set on them to keep them warm, just as a hen does on a nest of eggs. You take out a frame, hold it so the cold air strikes it and see how they will flatten their bodies and cling to the card to protect the brood.

The drone comb has much coarser cells and if you find you have any frames to it, cut it out and put in a sheet of the artificial comb foundation, as the drones are a great drain on the workers; they are obliged to feed them and they have no protection against them. Late in the fall the workers will kill off the drones, leaving only a few to winter over, but it is nothing but carelessness on your part allowing them to be there.

Then there are the queen cells; you find them at swarming time. They are about the size and shape of a small peanut and from three to seven in number.





Artificial Comb Foundation.

Method to Pursue in the Spring.

We always winter our bees in an outside cellar, the ordinary family cellar is not suitable. In the spring we set our bees out on the stands as soon as the days are warm enough, that they may take their cleansing flight. We may lose a few that will chill before they get back, but if we do not set them out early, the bees get restless, and they soil the hive and the comb and diarrhoeal difficulties ensue. We set them back in the cellar until the willow blossoms appear, then we set them out for the summer.

Put a little salt where they can have access to it, and have a shallow dish of water with a few shavings in it, so they will not to go to the watering tank for it.

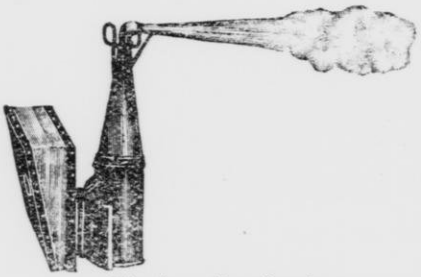
Always set your hives facing the east, so the bees can get the early morning sun and thus get them out early in the morning. Put chip dirt around the hive, so the grass cannot grow through. I always put a heavy chalk mark around the stand to keep the ants away, as they cannot cross it.

The first warm, quiet day I open the hive, scrape out all the dead bees and mold, find the queen and clip her wings, put on one or two sets of supers, then lay on an oilcloth with painted side down to keep the bees from crawling into the top of the hive. Now they require no more attention until swarming time.

Swarming.

When they swarm, I take my queen trap, pick her up as she crawls from the hive (it is the old queen and the young bees that leave), set the old hive off from the stand, throw a blanket over it, set a new hive on, and by that time the bees, finding the queen is not with them,

are coming back. I set the queen trap on top of the frames, that I have filled with artificial comb foundation, and when they have settled I turn the queen loose among them. Sometimes within five minutes from the time they started they are busy at work. Then I put on about two sets of supers, for these are the honey-makers. Now I turn to the hive they come from, I open that, go carefully through it, and remove all the queen cells, except one well built one. If I should not do this, in nine days they will swarm again and in four days a little handful of bees will start out that



Bingham Bee Smoker.

can never make a strong colony. Avoid this by cutting out the extra queen cells.

I always save every scrap of beeswax, melt it and sell it. That pays for my comb foundation, which I think profitable to use.

Outfit.

The outfit you need is a veil, a bee knife, a turkey wing and smoker, steady nerves, some courage and patience.

Handling the Bees.

In all your operations with bees, you must use gentleness. All quick, sudden jars and motions irritate them. Work slowly and carefully and you have nothing to fear. If they sting you and it swells your flesh, your system will become accustomed to the poison and soon it will not annoy you any more than the prick of a pin, and it is an excellent preventative of rheumatism.

Uses of Honey.

Honey is excellent for sore throat, cough and colds. White clover honey is the purest blood purifier known. Many of our most expensive bakery goods are sweetened with honey and as a warm biscuit eradicator it is unequalled.

DISCUSSION.

A Member—When you use that word "artificial," what do you mean?

Mrs. Ransom—It is the factory made comb foundation that we put in the frames and sections to start the bees so they will build straight comb.

A Member—How warm are your winter quarters?

Mrs. Ransom—As low a temperature as we can. We simply keep it down almost to freezing. I shouldn't think you people here would need to put your bees in a cellar; I am much farther north.

A Member—Is your cellar under ground?

Mrs. Ransom—Partly under ground. Of course, I aim to keep it above freezing. How do you keep yours?

The Member—About 45.

Mrs. Ransom—It never freezes in our cellar in the winter. We occasionally have to clean out the entrances, they are dying all the time.

Mr. Nordman—Isn't it the main thing to keep the cellar dry and well ventilated?

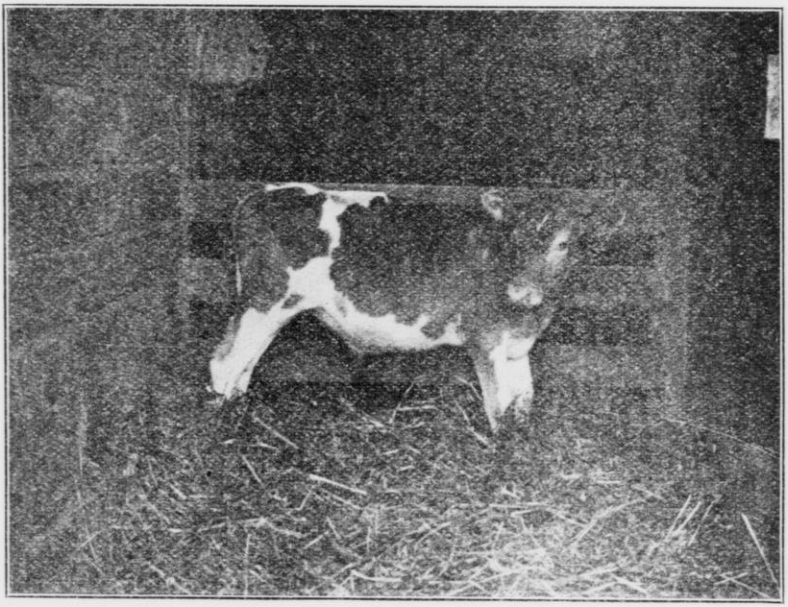
Mrs. Ransom—Yes, we have a ventilator in there and we keep that open unless it is very stormy, bad weather.

CALF RAISING.

L. E. Scott, Stanley, Wis.

I believe that every calf, like every child, "has a right to be well born." I believe it is not only the right, but the duty of every farmer to see that his calves are well bred. It is a duty that he owes to his wife and to his well born children; it is a duty that he owes to his community; it is a duty that he owes to his own pride and to his reputation as a good farmer and a useful citizen. Lastly, it is a duty that he owes to his pocket-book and to those that are dependent there-upon.

I shall spend but little time in exhortation. Gradually men are coming to appreciate the value of well bred stock, but the progress has been rather slow. We want to hurry up a little. We want to get busy in this matter. Nowhere are well bred sires more easily available than in Wisconsin. With males and females winning championships at our world's expositions, with cows beating the world's record in official tests, with service animals of some merit in almost every township, there is hardly an excuse for any farmer, large or small, anywhere in the state, breeding from an inferior scrub sire. Once well bred, it is equally important that the calf be well raised.



Prince Fairmount, 11301. A. G. C. C., at Three Months.

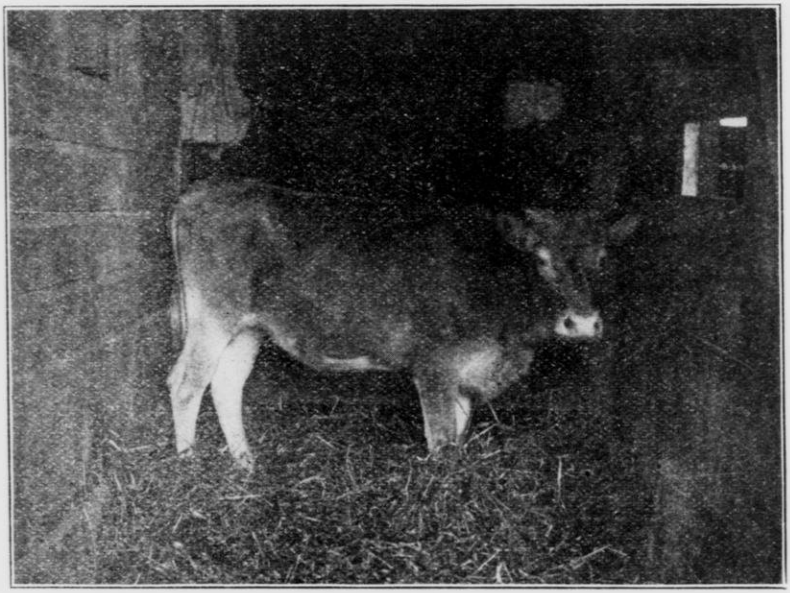
A Few General Rules to Follow.

In our practice, we leave the calf with its mother the first three or four days of its life in a clean, well

littered box-stall, taking care that the dam is kept quiet, lightly fed and given frequent small draughts of tepid water. This is an old, old custom and while you might rather hear something new in a Farmers' Institute, this old-fashioned way has never been, and never can be improved upon. You cannot change Nature's laws and the wise, motherly, old dame has stored up in the cow's udder an ideal food for her young one in the first few days together in quiet? But lest I become sentimental, let us consider the cold facts.

I am confident that the calf does better; I believe that the cow does better, and that both are better prepared or the separation which is to follow, than when separated at once.

Anticipating a very common question, I will say we find no serious difficulty in teaching the calf to drink nor with the cow when separating



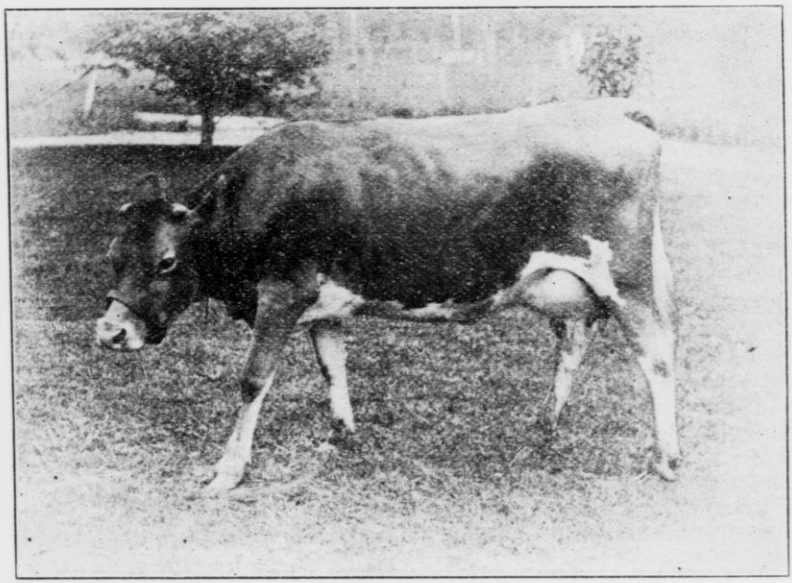
Dorothy, Eight Months Old and Still Drinking.

form of colostrum, and demands that it be taken in the prescribed manner, towit,—in small quantities, slowly, and well mixed with the saliva, the first process of digestion. Can any one imagine a stricter compliance with these rules than for the calf to partake of these first few meals in its own awkward way? Who has a better right? Ay more! Who, without compunction, would deny either dam or calf the enjoyment of these them at this period. We now teach the calf to drink, feeding its mother's milk. Just how much, will depend so much upon conditions that I am unable to state definitely, but will say 6 pounds per feed, twice a day to a Guernsey or Jersey, or possibly more to a Holstein, but I have had no experience with the latter or with the beef breeds. Could milk be at hand, sweet and warm, at the noon hour, it would no doubt be better to feed a

smaller quantity, say 4 pounds, three times a day, and if we could spare the time, I would certainly favor milking and feeding three times a day. It would undoubtedly be better for both cow and calf, and the product of the dairy would certainly be greater. Whether this increase would be commensurate with the extra time expended, is a question with me.

I say I cannot tell you how much to feed. I have only given you a quarts, because I want you to weigh the milk. In absence of a regular milk scale a 25-cent fish scale will answer. Just hang your pail on the hook and pour in the milk. It is only the work of a moment and may mean dollars in results. I have found in my experience that a variation of less than a pound in a calf's ration has caused trouble and that is closer than you can guess the amount in pouring the milk into a pail.

We feed whole milk about two



Fannie Fairmount, 19017 A. G. C. C., at 21 Months of Age.

starter and you must be your own judge beyond this. If the calf is thrifty and wiggles its tail vigorously when it reaches the bottom of the pail as though it would like a little more, put in another pound or half pound at the next feed. But be careful, at the first indication of indigestion, which may readily be detected by watching the droppings, hold up a little on quantity at the next feed.

I speak of pounds rather than

weeks from birth of calf, and then add a little skim milk direct from the separator, taking at least a week to make the change. Sometimes, in case of milk from high testing cows, we put in a little skim milk soon after the calf is taught to drink, but usually the calf is from three to four weeks old before it is deprived of all butter fat. By this time it is eating some hay, the best we have in the mow.

About this time we put a small handful of standard middlings on top of the milk and about a teaspoonful of blood meal or blood flour on top of that. The middlings prevent the latter feed, which is heavy, from settling into the corners of the pail and the calf in lapping up the middlings gets the blood meal. Just now we are using blood flour and like it the best of any highly concentrated feed we have ever used. In addition to this, a few whole oats fed immediately after the milk, is most excellent, and I do not object to a little corn meal in connection with these narrow feeds, especially if the hay is clover or alfalfa.

The Calf Pen.

The calves should be kept under shelter the first six months of their existence in roomy, well ventilated pens, with stanchion front and manger, to be used at feeding time.

The pens should be littered daily with dry straw, shredded corn fodder, or, best of all, where obtainable, dry saw dust. With the quantity of bedding usually employed, if allowed to be trampled under foot for a time, rather than removed daily, the pen will be kept drier and more nearly odorless. A cement floor is the most uncongenial bed possible for a calf, or any other animal to lie upon.

We do not like to have calves upon grass while feeding milk and have had far better success with dry feed in connection with it. We used to feed silage, but are withholding it now from our younger calves, as we find that the more hay we can get them to eat, the more milk we can feed without causing bowel trouble, and milk is the ideal food for the young.

A Perplexing Question.

If there is one question asked more frequently than any other in connection with calf raising, it is what to do for scours.

There are two distinct diseases known by this name. The more serious, but, fortunately, the one least frequently met with, is a germ disease called white scours. Of its origin or treatment but little is positively known by even our best authorities. So many out-breaks have occurred in aborting herds that some claim there is a close relationship between the germs that cause both diseases and that the calf is born with the germs already in the digestive tract. Others claim that the germ enters the system through the raw naval and claim immunity by sprinkling the bedding and stall with carbolic acid water before the calf is dropped, and upon birth, annointing the naval with some good disinfectant. For this last purpose a mixture of iodoform and boracic acid in equal parts has been recommended. These precautions are no doubt wise where the disease is anticipated.

As a remedy, high authorities advise castor oil, but I have never yet seen good results from its use, and I will confess that I have had a prejudice against the castor oil bottle dating from infancy. I am seriously impressed with a maxim which I once got from a veterinarian, which is: "Better do nothing than do worse."

I have never had but one case of this disease. The dam had aborted twice and the calf showed symptoms soon after birth, which developed into quite a severe case in a few hours. I milked the cow nearly dry, so that the calf could get but little nourishment, and that in the natural manner. The calf soon recovered and is now one of the thriftiest aimals in our stable. But of course, "one bird does not make a summer," and this is only one case.

Mr. George Wylie reports good results with soothing syrup, giving two or three teaspoonfuls daily, according to severity of case. Mr. H. C. Taylor, while administering prescribed medicines, says he has had the best success with those calves that were left with their dams. Calves with this disease usually die or recover in a few hours.

The other form of scours is far more common, but not nearly as serious. It is usually a mere diarrhoea resulting from indigestion, the primary cause of which, nine times out of ten, is injudicious feeding. Sweet milk in proper quantity, fed from clean pails, with what fresh water the calf wishes to drink, plenty of wholesome, dry feed, fed in a manger, roomy, dry and well littered quarters are all factors in raising healthy calves.

DISCUSSION.

A Member—I think the gentleman has outlined a very good system for raising calves, but it would not work in Sheboygan county, for the reason that our milk is too expensive. When milk is bringing 96 and 97 cents, you must give us something to take the place of it.

Mr. Scott—I think the milk for the first few weeks is well expended in getting the calf started. I have had experience in raising calves on whey, and I think our Experiment Station should take up this work of raising calves on whey. This new food that has come into use, blood meal and blood flour, is a concentrated food. The manufacturers claim it contains 87 per cent protein and I believe it is an ideal food to feed in connection with sweet whey, and after a calf has a good start with milk, I do not see any reason why you cannot grow calves with sweet whey by using the rich protein foods, but I do not want to say too much about that, because I haven't had much actual experience Of course, I realize that this is a cheese district. If we are going to have good cows, we have got to raise them from our own calves, and I believe that what whole milk we need for that purpose is money well expended, because we are going to raise nice, thrifty calves.

Mr. Nordman—It is worth more than any of this commercial food that we are able to buy.

Mrs. Ransom—I have had scours in calves and have had trouble that way. For my worst cases I used white oak ashes, poured water on them and gave the water to the calves. I have never lost one since I began that practice, and I have had them bloated, laying on the ground. Since I learned to do that, when I think a calf's stomach is getting a little out of order, I give them a little white oak ashes, and I have found that straightens up the calf's stomach and starts it again on the right road.

Mr. Goodrich—Mr. Scott spoke of two kinds of scours, one kind the lady has just been talking about,—that is the common scours that comes from the feeding. The kind he first spoke of is the white scours, they have it sometimes when they have never taken a drop of anything into their stomachs, they are almost born with it, at least they have it very soon after. Now, my son has a herd of thoroughbred Jerseys that he thinks a great deal of, and that disease broke out in his herd. He is quite an investigator, and he came to the conclusion that it is a germ disease and that the germs are in the barns, in the quarters, but with all the disinfectants they could use they never were able to get the germs out, but if the calf was seen in time, it could be saved; if not, it was lost. The idea is that the

germ may have access to the body of the calf through the umbilical cord and if that is disinfected right away every calf can be saved. He saved them all for a while, except one, when there was sickness and death in the family and the calf was not thought of, though it was a very valuable calf, one from a very valuable cow, and they lost it. He uses, I think it is zenoleum, and he saves his calf every time when he gets at it in time.

Mr. Scribner—There is a good deal of this trouble too by not taking proper care of your calf stable. I believe the calf should have the best place in the barn, the lightest and best ventilated, with good, clean beds. I do not know that I have ever had a real hard case of scours; we have been very fortunate or lucky or something. I think perhaps it has been due to weighing the milk. We are very careful to weigh the milk and give the calf only the right quantity and at the right temperature. It is so easy to put three or four pounds of milk into a pail and knock that temperature down 10 or 15 or 20 degrees before it really gets to the calf and that is bound to cause trouble. Once in a while we find one getting started a little wrong, and our remedy is simply to drop off the whole milk for two or three feeds, give them skim milk, and we have been able to regulate it every time by using this simple remedy. You know by the odor and the looks of the calf as soon as you stick your head in the barn if there is anything out of the way. If we are a little watchful, we can avoid a good deal of trouble.

The Chairman—At what temperature would you feed the milk?

Mr. Scribner—As near 98 degrees as you can possibly get it.

Mr. Scott—I fully agree with Mr. Scribner as regards ordinary scours, it is wholly within our control, but the white scours is a very different thing, and as yet we know but little about it. It is a germ disease, and while this experience Mr. Goodrich has related is very valuable and has worked well with his son, like abortion, this disease is very contradictory and we do not always know the origin of it or what to do to obviate trouble. There is a good deal to learn yet.

Presentation of Medal to Mr. Scribner from Wisconsin Jersey Breeders.

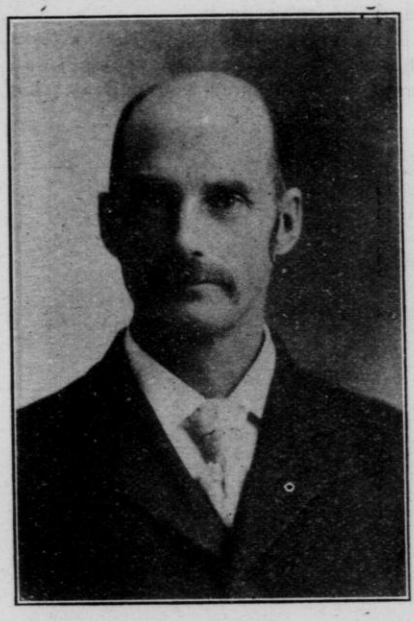
Mr. Jacobs—Mr. Chairman, as representing the Jersey breeders of Wisconsin, I want to say that at their last meeting, they voted Mr. Scribner a medal for his work in the department of Jersey breeding, and I take great pleasure in handing him the medal which they voted him at that time.

Mr. Scribner—I wish to thank the worthy gentleman, Mr. Jacobs, and those connected with him in this presentation, very heartily. Of course, in my starting out with my little dairy herd, I had no idea where it would land me. I simply started out to improve my own herd and have kept steadily on that line.

Mr. Chairman—I presume most of you know that this is the gentleman who owned Loretta D., the great cow at the St. Louis Exposition, and he will now tell us about his methods in developing such a cow.

DEVELOPING A COW.

F. H. Scribner, Rosendale, Wis.



Mr. Scribner.

When we stop to think that all kinds and breeds of cattle undoubtedly originated from the same pair that the good Lord created at the beginning, we begin to realize what an artificial production the cattle of today are; how environment, conditions and tastes of men have developed them along different lines, until we have many different breeds, with characteristics peculiar to each breed, and each breed breeding true to the type, color and conformation of its own peculiar breed. Of course, this was the work of ages and required a great deal of skill, patience and perseverance, but it shows what can be accomplished if we have a definite aim in view.

Cows, like men, are good or bad, oftentimes because of their environment, bringing up and education. We look for and expect men to be good if brought up in good and religious families and communities. I have often heard it said, "Give me the first six years of a child's life and I will tell you with a great deal of certainty what the future of that child's life will be," so I believe that the conditions under which an animal is reared determine in a large measure her future usefulness or uselessness.

How to Obtain Profitable Cows.

As with men, the parentage is of great value and we look for and have good reason to expect cows to be better cows from a long line of productive ancestry, so this then is the stepping stone in the developing of a dairy cow.

A profitable cow in my estimation is one that can produce in a year, or still better a series of years, a good, maximum yield of butter at a cost that will yield a good profit to her owner and also produce a strong, healthy calf each year. This should be one of the requisites in securing a sire for the head of the herd; not only see that he is from a productive strain, but from a family of regular breeders, because he not only reproduces his good qualities, but often intensifies his weak points as well. See that he is as near perfect in conformation and dairy make-up as possible, for with all the care we may exercise in the mating of our animals, some faulty ones will develop that we had not figured on, so if we have looked well to this end, to see that the sire is right and that the dams we are

to use for foundation are right, we have gone a long way toward their development.

I recently heard of a breeder who examined the little heifer calf when it came into the herd and if it did not have so many developed teeth and the udder and teats just so well developed, it was knocked in the head. I want to say that if we had practiced such a method in our herd we should have slaughtered some of our most valuable animals, for we have found that all heifers do not develop alike, some are veritable little cows at six months old, while others do not develop real good cow qualities until three or four years of age.

A Well Developed Yearling Jersey.

Some Steps that Lead to Success.

Calves should be fed in such a way as not to impair either growth or digestion, for later on we are going to ask them to take care of a lot of feed so they may develop and be profitable animals, but if fed and cared for in a careless and harmful manner, their digestive faculties have been impaired, and they simply say, "we can't do it."

I am still a believer that heifers should not freshen too young. If allowed to drop their first calf at from 28 to 30 months of age, they will get a little more growth and strength, and we believe their digestive capabilities are also strengthened.

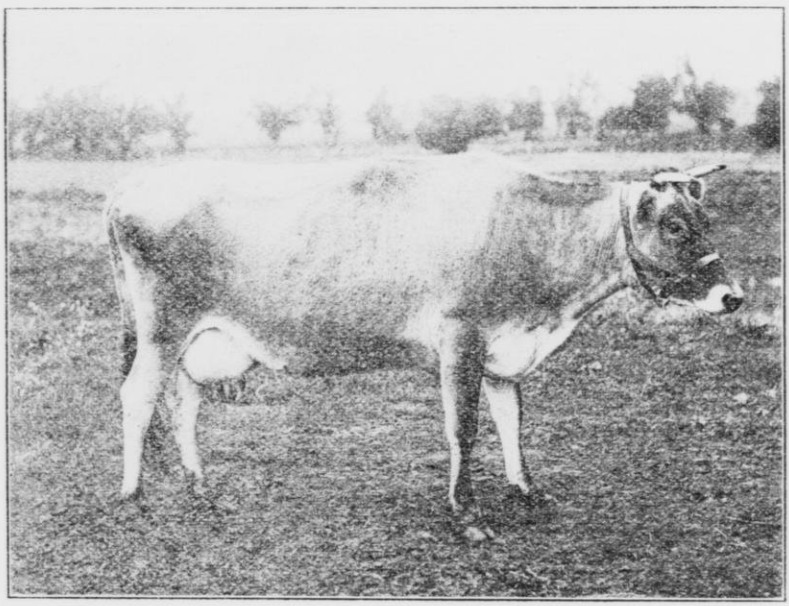
There are many things that enter into the development of the dairy cow, and possibly if any one was dropped out the best of results could not be obtained, and the man who uses that part of his body above his ears the most freely usually succeeds best.

We have come to believe that a large part is due to the feed end of

the question. The organs of digestion, like the other organs and muscles of the body, are developed best by constant use; the breeder who through neglect has not provided in some way for the emergencies that always come, is short sighted. We all know that when a cow once shrinks in her milk, how hard it is to get her back, and quite often it is impossible, even with the best of feeds, so it stands us in hand to provide in some way for these times and either have some soiling crops growing, or enough silage stored up to supplement the short pastures of summer, also to supply succulent feed for winter use.

I believe there is such a thing as compelling success. Every breeder should have such a complete understanding of his business and the individual needs of each animal so that there is no time in the year when she may not have an abundance of good, rich, juicy foods, best suited for milk production.

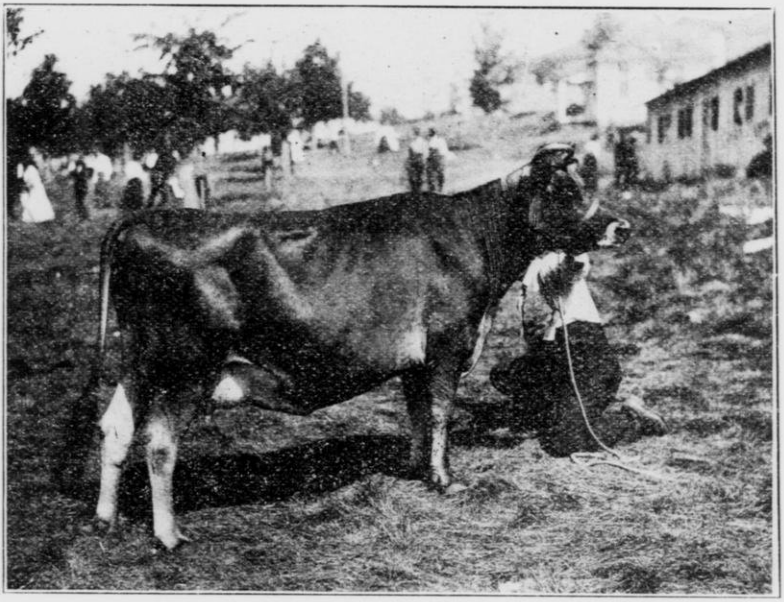
The successful development of cows rests largely on the breeder's equipment. Loretta Ds, Yeksa Sunbeams or Shadybrook Gerbens do not come by happenstance; they are the result of equipment. First, right breeding; second, right feeding; third, right care. One man in writing about cows says, 'The cow does not make her milk from running brooks or sunny skies." To be sure she does not, yet I believe that the water and the sunshine are quite important factors in the best milk production. Convenience for watering and at the right temperature means something, and the pleasantly situated cow stable, with plenty of windows for the sun to shine through, means something; good, warm, clean stables, well ventilated,



A Well Developed two-year-old Jersey.

balanced rations, kindness, patience, watchfulness, stick-to-itiveness, all mean something.

I made the assessment in our town last year and in getting statistics, asked how many cows were kept during the year and how many pounds of butter were made, and in all the town only found three or four men who could answer definitely. Each one knew how many bushels of grain and potatoes were grown and how many tons of hay, but when it came to the cow question it was all an utter blank. Is it a wonder then that the average butter production of Wisconsin is so low when so little interest is taken?



A Well Developed Jersey Cow.

DISCUSSION.

Mr. Scribner—At the time of the St. Louis Exposition, Mr. Hill, who lives near my place and we are very intimate together, had picked out two heifers to take to St. Louis; he thought he picked out two of the best and they showed up fine; he left two at home that did not look so well, but when he came back in the fall those two heifers proved to be better than the other two; they had not developed alike, so we cannot always tell which will make the best cow, we have got to wait and see.

Mr. Scott—Don't you think it is of great importance to see to it that your heifers are fed supplemental foods when the pastures are dry?

Mr. Scribner—Certainly. Our heifers are fed just as well as our cows, and I think it is just as important in developing our heifers to make productive animals as any other one thing. We may breed well, but if we do not feed right and have plenty of supplemental foods, keep them developing along the best lines, we surely have made a mistake.

Supt. McKerrow—How about Loretta D? Was she a heifer that developed early, or was she one of these late developers that you spoke about?

Mr. Scribner—She was one of the later developers. We thought Loretta D. was a mistake. She did not show what she was until she got to be five years old. I thought when she dropped her first calf she was surely a failure and I was positive of it when she dropped her next calf. With her next calf she commenced to get into form and with her next calf she was in splendid cow form. Some people think that form doesn't cut much figure. When I go into a herd of cattle or a show ring, I am not supposed to know anything about the blood or the pedigree of the animal, I must pick them out by the way they look to me, and I want to pick out the cow that in my estimation looks as though she would be a profitable worker. Now, I want depth, I want to see plenty of depth to the cow. I like to see a good, strong, muscular jaw, a good eye, and a good wide muzzle. The other day when I went into the calf stable to feed the calves, I noticed one calf had a good, broad mouth, and I said, there is going to be a good feeder, with good constitution. When I go into a box stall and see a calf with a slim nose and a narrow jaw, I say that one is not going to be a very large eater, it will have a weakened constitution. When we pick out a cow, we want to see that she has a good, strong, muscular jaw, we want a cow that is able to eat a lot, and the cow that has a good strong, muscular jaw is the one that is able to eat a lot. It is not the cow you can get the least into that is going to be the most profitable, it is the cow usually that you can get the most into. The man who is going to feed his calves in a stingy way, is not going to develop Loretta Ds or Yeksa Sunbeams. It is the liberal feeder—well, the liberal feeder may be a poor feeder too—the man who feeds a lot of corn meal and such food as that may be a liberal feeder, but he is liberally feeding the wrong kind of food, so that we want to raise the right kind and a lot of food on our farms. We want to raise a lot of clover hay and alfalfa and corn fodder and we want the kind of an animal that is able to eat up all of this food and turn it into milk. We want to see that she has a rather slim, long neck, not too short and not too thick. We want that sharpness over the shoulders. I do not object to a cow laying on a little flesh; in that way she may store up a little surplus energy for the calf, but when she does come into milking condition, you will find her shoulder coming down in the right shape, like the peak of a roof, and when I see a cow with her shoulder in that condition, I say, "there is an animal that is turning her food in the right direction." Some of the cows that put all their food on their backs are like some of our women that put all their money into clothes. We want a cow that puts her food into the milk pail. We want a wedge-shape, not only this way, but that way (indicating). Then we want good milk veins and a good udder.

A Member—Do you grain your heifers?

Mr. Scribner—Always. I have been asked many times how much I feed heifers when I feed them oats, and I answer, "I feed them just what they will clean up every time, but no more." I have seen men who would put six quarts of oats in a calf's manger because they wanted to be liberal. Some will be left of course and they will get musty. Feed in such a way that they will eat it up slick and clean.

Mr. Convey—Did you ever know a

large producer without good dairy form?

Mr. Scribner—I never knew a real large producer without a good dairy form, but I have seen some fair producers that were not of quite so good dairy form.

Mr. Goodrich—They will give a good mess of milk quite a while.

Mr. Scribner—I want to pick a good dairy form every time, as I consider form a good indication of persistency.

Mrs. Howie—Now, in regard to those two calves that Mr. Hill sent to the Exposition and the ones he kept at home, don't you think that possibly the keeping of those two at home had much to do with their development, and that the ones that were sent to the Exposition were held back by the treatment received there?

Mr. Scribner—We know that fairs are not of any benefit to stock, but of course these were fed and cared for right. I do not think that had much to do with it.

Mr. Jacobs—After your cow is developed and everything is done according to your suggestion, don't you think there is a great deal of importance to be placed on the way the milking is done?

Mr. Scribner—I certainly do. I think we should take great pains in educating our milkers and the best way to educate a milker is to put the milk sheet up in your barn. I cannot tell a man just how to do it, but if he has a milk sheet there he will pretty soon find out for himself. If he is not getting the milk, the milk sheet will show it, there are so many things to be read between the lines of a milk sheet. It not only tells the amount which the cow gives, but also her persistency, and he soon learns that the cow that gives milk the longest time is the most profitable cow. I do not believe a milker ever sets down on the milk sheet in my barn what a cow is giving that he does not look back to see what she gave the last time. It is a great educator and it does not take so long a time where you have milk sheets all ruled off, your scales right there and your pails all weigh alike, so you do not have to stop to subtract at all, but you set it right down, and at the end of the month you are able to tell all about it. We haven't a bull calf or a heifer calf that we do not have a record of, and this is kept up year after year so we know which cows in our herd are the best in the long run.

A Member—Will these qualities that you are looking for in a good cow apply to all varieties?

Mr. Scribner—They apply to all dairy breeds that I know of. If I am going into the show ring, I judge them all from the same dairy type.

A Member—And you have found that that would be the case with the best milkers in every breed?

Mr. Scribner—Yes. Of course, breeds have their own peculiarities or characteristics. We find Guernsey breeders place a great deal of stress on the skin color and they claim considerable from that, and there are peculiarities in other breeds, but when it comes to general make-up, they are all about the same.

Mr. Convey—I think one of the most important subjects presented in your paper is the matter of summer feeding. Land is high priced, you wish to keep up the quality of your cows, would you think you could get along without summer feeding, even if you had abundance of pasture?

Mr. Scribner—No, I do not. Even last year, with all the rain we had, I do not think there was a time we did not need something to feed. Of course we had our silo to fall back on, and that is one of the best things

on the farm. Mr. Convey once asked me, "Which would you rather have, a good silo or 40 acres more land?" And I answered, 'I rather think I would take the silo." You have stored up there so much fine food, always handy, and we really feel that we could make better use of that good silo than of 40 acres more land.

Mr. Convey—Outside of silos, what grain would you prefer to feed with grass?

Mr. Scribner—Ground oats and corn make pretty good feed on grass.

Mr. Convey—How should that be fed, with clover hay this time of year?

Mr. Scribner—Clover hay is all right, too.

Supt. McKerrow—How will that grain and hay mix?

Mr. Scribner—Not so well for winter, as there would be too much of the fattening elements for most cows. I do not mean that grain is the best milk food in the world, but we have got to balance up our ration. Grass has a great deal of protein, and we have got to balance it up with a little bit of carbohydrates. If we had put in wheat bran or gluten or oil meal, we would have a one sided ration. Corn meal and grass make a very well balanced ration, particularly if that grass has a good deal of clover in it.

Mr. Convey—I think you would do well to raise some kind of a soiling crop. With clover and corn meal and peas and oats later on feeding the corn in the barn, keeping up your summer feeding, that would be all right, wouldn't it?

Mr. Scribner—Mr. Convey is right. We should grow some green soiling crops to feed our cattle if we haven't a silo.

Mr. Nordman—Don't you think as between the two, fresh clover is better than grain?

Mr. Convey—Fresh clover is all right, but the season is so short.

Supt. McKerrow—You can have clover all summer practically if you are cutting it for soiling.

Mr. Convey—There is part of the dry season you do not get it in a nice condition. Corn is the only food to feed at that time. After that time, you can have nice food from August until cold weather comes on, on clover.

Supt. McKerrow—Up in your particular corner of the state, that is a good way to do.

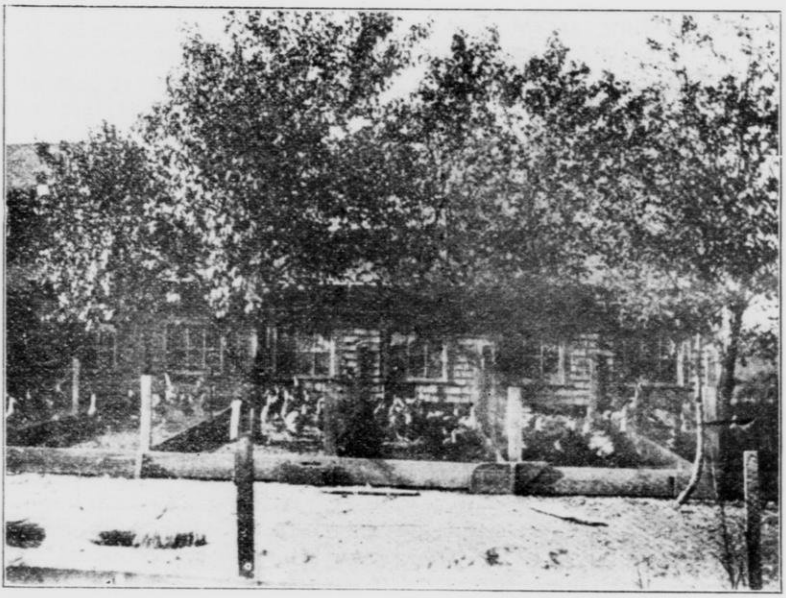
Mr. Scribner—Along the line of supplemental foods for summer, raise them if possible. This is the cheaper way, and more than that, the cows can stand it longer on some green soiling crop than too much grain. While the grain is good and contains chemically what the cow needs, it taxes the digestive organs too much, being harder to digest. Those that feed heaviest on grain have the shortest lived cows.

POULTRY HOUSES AND RUNS.

C. E. Matteson, Pewaukee, Wis.

The question of how to build and equip poultry houses and runs sufficiently large and roomy to accommodate the number of fowls kept on the farms seems to be the hardest of all to get at. There are but few people who keep fowls but what have realized the profits to be derived from them, but it does seem so hard to get them to provide room enough for them to do their work in. Some 17 years of experience has taught me that plenty of room is just as essential as warmth. They really go hand in hand and should be combined in the construction of all poultry buildings; in fact, if they are not combined, the house is not modern.

In order to make this subject clear to you, I wish to say at the outset that all recommendations given herein are for winter use entirely. We need not worry much about the spring and summer months, nature assists us at such times, but fall and winter eggs are always more profitable, and if we expect these profits we must be prepared in advance, so that our winter layers are not caught out in the inclement weather of Wisconsin, which is sure to come in its season.



Brooding House and Yards showing Indian Runner Ducks in Yards at the Poultry Plant of C. E. Matteson, Pewaukee, Wis.

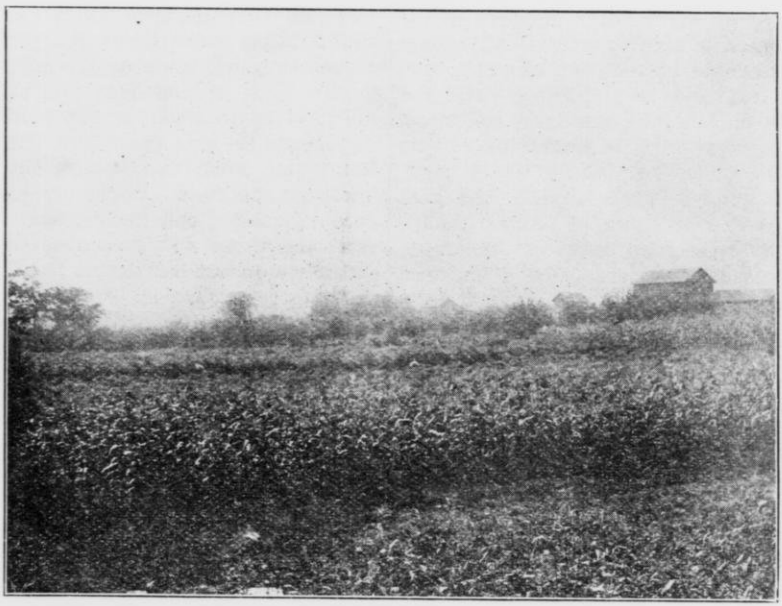
Location and Plans for Hen House.

If a new house is to be erected, its location is the first thing to consider. A south or southeast slope

is to be preferred, principally to afford good drainage and to catch the early morning rays of "Old Sol," and if possible protected on the north and west by either a grove or some of the farm buildings.

A stone foundation is preferable to setting the house on posts and skirting it around with boards. As to size, that must be determined by the number of fowls that are to be kept. Multiply the number of fowls you wish to keep by six, thus allowing six square feet for each fowl, which indeed is none too much, then plan the size of the house accordingly.

Partition off, so that the roosting room occupies only one-third of the whole amount of room, and have that built just as warm as you would build your own dwelling, because warmth in the roosting room represents food, and there is little danger of getting them too warm. My houses are constructed so that two colonies occupy one roosting room, they being kept apart by a lath partition (poultry netting is better). The doors are arranged so they open directly into the scratching shed, which acts as a storm shed to the roosting room; all openings from the roosting room go directly into the shed, a fact that should not be overlooked; in fact, every move in the building of the house should be to get the part of the house in which the fowls sleep warm and comfortable.



General View of Poultry and Fruit Farm of C. E. Matteson, showing Part of the Building used for Poultry; also Plum Orchard, Raspberry Plantation, etc.

Equipment of Roosting Room.

Roost platforms and perches should be placed in the warmest part of the room, not forgetting convenience in cleaning, etc. This platform, or

dropping board, as it is more commonly called, should not be over three feet from the floor, perches not over eight inches above the platform. The perches should be flat.

Nest boxes should be located somewhere in the roosting room, always lower than the perches, so as to avoid the fowls going to roost on them. One word of caution right here, is not to have any of the furniture of a poultry house nailed there as a fixture; everything should be movable, so that any time we wish to clean and treat for the little red mite, or general cleaning up is desired, there is nothing to hinder us and no hiding places for these little pests. This applies especially to the nest boxes—never think of nailing them.

I use just rude boxes of the proper dimensions, set loosely on a platform not too high from the ground floor, each box being an individual by itself, which makes it easy to clean. Do not have too many of these boxes. Generally a house is furnished with more than are needed.

The Scratching Shed.

Where single colonies are kept, only one shed need be erected, always to the east or west of the roosting room and just twice as large. Although this scratching shed is cheaply built, only a single thickness of matched boards, closed in on all sides, it is really the most important part of the whole house. It is their kitchen; it is where we want them to spend most of their time during the day.

Now, as to windows, put them in for the purpose of light only, not for heat, as many do. If you do, you will be sadly disappointed. Put in just what you need for light only, and have those right down near the bottom sill, so as to get the light on the floor where the fowls are. One window 9x12, 12 lights, is plenty of light for 35 fowls. You may put as many windows in the shed as you wish, but be sure to hang them all on sash bolts, so that a thorough airing can be given each day as the fowls are busy working in the sheds. The roosting room, especially, where the fowls sleep, should be thoroughly aired if possible each day.

Yards.

I wish to emphasize with all my might that a house is never complete without a yard; no matter how small the house, it is not complete unless the yard is attached to the south to correspond to the size of the house. Not that I advise the yarding of fowls on the farm where an abundance of range can be given, but there are times when we need yards, and if we do not have them the fowls suffer in consequence.

My winter yards are 16 feet wide by 48 feet long, but where summer yarding is practiced, I have them at least three times as large, so that green food will grow in them the entire season, and to furnish a nice range.

DISCUSSION.

A Member—How do you place your perches? Would you place them obliquely on an incline?

Mr. Matteson—That depends on how you locate them. If they are located so that your fowls must get up from one side, there is danger, if you have them level, of the fowls filling up the first perch first. In that case, make it slant about 20 degrees.

A Member—Is it desirable to use nearly or all glass front in the scratching shed?

Mr. Matteson—I am not here to object to that, although it is unnecessary, but it is especially objectionable in the roosting room. You see we have in mind that we are going to

build that roosting room so it will be warm at night. You see your room faces west and with windows, instead of radiating heat after dark, it radiates cold. We have got to have windows for light.

Mr. Herbst—I imagine you ventilate by opening your windows? Do you have anything over those openings at all?

Mr. Matteson—These windows are hung on sash bolts, they will open from the bottom or the top. We do not leave the windows open when the fowls are in there.

Mr. Herbst—I have found out that poultry will take cold if there is a draught. I have common gunny-sacks stretched over my windows, and most of the time my windows are raised. Plenty of fresh air can come through, but it is not in a draught. At night time I open the windows according to the weather.

Mr. Matteson—We air out during the day when the fowls are supposed to be out scratching, doing their work. Mr. Herbst thinks they can stand more cold than we do, but they certainly need a good deal of air. Ventilation must be used on a good deal smaller scale with fowls than with your larger animals. We have an inlet to this house and in a roosting room I have it arranged so there are two openings to scratching shed for winter use. The inlet is on each side and during mild weather we leave those open and that permits a draught way below the fowls and takes off the carbonic acid gas, all that is liable to accumulate.

Mr. Herbst—Do you prefer a high or low ceiling?

Mr. Matteson—I am pretty high myself, and of course I have to have the houses high enough for me to get in and do the work. For the comfort of the fowls, I do not think it is necessary to have them over six or seven feet; mine, I think, are seven feet in the clear and the roosting rooms are lathed and plastered.

Mr. Hill—When Mr. Matteson built this house a good many years ago, he didn't know so much about hens as he does now, and he put up a weather vane in the shape of a rooster; his wife asked him why he didn't put up a hen instead of a rooster, and he said it would be too much trouble to climb up there to gather the eggs.

Mr. Matteson—The eggs would roll down this incline, all the way down. You want to remember one thing, I am not recommending this house for summer use, and I would recommend you to have your fowls roost in this shed in the summer time, it would be too close in the summer in the roost room. All you need to do is to put up your temporary perches in the shed, and there in the roost room is a splendid place to set the hens.

A Member—What are your objections to having the hens remain in the winter house during the summer time?

Mr. Matteson—There are no direct openings out of doors, and at best it is liable to be stuffy and warm in there during the sultry season, and that is one of the sources of cholera.

A Member—About how large a house would you build for 100 hens?

Mr. Matteson—I would have altogether about 600 square feet, about 200 square feet in the roosting room and 400 square feet in the scratching room, and I would partition off the roosting room by all means. The house I first constructed is all lathed and plastered; it is the most expensive and the poorest house I have. It gets too warm and they have to go direct from that warm room out of doors. Another thing, I use an earth floor and I like that, it makes ideal conditions; it keeps them scratching and gives their plumage a nice, bright color.

Adjourned to 1:30 p. m.

AFTERNOON SESSION.

Convention met at 1:30 p. m. Superintendent McKerrow in the Chair.

STABLE SANITATION.

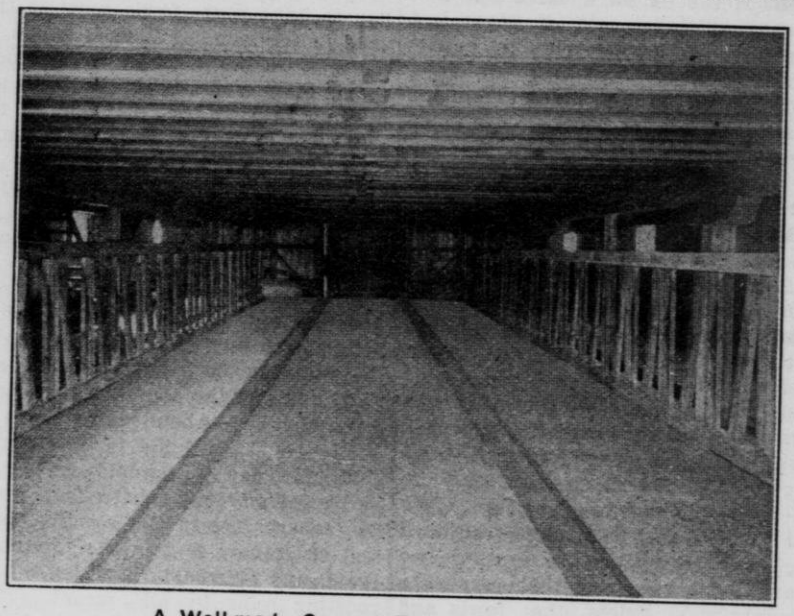
E. L. Aderhold, Neenah, Wis.

It would be an easy matter to find evidences that the question of stable sanitation has been badly ignored, and, in some features, entirely misunderstood by the masses of milk producers.

In case we were to inspect a promiscuous lot of 20 stables, we might find a few that have fair ventilation, plenty of light, white-washed walls and ceilings, sanitary floors, an absence of strong odors, and where clean cows are kept.

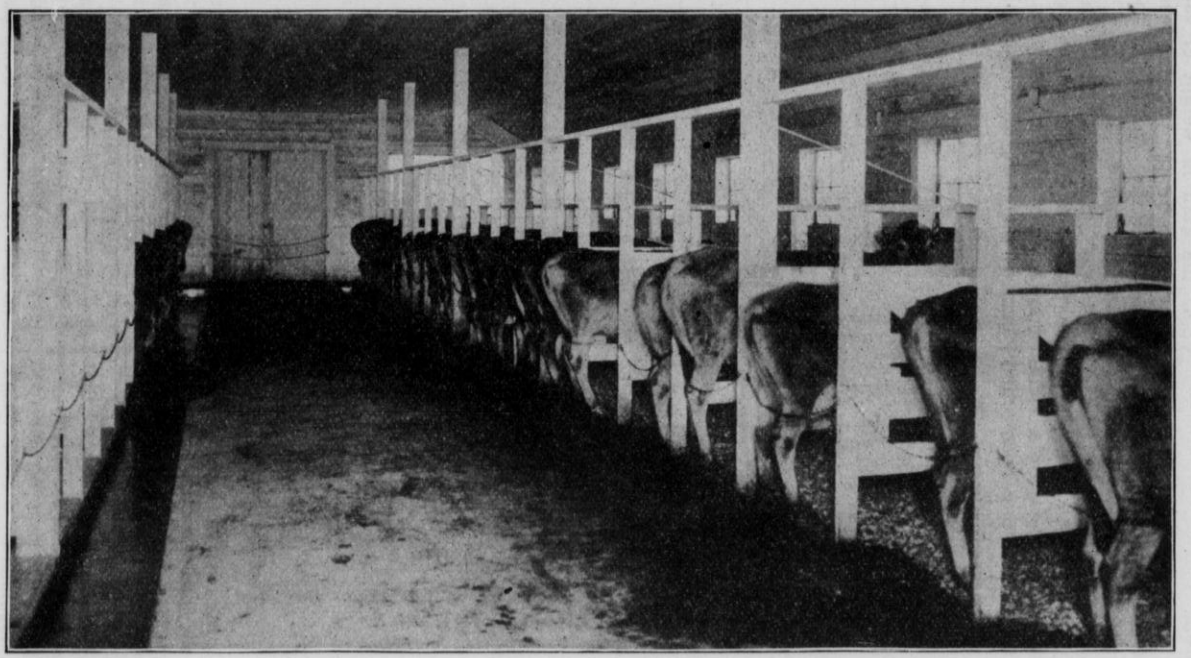
In most of the stables, however, we would find the ventilation very faulty, not enough light, cob webs and dust over-head; in some we would find leaky, rotten floors, putrid soil underneath, strong odors and cows plastered with dung.

Milk produced under such conditions does not belong in the same class with milk that comes from clean cows which are kept in a sanitary, healthful stable.



A Well-made Cement Floor is always Sanitary.

The man who works in a tannery becomes so accustomed to the odor connected therewith that he fails to notice it. In a like manner, the man who daily works in a filthy stable

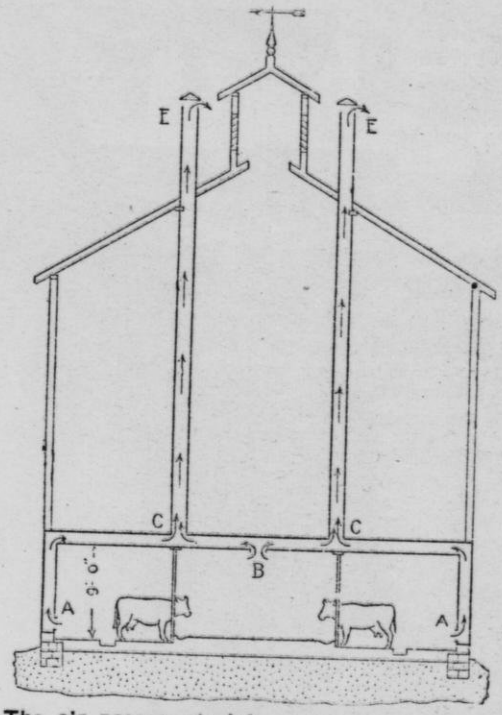


White-washing Costs Only a Small Sum, But How Clean and Sanitary it Makes the Barn.

may not appreciate the odors that prevail therein.

The law requires that the stable shall be well lighted, well ventilated, not filthy, and the cows shall not be filthy.

A penalty of from $25 to $100 for each offense is imposed for a violation of this law. Stable inspection will be in progress hereafter, so it behooves every dairyman to thoroughly post himself on the stable question.



The air passes straight out through the roof.

Contamination of Stable Air.

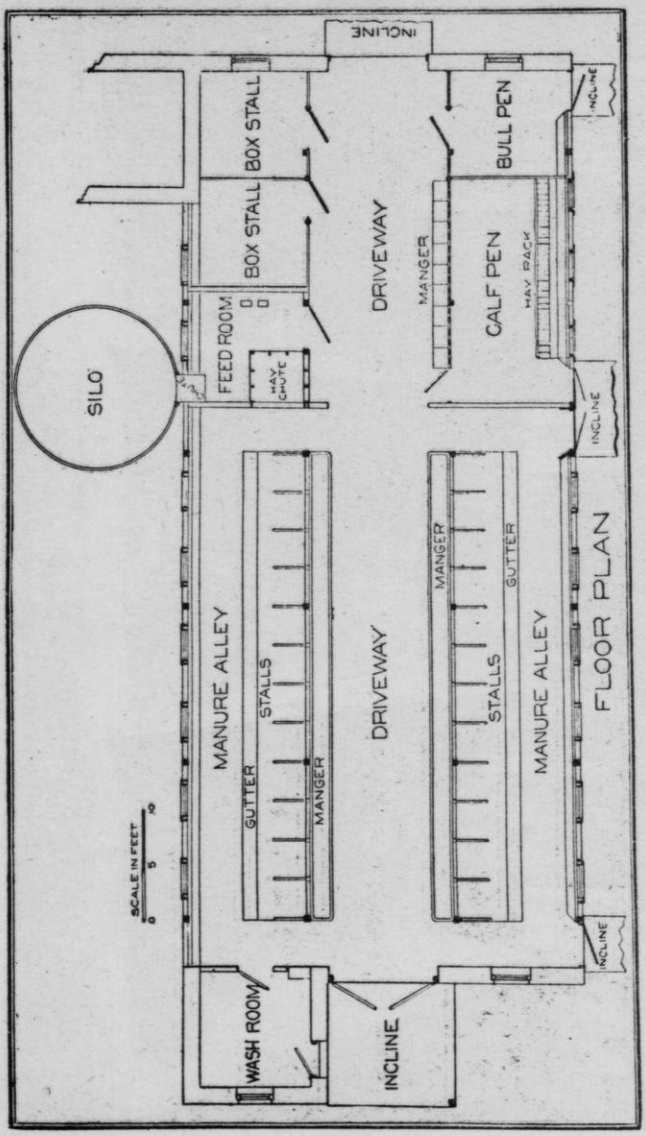
An experiment is recorded that throws some light on this subject.

The weight was kept of the food and water consumed by a steer weighing 1,600 pounds, also the weight of the solid and liquid manure voided and the gain in the weight of the steer. The weight of said voidings plus the gain in weight of the steer proved to be 49 pounds less in 24 hours than the weight of food and water consumed.

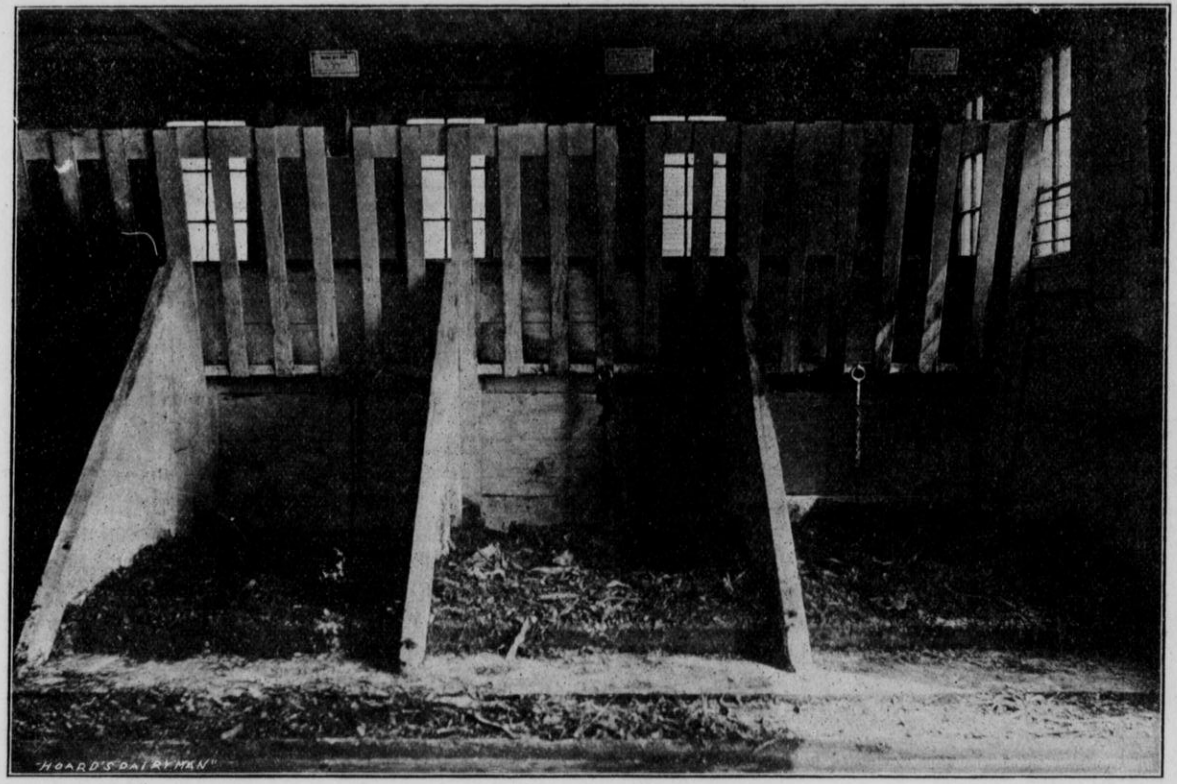
It was presumed that these 49 pounds of food and water were discharged mostly from the lungs in the form of moisture and carbonic acid gas; nearly half of it being converted into carbonic acid gas.

When one animal will discharge so large an amount of impurities, we must conclude that, with a stable full of live stock, the constant discharge of impurities amounts to considerable. To this must be added the odor arising from the dung and, possibly, from a decaying floor and foul soil underneath.

Upon reflection, it becomes at once



Floor plan of Modern Dairy Barn furnished by U. S. Dep't of Agriculture.

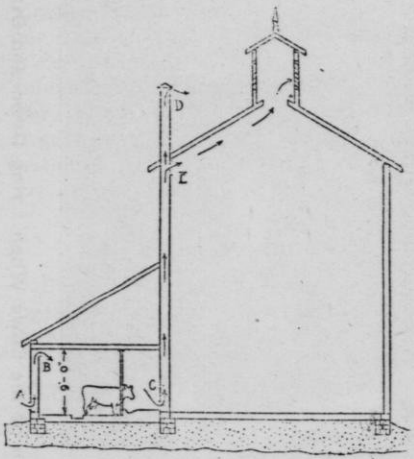


Model stall empty and after it has been cleaned—Note ring and rope for tying cows. Illustrations furnished by ex-Gov. W. D. Hoard, Ft. Atkinson, Wis.

apparent that if the stable air is to be kept comparatively pure, it must be kept rapidly changing. Inasmuch as the carbonic acid gas is poisonous, it is not fit to be breathed again, being heavier than air, it settles to the bottom. The coldest air also settles. In the upper layer we find the heat and the best air in the stable.

Ventilation.

The system of ventilation in use in many stables is an opening in the



One method of ventilating a lean-to stable.

ceiling with everything else closed in cold weather. That system does not remove the foulest, coldest air; it does not provide good circulation; it does remove the best air and the heat.

The only thing well done by this system lies in its demonstration of the ignorance of the masses on stable ventilation.

Good Ventilation.

We should aim to have the stable air as fresh as possible, yet sufficiently warm. Cows will not yield milk profitably if they are obliged to shiver from cold.

This picture illustrates the King system of ventilation, the principal features of which are that it removes the lower layer of air, but does not permit the warm air to flow out. In a well constructed stable, this insures a rapid change of air without unduly lowering the temperature.

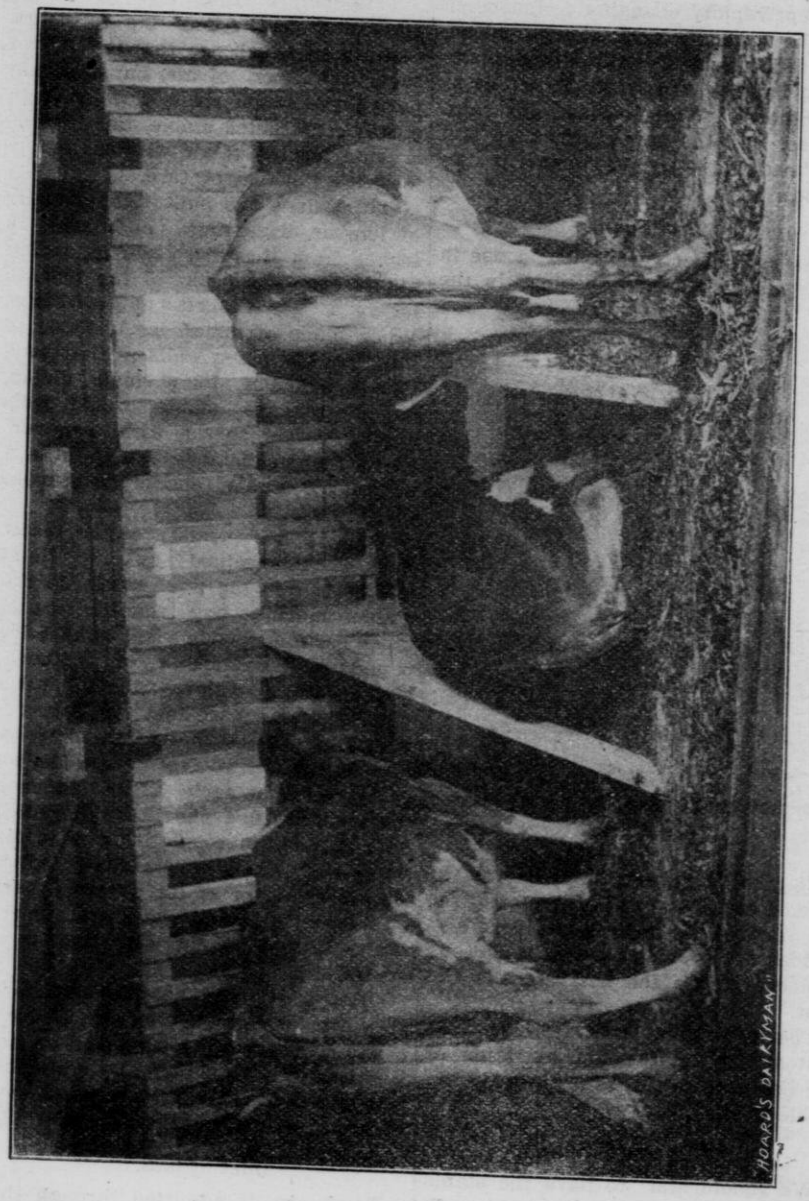
Outlet flues are built tight, usually of lumber, beginning eight or 10 inches from the floor and extending higher than the peak of the roof, to insure a good draft at all times. When made of metal, ice is liable to form on the inner walls. One such flue is sufficient for a small stable, but the average stable would probably be better served with two ventilators some distance apart, while a very large stable should have more than two.

The proper capacity of the outlet flues is determined by the total weight of all the live stock in the stable, figuring one square foot of cross section inside for each 5,000 pounds of live stock. For instance, if the stock weighs about 20,000 pounds, four square feet would be required, which could be furnished by one ventilator two feet square inside, or by two flues each 12 by 24 inches inside. Each flue should be provided with a slide, for regulating flow of air when there is a very strong wind. The lower layer of air at every part of the stable should have an opportunity to flow along the floor to a ventilator.

Outlet flues may be placed where they are the least in the way. If such a flue happens to be placed close beside a cow, she should be protected from draft by a partition several feet high and as long as the cow is.

Inlet Flues.

Fresh air is admitted through the small flues at the walls which com-



Relative Position of the Cows When Lying Down and Standing.

pel the air to travel upward about four feet, after which it is delivered at the top of the stable, where it meets the heat and becomes warmed. This arrangement prevents the warm air from flowing out, inasmuch as it will not travel downwards against the colder, heavier air outside. These inlet flues are usually four to five inches in diameter and are distributed on two or more sides of the building, say one every 10 or 20 feet. I think some of these inlet flues should be extended so that they will deliver air right over the cows, or over the center of the stable. This would insure a more perfect circulation. These inlet flues are, in my opinion, not of very great importance, but I would urge every dairyman to install the outlet flues as soon as convenient and follow directions closely.

Do Not Waste the Heat.

Heat in a stable represents food, so during the winter we cannot afford to waste heat. It should be utilized to the fullest extent possible in warming fresh air. It should not be permitted to flow, leak or be conducted out. That means a tight ceiling, tight walls, preferably with one or more dead air spaces or some other good insulation.

Light and Disinfection.

Sunlight doesn't cost anything, so we should not deny it to cows. The amount of window space recommended by the United States Department of Agriculture is six square feet per cow. Windows should be long, placed vertically, most of them preferably on the south and east sides where they are protected from the coldest winds.

Whitewash is a most effective, inexpensive agent of sanitation and should be used about twice each year on ceiling walls and fixtures. It can be best and most conveniently applied with a spray pump.

Floor.

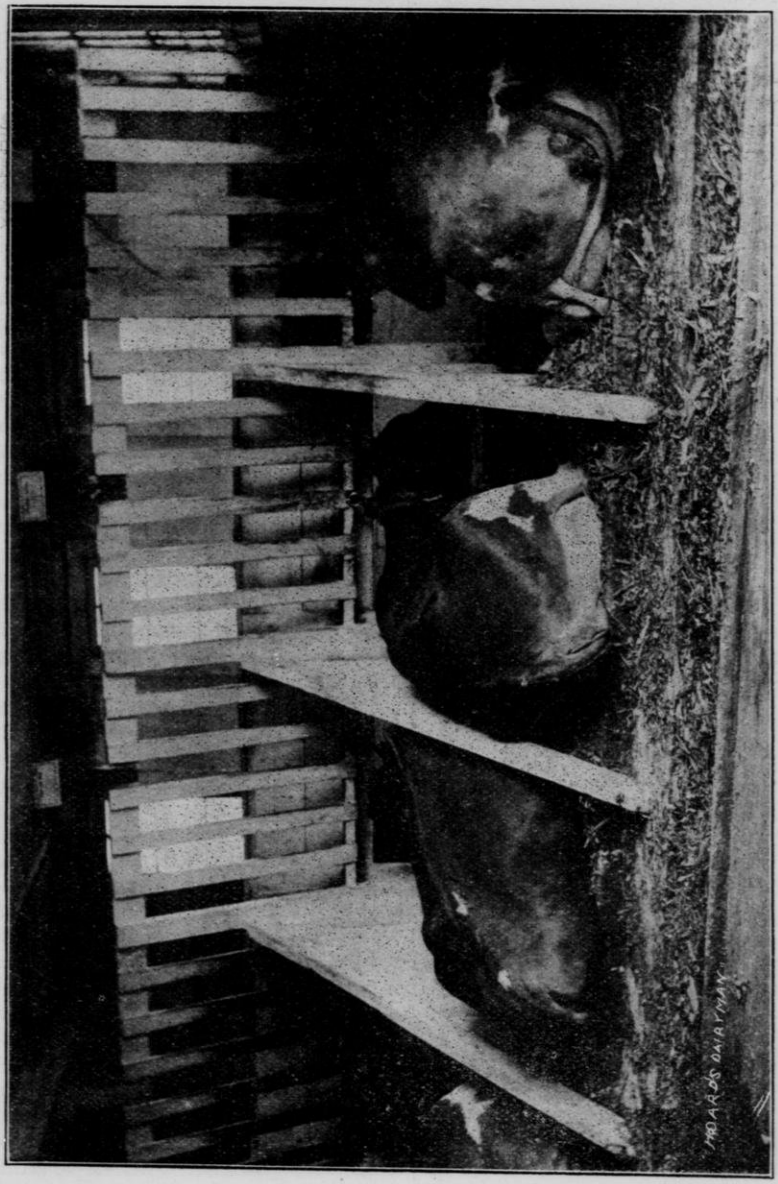
The plank floor, as commonly laid, during the greater part of its life time permits liquids to leak through into the soil, which becomes foul and from which gasses rise upwards into the stable. As a rule it is a decidedly unsanitary floor. Whenever a new floor is to be laid, cement concrete should be used by all means. Then there will be no leaking and no decay. The platform where cows stand should be covered with a one inch board floor. The pitch of the platform should be one inch from manger to gutter. The size of the gutter according to some of our most progressive dairymen should be eight inches deep by 20 inches wide. Other good dairymen maintain that it is not necessary to have it so big.

The walk back of the gutter may be lower than the platform. It should slope towards the gutter and it should have a rough surface to prevent slipperiness.

The inner surface of the manger should be very smooth to facilitate cleaning.

Common decency, as well as the law, requires that cows shall be kept clean. It is not expected that farmers will spend much time cleaning cows. The owners of clean cows do not. The sensible thing is to arrange the stalls so that cows cannot get filthy, and on this point some farmers will be obliged to do some studying, otherwise they may get into trouble.

The proper thing is to have each cow lined up to the gutter. To accomplish this, the mangers, or gutter, may be made on the bias in order to provide stalls of various lengths. For instance: the stall at one end of the row may be six inches longer than the stall at the other end. The cows



Position of Cows When Lying Down.

may then be placed in stalls that nearly fit them. The fit can be made perfect by using an adjustable fastener. We cannot change the length of the cow, so we should make the stall fit her. Besides that, to be comfortable, the cow must be free to move her head sideways. The rigid stanchion does not permit this freedom, so the cow should not be subjected to the punishment of being fastened half of her lifetime with such a device. As a matter of course, a box stall should be available at calving time.

The sprinkling of land plaster behind cows daily, as practiced by some of the most successful dairymen, tends to hold the ammonia in the manure, thereby preserving the fertility and also lessening the contamination of the stable air.

Where horses and calves are kept in the same building with cows, it is an advantage to have them partitioned off.

Where manure is kept in the barnyard, it should, if possible, be piled up some distance away from the barn so that cows do not need to wade through it.

Having provided sanitary, healthful. comfortable quarters, such as every cow owner ought to have, the cows should not be left too long outside on winter days. The stable keeps the cows warm and the cows keep the stable warm; they cannot do so if left outside too long.

DISCUSSION.

Mr. Aderhold—If any of you will agree to put in this system of ventilation and have it in working order by next winter, I will furnish you the plans so you cannot go wrong. Hold up your hands, if there are any such. I see six or seven and I have just about that many duplicates.

A Member—If the air is so heavily laden that it will settle down to the floor and so full of moisture, how will it follow up that shaft and get out?

Mr. Aderhold—There are several reasons. Here is the cold air coming in, and that is being expanded by the heat. When expanded it takes up more room and it will seek the lines of least resistance to escape from the stable and this shaft furnishes the least resistance. Another thing, this lower layer of air, while it is the coldest in the stable, is warmer than the outside air, and that would have a tendency to make it rise. Another thing, there is usually a little breeze blowing across the top of this shaft that helps it out.

A Member—I have been ventilating on the same principle, but sometimes in cold weather there is a steam rises from the top of the barn. Is there any way of preventing that?

Mr. Aderhold—Oh, there may be a little moisture against the ceiling. I do not know just how good your ventilation is, whether you have your flues large enough. How big is your ventilator inside?

The Member—It is about 16 inches wide and four inches thick, right on the side of the building. I only have one horse and one cow in there, it is a very small barn and there is always considerable moisture being thrown out into the air.

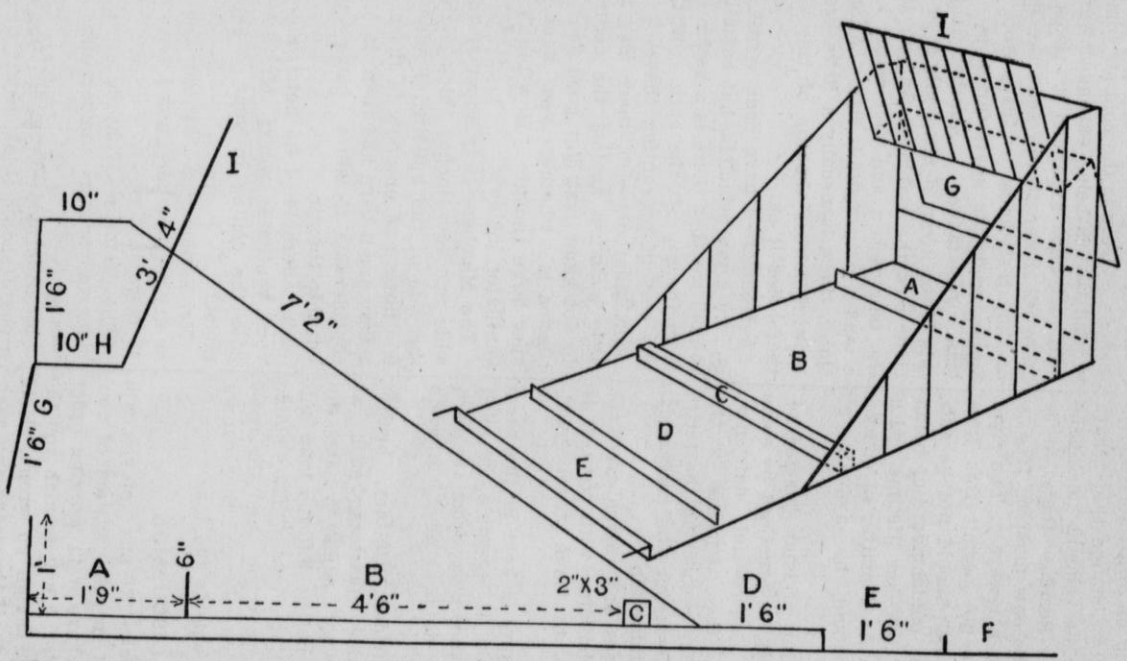
Mr. Aderhold—I do not know how your ventilator works. Mr. Scribner, does the ceiling in your stable get moist?

Mr. Scribner—No, sir, our ceiling is as dry as it is here, and I have about 45 cows in there.

The Member—What do you consider a proper temperature for a stable?

Mr. Aderhold—From 40 to 60 degrees, I should think, would be about right.

A Member—My stable is above ground, and it is across the end of the barn. There is a scaffold over



Side and Perspective views of Model stall, with dimensions of different parts. A. manger; B. where cow lies; C. adjustable piece; D. where cow's hind feet rest; E. gutter; F. driveway; G. door; H. bottom of hay rack; I. slats of hay rack.

it and a door in the front. Could an outlet and an intake be put on the same side of a building?

Mr. Aderhold—You should have your intakes on as many sides of the building as you can, and there will be some on the same side where the ventilator is. You have got to watch this thing; it happens sometimes that air from a certain inlet goes right down and out through the ventilator. When you find that the case, you will have to extend it a certain distance into the stable or close it up.

A Member—Some folks claim that the outlet should be right under where the air comes in.

Mr. Aderhold—I think you can make it work that way. Watch the air at the inlets. You may in a few cases have to extend them a certain distance from the wall to get out of this current.

A Member—The outlet could be run right on the outside of the barn?

Mr. Aderhold—Yes; you might have to protect it a little better from the frost though on the outside.

The Member—It would be less work to put it in and would be more out of the way than it would be inside of the barn.

Mr. Aderhold—I don't know, you can put it inside of the wall pretty near as well as outside, without having it in the way. You can have it in the corners, or against the gable ends, but any way to arrange it and not violate the rules I mentioned will do the business.

Supt. McKerrow—But wouldn't you get a better diffusion of air in your stable with the intakes upon both sides, evenly divided all around your stable, rather than to have them on the same side?

Mr. Aderhold—I would not recommend having the intakes only on one side; that would not work well, unless the wind was right. You should have them from opposite sides and three or four sides might be better.

Supt. McKerrow—You are heating the stable all over with the cows, and it is the diffusion of air you are looking for.

Mr. Aderhold—I think it is a good plan to extend some of those in farther to diffuse air directly over the cows.

A Member—In my case, I could put them on three sides.

Mr. Aderhold—That would be all right.

A Member—How close to the floor do you have those outlets?

Mr. Aderhold—About eight inches.

Mr. Imrie—Would you have a slide in that large outlet up in the ceiling?

Mr. Aderhold—That is a good idea in warm weather. When you can have the doors and windows open, I would just open that slide and let it draw all the air from the top.

Mr. Swart—How are we going to keep those cows clean and nice?

Mr. Aderhold—They should be fastened in such a way that the floor of the stall remains clean, and then use the currycomb every day for a few minutes.

The Chairman—How would you fasten them to prevent them from getting in the manure?

Mr. Aderhold—I do not know that there is any general principle. Ask some of these dairymen.

Mr. Moore—I think one of the principles is to clean the manure out so the cow cannot get in it. In St. Croix county last week I visited 34 farms with the idea of inspecting the condition of the hand separators, and in nine-tenths of those places, I found the cows were simply walking manure piles. On one farm we found the cows looking fine, they were better groomed than any of the horses I saw, and the reason for that turned out to be that they had a newcomer

girl who did the milking and took care of the cows.

Mr. Utter—Where do those "newcomer" girls come from?

Mr. Moore—This one came from Norway.

Mr. Aderhold—How much time did you spend at that dairy?

The Chairman—That is a leading question, we won't require the witness to answer, but we will say that he is out for the educational benefit of the state and that we will permit him to stay a little while to help along the cause of education. There is another important thing that comes in on this question of the cleanliness of cows, and that is to have your stall just right in length, so the cow stands and lies down in the right place.

A Member—According to that, we would have to have the cows all the same length.

The Chairman—No, we can have a movable manager, or it is a simple matter to build some stalls a little longer than the other if your cows are of different sizes.

Mr. Aderhold—Have your gutter on the bias, so that at one end of the row the stalls will be a little longer than at the other, and have adjustable fasteners.

The Chairman—Some of the stanchions that are being offered have an extension, they can be changed to fit any length.

Mr. Convey—I do not believe in having stanchions for cows; I think we have a good deal better system for handling cows. I think people should be punished for putting cattle in anything like the old style rigid stanchion. They are convenient, but they are unclean, because the cows will not lie at right angles of the stanchions. Where you have a good cow giving lots of milk and a large udder, she will lie flat over on her side and another cow will step on her teats. If they are swinging stanchions, they may answer the purpose, but the stiff, rigid stanchions ought to be done away with.

The Chairman—The stanchion I spoke of is the swinging stanchion, and the intention is to put in a light partition also. But you could do it with these stalls that have no stanchions in. The idea is to regulate the length so that every cow has a stall in proportion to her length.

Mr. Aderhold—I said yesterday, under the subject of "Lawful Milk," that this stable inspection was due to begin any time, and probably by next fall there will be a good deal of inspection made. Now, the law says that in case these inspectors find flagrant violations they shall prosecute and the inspectors are sworn to do their duty. As I have said, it is the purpose of the chief commissioner to obtain an enforcement of these laws as quickly as possible and with as little prosecution as is necessary to get the results. I do not want to make any threats at all, but you must understand that where we find flagrant violations of these laws there is liable to be trouble, and the object of the Dairy and Food Commissioner in furnishing a man to attend each institute this winter and discuss this subject with the farmers, was to give them an opportunity to get in line with the law, and where it is necessary to make changes, do so before the inspector comes.

The Chairman—I want to emphasize what Mr. Aderhold has said. In sending out men to attend the Institutes, the object has been that the farmers should not get into trouble, that they should be forewarned, but the trouble about this thing is that the fellows that bring in the dirty milk to the factories do not come to the institutes, they are too busy at home not cleaning their cows. It is a great thing for a man to get the

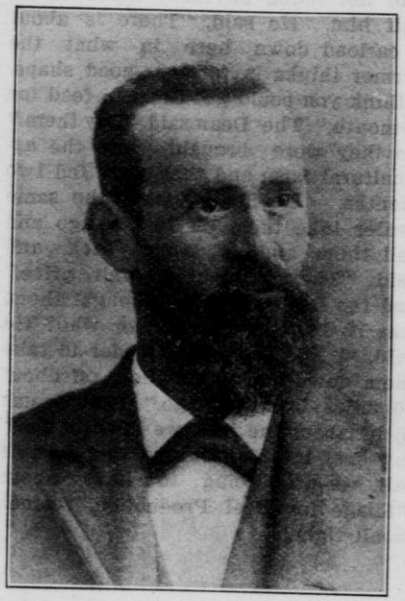
idea into his head that he had better keep his manure heap at home instead of taking it to the factory in his milk. We have some samples here left from the straining of milk and that would be an object lesson to many a farmer if he would only come and see it.

Mr. Utter Called to the Chair.

The Chairman—If we should go down to the stock yards at Chicago and ask what they thought of Wisconsin beef, we would not get a very flattering reply. Even where we have pretty well bred steers, they are not usually well fed, and perhaps the average farmer does not realize what a really well fed steer means. Even our Dean Henry was a little mistaken in his conception of what a well fed beef is. He wanted to fatten a carload of beef on some experiments and he went to a local buyer and asked him to pick up a good, thrifty lot of beeves, he said he would like to fatten them for the Chicago market. The dealer said he would do so. A week or two passed and he didn't hear from the dealer, and the Dean asked him about it, why he had not furnished those cattle, and he said he had not found anything that would suit him. He said, "There is about a carload down here in what the farmer thinks is pretty good shape. I think you could get them to feed for a month." The Dean said, "Buy them." So they were brought onto the agricultural farm and they were fed two months. He finally had the same dealer take them off to Chicago and sell them, and he came back and said, "They brought a fair price," and the Dean asked who bought them, was it Swift or Armour, or who? He said, "I sold them to a feeder to take them down and finish them off about 40 miles from Chicago." That seems to be about the idea we have of feeding beef in this country, and so this talk we are going to have about "'Silage for Beef Production," comes in all right.

SILAGE FOR BEEF PRODUCTION.

David Imrie, Roberts, Wis.



Mr. Imrie.

My subject, as you have heard, is silage for beef production. The production of beef for the last few years has been rather discouraging, as prices are low and feed stuffs are comparatively high, so that the producer of beef has made but little money, but on all Wisconsin farms the grains and grasses should be fed to live stock, as we can market the crops in a more concentrated form and retain more of the fertility on the farm by so doing.

We are not all dairymen or sheep men and we all like good, juicy beefsteak and some one will have to raise the beef. To make money out of any article placed on the market, we must produce a good article and do it as cheaply as possible, therefore we should look to what our feed costs us.

Some of the Elements that Enter into Beef Production.

To make beef cheaply, we must have the right kind of animals to feed and the right kind of feed to develop them. They should be put on the market young, as it costs less to make a pound of gain on the young animal. Then keep them growing from birth to the day they are marketed by feeding the right kind of feeds that will produce growth and fat. Where corn can be grown successfully, it is our cheapest fat producer. Having grown our corn crop, how can we save it so that we can realize the most from it?

I contend (and all of you that have silos will bear me out in this) that we can harvest our corn crop and place it before our stock cheaper in the form of silage than in any other way and with less waste, as it is all consumed. For beef production we want silage that is rich in corn. Do not plant it too close in the drill, about 8 inches is right, so that every stalk will have a good ear on it. Put it in the silo at the proper time and you have an ideal food for growing calves, young cattle and fattening steers.

Do not misunderstand me and go away from here with the idea that good corn silage is all you need to make a success of beef production. As soon as the calf will eat coarse feed, feed him what silage he will eat up clean twice a day, with whole oats and clover hay. We usually put our steers on the market as two-year-olds. The first winter they get silage, what they will eat twice a day, with ground oats and barley or oats and

corn (two-thirds oats and one-third corn), clover hay and shredded corn fodder. Feed until pasture is good. The next fall commence to feed before pastures begin to fail. Bring them to fall feed gradually. In fattening, remember you cannot fatten on silage alone, no matter how well eared the corn is, you must have more corn. We feed about like this. In the morning, 35 to 50 pounds of silage and a good panful of ground oats and barley, or oats and corn, or bran and corn, or shorts and corn; about 10 o'clock they have what shock corn they will eat. Their mangers are also filled with clover hay. At night, they get the same feed of silage with the oats and barley, etc. After this is eaten, they get crushed or snapped corn, what they want, a little oil meal is also beneficial. After they are on full feed we generally feed them from 100 to 120 days.

The trouble with us farmers is, we cannot tell by actual figures just what is gained by the use of silage in producing beef, as we do not weigh the animals nor the feed consumed; the only way we can judge is from one year to another. As we have fed steers on dry feed, on whole corn and on ground corn and with silage, I will say I have never had as good success as when I fed silage in conjunction with the other feeds mentioned. We allow the steers to run in a yard and feed in the barn, where they can go in and out as they please, with fresh water and salt always before them.

Results of Experiment Station Experiments.

Some of the experiment stations have been experimenting of late on silage for beef. I will not detain you long with these experiments, simply giving you one from the Kansas Experiment Station, Bulletin No. 124. I will take only two lots from this experiment. Each lot were two years old, weighing about 1,000 pounds each live weight. One lot was fed silage, alfalfa, corn and kafir corn; the other lot had alfalfa, corn and kafir corn. I will not give the experiment in detail, but a summary of it.

These steers were fed in three periods each of 70 days duration, making 210 days. Prof. Otis says: 'In the grain column it will be noticed that the silage steers required a large amount of grain per 100 pounds gain in the third period. This is partly accounted for by the fact that the silage gave out during the latter part of the period, when it became necessary to feed dry hay alone, and partly by the fact that the silage steers fattened more rapidly and were ready for market earlier than the others and consequently gained less near the close of the experiment." They were sold to Armour & Co. The silage lot sold for 25 cents per hundred more than those fed without silage. The silage lot was pronounced excellent, fat enough for the ordinary trade. The silage lot contained the largest per cent of fat. Armour & Co. said: "This lot possessed the per cent of fat desired by the packers." The carcasses of the silage lot showed good quality. They were covered with the right amount of fat, the loins and crops were excellent; the carcasses showed very little waste and were salable in any market.

Lot.	Gain per head.	Feed consumed per 100 lbs. gain.		
		Grain.	Ensilage.	Alfalfa.
	Lbs	Lbs.	Lbs.	Lbs.
With Silage.....	446.8	715	471	329
Without Silage.....	417.9	733	.....	485

It will be noticed that for every 100 pounds of gain the 471 pounds of silage saved 18 pounds of grain and 156 pounds of alfalfa. At 54 cents per cwt. for grain (average of corn and kafir corn) and 27½ cent per cwt. for alfalfa, this 471 pounds of silage made a saving of 52.62 cents, but this is not all. The silage steers sold for 25 cents per cwt. more than those without silage. This added makes the 471 pounds of silage worth 77.62 cents, or, at that rate, $3.29 per ton.

Average land in Wisconsin will produce from 12 to 25 tons of silage per acre. With the yield of 12 tons per acre, there is an income, according to the above experiment, of $39.84 per acre; at 25 tons the income would be $83.25 per acre. The silage fed steers made a profit of $4.10 per head, while the same grade of steers, on the same feed, except silage, lost $1.47 per head.

From the above experiment and others from different states and from my own experience, I am fully convinced that silage is as beneficial in the production of beef as in the production of milk or mutton.

DISCUSSION.

Mr. Imrie—I realize that this being right in a dairy section, there would probably be little interest in this subject; very likely there is not a man in the room who has fed steers for years, and one reason has been because the prices have been so low where they were feeding them for a long period it didn't pay. Through experiments at the station, they have found that they could not utilize pasture or anything of that kind, it had to be weighed and figured up, and all this counted against the profit.

A Member—About how ripe would you put corn in the silo?

Mr. Imrie—At just the same stage that you would cut it to put it in the shock, while the stalks are green, but the ears are ripe. Now, to put corn in the silo, it should be of a variety that the ears will ripen first. There are certain varieties where the stalk and the ears ripen at the same time, or the stalk perhaps a little before, but I would have for the silo some kind of corn of a variety that the ear will ripen first and the stalk will be still green.

A Member—What do you consider the best corn for the silo?

Mr. Imrie—Whatever kind of corn that can be raised most successfully in your locality. We use yellow or white Dent and I have used a little Flint corn. Do not use sweet corn.

Mr. Convey—You did not state whether you planted it thick or thin?

Mr. Imrie—I said that for beef production we plant it about eight inches in the row, so there will be an ear on every stalk. If you were planting it for the dairy cow, you wouldn't want too much corn, and you would plant thicker, but we want as much corn as possible.

A Member—Where the corn gets ripe in the ear, is not most of the substance gone out of the stalk?

Mr. Imrie—No, sir, it is just at its height, very best point you can cut it is just when the ear is ripe.

A Member—You know that as soon as grain of any kind matures or ripens to seed, the substance is gone out of the stalk. In growing flowers, the more constantly you will pick them and keep them from seeding, the better they will bloom, because the substance goes from the stalk, but as soon as they mature, it seems to me that the substance is gone pretty much from the stalk.

Mr. Imrie—It might be gone from the stalk, but it is in the leaf and ear, it is at its fullest development when the ear is just ripe, all grains

are. After that, the stalk begins to go down, of course.

Mr. Convey—In the examination of the corn plant, it is found to be somewhat different from other green crops; that is, it develops drying matter very rapidly approaching maturity, and the main thing to be guarded against in putting it in the silo is not to have it so dry that it will heat up again. If you get it in with the largest amount of moisture, it will be of the largest feeding value. We aim to put it in as dry as is safe to put it in, and thus we avoid an excess of souring.

A Member—Why is field corn preferable to sweet corn?

Mr. Imrie—You know in making vinegar, we use water and sugar. The sugar in our sweet corn turns sour. Years ago they used very large southern sweet corn and it made very sloppy, sour silage.

A Member—That would not have been true if it hadn't been too green, would it?

Mr. Imrie—It must go through the heating process, or souring process, and the sweet corn makes it too sour.

A Member—I am thinking of building a silo very soon at the asylum farm. I have been feeding steers for 20 years for use there, and we are thinking of building a silo, both for milch cows and more largely to feed fattening steers, and I want to know as much about this as I can.

Mr. Imrie—I am glad there is one man in the audience who continues to feed some steers. You will find that in feeding this silage to steers, you can get them on full feed—that is where the usual danger occurs, in getting them on full feed on dry corn, without having a set back, especially if you have a carload and are feeding them loose in the barn. Some may get off their feed, and some that are a little greedy will eat too much, and when a steer gets off his feed it will take two or three weeks before you can get him started again and you lose that time. If you have this silage and feed carefully until you get them on full feed, feeding in that way I have never had a single steer go off his feed. It is almost like feeding him on pasture and feeding him grain.

A Member—I have tried to avoid that by having a large variety of corn planted and cutting it up with the feed cutter and feeding with grain.

Mr. Utter—I think there are more mistakes made in putting corn into the silo too green than too ripe.

Mr. Imrie—I think so. In freezing corn, the leaves freeze and the stalk is greener than if it had not been frozen, and I have had very good silage, although the leaves got quite dry, but there was plenty of moisture in the stalk.

A Member—How would it do to put corn stalks in after they had been husked?

Mr. Imrie—I think if you husk it early enough, it would be better than corn stover, but it is not as good as if you put the corn with it.

A Member—Mr. Screvrow, over here, has fed a few steers on silage. I wish he would tell us how he likes it.

Mr. Screvrow—I like it first rate. I had five steers, I got them the 16th of November, fed them on silage and gave them a little timothy hay until the 12th day of Febuary, and towards the last I fed them about a bushel of ground corn. Before Christmas I fed them a little ground barley, but not very much, just to keep them going, and that was about all; about the middle of January I started in with the corn and toward the last I fed about a bushel of ground corn every day to five steers. I bought them for $110 and when I sold them I got

$220, just double the money in not quite three months. That was the first I ever fed.

Mr. Imrie—That was a good start.

Mr. Convey—In regard to husking corn for the silo, I would advise you not to do it; the corn is too dry, too light. Lots of people think it is dry enough to burn up, buf that is a mistake. I have seen where a party cut and shocked his corn and afterwards he concluded to put it in the silo; it all molded and a good deal of the value was burnt out. You cannot put your corn in a better place than in the silo to get full value out of it.

A Member—We have a man at Sheboygan Falls, Jake Barr, and he likes sweet corn for the silo for milch cows. A year ago he cut his corn and put it into the shock, but last year he cut it and put it into the silo and he likes it first rate.

Supt. McKerrow—I knew some farmers in this state who picked their corn off years ago, but they have all quit.

Mr. Convey—Every one of them quit it. A. O. Fox filled a large silo from a field of corn that had been cut and shocked and picked, but it spoiled the silage. The question of putting sweet corn into the silo has been thoroughly tested by our station, and they do not recommend it. It will develop a higher degree of acidity than it should have, the same degree that you get in your immature field corn. That matter has been tested all over the United States, it does not give good results.

The Chairman—We have a few minutes spare time and perhaps it would be well to take up the subject of "Silo Construction." All of you gentlemen who have silos, please raise your hands. There does not seem to be many.

A Member—I will guarantee there are 50 silos in the town of Sheboygan Falls. I wish we could hear something about the results of using the stave silo.

Mr. Imrie—I have not had any practical experience with the stave silo My silos are inside the barn, built on the principle of a stave silo, but they are protected from the frost. There are only two thicknesses of board, without any outside covering, except the barn. Twelve feet of it are in the stable, and below the stable floor. I think in a cold country, if you build outside, that a stave silo would freeze; in fact, I know it would. If you have a stave silo, you have to watch it, keep tightening the hoops, or when you begin to fill it you have to loosen the hoops. You can get a bulletin from the Experiment Station giving a very good description of a number of kinds of silos, and how to build them, with full directions, figures as to the capacity of silos, etc. In figuring the capacity of a silo, you should always remember that you should figure the full number of cattle to be fed and make the size in proportion. It is better to have it deep and narrow than wide and shallow, because you have got to feed off a certain amount every day, or it will spoil, especially when the weather gets warm. I wouldn't make it less than 24 feet deep, and 30 is better. Go into the ground four to eight feet, according to how it is located and what you think about getting it out. It will always keep the best down at the bottom where it is an even temperature and it is airtight. The most permanent kind, perhaps, are those built of stone and brick; where stone is plenty and lime is cheap, it will make just as cheap a silo as any.

A Member—How would concrete be?

Mr. Imrie—It is all right. They are building them.

Supt. McKerrow—Concrete is the building material of the future. About

two weeks ago we were holding an Institute at a little village called Stonebank, in the northern part of Waukesha county. We only had a small audience, and we asked the question how many silos were represented, and I am satisfied one-third of the hands went up. This concrete question came up and we had testimony from three farmers who had built concrete silos a year ago, also from a gentleman who built them as a contractor, and he had his blue prints there; they were built in an octagon, eight-sided form in frames, with heavy steel wire reinforcement, and were giving the parties great satisfaction. These silos were all 30 feet deep, 15 feet in diameter in the clear and cost about $300 each. The concrete was put in forms and it was built quite rapidly, from three to six feet per day. There was an air space in the wall. Of course there were ties in the places where the joints came, but the larger portion of it had an air space. That was cheaper than they could build with brick in that locality. While they had plenty of field stone there, the farmers gave it as their opinion that they could build these concrete silos just as cheaply as to use stone on their own farms.

Mr. Imrie—Did he use gravel or crushed rock?

Supt. McKerrow—Gravel, such as is found in that district. Speaking of those who have stave silos out of doors, I will say that one-half of them are not satisfactory on account of their being out in the wind and the snow; they are certain to shrink up and there is the trouble, but I have found some stave silos in barns, that seemed to be satisfactory for the amount of money they cost. Of course they are cheap if they are built inside and they seem to give good satisfaction.

A Member—Can a small silo be built to produce good silage?

Mr. Imrie—There is a limit. If you get it very small, it might freeze clear through, but I do not think it is practical to make it less than 12 feet.

A Member—Where you had only four or five cows, wouldn't you build it inside the barn?

Mr. Imrie—Yes, you could make a stave silo inside the barn, but by the time you figured everything it would hardly pay for that number of cows, but if you had the ground to raise the corn on, you could keep more cows as soon as you got the silo.

Supt. McKerrow—I would cut that down a little from 12 feet, I think I would say 10. It is pretty small, but if you have the air space and it is inside the barn where you can keep it from freezing, I think it would work all right.

The Chairman—Superintendent Emery, of the Dairy and Food Commission, has prepared a very interesting exhibit of adulterated foods and he has been giving lectures around the state, commencing at the State Fair, which have given the consumer a good deal of information about the kinds of food products they have been consuming. Today we are fortunate enough to have this exhibit at this place and Dr. Fisher is here to tell us about it.

FOOD ADULTERATION.

Dr. Richard Fischer, State Chemist, Madison, Wis.

Dr. Fischer.

The practice of adulterating foods is not of recent origin, in fact it may be said to have commenced with the very beginning of commerce in food products. In primitive states of society there may be knavish tricks, ignorant bartering and substitution of bad for good, but no systematic sophistication is possible. Again in the semi-pastoral state in which the food of a family is raised from the soil on which they dwell, and clothing produced from their own sheep and spun into textile garments at their own firesides, commercial frauds are unknown or undeveloped.

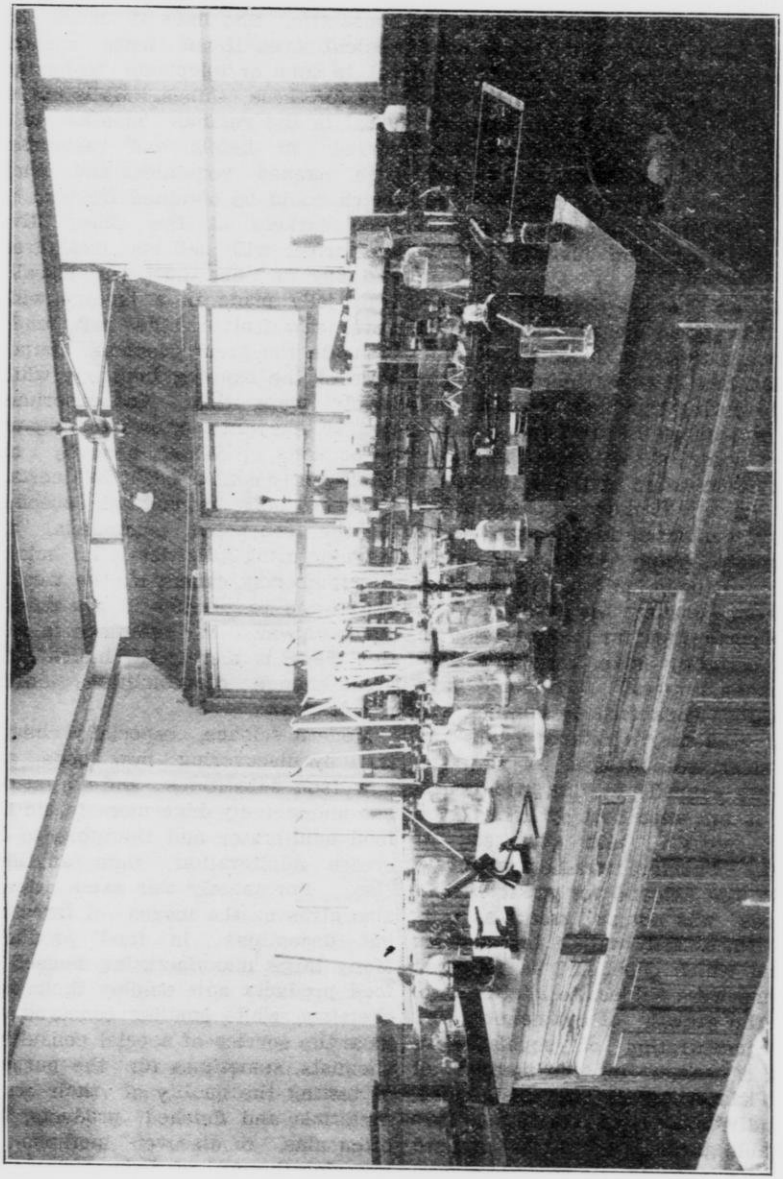
Without wishing to interpret the biblical references to the substitution of a stone for bread and of a serpent for fish as very early instances of gross food adulteration, we find probably the first authentic records of such adulteration in the writings of the historians of ancient Greece and Rome. In Athens the adulteration of wine reached such a stage as to necessitate the appointment of a special inspector. Greek history has handed down the name of one Canthare, who excelled in ingenuous mixtures and knew how to impart the flavors of age and maturity to new wine. Pliny aludes to the fraud practiced by bakers in Rome: "for they added to the bread a white earth, soft to the touch and sweet to the taste." He also deplores the frequent adulteration of wine: "even the rich," he says, "cannot obtain the natural wines of Falerno, for they are adulterated in the cellars and certain wines from Gall are given artificial coloring by means of aloes and other drugs."

In Europe, during the middle ages, food adulteration was frequently practiced, the bakers, brewers, pepperers and vintnors being most frequently accused of corrupt practices. The punishment inflicted upon offenders was often most drastic, corporal and even capital punishment being common occurrences. As late as 1444 a dealer in Nurenberg who had sold false saffron was burned together with his saffron and in the following year two men and a woman were buried alive there for the same offense. At Biebrich on the Rhine, in 1482, a falsifier of wines was condemned to drink six quarts of his own wine. It seems needless to say that he died from the effects. This mode of punishment certainly seems an eminently just one, and if enforced at the present time would

doubtless decrease the number of manufacturers of adulterated foods. In Paris in 1525, a baker convicted of selling false bread was condemned by the court to be taken from prison to various public places with bared head and feet, small loaves of bread hanging from his neck and a lighted wax candle in his hands. In each place he had to make "amend honorable" and ask mercy and pardon of God, the King and Justice for his fault.

While we thus see that food adulteration has by no means been confined to modern times, the extent of adulteration has however increased enormously during the last 50 years. To seek the causes for this increase implies a study of the reason for practicing adulteration and this is always found (except in the rare cases of accidental contamination) in the desire for financial gain. While the innate cupidity of mankind has perhaps not increased during the last century, the opportunities for adulteration of foods certainly have, and "opportunity makes thieves." Formerly most of the food consumed by families was raised at home; whatever fruits and vegetables were desired for the winter were canned by the good housewife; meats were kept by being dried salted, pickled and smoked or frozen. The fare was comparatively simple, the demand for great variety in foods was not as great as it is now. Necessarily only a few articles of food which could not be prepared at home were subject to adulteration. With the growth of our country and the concentration of population in cities, a change in the method of living has occurred. The small home, the individual house with its little vegetable garden, its little orchard (and I might add its cow barn and pig-sty) is rapidly disappearing, to be replaced by the apartment house, the flat and the tenement. The practice of canning fruit and vegetables has become a lost art to many a house-wife. She finds it more convenient, even if not more economical, to send or telephone to her grocers for these things. It is not unusual in the summer months to be served in hotels and restaurants with canned vegetables and fruits, which could be obtained fresh in the local markets at the time. Even the farmer will sell his fresh fruits and buy for his own use so-called fruit jelly made in a factory which never saw fruit. I do not underestimate the great economic importance of the canning industry, which, barely more than an experiment in 1880, has since grown to gigantic proportions. When honestly and intelligently conducted, it has certainly been a boon to mankind, especially in the congested commercial and manufacturing districts, in mining and lumbering camps, on the treeless plains and to armies in the field in times of war. My reference to it in this place is merely to indicate the great change of conditions during recent years.

Modern science, especially chemistry, by discovering new foods and new food substitutes and imitations has undoubtedly done more to aid the food adulterator and therefore to increase adulteration than anything else. Fortunately this same science also gives us the means of ferreting out deceptions in food products. Many large manufacturing houses of food products now employ their own chemists, while smaller concerns engage the service of special consulting chemists, sometimes for the purpose of testing the quality of their crude materials and finished products, too often alas, to discover methods of lowering the cost of their products by the addition of adulterants which they hope will escape detection by food analysts. Between the chemists

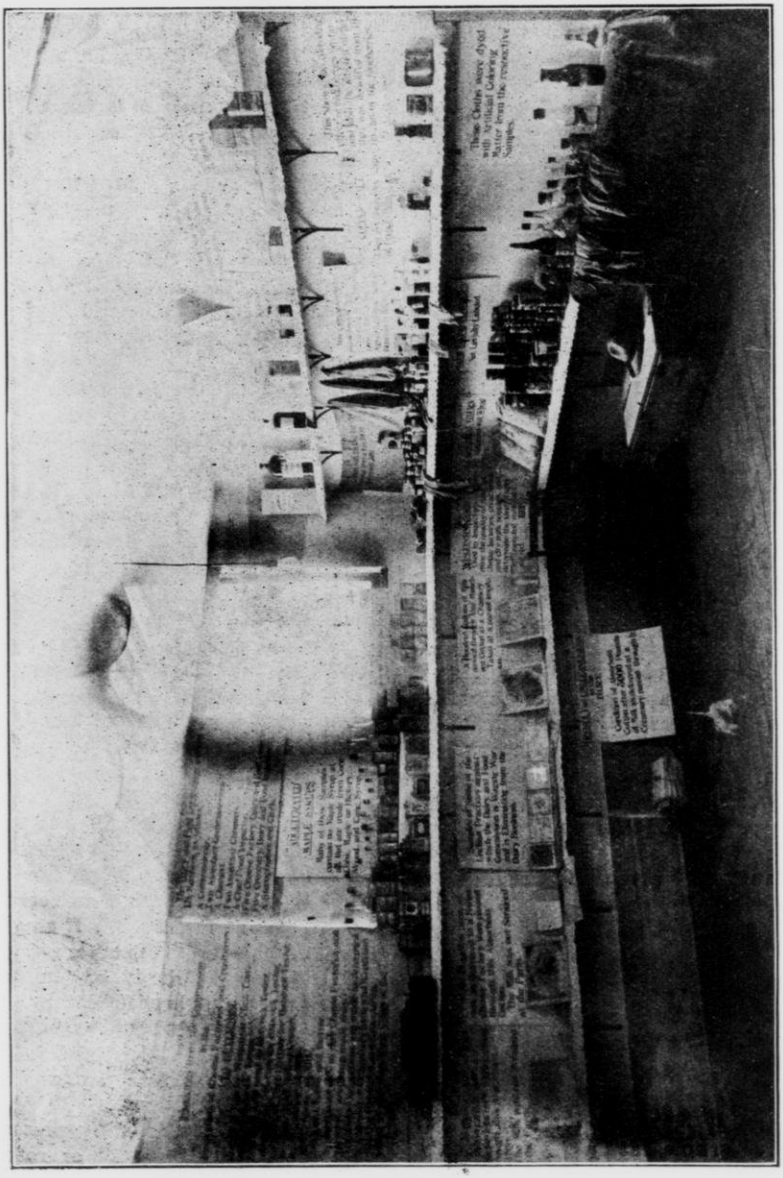


Laboratory of Wisconsin Dairy and Food Commission.

of these manufacturers and the food analysts a never ending game of hide-and-seek is in progress. The scientific and skillful food adulterator might well be called a modern alchemist with this difference, that while the alchemist of yore attempted to change baser metals into true gold, his modern successor is constantly trying to make from baser or cheaper materials mixtures that shall possess the appearance though not the quality of more expensive natural foods. The attempt to discover cheap substitutes for natural food products cannot of course be condemned in itself, and such substitutes if of equal or similar food value, even though inferior in taste and appearance, may prove and have proved of considerable economic importance. As an example might be given glucose, produced by the action of strong mineral acids upon starch. After the acid is neutralized, the product consists of dextrose, maltose and dextrin, together with a small amount of harmless mineral matter. The glucose so produced has about the consistency of honey, contains nothing injurious to health if properly made, and has about the same food value as an equivalent amount of cane sugar. However it is much inferior in sweetening power and can be produced at a much lower cost. If sold for what it is and for a reasonable price, it must certainly be regarded as a legitimate substitute for cane sugar and a cheap food for the poor. But the true adulterator cares little or nothing about the general economic value of his discovery. His aim is to sell his wares, not for what they are, nor for a corresponding price, but to dispose of them as and for a more expensive article at a price only slightly below the actual cost of the genuine, thus killing two birds with one stone; making large profits and ruining the business of the manufacturers or producers of honest goods.

What Constitutes Food Adulteration?

Before going further, let us consider the question of what constitutes an adulteration in a food. According to Webster, the verb adulterate is defined as: "To corrupt, to debase, or make impure by the admixture of a foreign or baser substance." The Century dictionary gives the following definition: "To debase or deteriorate by an admixture of foreign or baser materials or elements." Most cases of food adulteration would be covered by these definitions, the admixed substances being sometimes injurious to health, but more often harmless. As this, however, would not cover all cases where deception is practiced or the health of the consumer endangered, the general legal definition of a food adulteration is broader and includes all foods which are either deleterious to health, or in whose sale fraud is practiced. Thus the general law on food adulteration in Wisconsin, which is essentially that of most states of the union, specifies that all articles of food (the term food being here used in a broad sense as including all articles of food or drink or condiment by man) shall be deemed adulterated: If any substance or substances have been mixed with it so as to lower or depreciate or injuriously affect its strength, quality or purity; if any inferior or cheaper substances have been substituted wholly or in part for it, if any valuable or necessary constituent has been wholly or in part abstracted from it, if it is an imitation of or sold under the name of another article; if it consists, wholly or in part, of a diseased or infected, decomposed, putrid, tainted or rotten animal or vegetable substance or article, whether manufactured or not; if it is colored, coated, polished or

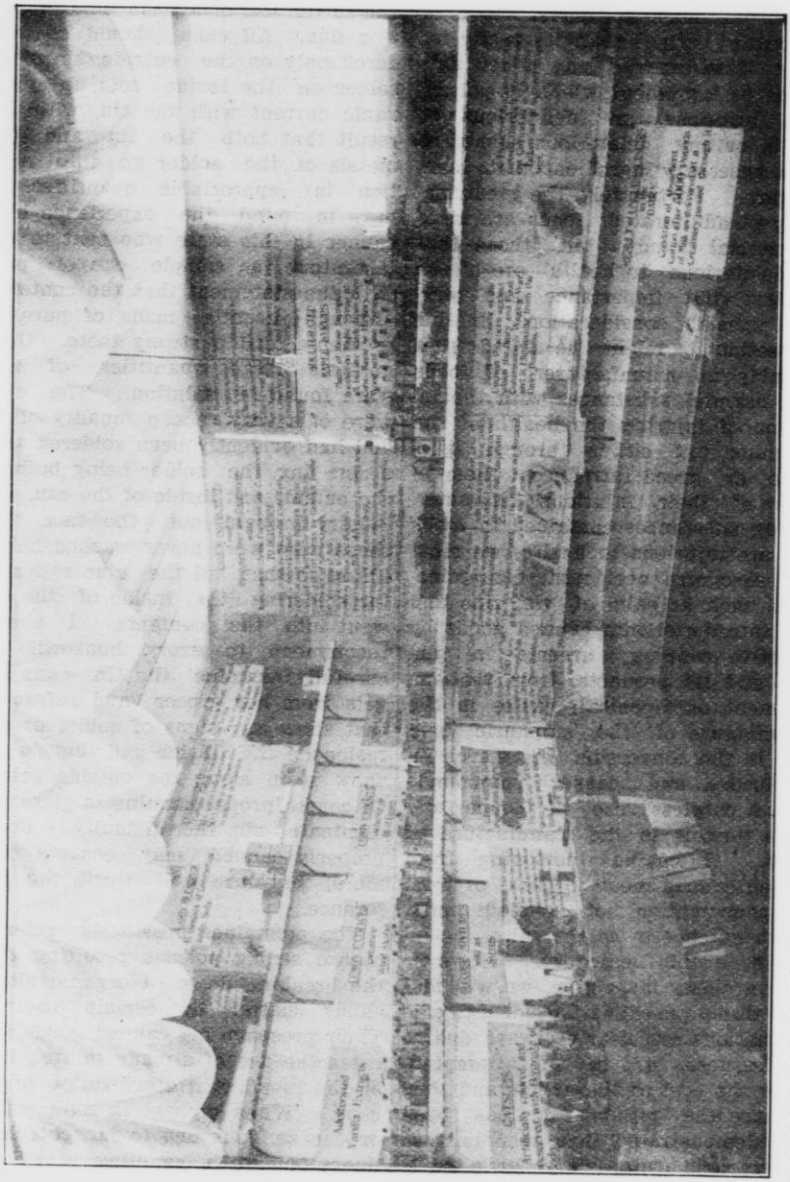


Part of Exhibit of Adulterated Foods made by Dairy and Food Commission at Wisconsin State Fair, 1905.

powdered, whereby damage or inferiority is concealed, or if by any means it is made to appear better or of greater value than it really is; lastly, if it contains any added substance or ingredient which is poisonous, injurious, or deleterious to health, or any deleterious substance not a necessary ingredient in its manufacture. Fortunately, the great majority of adulterated foods are mere commercial frauds, but those that are deleterious to health are of the greatest vital importance and warrant special consideration. In this connection it might be stated that probably no manufacturer of foods adds harmful substances with the intention of injuring the health of the consumer, but either through ignorance or greed introduces them in spite of their injurious character. Among substances contained in foods that are injurious to health, we must first recognize accidental contaminations, such as salts of tin, zinc and lead introduced into canned goods by defective canning; arsenic in glucose and its products, from the employment of arsenical pyrites in the manufacture of the sulphuric acid used in the conversion of starch into glucose, and copper compounds from a careless use of copper and brass vessels in the manufacture of foods. Ptomaine poisoning from spoiled canned meat or fish or from the consumption of spoiled milk, cream or cheese might also be included in this category. However upon a closer inspection, we will find that these so-called accidental contaminations are nearly always due to carelessness, or to an attempt to lower the cost of the article and thus increase the profits. It has been well demonstrated that even in case of very acid fruits very little tin is dissolved from the can, if a tin plate of a sufficient thickness of tin is employed. Great care should also be taken in the selection of a solder that is free or nearly free from lead, and in the use of a rosin instead of a zinc flux. All cans should be soldered only on the outside, since the solder on the inside sets up a galvanic current with the tin, with the result that both the tin and the metals of the solder go into solution in appreciable quantities. I have in mind the experience of a canner in this state who sent to our laboratory a sample can of peas with the statement that the contents, although recently made of pure ingredients, had a strong taste. Upon analysis large quantities of zinc were found in solution. The cans were of a very cheap quality of tin and had evidently been soldered with a zinc flux, the solder being both on the outside and inside of the can. An inquiry brought out the fact that these cans were never washed before filling so that all the zinc salt used for soldering the inside of the can went into the contents. I should recommend to every housewife to carefully examine the tin cans she gets from her grocer and refuse all that show any signs of solder or corrosion on the inside and that do not show resin along the outside solder. Of course proper canning in glass will eliminate all this difficulty. Foods properly canned may cost a trifle more, but are well worth the difference.

The ptomaines previously referred to are strong poisons resulting from the breaking down of organic nitrogenous matter by certain bacteria. Their presence in canned goods indicates the use of already tainted food, or the insufficent sterilization of the cans. When present in milk, cream or cheese, it is due to lack of cleanliness or care in handling.

Copper compounds when present in foods are generally intentionally employed as coloring agents, especially



Part of Exhibit of Adulterated Foods made by Dairy and Food Commis sion at Wisconsin State Fair, 1905.

in canned peas and beans. We are all familiar with the looks of many brands of French peas, of a color so intense as might make a fresh pea turn still greener with envy. The quantity of copper salt needed to produce this coloration is not very great but still far from negligable. A single can of colored peas has been found to contain the equivalent of 37 grains of metallic copper. Other poisonous coloring matters employed are lead chromate, barium chromate, red lead, picric acid and many coal tar dyes. Coal tar dyes are by far the most generally employed in coloring foods, because of their great permanence, as well as their intense coloring power. Generally known as aniline dyes, they are all popularly regarded as being extremely poisonous. As a matter of fact, they may or may not be poisonous in the quantities used. Some of them are inherently poisonous, even in very small doses; others are made so by the use of arsenic or metallic salts in their preparation; still others are comparatively harmless. The food manufacturer who argues for their use, however, rarely knows even the chemical character of the dyes he employs, to say nothing of their physiological effects. He generally buys them under a trade name and if he has any conscientious scruples on the subject may go so far as to demand of the dealer a guarantee of their harmless character. Unfortunately such a guarantee is frequently worthless.

The high internal revenue tax on grain alcohol has made this substance so expensive that there is a great temptation for manufacturers to substitute for it the cheaper wood alcohol, with the result that we frequently find in our daily papers accounts of individual or wholesale cases of poisoning from the consumption of whiskey or flavoring extracts containing wood alcohol. That this criminal substitution cannot be ascribed entirely to greed but is due in large part to ignorance or misinformation on the part of manufacturers I have little doubt. The statement has been frequently made that wood alcohol when pure is less poisonous than grain alcohol; nothing could be farther from the truth. While grain alcohol is in part oxidized to the relatively harmless carbon dioxide, in part eliminated unchanged, wood alcohol is gradually but completely oxidized to the poisonous formic acid with the probable formation of the intermediate product, formaldehyde. This formaldehyde seems to have a peculiar selective action on the most highly organized parts of the nervous system, probably combining with the nerve substance, so that partial or complete paralysis of the optic nerve always accompany poisoning by wood alcohol.

Use of Preservatives Most Pernicious Practice.

But of all harmful food constituents that the food chemist has to deal with, added preservatives easily take the front rank. While the use of salt, spices, wood-smoke, vinegar and sugar for the preservation of foods has been practiced from time immemorial and is certainly unobjectionable, the study of bacteriology and the knowledge gained thereby that the decomposition of most foods is due to the presence and growth of micro organisms, namely bacteria, yeasts, moulds and fungi, and that anything that will stop the growth of these organisms will act as a food preservative have led to great changes in the methods of food preservation. Of these, the methods of preserving food by heat sterilization or by cold storage are easy of application and very effective, but manufacturers of and dealers in foods have sought

even cheaper ways of preventing their spoiling.

This has led to the extensive and rather indiscriminate use of chemical preservatives, the prime requisite of which from the standpoint of the unscrupulous manufacturer is that it be a good antiseptic, that it be practically tasteless and odorless and if possible difficult of detection even by chemical means. The ideal chemical food preservative would be a tasteless and odorless substance, which, while possessing strong antiseptic properties would be entirely harmless, even in the largest quantities in which it might be taken in food. It is very doubtful, however, whether such a substance will ever be found. As an abstract proposition, it seems fairly safe to say that any chemical substance that will destroy bacteria and yeasts will also interfere with the action of enzymes and therefore with digestion.

The chemical preservatives that are most extensively used in foods at the present time are formaldehyde, borax and boric acid, salicylic acid, benzoic acid, sulphurous acid and sulphites and fluorine compounds. While the toxic character of some of these compounds in the quantities used in preserving food is in dispute, their indiscriminate use is certainly not justifiable, the less so, since the other methods of preserving food already mentioned are entirely efficient and free from all objection. Furthermore, it seems fair to demand that in all cases where any doubt exists concerning the injurious character of any ingredient of food, the benefit of this doubt should be given the consumer. Before permitting the use of any preservative in foods, proof beyond a reasonable doubt should be required of the innocuous character of that preservative. The question of the deleterious character of borax and boric acid has been long under controversy, packers and the manufacturers of preservatives containing these chemicals being especially active in attempting to prove their harmless character. However in 1902, after a series of investigations made by the most renowned and competent physiologists and pharmacologists of Germany, the German government declared itself against the use of boric acid and its salts in foods. About this time, the Bureau of Chemistry of the United States Department of Agriculture, under the direction of its chief Dr. Wiley, commenced a study of the effect of chemical food preservatives on man, commencing with boric acid and borax. After the most elaborate investigations ever undertaken on such a subject, Dr. Wiley concluded that borax and boric acid taken in food, either in small quantities for long periods of time or larger quantities for shorter periods of time, interfered with digestion and were therefore deleterious to health. Investigations are now being conducted with other preservatives so that in the near future we may expect authoritative statements concerning the effect of these compounds and definitely settle the question of their deleteriousness.

But aside from the intrinsic poisonous character of food preservatives, even greater harm may come from their use. Thus frequently they are employed to cover up decomposition which has already set in. Reliable sausage makers inform us that when fresh meat is used no difficulty is experienced in making sausages that will keep for a reasonable length of time and it is only when the meats used are slightly tainted that preservatives become an absolute necessity. The manufacturer of one preservative mixture sailing under the inviting name of "Freeze-em" gives directions on the label for restoring

tainted poultry to a fresh condition by soaking them in a solution of his compound. Although the appearance of such poultry may be improved and the odor of decay removed the products of decomposition remain. The manufacturers and users of preservatives frequently ask us: "Is it not more dangerous to eat decayed meat than the preservatives we employ?" But who would knowingly eat decayed meat? However the use of preservatives may render possible the consumption of partially decayed meats by removing the signs of decay.

Sodium and calcium sulphites are used extensively in the conservation of meats, either mixed with the chopped meat or sprinkled on the surface of a larger piece. We have found in our laboratory as much as 50 grains of sodium sulphite in a single pound of Hamburger steak. Although in itself probably injurious to health by the neutralization of the acid in the gastric juice and the evolution of SO_2 in the stomach, its use is liable to be fraught with even greater danger by making old and partly decomposed meat appear fresh. In themselves, sulphites are but very weak antiseptics. They do, however, act as deodorizing agents and when applied to meat give it a bright red color, resembling the bright red oxyhaemoglobin of fresh meat. Meat treated with sulphites may therefore have undergone advanced decomposition with the formation of large amounts of poisonous ptomaines and still look and smell fresh. The danger signals have been removed. A sample of chopped meat preserved with sulphites was brought to our laboratory by an inspector and was kept for three days at the laboratory temperature during the hot days of August. At the end of that time it still appeared fresh and was odorless, but a bacteriological examination revealed the fact that there were over a million bacteria, largely putrefactive, in one gram (15 grains) of that meat.

Experiments have proven that while formaldehyde readily destroys lactic acid bacilli, it is without much effect upon putrefactive and typhoid germs. Therefore when added to milk it will retard or prevent souring while the growth of injurious bacteria may go on unrestrained. In fact they will grow more rapidly than in normal milk, for the growth of the lactic acid bacteria in this milk greatly retards the development of all others that may be present. While no mother would give sour milk to an infant, the addition of formaldehyde, by preventing souring, removes the best if not the only indication to her of age and therefore probable unwholesomeness. The same may be said concerning the addition of soda to milk. In itself comparatively harmless, it may prove dangerous by the removal of the danger signal. One of the great objections to the use of chemical preservatives is that those who use them most freely are entirely ignorant of their nature. Milkmen and butchers are made the victims of enticing circulars and smooth-tongued salesmen, who assure their prospective customers that the constituents of their preserving mixtures are entirely harmless and (what is of even greater importance) cannot be detected by the chemist. Thus a bottle containing a formaldehyde solution was labeled "Freezine" and bore this statement: "It freezes the bacteria and immediately evaporates." Another package of milk preservative designed for preserving a single quart of milk contained 45 grains of borax, enough to neutralize a large amount of gastric juice and completely stop

digestion in a child's stomach. Butchers buy sulphites and boric acid mixtures under the name of "Freezem," "Preservaline," etc. Of course these are all guaranteed harmless, so when the butcher uses them by the handful he may feel free from any moral guilt. It has not been an uncommon practice for butchers to throw all their meat trimmings and scraps in a greater or lesser state of decomposition into a receptacle, sprinkle them over with preservatives and then at their leisure make them up into sausages or other chopped meat compounds. The absolute prohibition of chemical preservatives in such foods renders this practice impossible and insures to the consumer wholesome meat to begin with and cleanliness in its manufacture.

Before leaving the subject of food preservatives, I want to sound a note of warning to housewives against the use of so called "Canning Compounds," which it seems are coming into more frequent use every year. Those examined in our laboratory were found to contain either boric acid or salicylic acid in very considerable amounts. Following the direction of Mrs. Price's Canning Compound, for instance, would mean the introduction of about 1 per cent of boric acid to a food, certainly enough to keep it from fermenting, but also probably enough to keep it from being digested for some time after eating. Since these compounds are not sold as foods, their sale may not be unlawful according to our present laws, and the housewife using them does so upon her own responsibility.

Artificial Coloring Main Aid to Adulteration.

Together with preservatives, artificial coloring matters are undoubtedly the main aids to the adulterator of foods. Except in a very few instances, their effect and their purpose is to conceal inferiority and to make the foods to which they are added appear better than they really are. By their use the adulterator is enabled to make a mixture of starch, paste, glucose and a little acid pass for currant and raspberry jelly, to make spirit vinegar resemble cider vinegar, to sell a solution of artificial vanillin and coumarin for pure vanilla extract, to make a bright colored tomato catsup from green and from over-ripe tomatoes or from tomato refuse, or even from turnips or almost any finely comminuted vegetable matter. Old meats are made to look fresh, spoiled fruit and fruit refuse made up into jams and preserves of a more enticing hue than the pure product; orange, apple and raspberry cider made by the barrel without a trace of the fruit from which they are supposed to be the sole product.

Manufacturers of food have told us time and again that artificial coloring matter in food should be permitted because the public demands it, that they must have it to satisfy their aesthetic sense, that it stimulates the appetite and aids digestion. As far as the latter argument is concerned, while it is undoubtedly true that the sight of a beautiful red cheeked apple or peach is enough to make "your mouth water," it is only because of your recollection of the good taste of such appearing fruit. As soon as you would come to associate the red color of some of the adulterated foods with their particular taste, I fear the effect would be the reverse. With regard to the aesthetic argument, I doubt whether the fact that people like to fresco their stomachs with food containing artificial coloring matter would place them on a higher plane of civilization than if they painted their faces with the same dyes, as did the aborigines of this country. If that were the reason for using artificial coloring matter in

foods, why not paint your beefsteak a pea green and your pancakes a sky blue? If you desire colors to please your eyes during your meal, it is certainly better to use them in decorating your table or your room so you could continue to enjoy them after your repast, instead of eating them and putting them out of sight.

But do the public demand this artificial color in food? It may be that some who have never seen catsup or strawberry preserves "like mother used to make" may prefer to buy the artificially colored to the natural product, since both of these substances lose much of their color in the process of preparation, but aware of this matter, would you not eat the natural product with greater relish, knowing that it contains no artificial coloring matter? Whenever an artificially colored food sample comes to my laboratory, the question immediately arises in my mind: "what secret are you trying to hide underneath this gaudy hue?" For foods properly made of pure materials need no color to make them attractive to the eye. Only two years ago practically every food manufacturer in the country, even though opposed to artificial coloring in other foods, insisted that its addition to catsup was absolutely necessary to make that article salable: "The public demand it," they claimed. But when they came to realize that the permission of this coloring enabled the worst adulterated catsups to appear as good as their best grades and therefore to successfully compete on the market with their goods, they decided that perhaps the public was not so very insistent upon its demands after all. One of the most hopeful signs in this question is the fact that all the more reliable manufacturers of catsup are now preparing these goods without artificial coloring matter and advertising that fact on their label. We have their assurance that this statement aids them in selling their goods. Concerning the quantities of coloring matters used in food, I need only to refer you to our exhibit to prove that it is anything but infinitesimal.

It would be impossible in the brief time at my disposal to give you a complete description of the character of food adulterations as now practiced. The object of our exhibit is to give an optical demonstration of a few of the adulterated foods that have recently been picked up by our inspectors in the markets of Wisconsin and analyzed in our laboratory. In addition let me give you a brief statement of the most common adulterations of the more important articles of food as found in our laboratory.

Common Forms of Food Adulteration.

Baking Powder: Containing alum, and deficient in available carbonic acid and therefore leavening power.

Buckwheat Flour: Low grade wheat, rye and corn flour. Also gypsum.

Butter: Oleomargarine and renovated butter sold for dairy and creamery butter. Butter containing 30 per cent of water.

Chocolate and Cocoa: Containing starch and oxide of iron.

Candies: Paraffin, clay, stearic acid.

Catsup: Artificial color, chemical preservatives, tomato refuse (skin and seed).

Cheese: Skim milk cheese sold for whole milk cheese. Whole milk cheese sold for cream cheese.

Apple Cider: Adulterated by addition of preservatives (salicylic acid and hydrofluoric acid). Often diluted with water or sugar water. Sometimes contains no apple juice, but is made from sugar, water, tartaric acid, artificial flavor and coal tar dye.

Raspberry and Orange Cider and

Root beer: Made from sugar, water, tartaric acid, saccharin, salicylic acid and coal tar dyes.

Soda Waters: Often contain saccharin, salicylic acid, coal tar dye.

Cod fish and Oysters: Boric acid.

Cream: Boric acid, formaldehyde, gelatine, artificial coloring matter, deficiency in fat.

Evaporated and Condensed Cream: Containing only 7-9 per cent milk fat.

Cream of Tartar: Composed of calcium acid phosphate, calcium sulphate, alum and starch.

Grape Juice: Sugar water, tartaric acid and coal tar dye.

Currant, Strawberry and Raspberry Jellies: Made from apple pomace, starch paste, gelatine, glucose, artificial flavor, tartaric acid and coal tar dye.

Jams and Preserves: Made from under ripe or decayed fruit, from fruit refuse, apple pomace, starch paste, glucose and coal tar dye. Sometimes foreign seeds added.

Lard: Cottonseed oil and beef stearine, beef tallow.

Lemon Extract: Wood alcohol, terpinless lemon oil, robbed oil of lemon, oil of lemon grass.

Vanilla Extract: Wood alcohol, vanillin, coumarin, prune juice, caramel, coal tar dye.

Cider Vinegar: Spirit vinegar with artificial coloring matter, sugar, glucose or apple pomace.

Malt Vinegar: Spirit vinegar with artificial coloring matter, sugar or glucose.

Wine Vinegar: Spirit vinegar.

Spirit Vinegar: Pyroligneous acid.

Maple Syrup: Mixed with glucose, cane syrup or sorghum, or made entirely from sugar and a decoction of maple wood, hickory wood or corn cobs.

Maple Sugar: Made by the evaporation of the above.

Meats, Chopped Meats and Sausages: Colored with coal tar dye and preserved with sulphites and boric acid or borax.

Milk: Formaldehyde, boric acid, borax, added water, skimming, artificial color.

Molasses: Glucose, poisonous salts introduced in the refining of sugar.

Sorghum: Glucose.

Syrup: Glucose.

Olive Oil: Cottonseed oil and peanut oil and other foreign oils.

Pepper: Pepper dust, pepper hulls, cocoanut shells, olive pits, roasted cereals.

Cayenne Pepper: Oxide of iron.

Wine: Sugar, water, tartaric acid, tannin, coal tar dye.

Restrictive Laws.

It is difficult to obtain a correct estimate of the amount of adulterated food stuffs consumed by the American people, but it is undoubtedly very large, various writers having placed its value at from $250,000,000 to over $1,000,000,000 annually. This does not of course mean that there is no value at all in any of these adulterated goods, but their actual value is always much less than that of the pure articles for which they are sold, and immense fortunes have been built up from the difference.

Naturally you will ask, what is being done to protect the people from this avalanche of adulteration that is threatening their health, as well as robbing their pocket books. Most of the European countries have enacted more or less stringent pure food laws during the last half century, those of Germany especially being rigidly enforced. In that country no city of 20,000 inhabitants is without its food chemist or chemists and manufacturers and sellers of adulterated food are severely punished. Of the more important countries of Europe, England is most lax in its inspection of foods and consequently we find it the dumping ground of a

large amount of food that is unsalable in the countries from which it is shipped. Up to within recent years, the United States shared with England the unenviable reputation of importing large quantities of adulterated food stuffs, but since the passage of an act on that subject by congress, all imported food products must conform with the pure food regulations of the country from which they come. While in this way we are now fairly well protected from the adulterator abroad, we are almost absolutely at the mercy of the American species as far as national regulations are concerned, for while a state can punish its offenders within its own borders, it is helpless in reaching the fraudulent manufacturer or jobber in other states. The state must hold the dealer within the state responsible for the sale of adulterated foods, as that is the only way that it can protect the consumer, and that should be of course the main object of all pure food legislation. A National Pure Food Law regulating interstate commerce in foods and placing the responsibility for the sale of adulterated foods upon the manufacturer, while not a cure-all, would greatly improve the situation. For the last 15 years attempts have been made at every session of congress to have such a law enacted, but in each instance these efforts have come to naught through the influence of manufacturers who owe their prosperity, if not their very existence to the fraudulent sale of adulterated food products. At the last session of our National Lawgiving Body a Pure Food Bill, having the endorsement of the National Association of Dairy and Food Commissions, passed the house but failed of passage in the senate, it being an open secret that the so-called Blended Whiskey interests were largely responsible for the defeat of this measure. It is probable that another attempt will be made to defeat this bill in the present congress by the introduction of another which has the sanction of the organized manufacturers of adulterated foods. In the interests of a long-suffering public, this latter bill should meet with deserved defeat, for a poor National Food Law would certainly be worse than none at all.

Most states of the union now have their own Pure Food Laws in some form or other. In Wisconsin a few loose laws regulating the sale of foods had been placed on the statute books as early as 1879, but as nobody was entrusted with their enforcement, they were practically useless. As in many other states, so in Wisconsin it was mainly through the efforts of the dairy interests that in 1889 the office of Dairy and Food Commissioner was created (together with that of Chemist and Dairy Inspector) whose duty it was to enforce the Dairy and Food Laws of the state. In 1898 these laws were revised to make them conform with similar laws in Massachusetts, New York and Ohio, and at the same time another inspector and a stenographer and clerk were added to the Commissioner's force. During the last three years, this force has been further increased so that now the commission consists of the commissioner, two assistant commissioners, the chemist and two assistant chemists, a stenographer and confidential clerk, and 11 inspectors, a largely increased force, but still small considering that their work includes the inspection of more than 6,000 grocery stores, 2,000 meat markets, 3,000 creameries and cheese factories, 900 drug stores, and hundreds of city dairies. At the same time the laws have been greatly strengthened by the enactment of numerous specific laws making their

enforcement in the courts much easier. Among special laws in force at the present time are laws regulating the sale of dairy product, of oleomargarine, renovated butter, vinegar, honey, glucose mixtures, maple syrup, flavoring extracts, chopped meats and sausages, and foods containing chemical preservatives. In effect these laws prohibit the sale of all foods containing ingredients injurious to health and all foods that are mere imitations of natural or well known manufactured food products, but permits the sale of all other foods if sold exactly for what they are and when properly labeled. This proper label is intended in all cases to be an honest label, plainly disclosing to the purchaser the character of his purchase. In the enforcement of these laws, the commissioner has had the hearty support of all honest food dealers in the state, including the State Wholesale Grocers' Association, Retail Grocers' Association, Dairymen's Association, Buttermakers' Association and Cheesemakers' Association. It is but fair to state that the great majority of Wisconsin dealers intend to conduct an honest business, but are themselves frequently made the victims of unscrupulous manufacturers and jobbers. Besides prosecution, publicity is resorted to as a means of enforcing the law. Quarterly bulletins, giving the results of the chemist's analyses of foods, as well as the results of inspection, and other pertinent information from the commissioner are distributed to food manufacturers and dealers and all other citizens applying for them. By disseminating knowlege concerning the character of food adulterations in Wisconsin and giving the names of manufacturers of and dealers in adulterated foods, they have been a great aid in forcing such foods out of the state.

Woman's Share in Combating Food Adulteration.

The importance of pure and wholesome food cannot well be overestimated. Upon it depends to a considerable extent the health, happiness and prosperity of this and future generations. To secure it requires the combined efforts of the state, the honest dealer and the consumer. Upon the women of this country rests a great share of the responsibility in this matter. Let them study the problem of foods as diligently as they are studying the problem of dress; let them study closely the character of food adulterations so as to be able to discriminate between the pure and the false and then apply this knowledge in the selection of food for their table. Demand of your dealers that they carry only pure food and patronize only such as will accede to your demands. In doing this, however, you must not forget that adulterated food can be sold more cheaply than the pure, that it is more expensive to produce clean, sanitary milk than dirty milk, that you must expect to pay more for good, clean, wholesome meat than for the embalmed variety. Furthermore, remember that the state cannot protect you when you buy your foods outside of the state, that it is also extremely difficult to follow up the sales made by traveling peddlers and people buying from them do so at their own risk.

The interest recently exhibited by the women of the country in the question of food adulteration is extremely gratifying. With their continued aid we may hopefully look forward to the rapid diminution, even if not the total extinction, of this modern parasite, the adulterator of human foods.

RESOLUTIONS.

The committee on resolutions, through its chairman, Mr. L. E. Scott, made the following report, which was unanimously adopted.

Whereas, In His allwise providence, God has seen fit to remove from among us our beloved friend and co-worker, Dennis B. Foster, and that in his death the Wisconsin Farmers' Institutes and the cause of agricultural education have lost an efficient and conscientious worker, the state of Wisconsin a valuable and trusted citizen, and his family have suffered an irreparable loss; therefore, be it

Resolved, That we tender to his family our sincere sympathy in their bereavement, that they be sent a copy of these resolutions, and that the same be printed in the forth coming Bulletin.

Whereas, At this, the Twentieth Round-up Institute, the local committee and citizens of Plymouth have spared no pains and have left nothing undone that would contribute to the success of this meeting and the comfort and convenience of the workers and visitors in attendance; therefore, be it

Resolved, That a vote of thanks be tendered them for their kind consideration and earnest support.

Resolved, That we extend our thanks to the railroad companies for granting reduced rates to those attending this Institute.

Whereas, The Farm Institute is now a recognized means of agricultural education second to none other, and

Whereas, Our agricultural interests and consequent demands for this class of instruction have increased far beyond our expectations, and

Whereas, The increased expense has compelled the management to refuse more than two-thirds of the applications of farmers for Institutes, cutting the work from 100 two-day meetings to 80 one-day meetings; be it, therefore

Resolved, By the farmers of the state in this Twentieth Round-up Institute assembled, that we hereby respectfully petition our legislature to increase the appropriation for this work to an amount commensurate with the demands.

Resolved, That the Round-up Farmers' Institute of Wisconsin urge the congressmen and senators from Wisconsin to vote to abolish the free distribution of common seeds by the government and to favor the appropriation of more money in the introduction of valuable new seeds and plants, and in the improvement of plants and animals by breeding.

Resolved, That we, the citizens of the state of Wisconsin assembled at this, the Twentieth Annual Round-up Institute, in the city of Plymouth, do hereby urge upon our representatives in congress to use their utmost endeavors to secure the passage of the Heyburn Pure Food Bill, which h s passed the senate, believing that its passage will materially aid the cause of pure foods.

CLOSING REMARKS.

Supt. Geo. McKerrow, Madison, Wis.

Ladies and Gentlemen: We have been here with you three days and have held the Twentieth Closing Farmers' Institute for the State of Wisconsin.

Those of us who have come from around the state and from outside of the state to take part in this meeting are leaving you very well pleased, indeed. The Twentieth Annual Closing Institute held here in the city of Plymouth sizes up favorably with those held in the nineteen other places in the state of Wisconsin; indeed, I am told by the ladies who have been in attendance at the

ladies' session, that that part of it surpasses all the others. The ladies of Plymouth should have credit for their efforts, though not any more than the men.

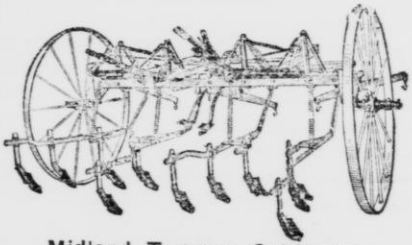
I want to thank everybody that has helped to make this Institute a success; the resolutions passed do that, but I want to add my personal thanks. Now, I hope that every one of you in attendance upon these different sessions have been benefitted, and if it has stirred you to doing a little better and a little more than you did before, it has certainly done you good.

Thanking you again, this meeting stands adjourned.

List of Prizes Awarded Wisconsin Farmers at the Twentieth Closing Farmers' Institute and Mid-winter Fair in Wisconsin held at Plymouth Sheboygan Co., March 13, 14 and 15, 1906.

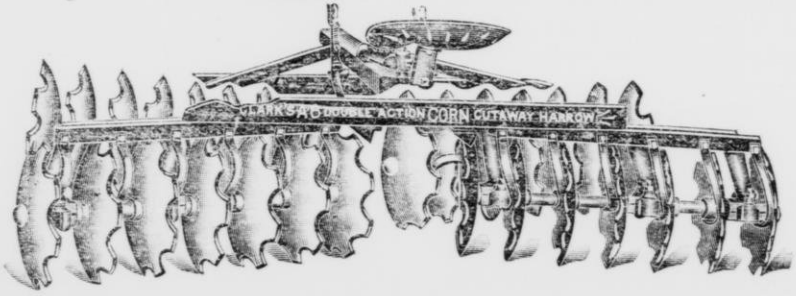
Best collection of farm products grown by exhibitor (corn, small grains, vegetables, etc.) No. 19 Bowsher Feed Mill, price $40, offered by N. P. Bowsher Co., South Bend, Ind., awarded to Mr. H. P. West, Ripon.

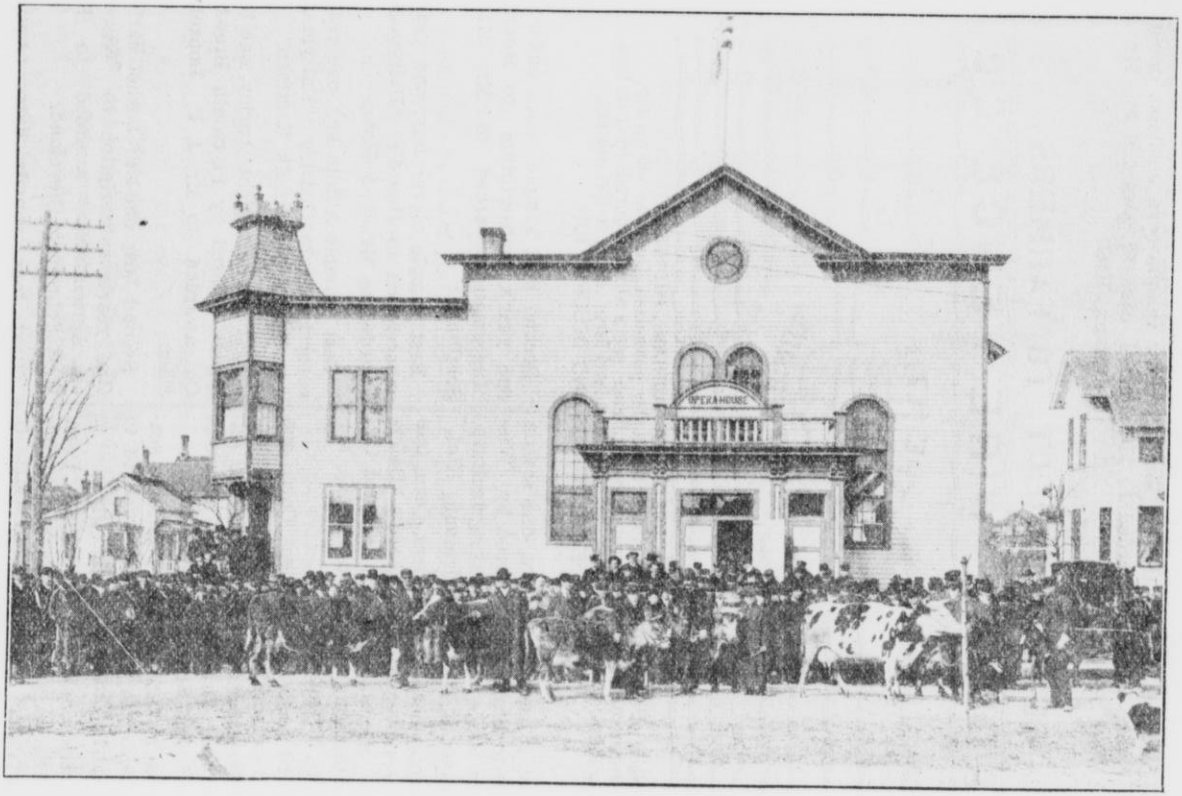
Best exhibit of corn, different varieties, grown by exhibitor, Two-row Cultivator, price $53, offered by Midland M'f'g Co., Tarkio, Mo., awarded to Mr. H. P. West, Ripon.



Midland Two-row Cultivator.

Best exhibit of potatoes and roots grown by exhibitor, Four-Horse Harrow, price $50, offered by the Cutaway Harrow Co., Higganum, Conn., awarded to Mr. C. McArthur, Plymouth, purchased by Supt. Geo. McKerrow.





F. H. Scribner Judging the Cows at the Round-up Institute at Plymouth, 1906.

Best exhibit of small grains grown by exhibitor, 20-rod roll 11-48 Wire Fence, offered by the Adrian Fence Co., Adrian, Mich., awarded to Mr. H. P. West, Ripon.

Agriculturist," awarded to Mr. Jac. Reineck.

Best sample corn ensilage, one-half bushel, cash $2, awarded to Mr. Ed Salzmann, Kiel.

Best 10 ears Dent Corn, one season ticket to State Fair, offered by Wisconsin State Board of Agriculture, awarded to Mr. Ed. Salzmann, Kiel.

Second best 10 ears Dent Corn, one year's subscription to Hoard's "Dairyman," offered by W. D. Hoard Co., Ft. Atkinson, awarded to Mr. C. McArthur, Plymouth.

Third best 10 ears Dent Corn, one years subscription to the "Wisconsin Agricuturist," offered by the Agriculturist Pub. Co., Racine, awarded to Mr. Gust Schreiber, Cleveland.

Best 10 ears of Flint Corn, one season ticket to State Fair, awarded to Mr. Alvin Zinkgraf.

Second best 10 ears Flint Corn, one year's subscription to Hoard's "Dairyman," awarded to Mr. G. Schreiber, Cleveland.

Third best 10 ears Flint Corn. one year's subscription to the "Wisconsin

Second best sample corn ensilage, one year's subscription to Hoard's "Dairyman," awarded to Mr. Gust. Schillinger.

Best sample clover hay, one year's subscription to Hoard's "Dairyman," awarded to Mr. P. J. Haag.

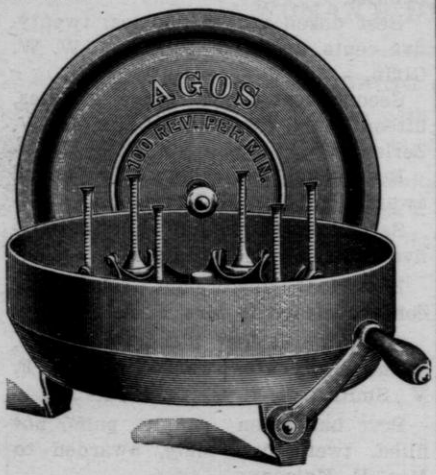
Best sample Alfalfa hay, one year's subscription to Hoard's "Dairyman," awarded to Mr. Frank Eastman.

Best one-half bushel barley, one box quarts, offered by Plymouth Brewing Co., awarded to Mr. J. P. Bonzelet, Eden.

Second best one-half bushel barley, One year's subscription to "Wisconsin Agriculturist," awarded to Mr. Gust Schreiber, Cleveland.

Best four pounds dairy butter, eight-bottle hand Agos Babcock Milk Tester, price $10, offered by Vermont Farm Machine Co., Bellows Falls,

Vt., awarded to Mr. J. W. Briggs, Peebles.



Agos Babcock Milk Tester.

Second best four pounds dairy butter, one year's subscription to Hoard's "Dairyman," awarded to Mrs. J. Struve.

Best American cheese, cash $2, awarded to Mr. Wm. F. Rehm.

Best draft team, cash $5, awarded to Mr. Albert Suemnicht.

Best single driver weighing over 1,100 pounds, cash $5, offered by Supt. Geo. McKerrow, Madison, awarded to Mr. Otto Henze.

Best grade Holstein cow over three years old, cash $3, awarded to Mr. Fred Daetz.

Best Jersey cow, cash $3, awarded to Mr. Nick Krumrey.

Second best Jersey cow, one year's subscription to Hoard's "Dairyman," awarded to Mr. Fred Daetz.

Best Guernsey cow, cash $3, awarded to Mr. Geo. Meyer.

Second best Guernsey cow, one year's subscription to Hoard's "Dairyman," awarded to Mr. H. F. Meyer.

COOKING SCHOOL EXHIBIT.

Best loaf of bread made from Ben Hur flour, one sack Ben Hur flour, donated by Huson Bros. & Timm Co., Plymouth, awarded to Mrs. W. W. Giffin.

Best loaf of bread made from Ceresota flour, one sack Ceresota flour, donated by H. J. Goelzer & Co., Plymouth, awarded to Mrs. J. F. Burke.

Best loaf of bread made from Atlas flour, one sack Atlas flour, donated by Fred Hein, Plymouth, awarded to Mrs. J. F. Burke.

Best loaf of bread made from Madelia flour, one sack Madelia flour, donated by Fred Hein, Plymouth, awarded to Mrs. C. G. Dietsch.

Best display of cakes, not less than six, one steam cooker, donated by Gaffron & Leifer, Plymouth, awarded to Mrs. F. V. Smith.

Second best display of cakes, not less than six, one picture, donated by A. H. Schram, Plymouth, awarded to Mrs. C. G. Dietsch.

Best lemon pie, one bottle cuticle lotion, donated by Corbett & Ackermann, Plymouth, awarded to Mrs. F. Kaiser.

Second best lemon pie, twenty cents, awarded to Mrs. A. Scheibe, Sr.

Best baking powder biscuits, two bottles of sirup White Pine and Tulu, donated by Corbett & Ackermann, Plymouth, awarded to Mrs. J. F. Burke.

Second best doughnuts, twenty-five cents, awarded to Mrs. J. Schlaich.

The Following Baked in Farm Home.

Best Devils Food made by farmer's daughter under 16 years, one

pair ladies' shoes, donated by A. J. Eichenberger, awarded to Miss Margaret Struve.

Best coffee cake and one dozen rolls one season ticket to State Fair, offered by Wisconsin State Board of Agriculture, awarded to Miss Frances Krumrey.

Best white, brown and rye bread, one season ticket to State Fair, awarded to Mrs. Frances Struve.

Best spice cake and angel food, one season ticket to State Fair, awarded to Miss Frances Krumrey.

Best loaf rye bread, one year's suscription to Hoard's "Dairyman," awarded to Mrs. J. Struve.

Competed for by Any One in the County.

Best fruit cake, $1.00, awarded to Mrs. F. V. Smith.

Second best fruit cake, fifty cents, awarded to Mrs. H. Krumrey.

Best dozen white cookies, twenty-five cents, awarded to Mrs. J. W. Schuler.

Best dozen ginger cookies, twenty-five cents, awarded to Mrs. W. W. Giffin.

Second best dozen ginger cookies, fifteen cents, awarded to Mrs. G. W. Zerler.

Best sunshine cake, fifty cents, awarded to Mrs. H. Krumrey.

Second best sunshine cake, twenty-five cents, awarded to Mrs. F. Kaiser.

Best loaf hickory-nut cake, fifty cents, awarded to Mrs. F. X. Zeigler.

Second best loaf hickory-nut cake, twenty-five cents, awarded to Mrs. F. V. Smith.

Best half-dozen cream puffs, not filled, twenty-five cents, awarded to Mrs. F. Kaiser.

Best apple pie, twenty-five cents, awarded to Mrs. W. W. Giffin.

WOMAN'S DEPARTMENT.

COOKING SCHOOL.

Held at Plymouth in Connection with the Closing Farmers' Institute, March 13, 14, 15, 1906.

Conducted by Miss Adella Sater, Orfordville, Wis.
Assisted by Mrs. Clara I. Ransom, Endeavor, Wis.
Stenographic Report by Miss Nellie E. Griffiths, Madison, Wis.

FIRST SESSION.

Tuesday Afternoon, March 13, 1906.

Miss Sater.

Our program for the afternoon is as follows:

Roast Beef Yorkshire Pudding
Stuffed Onions
Snow Pudding Boiled Custard.

The principal nutritive constituent of meat is proteid and is thus one of the best sources of building material for the body. The relative value of the different sorts of meat depends chiefly on the amount of fat they contain. Fat replaces part of the water, and not the proteid of the leaner meats. Roasting and broiling should only be applied to the most expensive cuts, for the meat is more tender and requires less cooking. The cheaper cuts are equally nutritious. but need greater care in preparing to render the meat tender. In the best cuts, the meat is fine-grained, for it comes from that part of the animal where the muscles are but little used.

The quality of beef depends on the age of the creature and especially on the manner of feeding. Also upon the time it is allowed to hang and ripen.

Question—Can you tell by the looks of meat if it is tender?

Miss Sater—Yes, to a certain extent. Good meat is well streaked and coated with fat. The flesh should be of a bright red color, fine-grained and firm. Tough meat has long, coarse fibres.

When meat comes from the market, remove from paper immediately, otherwise the paper absorbs some of the juice.

Never allow meat to stand in cold water, as the juice will be extracted, but wipe off with a cloth.

This is a five-pound rib roast. Usually I prefer to bone rib roast at home, then roll and skewer it. The bones may be utilized in making stock.

To Roast Beef.

Wipe, put on rack in dripping pan, rub over with salt and dredge meat and pan with flour. Place in hot oven, that the surface may be quickly seared, thus preventing escape of inner juices. After flour in pan has browned, reduce heat and baste with fat which has tried out; if meat is quite lean, it may be necessary to put trimmings of fat in pan. Baste every 10 minutes. When meat is about half done, turn it over, dredge with flour and brown on the other side.

Roast Beef Gravy.

Remove some of the fat from the pan, leaving three tablespoonfuls, place on front of range, add three tablespoonfuls of flour and stir until well browned. Add gradually one and one-half cups boiling water, or stock. Cook five minutes. Season with salt and pepper and strain.

Soup Stock.

Take the soup meat, having bones broken and meat cut into pieces, add salt and cold water. Let stand about 30 minutes, cover closely and cook slowly, keeping below the boiling point from three to six hours. The last hour, the seasonings should be added. Strain and cool as quickly as possible. Do not remove fat that has formed on the top of stock until you are ready to use stock. It excludes the air and keeps better.

You will notice in making stock we add salt and cold water at first, for the reason that both extract the juice which is desired. In boiling meat, the salt is not added until the last hour, for the juice is to be retained in the meat.

To Clear Soup Stock.

Remove fat from stock and put quantity to be cleared in stew pan allowing white and shell of one egg to each quart of stock. Beat egg slightly and add to stock. Place on front of range and stir constantly until boiling point is reached. Boil two minutes. Set back where it may simmer 20 minutes; remove scum and strain through double thickness of cheese cloth placed over a fine strainer.

Meat broths are not considered nutritious, they are simply stimulants. Properly made stock contains very little nourishment. The principal extractives and the proteids are still in the meat, but the flavoring matter having been drawn out, it is a tasteless mass.

Yorkshire Pudding.

Recipe.

One cup flour, one-fourth teaspoon salt, seven-eights cup milk, one egg, one-half teaspoon melted butter. Turn into hissing hot iron gem pans and bake 30 to 35 minutes in a hot oven.

Beat eggs very light, then add milk, flour, salt and butter. Beat the whole mixture two minutes with a Dover egg beater. This is to be served with roast beef. Very often the pudding is baked with the roast, but I prefer to bake it in gem irons, as the pudding is not so greasy.

Sift the flour once before measuring for everything. For fancy cakes we sift it several times. Fill the cup lightly; do not shake the cup for the flour will settle and consequently get more than should be.

These measuring cups I think are indispensable. You can purchase them at any good department store. They come in tin, glass and granite and are divided into thirds and quarters.

Stuffed Onions.

Recipe.

Remove skin from onions, and parboil 10 minutes in boiling salted water to cover. Turn upside down to cool and remove center with a sharp knife. Fill centers with bread crumbs and finely chopped onion which has been removed, seasoned with salt and pepper and moistened with cream or melted butter. Place in buttered shallow baking pan; sprinkle with buttered crumbs and bake in a moderate oven until tender. This may be served with white sauce and is very good served with beef or fish.

Another filling that is very good is two tablespoons finely chopped ham, one tablespoon butter, one egg, speck cayenne, three tablespoons bread crumbs, three tablespoons milk, one-half teaspoon salt.

Snow Pudding.

Recipe.

One and one-fourth tablespoons granulated gelatine, one-fourth cup cold water, one cup sugar, one cup boiling water, one-fourth cup lemon juice, whites of three eggs.

Soak the gelatine in cold water for 10 minutes. Pour over this slowly the boiling water and stir until dissolved. Add the sugar and lemon juice. When this mixture begins to thicken, beat until frothy; add whites of eggs beaten stiff, and continue beating until stiff enough to hold its shape. Fold or pile by spoonfuls on a dish, serve cold with boiled custard. A very attractive dish may be prepared by coloring half the mixture with fruit, red.

I chose this recipe because it is the foundation for so many desserts.

Question—What kind of gelatine do you use?

Miss Sater—I am using Knoxes' granulated today. If using in large quantities, there is a sheet gelatine that is much cheaper.

Some time ago, gelatine was supposed to contain a great deal of food value. Gelatine is not a substance which is capable of building tissues, but it is as a sparer of proteid, however, that gelatine is chiefly of importance in the food.

Pineapple Sponge.

This is another variation to the Snow pudding. Make jelly as above, not using more than one-fourth cup boiling water, and three-fourths cup chopped or grated pineapple and one-half cup pineapple juice, and one tablespoon lemon juice.

Question—In making Snow pudding, if you had no lemon juice could you use lemon extract.

Miss Sater—No; I should not try extract, a little acid is necessary.

Question—Supposing you were on the farm and got out of lemons.

Miss Sater—You could substitute strawberry juice, raspberry or grape juice; in fact, any fruit juice that is not too acid.

If you do not have gelatine, corn starch may be used, but it is not quite so palatable.

Boil one cup sugar mixed with two tablespoons corn starch and one cup of water until clear and transparent. When slightly cooled add to the stiffly beaten whites of three eggs. Add one-fourth cup lemon juice and beat until cold. Set in a cold place until ready to serve.

Orange Charlotte.

Recipe.

One and two-thirds tablespoons gelatine, one-third cup cold water, one-third cup boiling water, one cup sugar, three tablespoons lemon juice, one cup orange juice and pulp, whites of three eggs and whip from two cups cream.

Soak gelatine in cold water; dis-

solve in boiling water, add sugar, lemon juice, orange juice and pulp. Chill and when quite thick beat until frothy, then add whites of eggs beaten stiff and fold in cream. Line a mold with sections of oranges, turn in mixture, smooth evenly and chill.

Boiled Custard.

Recipe.

Two cups scalded milk, yolks of three eggs, one-fourth cup sugar, speck salt, one-half teaspoon vanilla.

For our boiled custard we use the yolks of the eggs, having used the whites for the Snow pudding.

In making a custard, we scald the milk first in the double boiler. When scalded bubbles appear around the edge of boiler. Mix the sugar and salt with the yolks beaten slightly, pour the hot milk on the egg mixture but do not put the egg mixture into the hot milk or the egg will not cook smoothly, then place it in the double boiler again. There are two or three tests for telling when the custard is done. You have all noticed in making a custard that after the sugar has been placed in the milk a foam appears, and when the foam disappears the custard is done. Another way is to tell by the coating on the spoon. In cooking milk and egg mixtures, they will curdle if cooked too long. The boiled custard may be restored to a smooth consistency by beating with a Dover beater and placing it in a cool place, but it will not be as thick as it would have been had it not curdled. If a custard is baked too long, it becomes watery, it is not as smooth, and the test is placing a knife in the custard. If it comes out smooth, with no custard sticking to the knife, it is done. When baking a custard it is necessary to place it in a pan of boiling water and bake in an oven that is not very hot.

Question—Does the custard go with the pudding?

Miss Sater—It is not necessary to serve a custard with this pudding, but I think the yellow and white is an attractive dish.

The custard should be stirred constantly while thickening and then cooled quickly. I have seen custards that were the right thickness when removed from the fire, but allowed to cool so slowly that there was enough heat left in them to curdle the custard when taken from the stove.

SECOND SESSION.

Wednesday Afternoon, March 14, 1906.

The program for the afternoon is as follows:

Creamed Peas in Timbale Cases
Eggs a la Goldenrod
Rice with Cheese
Quick Cake Coffee
We will make the cake first.

Quick Cake.

Recipe.

One-third cup soft butter, one and one third cups brown sugar, two eggs, one-half cup milk, three teaspoons baking powder, one-half teaspoon cinnamon, one-half teaspoon grated nutmeg, one half cup raisins, or one-half pound stoned and chopped dates.

Put ingredients in a bowl and beat all together for three minutes. Bake 35 to 40 minutes.

The recipe says "put the ingredients in a bowl and beat all together for three minutes." I have been told that if you proceed as with ordinary cake batter this cake will not be a success.

We have two kinds of cake mixtures; those of the butter cakes and those without butter, such as sponge cake and angel food. Sponge cake and angel food are made light by the air we beat into the eggs and made light by them. Then we have those with baking powder in them that are made light by carbon dioxide.

For this cake I use the "C" or light brown sugar, I like it better than the dark brown. In making a light cake, the fine granulated sugar makes a much finer grained cake than the coarse granulated sugar we so often get.

The usual method of making butter cakes is to cream the butter first, then add the sugar gradually while continuing to cream the mixture. If the whole egg is used, some say it is better to put the yolks in first, then the whites, but I have made very good cake by putting in the eggs after creaming the sugar and butter. You will find it will get creamy and white by beating a long time. After adding the eggs, add part of the flour before any milk is added, which prevents curdling. If you add the whites of the eggs separately, add them last, folding them in after the flour is added.

Beating a cake makes it light and stirring it makes it fine grained. This cake may be made with water. We think a cake is finer grained if made with water than if made with milk, but it is not so rich and it dries out very quickly.

Measure the flour just as carefully as I spoke of yesterday. Never measure flour until it has been sifted, then pile it just as lightly as possible in your cup.

Baking powder is a mixture of sodium bi-carbonate, cream of tartar and a drying medium, either flour or corn starch. As soon as moisture is added to the baking powder, it gives off carbon dioxide, so the mixture should not stand long after the moisture is added, as the gas which is to make the mixture light will escape before we get our cake into the oven.

Today I will use one-half teaspoon cinnamon, one-half teaspoon grated nutmeg. You can use chopped nuts and stoned dates chopped are very good in it also, but today I will use raisins. The raisins have been stoned and washed, half a cupful.

Question—Do you put everything in without mixing them?

Miss Sater—Everything is put in in the order of the recipe, then all combined and mixed together.

I think there are more cakes spoiled in the baking than in the mixing. It is essential to understand the oven in order to bake a cake successfully. We have rules that divide the baking of a cake into four periods. The first quarter it should begin to rise; second quarter should continue rising and begin to brown; third quarter should continue to brown, and the fourth quarter should shrink from the sides of the pan. It is a very good test of when the cake is done if it shrinks from the sides of the pan, unless it is a fruit cake or a pound cake. Or using a sterilized straw is another very good way of testing a cake. A cake baked with molasses or brown sugar has to be baked very slowly, as it burns very easily, especially if made with molasses.

If you use allspice, use one fourth of a spoonful of cinnamon and one-fourth of a spoonful of allspice.

If the loaf cracks on top, the cake mixture is either too stiff, or the oven is too hot so a crust is formed before the cake is sufficiently risen. If in too slow an oven, the cake is of a very coarse texture.

I like a split spoon very much in creaming butter and sugar. It hastens the process very much, I think.

Do not open the oven door for 15 minutes after putting cake in the oven. A loaf cake usually has to be a trifle stiffer than a layer cake. It takes longer for the heat to penetrate the loaf and therefore it needs to be a trifle stiffer to hold up the cells until the heat penetrates it. I also think a cake with fruit needs to be a trifle stiffer.

Eggs a la Goldenrod.

Recipe.

Three hard boiled eggs, one-half teaspoon salt, two tablespoons butter, speck pepper, two tablespoons flour, one cup milk, five slices of toast.

Make white sauce and add seasonings. Separate yolks and whites of eggs, chop whites finely and add them to the sauce. Arrange toast on platter and pour over the sauce. Force the yolks through potato ricer or strainer and sprinkle over the top. Garnish with parsley.

For the white sauce, put butter in saucepan, stir until melted and bubbling; add flour and seasonings and stir until thoroughly blened. Pour on the milk gradually, stirring until well mixed.

This sauce is of average thickness. For thin sauce, allow one tablespoon butter and one tablespoon flour for each cup of liquid, whether it be milk, stock or tomato juice. For a thick white sauce that I use for croquettes or cutlets, allow two and one-half tablespoons butter and one-third cup flour to one cup of liquid.

Just a word about the proper method of boiling eggs. Place the eggs in a dish that has been previously heated. Pour over them boiling water, allowing about one quart for four eggs. Place saucepan where the water will not boil but be kept at a uniform temperature, just below the boiling point. Cook from five to six minutes if liked soft boiled, and from 20 to 25 minutes if hard boiled. The exact time must be learned by experience, as it depends on the initial temperature of dish and eggs and the character of the dish.

In using hard boiled eggs for making other dishes, plunge into cold water as soon as taken from the stove to prevent discoloration of

yolks, which we see so often in hard boiled eggs.

Eggs belong to the same class of food as meat. They are a good substitute for meat, for they are rich in proteid. That is the reason a perfectly cooked egg is not kept in boiling water. There is one good rule to remember in cooking. Foods rich in albumen should not be cooked at a high temperature, for it hardens the albumen, thus making such foods more difficult of digestion. White of egg is the purest form of albumen, therefore it is important to cook eggs at a low temperature to render them easy of digestion.

Timbale Cases.

Recipe.

Three-fourths cup flour, one-half teaspoon salt, one teaspoon sugar, one-half cup milk, one egg, one tablespoon olive oil. Mix dry ingredients, add milk gradually and beaten egg; then add olive oil. Beat ingredients with Dover egg beater until well blended. Shape, using a hot timbale iron, fry in deep fat until crisp and brown; take from iron and invert on brown paper to drain.

Heat the fat and when quite hot put in timbale iron, having fat enough to more than cover. It is important that the fat is just right, and the iron must be the proper temperature. If fat is not hot enough, you will have a soggy, greasy case. The temperature of iron can be tested by dipping point of iron in batter; if no batter adheres to the iron, it is either too hot or too cold.

When fried, the cases should be crisp; if soft, the batter is probably too thick and should be diluted with milk.

I do not like a smooth iron, for it is rather difficult to keep a case from dropping off when fried. The fluted irons can be purchased in any style; heart-shaped, diamond, round or oval.

When buying timbale cases from a caterer they charge 25 or 30 cents a dozen. I am sure the actual cost when made at home is not over 10 cents. I think you can get 20 or 25 cases from this recipe.

Today we shall fill these cases with creamed peas, but you may use creamed oysters, fish, chicken, sweetbreads, or creamed vegetables. They also make a base for desserts. Never fill with any mixture until ready to serve.

Creamed Peas.

Recipe.

Use same proportions as in white sauce for Eggs a la Goldenrod. These are canned peas, so were opened some time ago, washed and allowed to stand. They have a better taste.

Question—In heating the peas, do you let them stand in hot water before mixing with white sauce?

Miss Sater—Yes; just long enough to become thoroughly heated.

Rice With Cheese.

Recipe.

Steam one cup rice, allowing one tablespoon salt; cover bottom of buttered pudding dish with rice, dot over with three-fourths tablespoons butter, sprinkle with thin shavings of mild cheese and a few grains cayenne, repeat until rice and one-fourth pound cheese are used. Add milk to one-half the depth of contents of dish, cover with buttered crumbs and bake until cheese melts.

Rice is the poorest of all cereals in proteid and fat, but it contains fully 76 per cent starch. On account of the small amount of proteid present, rice is not adapted as an exclusive diet, but should be combined with substances rich in proteid and fat, such as milk, eggs, etc.

Prof. Atwater states that "a rice

fed people are invariably weak physically," and it has been demonstrated by others that they lack invention and enterprise, a condition certainly true of the poorer classes among the Orientals.

In steaming rice, allow three to three and one-half cups of boiling water for one cup of rice. Place in double boiler and steam until kernels are soft, usually 45 minutes to one hour.

In boiling rice, allow two quarts of boiling water for one cup of rice. Twenty minutes is usually sufficient for boiling, if rice is not too old. Drain in coarse strainer, let cold water run through rice to wash off the starchy water, and place in oven to heat again. It is better when serving rice as a dessert or vegetable to boil it, for the kernels are distinct. It is more mushy in steaming. Use a fork in stirring rice to avoid breaking the kernels.

Question—Do you ever cook rice in milk instead of water?

Miss Sater—Yes; when making desserts.

Coffee.

Recipe.

One cup coffee, one egg, three cups cold water, four cups boiling water.

Scald coffee pot, mixed coffee with egg slightly beaten, add cold water and stir thoroughly. Place on range and let come to boiling point. Add the boiling water, and place on back of range where the coffee will not boil. The egg clears the coffee. Pouring in a little cold water will clear coffee also, but the egg gives it a rich flavor. Good coffee should be a rich amber color. If not boiled it has a cloudy appearance; if boiled too long, too much tanic acid is developed.

THIRD SESSION.

Thursday Afternoon, March 15, 1906.

COMMON SENSE ECONOMY.

Mrs. Clara I. Ransom, Endeavor, Wis.

In the feast of good things we have had set before us in the last three days, I feel as did Peter of old, and say: "It is good to be here." I feel incompetent to stand here and teach, although I have spent my life practicing that one thing—economy, and have always tried to mix it with common sense.

I know as I look into your faces that I am talking to women who are not striving to seek out for themselves some prominent field of service where they can attract the attention of the world, but are willing to be what God intended them to be, true helpmates to their husbands and kind mothers; who are prudent, industrious and are willing to use their brains in the careful planning of every duty; their hands in labor for those they love, and who are capable of making the place for which the French have no word that can be translated into the English word "home." The Americans have the word but not the article many times.

Economy is a hard subject to handle, because of the differences in tastes and requirements in different persons. Thoughtless people are apt to think these habits of saving penurious, but on the contrary they are the most generous and unselfish. The people who spend every cent as they go and take no thought for the morrow are generally the selfish ones, and the most important of all, a woman should be willing to bear her full share of the burden of maintaining a home and not let any one persuade her that she is devoting herself to a low sphere of action. I know American women are all ambitious and aspiring; how can they be otherwise when all the men are? Housekeeping, whatever may be the opinion of the new woman of today, is an accomplishment not to be disparaged and in comparison to the relations of real life and to the family all others seem trivial. It comprises all that goes to make up a well-ordered home, where the sweetest and best of our lives are enshrined. House-keeping should be learned in girlhood, instead of being taken up at marriage to be experimented on for the rest of one's life. A man will forgive his wife's inability to master one of Beethoven's Symphonies, but scorched steak and sour bread—never! The mother should teach her daughter all that goes to make up a well-ordered home—housekeeping, cooking and sewing. Do not let professors in classes teach her what should be your duty and pleasure to teach. A woman may be intellectual and accomplished, but if she is not a successful house keeper it is certainly discreditable to her, so no matter how talented a woman may be, or how useful in the society in which she moves, if she is an indifferent house-keeper it is fatal to her influence and a foil to her brilliancy.

System in Household Duties Important.

Many house-keepers there are in this broad land of ours who suffer grieviously for lack of practical

knowledge of the daily routine of the work of a house. They are intelligent, interested and anxious to learn, but from lack of training when young are almost helpless in the management and arrangement of their homes. Their daily work is a matter of care and worry, a shining example of labor never done, mainly because of a lack of routine or system. Business men appreciate the great assitance of a natural arrangement in which each duty with all its manifold small accompaniments has its time and place for accomplishent. It is a great help to a woman to systematize her work, but if she finds herself ignorant as to how to keep house, there is nothing very difficult for her to learn. If you make a poor batch of bread today, make a good one tomorrow, but an intelligent woman will succeed in most duties at the first trial. It often happens that a great deal of knowledge we did not know we possessed but has somehow found its way into our brain, will come readily to hand when needed.

If our great grandmothers heroically raised ten children and manufactured almost every article used by their families, even assisting in digging wells and rolling logs together to build a house, why should not their grand daughters take care of their families with all the surprising modern inventions? To be sure, the women of today have many claims on their time and strength that their grandmothers never heard of along social, literary and religious lines. They must attend to their religious duties, for "a woman without religion is like a rose without perfume;" they should study some to keep abreast with the wonderful age in which they are living, and all

Let Your Table be a Delight as well as a Necessity.

women have some social duties, for woman is a social creature, the associating with women of her own age and station in life keeps her young in mind, if not in body. The great lesson to learn is that work well done is robbed of its curse. No mother who has the happiness of her daughter at heart will neglect to teach her the duties of the household, and no daughter should be willing to remain ignorant of the smallest detail that contributes to the comfort and attractiveness of a home.

Some Lessons in Economy.

Economy in all things should be learned, but economy of time might be placed first. The greatest aid in economizing time is order, exact order, "a place for everything and everything in its place," as soon as the work is done. An orderly person will perform more work in a given length of time, other things being equal, than a disorderly person who is always searching for mislaid articles. Not only should the housekeeper be orderly, but each member of the family should keep his or her articles in order.

I see no reason why a woman should not use all manner of tools; why she should not be able to set a pane of glass, mend the gate, or paper a room; it will take no more good physical exercise than playing basket ball, rowing a boat, riding a bicycle, or baking china, as our well-to-do sisters do, and they are certainly more profitable exercise. A hammer and nails and a little care will keep a place in that neat order that so attracts one at sight. It looks as though people with live sensibilities and intelligence lived in it. Learn to use the hammer and paint brush.

Then a woman should do her work easily with all the wonderful labor-saving devices of the age; bread mixers, washing machines, and dish washers that will almost run themselves. But many of these things, while they remove heavy manual labor, often deceive us into undertaking more than we can carry out. Someone must supervise, and supervision is often more wearing than labor. Time is a good thing to save, but not at the expense of either physical or mental strength. The simpler a home is, the less the strain, the more elaborate we make it, the greater is the care of it, no matter how many labor-saving devices we may have.

The solution of the problem is perfectly plain. What we need in our homes is a much simpler style of living and we shall have it when we learn to live less for display and more for substance; more for comfort and less for ostentation.

Some Guides for Furnishing a Home.

Buy good, durable furniture. Better get a plain, well-made article of genuine wood, even if it is not so fashionable. Imitations are rarely satisfactory in furniture or carpets. Have nothing too good for ordinary wear or tear.

The carpets should be well chosen, of warm, neat pattern; stretch smoothly over a soft lining, which saves the carpets and deadens the sound. Always begin putting down a carpet in the corner to be covered by some large piece of furniture, as a carpet never runs quite true on a floor. Polished floors are nice, but a great care.

The lamps should be large and of the best pattern for safety. If they are bracket or hanging lamps, place them where they will light as many rooms as possible. My dining-room lamp hangs in such a way it lights the dining-room, the kitchen, and the pantry for ordinary work. Stint yourself nowhere in light, warmth and cleanliness.

We are responsible for the health of our families and must allow no scent or decay, whether from vegetables, meat or refuse in our cellars, and no old clothes or soiled linen to taint the air.

When Sickness Comes.

Do not get into the habit of calling in a physician for every simple complaint that comes to a family, but study the complaint carefully and use home remedies as much as possible. All women are born nurses, if they will only develop their talent. Your own common sense will teach you when a physician is needed. In nine cases out of ten, good nursing is more than medicine. And above all, avoid these wonderful cure-alls that flood the market.

The Family Sewing.

We really could not expect the average woman, with all her manifold duties, to do much sewing, unless she has a special gift in that line, but it hardly pays when neat, ready-made garments are sold for less than the retail cost of the material, still with cotton cloth in any width and the paper patterns sold so cheap, it is astonishing how successful one can be in making well-fitting garments.

Work dresses are best made from denim or seersucker. They cost but a trifle more than calico and they wash and wear so well. When you put a patch on a garment, put on a good big one, as the cloth is worn thin some distance around the hole.

The Woman with the Tray.

If a woman will plan her work carefully, I see no reason why she should not do her work easily and quickly. You have heard of 'The Man with the Hoe." I am the woman with a tray. I carry my tray upstairs with me, pick up lamps, papers, etc., and carry as many as I could at two trips with my hands. I take my tray down cellar and bring up at one trip everthing I need for the day. I set my table by stacking everything on the tray, and clear it off the same way.

In the evening I plan the work for the coming day. We generally take Monday to brush and put away Sunday clothes, clean lamps, change our beds, put clothes to soak and bake enough to last until washing and ironing are done. We always try to do some cooking while we are in the kitchen with steady fire.

Economical Selection of Meat.

Many house-keepers do not understand how to select meats wisely and to buy economically. Many women trust the butcher, or perhaps buy at hap-hazard without any clear understanding of what they want, and with no consideration at all for economy. A little knowledge of facts, with a moderate amount of experience and observation will soon enable us to buy economically.

The most expensive cuts of meat are not the most nutritious; their only virtue lies in being quickly and easily cooked and having a high-sounding appellation. The second and third cuts from the neck of beef are good boiling pieces. Plunging the meat into boiling water hardens the fibrine on the outside, encasing and retaining its rich juices. The whole theory of correct cooking in a nut shell is to retain as much as possible of the nutriment of the food. No salt should be added until the meat is nearly done, as it extracts the juices of the meat. Boil it gently, as rapid boiling does not hasten the cooking and every degree of heat above the boiling point is wasted. The round steak run through a meat grinder and broiled is a most appetizing dish. It is wonderful how little wealthy people get for their money. They buy the first half-ripe, out-of-season fruit or vegetables that are

placed on the market and after they have tasted them they wonder why they are not fond of them. Do not buy expensive fruit and vegetables, for they are usually tasteless, hot-bed products raised to please the eye and not the palate. In a short time the genuine wholesome article will be on the market and the price within the reach of all.

Household Accounts an Incentive to Economy.

..hether well-to-do, or in cramped circumstances, you will say that waste is a sin against yourself and the world. By keeping strict account of every cent received and paid out, you can guage your means, but within that limit be good to yourself and yours. Make the most of your money. Money is of use to feed, to clothe and to make you happy. It is no use to you if spent before it is earned, or if thrown away in nonsense. It is said that a wealthy French family will subsist on what the average American family wastes. It does not take any brains to throw food away, but it takes some to get it eaten. Many dishes are improved by being made over. I always make soup, salad and cake by the same recipe; whatever I have on hand goes in some of those dishes.

Place of Fruit and Vegetables in Household Economy.

As fruit is the most healthful of all foods, use it freely on the table; the variety that is the most plentiful and cheapest in the market. It is well to preserve some for winter use. Fruit for preserving should be carefully selected and not over-ripe, and, with the self-sealing glass jars to put it in is easily kept. I can more vegetables than fruit. Corn, peas, string beans and tomatoes are the favorite vegetables. I do not use any canning compound, simply cook tomatoes and put into cans. The string beans and peas I cook as I would for the table, then put them hot into cans and seal them, put them into a boiler of warm water and boil two hours. When I take them out I tighten the covers and run some warm beeswax around the rubber. I can corn by cutting it from the cob, packing it tight in cans, put on rubber and cover, screwing it tight. I put it in a boiler of water and boil four hours, then tighten top after allowing cans to partly cool in the boiler. All of these are like freshly picked from the garden and far superior to the tin-can article.

Purchasing the Household Supplies.

As far as possible buy all imperishable groceries at wholesale or in quantities, such as soap, starch, chocolates, etc. Your dealer will willingly sell quantities at reduced prices and it is quite a saving in the course of the year. There is no economy in buying inferior groceries, get the best and let the economy be shown in the way it is used. Let no part that is suitable for use be wasted. Did you know that apple parings make the finest jelly? Shun the paste-board store cooky.

A Knowledge of Foods Essential to Economy.

No one has mastered the art of cooking who does not know something of the chemical elements of foods and the purposes they serve when taken into the system. But do not get the hygienic craze and do not confound things healthful with things uneatable. It is best for those who wish to practice economy to know what foods will best supply the needs of a family and how the most real nourishment may be obtained. Have variety enough to make your food a delight, as well as a necessity. The whole system of family life depends on you. You are the engineer to feed the fire and keep the wheels

oiled. If you do your work well, your family will have strong bodies, steady nerves and clear brains with which to meet their work. There is a great work to be done in the American kitchen and if a woman strives nobly and conscientiously, I see no reason why victory should not perch on her banner of love.

I am afraid this all sounds very monotonous and prosiac to you, but that we earn money and throw it away in a foolish manner is unfortunately true.

DISCUSSION.

Question—Do you pack the corn real tight in the can?

Mrs. Ransom—Yes; up to about one-half inch of the top of the can, as the corn swells some in cooking. For peas and string beans fill the cans to the top.

Question—Do you seal it?

Mrs. Ransom—Yes; I put on a new rubber, screw the top down air tight. If any water gets in the can, it is liable to spoil the corn. Be sure to put a layer of corn husks in the bottom of the boiler.

Question—How long did you say you boil the peas?

Mrs. Ransom—Just about two hours, and they are just as fine as fresh peas.

Question—You do not put rubbers on the cans when you boil them, do you?

Mrs. Ransom—Yes; I put them on, but I tighten the cover after I take the cans out and if I think the rubber is not a good one I put on a new one.

Question—How long do you boil your oatmeal?

Mrs. Ransom—I never cook it so very long.

Question—Would that be 20 minutes or half an hour?

Mrs. Ransom—Yes. I can remember in the old-fashioned times when we put it on and cooked it the night before, but there is a starchiness to that kind of oatmeal. Now, I never do that, I cook it up quick in cold water. If you pour on boiling water it prevents the grain swelling and you have to cook it longer to get the grain properly and thoroughly cooked. Poorly cooked oatmeal is very distressing to a delicate stomach.

Question—Do you use oatmeal or rolled oats?

Mrs. Ransom—Rolled oats. We have gone back to the old-fashioned Scotch oatmeal, hominy and corn meal mush, all of these requiring more cooking, more chewing and more work for our stomachs. They say we will lose the use of our stomachs and teeth if we do not give them more work to do, which all predigested foods fail to do.

Question—You do not stir it while it is cooking?

Mrs. Ransom—I have a double boiler a cook it right up quick, stirring it as li le as possible, as that makes it salvy.

Question—Is the corn covered with water when you boil it?

Mrs. Ransom—Yes, it is. I should have emphasized that point. I put on water enough so I will not need to add any more, but if I do have to add any I use hot water instead of cold.

Question—Should the water come up to the top of the cans?

Mrs. Ransom—Yes. I lay the cans on the side. Just fill the boiler as full as I can, and sometimes I put in two layers of cans with corn husks between the layers.

Question—Do you let the cans touch each other?

Mrs. Ransom—Yes, it does no harm, unless you move the boiler, then they might press together and break.

Question—You put them in cold water?

Mrs. Ransom—Yes, I put them in

cold water. I commence to count from the time it begins to boil and iet it boil four hours.

Question—Which is the best rubber—the black, the red or the white?

Mrs. Ransom—I always buy the best rubbers. I get them for 10 cents a dozen.

Question—What age would you have this corn?

Mrs. Ransom—Do not take it too young, because if you do it will be soft. It wants to be almost to glazing, because in cooking it softens up; that is almost the last of our using the corn. It wants to be old, if it is not it is soft and mushy. We eat to much soft and predigested foods. Watch an Indian tear and chew his half-cooked meat from the bone. We envy them their strong, white, even teeth. Who ever heard of an Indian having dyspepsia and artificial teeth? They are not victims of the pre-digested food habit.

Mrs. Howie—You spoke of a woman papering her home and doing her own dress-making and all that. Now, perhaps a woman is not just inclined or fitted to do that; perhaps she does not like dress-making but she likes to be nicely dressed. Now, if she lives on a farm, would it not be much better for her to earn some money and have her dresses made by some one who is able to do the work? You would not compel a poor woman to do work she despises just because she needs to economize? Perhaps some woman on the farm will be adapted to raising a fine calf, perhaps she could do that perfectly and enjoy her work. Don't you think it would be a good idea for her to put her heart and mind on that and turn the money over for something she enjoys, make an exchange?

Mrs. Ransom—Certainly, I am that kind of a woman. I have had considerable experience with hired help and I have found that if I did not understand the work so I could direct it myself very often it would not be done in a satisfactory manner; a woman should understand how such work should be done, so she may direct the hired help.

Mrs. Howie—Don't you think we are a little foolish to do it, even if we are able? You said the trouble with us was we thought what other people thought. Why not apply that to ourselves. Every woman should be a perfect home-maker, but all housekeepers are not home-makers. The woman who has so much system she is almost painful is not always the ideal home-maker. A woman should understand how things should be done about her home, but if she can do something and exchange the labor for something she likes to do would it not be better? The dear Lord gave us talents and we should stick to those and not try to spread ourselves all over the world. We are like the man who gave the hen 41 eggs, he wanted to see "the blamed old thing spread herself."

Mrs. Ransom—That is just what a successful house-keeper must do. A successful farmer is the most intelligent of men. He has to study and understand the soil, the seed, the weather, the markets, the care and rearing of farm animals, the raising of fruit and garden and use every faculty and muscle he has, consequently he is healthier and longer lived than his brother, the professional man, who uses one faculty and a few muscles. The same with the housekeeper; the healthiest and happiest occupation that has ever been devised for women.

DOMESTIC SCIENCE AND ITS RELATION TO THE HOME.

Miss Adella Sater, Orfordville, Wis.

Among a great many people there has been a mistaken idea as to the real meaning of Domestic Science. How often do we hear that there is nothing practical about the Science, that it is only one of the many "fads" which we hear so much about, and that the instruction received is merely fancy cooking. I am sure you have all heard this remark, "That if their daughters can make as good pie and cake as their mothers, no schools would be necessary."

That is all very good as far as it goes, but conditions have changed somewhat and more is expected of a housewife. Schools and colleges are beginning to teach this new science. Its importance has been recognized, and citizens generally appreciate the work being done in these schools, and it will eventually find its place in the small towns and cities.

Domestic Science pertains to every department of home-making, and not merely with the cooking of meals. It takes up the science of cleaning and of hygiene, the care of the kitchen, household economics, the kind of food and its proper preparation.

Since this subject embraces so much and means so much to health and happiness, it is essential that at least an elementary knowledge of the principles of this science should be a part of every girl's education.

The first thing to be taught in any school is the science of health, the value of pure air and water, and what foods are necessary for a healthy body and the proper methods of preparing them.

It is impossible to discuss every branch of this subject in this paper, but before speaking of foods, I wish to speak of the kitchen.

The Kitchen the Index of the Home.

It has been said, 'there is such a close connection between the kitchen and the home that a story of the kitchens of the different nations would be the story of the homes of the nations. The mainstay of comfort in every home be it that of the millionaire or the man whose wage is but $10 per week, is in the kitchen."

Since the kitchen is the heart of the home it seems to me there should be more attention and thought given to the building of this room. Kitchens are very often too large. It takes a great deal of time and strength to perform the daily duties. Have a small kitchen with cabinet tables and stove arranged so the work can be done quickly and conveniently. I had the pleasure of helping to plan the kitchen in the institution with which I am connected and visitors invariably speak about the size, it being much smaller than is commonly seen in similar institutions.

I think every one will agree that the essentials of a successful kitchen are order, which is "heaven's first law;" cleanliness, which is "next to godliness" and eternal vigilance, which is "the price of success."

System in the Kitchen of Great Importance.

Too many housekeepers do not save steps in doing their ordinary work. Systematize the work. Pick out the most necessary things to be done each day and do them well. Have certain work for certain days of the week; plan meals for at least one

day and I find it a great help to plan for several days. The head must save the hands and the heels. We may get valuable ideas and many helpful suggestions from various magazines, and yet, after all every house-keeper must work out her own salvation.

Why is it we find so many nervous, fretful women after the day's work is over? Very often she does not know how to employ the time to the best advantage. Instead of planning her work so she will find time for her rest, for music, for art, and time for a certain amount of reading each day, her time is spent in overcoming difficulties created by her ignorance of all that pertains to the management of a home.

Knowledge of Foods Essential to Good Home-making.

The desire of every woman to bring her household expenditures within a reasonable limit has led many to a serious study of food values, and yet it is astonishing how few have clear ideas regarding the actual nutriment in the common food materials. "That the best is cheapest is not true of foods." In too many cases, even those who wish and try to economize, know very little as to the combinations which are best fitted for nourishment and have still less information as to the relation between the real nutritive value of different foods and their cost.

It has been said "The fate of a nation depends on how they are fed." To have a healthy mind there must be a healthy body. It is well known that a successful farmer does more than to buy good seed. If he is to be rewarded for his labor and get good crops, the soil must be cultivated.

Physicians have said that the various ailments and disorders found among many school children are due to malnutrition caused from an improper diet. This does not mean they do not get a sufficient amount of food, the error lies not in the amount, but in the kind of food.

Three times a day the housewife confronts these questions: What shall we have to eat? How shall it be prepared and served? What combinations are necessary to obtain as near as possible to a correct diet?

What is food? Anything which when taken into the body serves to build up the tissues, or to supply heat or energy. Cookery is the art of preparing food for the nourishment of the body. The body is composed of certain chemical elements which are found in the food. Every meal should be the result of the concurrence of all kinds of practical and scientific research. In selecting menus, monotony must be avoided. "Variety is the spice of life." My experience at the Ottawa Tent Colony has been that a higher standard of efficiency is attained and maintained by a variety of food, a change being made from one kind of meat to another, from one kind of vegetable to another, always, however, giving the body food stuffs in proper proportions to supply its demands. It is quite possible that any given food may have all the required constituents, but there may be too much of one and too little of another. Lack of one nutritive constituent is commoner than deficiency of all, or, in other words, an ill-balanced diet is more frequently met with than one which is deficient all around. The conclusion must be that a mixed and well-balanced diet is necessary for good health.

A California club woman states the following: "There is but few things on which health and happiness depends more than on the manner in which food is cooked. You may make homes beautiful, hang them with pictures, have them clean, airy and con-

venient, but if the stomach is fed with sour bread and burned meats it will raise such rebellions that the eye will see no beauty anywhere."

Scientific research on the part of chemists and food experts has aroused a great deal of interest on the part of many housewives, with a result of much improved kitchen conditions. The Department of Agriculture at Washington, D. C., sends out bulletins to farmers and housewives for the asking. No recipes are given in these bulletins, but fundamental principles are stated, based upon scientific research.

MISCELLANEOUS READING.

THE FARMERS' BOY.

Mrs. W. O. Benson, Hartford, Wis.

We have listened attentively and interestedly to able discussions on best methods of acquiring best results from all animals on our farms; the horse, the sheep, the dairy cow, the fatting steer, the pig and hog, and even the dog have all been well talked upon, but there is another little animal to be found on most of our farms that it might be well to devote a little time and attention to, and that is the farmer's boy.

Now, it has been well proven that to obtain best results from the dairy cow she must be kept in perfect comfort, she must not even be spoken to in a loud tone, and the same state of affairs exists with regard to all other domestic animals, excepting this boy animal. One might judge by the manner in which many farmers treat the boy that places were exchanged, the higher taking the place of the lower animal.

To the father of the boy we address ourselves now, and would ask of him to remember these words: "Like father, like son." If you domineer over your boy, if you allow him no pecuniary interest in the place, if you have not seen to it that at the opening of the district school he is well provided with good clothes and shoes, and all the required books, and when he grows older if you have not taken him into the firm and taught him to intelligently express his opinions and give his views in all business affairs; if you do not freely allow him the use of a horse and buggy when he wants to go away in the evening (indeed while he is dressing you might hitch up for him, then you need not fear that he will wait until you are engaged with your paper and sneak the horse by the door on the grass by the door to avoid the noise of the wheels and the hoofs on the pebbles of the driveway); if you, being a smoker yourself and being so selfish that you begrudge the boy even your poor company while indulging in the poor comfort of a poor smoke and he is compelled to sneak out behind the wood house to have his smoke by himself, fearing that you might see him in the act and repeat to him one of your terrible lectures that he is heartily tired of hearing and pays no attention to because he knows well that these faults and practices that you are rating him for exist in yourself and he has acquired them of you, if, I repeat, you have taken this course, you will not be pleased with the effect on your boy and will have made up your mind that boys don't pay any way, but, remember, "Like father, like son."

One of our writers has said "We judge the tree by what it bears," so when we meet with the steady, honest, upright young man, who has been raised on his father's farm and acquired his good practical education in the district school and finished in the high school of the nearby town, whether we meet this young man engaged in tilling the broad acres his father tilled before him, or if we meet him taking the foremost place in the large manufactories and business industries of the big city, for this is true of this type of farmer's boy, he gets the best place and the best pay in these institutions because he is

the most capable and trustworthy applicant, and in whatever capacity we meet this boy, we know that his father made it a study how to obtain the best results from the farmer's boy, and we very readily and truly say: "Like faher, like son."

And now the mother. I once heard a very gifted woman say—"What greater honor could be added to a woman's life than that she be the mother of a man?" Yes! But how much lies between the babe and the man? One of the first lessons of the mother to the boy should be implicit trust and faith in his father Even if the mother knows that the father's judgment is at fault in the training of the boy, she must not admit to the boy that such is the case. And above all things, do not let deceit creep in, do not hide the boy's wrong doings from his father; if the boy transgresses teach him to acknowledge his fault bravely, humbly, to ask forgiveness, and if punishment is administered, make him understand that the "way of the transgressor is hard." I have known mothers who, when the boy's father refused them spending money, would secrete it somewhere in the pantry on the shelf, in some cup, or under some dish, where the boy would find it before making his exit on a Sunday morning, to go and spend the day and the money, she did not know how or where. Oh, what a mistake! The foolish mother, thinking she was helping the poor boy to enjoy himself a little, he had to work so hard all the rest of the week, forgetting that "just as the twig is bent the tree inclines."

And now fond mother, do not make that common mistake of raking and scraping everything together to get enough money to send your John off to college or the university, or some of those institutions of learning just because your neighbor's boy of John's age is to attend there. It has probably been the aim and object of the neighbor's boy all his life to attain that height, while John would perhaps much rather hire out to chop cord wood; and by all means let the boy follow his inclinations. Instead of depriving the family of the use of that money which would send John to college for a term or two and from which he would derive no benefit, but would more likely be led into company the evil effects of which would follow him through the remainder of his life, instead of doing this let John hire out to his father or some neighbor, and do you see to it that if he works for his father that his father pays him for the work. And that well earned money you help John to invest in some way that will be safe and yield him a little yearly income. Then the money that would have taken him away to school, invest a goodly portion of that in newspapers and books, subscribe for a daily paper and a few weeklies, subscribe for all the local papers and pay for them; in this way help the boys to be public spirited and to patronize the home industries. Get some monthly magazines—Harper's, Scribner's and Munsey's,—do not think of getting along without the "Youth's Companion" for the boys, have a few good ladies' magazines for yourself and the girls. You will find that the boys will dip into them, too. And then make it a rule that all the birthday and Christmas in the family must be books. You will find they will much prefer to buy their own handkerchiefs and neckties and such, and will look forward eagerly for the book which they know will come from one to the other. Begin early to cultivate a taste for literature. We have found it a good rule in our family to have a great deal of reading aloud; whichever member begins a book is expected to read it aloud to the others. Let there be no room in

your house where there are not books and papers to be found, even if they are strewn about and litter up the place—they are the cleanest kind of dirt.

And then, some more of that money lay aside that you may all attend the concerts and lectures and entertainments during the winter. Let the father and mother go and take the children while they are smaller, and when the boy can go to these places by himself let his mother be his companion frequently. You need not go with him every time, but go once in awhile. And when you do go, don't go like a dowdy; don't think that any old thing will do for you to wear. Have good clothes and have them well made and in the prevailing styles. Don't wind a big, black scarf around your head and say that is good enough for a farmer's wife, who will look at me? Your boy will look at you and his heart will swell with pride and affection when he looks down at his well dressed, smooth faced, cheerful mother, and he says to himself, what would I not do for her? And so keep youthful for the boy's sake.

Let nothing in his life be so trifling that you do not take an interest in it. Be his confidant in all his childish troubles and grievances and he will naturally turn to you when the greater cares of life come to him, and there is not much danger of the boy coming to grief who makes a confidant of his mother. But in order to gain the boy's confidence, you must always have time to devote to him. What does it matter if this or that household task be not attended to if the boy needs your time? By losing this opportunity and then another and so another, the time in the boy's life comes when the mother's wise counsel might have saved him, but she is too busy with her household affairs, she has so many pies to bake, so many layer cakes and angel's foods, and rags to color for her new rag carpet, and all that sort of thing, she has no time to spare for the boys.

These things should not be so. Remember what it is to be the mother of a man, and remember also that "the hand that rocks the cradle is the hand that rules the world."

THE INFLUENCE OF FARM LIFE ON MORALS.

Mrs. E. D. Baker, Edmund, Wis.

The discussion of the best breeds of animals I am willing to leave to the farmer himself. Women have their opinions and preferences on the subject, but on the whole I think we are willing to concede this point to the husbands and brothers. But the kind of children this and the next generation have to take up the responsibilities of life, vitally concerns every mother of the land, and no one more so than the mother of the farmer boy or girl.

In speaking of the influence of farm life on morals, and on fitting the young for the great issues of life, I believe there is no place like the farm to inculcate those qualities of body and mind, those principles of honesty and virtue necessary to fulfill the requirements of a useful man and womanhood.

I believe the Divine command to "multiply and replenish the earth" is just as incumbent on the men and women of today as it was the day it was given utterance. I believe it is the duty of every man and woman who establishes a home to place children in it. The home is not complete without them. When we have done this, we have only begun the work set before us. The continuation of this work is the question vitally concerning every mother.

I believe we farmers wives have a great advantage in this work as we have everything necessary to sustain child life; the incentive to right living and healthy growth of body and mind, while the mothers in the towns and cities have many evils to contend with from the beginning to the end of the fight. We who have never known the temptations of city life from actual experience, can hardly conceive of the snares laid for the young of our towns and cities.

The "supreme court" of these households are often an unknown quantity in their own homes, the control of the children being left to the mother, who in turn, turns them over to servants or to the street, while they attend to the demands of society, the child giving account to no one for its actions.

Women of the country have comparatively none of these issues with which to contend. Here the child is early taught the lesson of industry and self-reliance; the boy with his father, the girl with her mother, become close companions and must of necessity know each other. We love and respect our friends as we know them. Our child loves and respects us as it knows us. Here lies our great opportunity. The parents who neglect this chance to gain their child's confidence can never estimate what they have lost, nor what they have withheld from their children.

It is not a difficult matter to gain the confidence of your child when it is young, but if this opportunity is neglected it is more difficult as the years go by, and when parent and child get out of touch, one's influence is lost to a vast degree.

We are all largely children of circumstances and we owe much of what we are to early influence and environment. It is true we can outlive or overcome our natural tendencies, but we need help from the beginning.

I well remember when I was a child I was too lazy to live. I can remember of crying because I had to dress every morning before I could have my breakfast and of thinking life held few pleasures if I must needs go through the process every day. But once, and it has been a life-long lesson to me, I was taken out of bed, heartily spanked and made to dress in five minutes. Since then I have been willing to make my toilet at least once a day, and I owe this change to a wise and adored mother.

I have found that life on a farm with husband and children to live and care for, is not conducive to a spirit of self-gratification and ease. Our mothers and grandmothers were pardonable for desiring an easier mode of livelihood than the farm, for their lives were one of toil from morn till eve. But we of today, with all of the comforts, many of the luxuries and comforts of our city neighbors, ought to be content, as indeed I believe we are.

Our daily newspapers, our telephones, our convenient railroads, and our spirit of progress bring us in touch with the whole world, and we have none of the baneful influences of the city. Here we can inculcate those principles of honesty and industry, sobriety and virtue, untrammeled by outside influences that outweigh our efforts in behalf of our child.

I know we have to work, and to work hard, but it is not as hard on us or on our child as the wakeful nights, the tear-dimmed eye, or the remorse of a night's debauch in questionable society.

The best in our hearts, the best in our homes and the best in our lives is none too good for our children. We want to educate them the best we can afford. It is the boy or girl raised on the farm who reaches the summit. The majority of our leading men in politics, finance and comerce today were raised on farms and the world will always have need of such.

PLANT BREEDING.

Wm. Toole, Baraboo, Wis.

(Written for and read before the Merrimac, Sauk County, Farmers' Institute, Feb. 26-27, 1903.

The subject chosen is a broad one and could not well be covered by a short paper suitable for this occasion, therefore we will consider it mainly from an agricultural standpoint.

At some other time, it might be desirable to speak of pollenation, and the floral envelope, of corrolla and calyx, and the office and functions of sepals and petals, filamet and anthers, style and stigma, ovary, embryo, etc., but so much can be done in plant breeding without resort to artificial crossing, we will touch but lightly on that phase of the subject.

Plant breeding mainly consists of continued selection from successive plant growths, for the sake of improvement in some directions, as increased yield, better quality, or greater variety or adaptation to certain conditions of climatic or other environment.

These improvements are more surely led up to through successive growing from seeds than in any other way, but the opinion is gaining among close observers that there is slight bud variation going on, which may be taken advantage of through graftage or cuttage, in the same direction as we get new varieties from that form of bud variation called a "sport." Many varieties of roses, chrysanthemums, carnations and other flowers and some kinds of fruit have been obtained by propagating from a single branch, which has differed from the balance of the plant or bush, but it is not yet proved that we may have trees more productive, or with fruit varying in color or flavor, because the cions have been selected from particular trees of the given variety.

For producing new varieties of roses, orchids, carnations, and other kinds of flowers, artificial pollenation is necessary for the sake of securing certain combinations, and probably in the creation of new varieties of fruits more artificial crossing and hyberdizing will be done than has been, but nature gives a hand so readily to this kind of work that many will always be satisfied with natural pollenation to help them get new varieties from seed.

With trees, shrubs or plants which are increased from graftage or cuttage, the new variety having been secured, the plant breeders work is

accomplished with that particular variety, but another problem confronts the breeder of varieties of farm crops, or other plants, which are only reproduced from seeds. The new variety being found, it is necessary to breed it to constancy, or even greater improvement.

There is a wide difference with different species in tendency to vary, as we see in clover as compared with wheat or oats, or tendency to mix or cross, as shown in corn or melons. The more a kind of plant is inclined to natural variation, the greater the difficulty in establishing a fixed character, and the greater the difference between any plant and its immediate parent, the stronger is the tendency of its progeny to revert towards the original type, but we know, as with the pansy, that constant breeding in one direction will establish a considerable degree of constancy.

As most farmers allow their varieties of grain to soon deteriorate, we may feel that the man who keeps his variety of corn, wheat or other grain up to the original standard of excellence is deserving of the worthy name of "Plant Breeder." In fact, if better care was taken of existing varieties, we need not be continually on the lookout for something new. I prefer to grow some varieties of garden peas myself for seed, rather than chance getting the same varieties in poorer quality from the dealers. We have grown the same variety of corn for about 20 years and others come to us for a new supply occasionally, because they have let theirs run out. If we had given as much care to breeding our corn as we have to our pansies, we would by this time have a still more superior variety.

In regard to breeding to fit to special environment of soil or climate, we know that the same species often differs in degree of hardiness in different latitudes, as well as adaptation to different soils, showing what nature has done in special breeding.

Much money has been spent by our government in procuring from other countries fruit, grains and forage plants, which through long periods of time have been bred up by the people of those countries, to fit them to conditions supposed to be similar to our own. We have hoped for much from Russian apples and the result has paid well for the expense and labor, yet this part of the world will not possess just the kinds needed until they have been bred up to. Turkestan alfalfa and grains from other places promise to do much for Wisconsin's farming, but if holding to present quality, or even improvement is not bred for, there will be continued need for getting fresh supplies from the original sources.

We expect and receive much benefit from our experiment station's testing of varieties and this is leading in some things up to plant breeding. It is to be hoped now that our short course students are organized as an "Experimental Association," they will take up plant breeding as part of their home work. They should not be content with receiving first benefit from the testing of varieties from the government, but also should accept these new varieties as a foundation for future improvement.

I was much interested in listening to the address of Professor Hays, of Minnesota, before our short course boys at their annual reunion at Madison. He told of the many thousands of dollars annual gain to this state, resulting from breeding up varieties of wheat which are more productive than any they have had heretofore, also of the many thousands of acres, 60,000, I believe, sown from the tenth

years increase from one grain of wheat.

I was interested some years ago in Professor Hays' plans to establish a more hardy variety of clover. Asking him about it, and also speaking about the possibility of breeding medium clover a little later and a variety of timothy earlier, so that the two might be fit for cutting at one time, he said that the hardy clover experiment was postponed because of the immediate importance of other experiments carried on. He thought the clover and timothy experiment might be sucecssful, but it was questionable if the timothy seed would sell in the market as well as some of the dozen or more varieties of timothy which he has originated.

One need not be a college professor to take up and make successful this plant breeding. Searching your wheat or oat fields, you may often find plants more hearty or with grain finer than the others which crowd them. Here is a chance to begin your selection. Several selections may be made and as many plats started. Soon culling out and rejection may follow, and in a few years you have a chance to see improvement made. If you have a good variety, save a little every year by hand threshing for your stock seed. Pure seed cannot be had from a threshing machine.

With corn more constant care in selection is needed for best results, because of tendency to mixture and variation. Secure the best variety obtainable for your locality and make a close selection each year, for a breeding plat. Choose for fodder as well as grain and have a standard which is strictly adhered to. Do not neglect to cut out before silking time the blind stalks, or any plant which you judge to be off from your line of breeding. A few years of such care will give you an exalted instead of a run-out variety, and if each farmer raised the best kind for his locality, the results would be many dollars added to the value of Wisconsin's farm production each year. No one has greater opportunities for selection than the farmer or market gardener, and the good housewife who loves her flowers may have opportunity to save for the world something of beauty which might otherwise be lost.

While there may not be much pecuniary benefit directly resulting to the individuals who make these plant improvements, the good done to agriculture at large may be incalculable and to the young there is no branch of nature study which would do more to cultivate the faculties of observation, comparison and discrimination than will this plant breeding. To be able to see the good things of life and to make use of opportunities ere they are gone, are qualities well worth cultivating.

There is one feature of plant breeding which does not receive the attention which it should. That is the adaptation of varieties to particular soils. In testing varieties, great yielding qualities are sought for. To prove this yielding power, the best of soil is chosen and little thought is given to the sandy soils which may be good of their kind, yet differ greatly in their needs from either the black prairie or rich clay soils. In choosing the No. 4 or Swedish oats as best at the Wisconsin Experiment Station, many varieties were tested, yet who knows but that some other varieties might be best suited for some particular soils.

There are yet great possibilities for further improvement in all lines of plant growth. We need beautiful roses approaching the hardiness of our wild ones. Our native fruits show natural variation enough to encourage hope for great improve-

ment. Much has been done with our native plums at our experiment station and elsewhere. Our native crab apples and two species of native cherries are being taken in hand. Peaches will yet be grown in Wisconsin as safely as the so-called "hardy perpetual" roses. When that coming seedling apple wins the Minnesota one thousand dollar prize, there will be so many other good varieties produced we will have an abundance of good kinds of apples. So much good in improving varieties has been accomplished by a few, we must expect that when each farmer acts on the belief that it is his duty to improve not only his breeds of stock, but also his varieties of farm crops, one cannot help wishing to live longer, to see the good things in store for Wisconsin farmers of the "Sweet Bye and Bye."

WORKINGS OF THE STATE LIBRARY COMMISSION.

Miss L. E. Stearns, Madison, Wis.

[Address at Round-up Institute at Plymouth.]

As a representative of the State Library Commission, I am very glad to respond to the request of the local library board and to say to you that you have here in Plymouth the best public library in any Wisconsin town of its size, and I am sure the local librarian will be very glad to have any of you visit the library. It has been administered on a most liberal plan toward the farmers. In many cases in the state, a tight line has been drawn and a farmer living across the street is not allowed to take books from the local library, but here they are glad to have all the people take books, and I am told that there are over 200 farmers drawing books from this library.

I have heard the question asked here as to how you could keep the boys on the farm. There are two things the boy does not have on the farm that he has in the city, and those are amusements and books. Of course the boy that goes to school has books, but when he has read all the books in the school and goes out on the farm, unless he has access to some library, he misses his reading

The System of Traveling Libraries.

Now, to meet that demand, the state of Wisconsin has established a state system of traveling libraries. The state for three years has been spending thousands of dollars each year to supply the children with reading matter in the schools.

Two years ago the state legislature made a small appropriation for the purchase of books to supply the demand from the farms, and we have now about 400 of what we call traveling libraries, 50 or 60 good books put up in a box, and we send them out to those who will organize one of the associations necessary to secure them. If any one here is interested in this matter and will send to Madison, to the State Librarian, for blanks, he will gladly respond. We have books, not only in English, but in German, Polish, Bohemian and French. We hope to have a free library at the county seat of every county, supported, in part, by the people of the county seat and, in part, by the whole county, and that the county library shall be supplied with all manner of reference books for the benefit of the people of the whole county.

Then we want public libraries in all the towns that can support them.

Then we want a system of traveling libraries and then we want a system under which a farmer, or any one of his family, can send for a certain individual book and receive it, and we want the representatives of the state of Wisconsin to push the bill in the interest of popular education, reducing the postage rate on books handled in that way. We hope every farmer in the state will help us secure this.

The expense of getting these traveling libraries is simply the payment of the freight on the box from Madison to your place. The books are kept six months, then returned to Madison and another box sent out, and all it costs you is the payment of the freight on the boxes.

THE FARMER'S WIFE.

Mrs. Eda M. Atwood, Trempealeau, Wis.

In this Institute you have talked about the horse and the cow, of swine, sheep, potatoes and corn, but I have heard nothing about the farmer's wife, so I have chosen a subject which, though not of special interest, will be a deviation from the well-beaten path of Farm Institute work.

When young farmers start out upon their chosen life work they do not choose for their wives the dolls of fashion or those girls who have merely pretty faces to commend them. The most intelligent and the most sensible girls having withal the beauty of youth, are the ones they ask to walk beside them on the journey of life. Thus, as a class, to begin with, they are fully equal, if not superior, to any other class of women. Upon their marriage they enter upon their new sphere, perhaps an entirely different one, with willing hearts, willing hands and willing feet. With youth and health and the prospect of happiness before them in the love and companionship of their strong, young husbands, there is everything to stimulate them to do their best. Why is it, then, that as the years glide along we see so often the forlorn picture I now draw your attention to.

As cares and duties accumulate these girls, now women, gradually withdraw from the pleasures of society, they drop from their list one after another of their girlhood friends, their music is neglected, books are rarely opened and papers scarcely glanced at, they even rob themselves of their slumber because time is so precious and the work must be done. The consequence of this over-work and over-strain is that the farmer's wife grows old and faded, spiritless and behind the times, her good clothes are so old fashioned that they cause remarks from the giggling school girls whose own mothers may be overworking to keep them at school. Every year adds only another wrinkle to those already stamped upon her brow and in twenty years from the time she begins this life she might not recognize herself in a comparison. Not by any means is this a picture of all farmers wives, far from it, and many a woman who has never lived on a farm is as overburdened and jaded, but you must all admit that it is often a too true picture, painted perhaps with too much shadow to be pleasing to the eye, but, nevertheless truly done. In looking at such a picture many a girl has declared she never would be a

farmer's wife, never; but when the right one came along she forgot all about it and unhesitatingly said "yes," even if he was a farmer.

Now let us see if we cannot lighten up our gloomy picture so that when middle age comes on we will discern a serene and peaceful look in place of the fretfulness and wrinkles, a pleasant sparkle to the eye, a buoyant step, a form well rounded with maturity but not stooped and aged prematurely, and hands that show—not that they do not work, for work is a duty and a blessing and laziness is sinful, but that they do know how to be restfully idle occasionally. Let us give our picture a touch of vermillion here and there to brighten it and we will have a model farmer's wife. Our surroundings cannot always be chosen, but let us rapidly glance at a few things that from observation, experience and mistakes, I believe will aid in producing our model. There is plenty to do in this great world of ours for all and surely a farmer's wife should not wish to be exempt, but I protest against this steady strain, physically and mentally, which results in broken down health and shattered nerves.

At the beginning I would suggest that her house be neither too large nor too small, one requiring too many steps and too much labor to care for and the other cramping and hindering the performance of her duties. The kitchen, pantry and dining room should have conveniently placed all the appliances needful to easily and quickly perform the work required in preparing the meals. Wood and water should be in abundance and placed conveniently near a good range. A refrigerator also is a necessity. It saves steps and prevents waste. A sewing room and a first class sewing machine is also needed for the family sewing and repairing, and for the laundry all the modern conveniences. These and more are absolutely required. If a woman's work be well done it adds so much to the happiness and comfort of a family and when poorly done entails so much misery upon those who are powerless to avert it. The dining room should be cool in summer and warm in winter. The sleeping rooms clean and well-ventilated. The sitting room should be always pleasant and inhabitable, and on the table should be found books and papers for perusal, in the windows a few attractive plants for a rest to the eye and comfortable chairs for a rest to the body. The work basket need not be utterly banished, for this room should be the family resort and also serve as a reception room for company. A parlor as often found is entirely out of place on a farm. A woman's friends will be more pleased to see her in a cheerful sitting room than in a parlor which is dark and stuffy in summer and cold and dreary in winter, which chills one's sociability upon entrance and into which the boys are never allowed to step.

"Cleanliness is next to godliness" they say. I protest against a woman being a slave to a spotless kitchen floor, nevertheless I would have her work neatly and be careful to avoid the unnecessary slopping and sozzling of the floor, the table, the pantry shelves and her own clothing which causes so much needless labor and makes her rooms untidy and uninviting. My model farmer's wife should never be seen with unkempt hair and unlaced shoes, with a dress gaping at the fastening or an apron on which the flies swarm in summer and in winter stands alone from grease and dirt. The farmer's wife, should always be well-groomed, like his horses. I would have her systematize her work and all things be done on the day and at the time it should

be as nearly as possible. For instance, divide up the weeks regular work, Monday washing, Tuesday ironing, Wednesday baking, Friday the general sweeping and cleaning, and Saturday baking again. The habit of systematizing everything is of untold help. When the week's work is thus successfully accomplished let the weary housewife rest from her labors and with her husband and children put on the Sunday garments, leave the week day cares locked up in the house and drive to church. The amount of rest that can be gotten out of this freedom, the drive and the mingling with others is an essential aid in producing our brightened picture aside from the religious gain.

I have left out Thursday, you say? So I have. There are always extra jobs coming along which one has not reckoned upon. A spare day gives us a margin and a chance to work in the extras into the week's work without crowding. Company may come. If there is an unfilled day the order of doing the work may be varied to accommodate any unexpected event and company will not, as it should not ever, be a burden. Or perhaps it gives a day for a social visit or a trip to town which will be restful change from the monotony of the daily routine.

Children, always a blessing, can not but bring with them endless care and labor, and yet what mother would exchange places with a childless woman and wear her crown of thorns. When the family is large the benefits to be derived from a systematic arrangement of the weekly work cannot be overestimated. If we run our household affairs on schedule time there will be much less friction and no collisions. Children are forever getting dirty, littering the house and wearing out their clothes. The elder girls should be taught to help with the work and save steps for mother as soon as possible. If there are no older girls teach the boys to be equally helpful. They are usually stronger to carry water and milk in and out than girls are and I know that boys can be taught to cook a meal or bake the bread full as well as a girl when necessary. Do you say it is girl's work? Well, so it is, but in the absence of boys I have seen girls bring in the wood, feed the calves, milk the cows and build the fire in the morning, and it was done just as well as a boy could do it if not a little bit better. Our duty is to help wherever that help is needed, and is there a man here who assisted when a boy in lightening the cares of his mother who would now blush to own it? Does it make him less manly? No, indeed! Duty well performed brings with it a self satisfaction even when it consists in doing what is usually termed "girl's work." Let boy or girl learn how to do everything useful that comes along and do it well. It will increase the power for usefulness in the man or woman.

Another thing a woman needs is out door air. If you shut a man up in the house all day, a week, a month, a year, how would he bear it. He would feel some like a caged lion. With the surroundings that some women have he might even be tempted to fret and scold, which would be very naughty. Are the requirements of men and of women so different in regard to fresh air? Should the mere difference of sex confine one to the four walls of a house with only the outlook from window or door, while the other revels in God's free air and sunshine and all the everchanging beauties of nature? By no means do I mean to infer that it is a man's fault that a woman is deprived of this blessing. As her duties increase she too readily drifts into the habit

of staying at home. She is too busy or too tired to go out, even though she is conscious it would benefit her. Now is the time when a man can do so much to prevent the sad picture I brought before you at first from becoming a reality. He can procure assistance in the house at least one day in the week to lighten the burden. He can dispose of the milk or cream to a creamery where the work of converting it into butter can be done without a thought of the tired housewife. If a hand separator is used the same room that contains it can be provided with a fire and water and a boy 16 years old can do his share of the milking, separate the milk, wash and scald the separator cans and pails ready for the next milking and attend school, too. The creamery is one of the greatest boons to the farmer's wife.

Then, too, a man could devote a little of his time and strength to the culture of flowers and satisfy a woman's love for the beautiful. He could hitch up the team and take her for a ride, even though it be only on an errand to a neighbor or to town, and besides all these once in every two years, if not oftener, he could go down into his pockets and provide her with the money to go on a fortnight's visit to mother, sister or friend. Such a change would do wonders to keep her young and he would be more than repaid on her return by the sparkling eye, the springing step. the renewed strength to perform and interest in the aforetime tiresome round of domestic duties. And don't wait, my brother, till she is too tired to enjoy such a trip.

Last, but not least, I would insist on more sleep. A woman once remarked "I have twenty things to do. The twentieth one is to have a nap so I will do that first," and she did and was better fitted thereby to do the remaining nineteen. If more weary women would do likewise, if, when they begin to feel their powers fail, they would devote a certain portion of the day to sleep, it would not only lengthen their days but enable them to grow old gracefully. Not half enough has been said or written about the value of sleep for weary bodies and brains. There are thousands of women in the land, to say nothing of the men and children, who are using up just a little more of their vital energy each day than they manage to lay by for that day and by doing so are gradually exhausting their balance in the bank of health and some day there comes a breakdown, a period of physical bankruptcy. An extra hour or two somewhere during the twenty-four devoted to sleep is the most precious means of recuperation from the daily program of the busy housekeeper and would probably prevent more than half of these disasters. And yet how few people take the full measure of nature's universal remedy! People have so little faith in nature and her promptings. It seems so much more "the thing" to take somebody's "tonic" or "rejuvenator" or to try the water cure, the salt cure, the faith cure, even, or something you can take from a bottle or measure in a spoon. It seems so ridiculously commonplace and inadequate to simply go to bed and go to sleep an hour earlier, later, oftener or all three. If the "sleep cure" were used as it should be half of our physicians would have no practice and could then with their knowledge and education make excellent farmers. Sleep being the restorer and replenisher of life's vital energy it is not enough to have barely sufficient for each day's requirements. The reservoir should be always full and ample for the droughty times of trouble and affliction and unusual care. There is no danger of sleeping too much or

too often. To sum it all up, needful rest and recreation are as essentially a duty as work and in the end the time devoted to this will be found to be not wasted.

Let these suggestions be carried out as nearly as circumstances will permit and our picture will have received those touches of color which will change it to one charming to behold and the pleasure of living will be enhanced to both husband and wife and the children will go out into the world with the conviction that nowhere could there be found a home equal to the one they have left and whose influence will be felt forever.

[Recognizing that cement is to be the building material of the future, we believe it will be profitable to Wisconsin farmers to study this bulletin—Ed.]

CEMENT MORTAR AND CONCRETE: PREPARATION AND USE FOR FARM PURPOSES.

[Farmers' Bulletin No. 235, U. S. Dep't. of Agriculture.]

INTRODUCTION.

The many letters received and referred to the Office of Public Roads with reference to the use of cement and the adaptability of concrete for various farm purposes have made it seem advisable to issue a short bulletin on the subject, in which a proper method of mixing concrete is described, together with a few of the many uses for which concrete is well adapted. No attempt has been made to give a technical discussion of the subject, the sole object being to treat in an elementary way those points in concrete construction which are of particular interest to the farmer.

CEMENT.

The term "hydraulic cement" is applied to one of the most useful materials of engineering construction and one which in recent years has become widely extended in its field of application. Hydraulic cement possesses the property of hardening, or setting, under water, in which respect it differs from lime, which does not harden except in the presence of air. Thus it is evident that in all places where air is excluded, such as foundations, thick walls, etc., cement mortar should be used instead of lime.

Only two classes of cement will be discussed here—Portland and natural. The difference between these is due partly to the method of manufacture and partly to the condition and relative proportions of the materials employed, which are, generally speaking, limestone and clay. In the manufacture of Portland cement the separate materials are mixed in such proportions as have been found by experience to give the best results. The mixing is done by grinding the materials together in mills, after which the mixture is burned at a very high temperature in kilns, and the resulting clinker ground to an impalpable powder is known as Portland cement. In the case of natural cement the materials used have been already mixed by nature in approximately the correct proportions, being found in the form of a rock which is generally classed as a clay limestone, or a limey deposit technically called

calcareous clay. This material is burned at a much lower temperature than Portland cement. When the manufacturer has each ingredient absolutely under control and can adjust the proportions to suit all conditions, it is reasonable to expect that a better and more uniform product will result than when the materials are found already mixed. Portland cement is far more extensively employed than natural cement on account of its superior strength, although the latter is frequently used in cases where great strength is of little importance. The superior strength and durability of cement as compared with lime, together with the low price at which it may now be procured, have caused the former to replace the latter in engineering construction to a great extent.

Storing Cement.

In storing cement care must be exercised to insure its being kept dry. When no house or shed is available for the purpose, a rough platform may be erected clear of the ground, on which the cement may be placed and so covered as to exclude water. When properly protected, it often improves with age. Cement is shipped in barrels or bags, the size and weight of which usually are as follows:

Bulk and weight of cement in ordinary barrels and bags.

Kind of Cement.	Per Barrel.		Per Bag.	
	Quantity.	Weight (net).	Quantity.	Weight (net).
	Cu. ft.	Po'nds.	Cu. ft.	Po'nds
Portland	3½	380	⅞	95
Natural*	3½	300	¾	75

*Western natural cement usually weighs about 265 pounds per barrel net.

CEMENT MORTAR.

Cement mortar is an intimate mixture of cement and sand mixed with sufficient water to produce a plastic mass. The amount of water will vary according to the proportion and condition of the sand, and had best be determined independently in each case. Sand is used both for the sake of economy and to avoid cracks due to shrinkage of cement in setting. Where great strength is required, there should be at least sufficient cement to fill the voids or air spaces in the sand, and a slight excess is preferable in order to compensate for any uneven distribution in the mixing. Common proportions for Portland cement mortar are 3 parts sand to 1 of cement, and for natural cement mortar, 2 parts sand to 1 of cement. Unless otherwise stated, materials for mortar or concrete are considered to be proportioned by volume, the cement being lightly shaken in the measure used.

A "lean" mortar is one having only a small proportion of cement, while a "rich" mixture is one with a large proportion of cement. "Neat" cement is pure cement, or that with no admixture of sand. The term "aggregate" is used to designate the coarse materials entering into concrete—usually gravel or crushed rock. The proportion in which the three elements enter into the mixture is usually expressed by three figures separated by dashes—as, for instance, 1—3—5—meaning 1 part cement, 3 parts sand, and 5 parts aggregate.

In the great majority of cases cement mortar is subjected only to compression, and for this reason it would seem natural, in testing it, to determine its compressive strength. The tensile strength of cement mortar, however, is usually determined, and from this its resistance to compression may be assumed to be from

eight to twelve times greater. A direct determination of the compressive strength is a less simple operation, for which reason the tensile test is in most cases accepted as indicating the strength of the cement.

Mixing.

In mixing cement mortar it is best to use a platform of convenient size or a shallow box. First, deposit the requisite amount of sand in a uniform layer, and on top of this spread the cement. These should be mixed dry with shovels or hoes, until the whole mass exhibits a uniform color. Next, form a crater of the dry mixture, and into this pour nearly the entire quantity of water required for the batch. Work the dry material from the outside toward the center, until all the water is taken up, then turn rapidly with shovels, adding water at the same time by sprinkling until the desired consistency is attained. It is frequently specified that the mortar shall be turned a certain number of times, but a better practice for securing a uniform mixture is to watch the operation and judge by the eye when the mixing has been carried far enough. In brick masonry the mistake is frequently made of mixing the mortar very wet and relying upon the bricks to absorb the excess of water. It is better, however, to wet the bricks thoroughly and use a stiff mortar.

Grout.

The term "grout" is applied to mortar mixed with an excess of water, which gives it about the consistency of cream. This material is often used to fill the voids in stone masonry, and in brick work the inner portions of walls are frequently laid dry and grouted. The practice in either case is to be condemned, except where the conditions are unusual, as cement used in this way will never develop its full strength.

Lime and Cement Mortar.

L. C. Sabin* finds that in a Portland cement mortar containing three parts sand to one of cement, 10 per cent of the cement may be replaced by lime in the form of paste without diminishing the strength of the mortar, and at the same time rendering it more plastic. In the case of natural cement mortar, lime may be added to the extent of 20 to 25 per cent of the cement with good results. The increased plasticity due to the addition of lime much facilitates the operation of laying bricks, and has caused lime and cement mortar to become largely used.

Cement Mortar for Plastering.

In plastering with cement, a few precautions must be observed to insure good and permanent results. The surface to receive the plaster should be rough, perfectly clean, and well saturated with water. A mortar very rich in cement is rather a drawback than otherwise on account of shrinkage cracks which frequently appear. The mortar, consisting of two or three parts sand to one of cement, should be mixed with as little water as possible and well worked to produce plasticity. It is essential that the plaster be kept moist until it has thoroughly hardened.

Materials for Making Concrete.

Sand.

In securing sand for mixing mortar or concrete, if it is possible to select from several varieties, that sand should be chosen which is composed of sharp, angular grains, varying in

*Sabin, L. C., Cement and Concrete, 1905.

size from coarse to fine. Such sand is, however, not always obtainable, nor is it essential for good work. Any coarse-grained sand which is fairly clean will answer the purpose. If gravel, sticks, or leaves be present they should be removed by screening. The voids in sand vary from 30 to 40 per cent, according to the variation in size of grains. A sand with different-sized grains is to be preferred, because less cement is required to fill the voids. By mixing coarse and fine sand it is possible to reduce the voids considerably.

It is customary to use the terms "river sand," "sea sand," or "pit sand," according to the source of supply. River sand as a rule has rounded grains, but unless it contains an excess of clay or other impurities, it is suitable for general purposes. When river sand is of a light color and fine grained it answers well for plastering.

Sea sand may contain the salts found in the ocean. The tendency of these salts to attract moisture makes it advisable to wash sea sand before using it for plastering or other work which is to be kept perfectly dry.

Pit sand for the most part will be found to have sharp, angular grains, which make it excellent for mortar or concrete work. Where clay occurs in pockets it is necessary either to remove it, or else see that it is thoroughly mixed with the sand. The presence of clay in excess frequently makes it necessary to wash pit sand before it is suitable for use.

The results of tests made in this laboratory would indicate that the presence of clay, even in considerable amounts, is a decided benefit to "lean" mortars, whereas it does not appreciably affect the strength of a rich mixture.

Gravel.

It is important that gravel for use in concrete should be clean, in order that the cement may properly adhere to it, and form a strong and compact mass. As with sand, it is well to have the pieces vary in size, thereby reducing the voids to be filled with mortar. The voids in general range from 35 to 40 per cent.

Crushed Stone.

The best stone for concrete work consists of angular pieces, varying in size and having a clean, rough surface. Some form of strong and durable rock is to be preferred, such as limestone, trap, or granite. The total output of the crusher should be used below a maximum size, depending upon the nature of the work in hand. All material under one-eighth inch will act as so much sand and should be considered as such in proportioning the mixture. Precautions must be taken to insure a uniform distribution of the smaller pieces of stone, otherwise the concrete will have an excess of fine material in some parts and a deficiency in others.

Less than 8 per cent of clay will probably not seriously impair the strength of the concrete, provided the stones are not coated with it, and may even prove a benefit in the case of lean mixtures. The voids in crushed stone depend upon the shape and variation in size of pieces, rarely falling below 40 per cent unless much fine material is present, and in some cases reaching 50 per cent. A mixture of stone and gravel in equal parts makes an excellent aggregate for concrete.

Stone Versus Gravel.

It would appear from tests that crushed stone makes a somewhat

stronger concrete than gravel, but the latter is very extensively used with uniformly good results. This superiority of stone over gravel for concrete work is attributed to the fact that the angular pieces of stone interlock more thoroughly than do the rounded pebbles, and offer a rougher surface to the cement. A point in favor of gravel concrete is that it requires less tamping to produce a compact mass than in the case of crushed stone. Then, too, the proportion of voids in stone being usually greater than in gravel, a proportionately greater amount of mortar is required to fill the voids, which means a slight increase in the cost of concrete.

Cinders.

Cinder concrete is frequently used in connection with expanded metal and other forms of reinforcement for floor construction, and for this purpose it is well adapted on account of its light weight. Its porosity makes it a poor conductor of heat and permits the driving of nails. Only hard and thoroughly burned cinders should be used, and the concrete must be mixed quite soft so as to require but little tamping and to avoid crushing the cinders. Cinder concrete is much weaker, both in tension and compression than stone or gravel concrete, and for this reason admits only of light reinforcement.

Concrete.

General Discussion.

Cement concrete is the product resulting from an intimate mixture of cement mortar with an aggregate of crushed stone, gravel, or similar material. The aggregate is crushed or screened to the proper size as determined from the character of the work. In foundation work stone or gravel 3 inches in size may be used to advantage, whereas in the case of molded articles of small sectional area, such as fence posts, hollow building blocks, etc., it is best to use only such material as will pass a one-half inch screen. An ideal concrete, from the standpoint of strength and economy, would be that in which all voids in the aggregate were completely filled with sand, and all voids in the sand completely filled with cement, without any excess. Under these conditions there would be a thoroughly compact mass and no waste of materials.

It is a simple matter to determine the voids in sand and also in the aggregate, but in mixing concrete the proportions vary a great deal, depending in each case upon the nature of the work and the strength desired. For example, in the construction of beams and floor panels, where maximum strength with minimum weight is desired, a rich concrete is used, whereas in massive foundation work, in which bulk or weight is the controlling factor, economy would point to a lean mixture. When good stone or gravel is used, the strength of the concrete depends upon the strength of the mortar employed in the mixing and the proportion of mortar to aggregate. For a given mortar the concrete will be strongest when only enough mortar is used to fill the voids in the aggregate, less strength being obtained by using either a greater or less proportion. In practice it is usual to add a slight excess of mortar over that required to fill the voids in the aggregate.

It is more accurate to measure cement by weight, unless the unit employed be the barrel or sack, because when taken from the original package and measured in bulk there is a chance of error due to the amount of shaking the cement receives. As it is less convenient, however, to weigh the cement it is more common to measure it by volume, but for the reason stated this should be done with care.

Proportioning Materials.

For an accurate determination of the best and most economical proportions where maximum strength is required, it is well to proceed in the following way: First, proportion the cement and sand so that the cement paste will be 10 per cent in excess of the voids in sand; next, determine the voids in the aggregate and allow sufficient mortar to fill all voids, with an excess of 10 per cent.

To determine roughly the voids in gravel or crushed stone, prepare a water-tight box of convenient size and fill with the material to be tested; shake well and smooth off even with the top. Into this pour water until it rises flush with the surface. The volume of water added, divided by the volume of the box, measured in the same units, represents the proportion of voids. The proportion of voids in sand may be more accurately determined by subtracting the weight of a cubic foot of packed sand from 165, the weight of a cubic foot of quartz, and dividing the difference by 165. *

For general use the following mixtures are recommended.

1 cement, 2 sand, 4 aggregate, for very strong and impervious work.

1 cement, 2½ sand, 5 aggregate, for ordinary work requiring moderate strength.

1 cement, 3 sand, 6 aggregate, for work where strength is of minor importance.

Aggregate Containing Fine Material.

In the case of gravel containing sand, or crushed stone from which the small particles have not been removed by screening, the amount of such sand and fine stone should be determined and due allowance made for it in proportioning the mortar.

When mixing an aggregate containing small particles with mortar, the same conditions obtain as if these particles had been screened from the aggregate and added to the sand used in making the mortar, and in reality we have a mortar containing a larger proportion of sand than was present before the aggregate was incorporated. It is evident, then, that in such cases the quality or richness of the mortar should depend upon the proportion of fine material in the aggregate.

For example, suppose that 1 cubic foot of gravel contains 0.1 cubic foot of sand, and that the voids in gravel with sand screened out measure 40 per cent. For general purposes this would suggest a 1–2–5 mixture, but since each cubic foot contains 0.1 cubic foot sand, 5 cubic feet of gravel will contain 0.5 cubic foot sand, and the proportions should be changed to

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* The following will serve as an example of proportioning materials: Assume voids in packed sand to measure 38 per cent and voids in packed stone to measure 48 per cent. Cement paste required per cubic foot of sand=0.38+1-10×0.38=0.42 cubic foot, approximately. By trial 1 cubic foot of loose cement, lightly shaken, makes 0.85 cubic foot of cement paste, and requires $\frac{0.85}{0.42}$ or 2 cubic feet of sand, approximately, producing an amount of mortar equal to 0.85+2 (1—0.38)=2.09 cubic feet. Mortar required per cubic foot of stone =0.48+1-10×0.48=0.528 cubic foot. 0.85+ 2(1—0.38)=2.09 cubic feet. Mor- will require $\frac{2.09}{0.528}$ =4 cubic feet of stone, approximately. The proportions are therefore 1 part cement, 2 parts sand, 4 parts stone. Although such a determination is usually considered unnecessary in practical work, it may be of sufficient interest to justify giving it.

1 part cement, 1½ parts sand, 5 parts gravel.

Mechanical Mixers.

It has been demonstrated that concrete can be mixed by machinery as well, if not better, than by hand. Moreover, if large quantities of concrete are required, a mechanical mixer introduces marked economy in the cost of construction. None of the various forms of mechanical mixers will be described here, since concrete in small quantities, as would be used on the farm, is more economically mixed by hand.

Mixing by Hand.

In mixing concrete by hand a platform is constructed as near the work as is practicable, the sand and aggregate being dumped in piles at the side. If the work is to be continuous, this platform, should be of sufficient size to accommodate two batches, so that one batch can be mixed as the other is being deposited. The cement must be kept under cover and well protected from moisture. A convenient way of measuring the materials is by means of bottomless boxes or frames made to hold the exact quantities needed for a batch.

A very common and satisfactory method of mixing concrete is as follows: First measure the sand and cement required for a batch and mix these into mortar as before described. Spread out this mortar in a thin layer and on top of it spread the aggregate, which has been previously measured and well wetted. The mixing is done by turning with shovels three or more times, as may be found necessary to produce a thoroughly uniform mixture, water being added if necessary to give the proper consistency. The mixers, two or four in number, according to the size of the batch, face each other and shovel to right and left, forming two piles, after which the material is turned back into a pile at the center. By giving the shovel a slight twist, the material is scattered in leaving it and the efficiency of the mixing is much increased.

Consistency of Concrete.

A dry mixture, from which water can be brought to the surface only by vigorous tamping, is probably the strongest, but for the sake of economy, and to insure a dense concrete well filling the molds, a moderately soft mixture is recommended for ordinary purposes. Where the pieces to be molded are thin, and where small reinforcing metal rods are placed close together or near the surface, a rather wet mixture may be necessary to insure the molds being well filled.

Use of Quick-Setting Cement.

In the manufacture of such articles as pipe, fence posts, and hollow blocks, a rather large proportion of quick-setting cement is sometimes used, the object being to reduce the weight and consequent freight charges by means of a strong mixture, as well as to make the concrete impervious to water. The use of a quick-setting cement permits the molds to be removed sooner than would be possible with a slow-setting cement, thus reducing the number of molds necessary for a given output. Quick-setting cements are not recommended for such purposes, however, as they are usually inferior to those which set slowly.

Coloring Cement Work.

In coloring cement work the best results are obtained by the use of mineral pigments. The coloring matter in proportions depending upon

the desired shade, should be thoroughly mixed with the dry cement before making the mortar. By preparing small specimens of the mortar and noting the color after drying, the proper proportions may be determined.

For gray or black, use lampblack.
For yellow or buff, use yellow ocher.
For brown, use umber.
For red, use venetian red.
For blue, use ultramarine.

Depositing Concrete.

Concrete should be deposited in layers of from 4 to 8 inches and thoroughly tamped before it begins to harden. The tamping required will depend upon the consistency of the mixture. If mixed very dry it must be vigorously rammed to produce a dense mass, but as the proportion of water increases less tamping will be found necessary. Concrete should not be dumped in place from a height of more than 4 feet, unless it is again mixed at the bottom. A wooden incline may be used for greater heights. Rammers for ordinary concrete work should weigh from 20 to 30 pounds and have a face not exceeding 6 inches square. A smaller face than this is often desirable, but a larger one will be less effective in consolidating the mass. In cramped situations special forms must be employed to suit the particular conditions. When a thickness of more than one layer is required, as in foundation work, two or more layers may be worked at the same time, each layer slightly in advance of the one next above it and all being allowed to set together. At the end of a day there is usually left a layer partially completed which must be finished the next day. This layer should not be beveled off, but the last batch of concrete should be tamped behind a vertical board forming a step.

To avoid introducing a plane of weakness where fresh concrete is deposited upon that which has already set, certain precautions have to be observed. The surface of the old work should be clean and wet before fresh material is put on, a thin coating of neat cement grout being sometimes employed to insure a good bond. The surface of concrete to receive an additional layer must not be finished off smoothly, but should offer a rough surface to bond with the next layer. This may be done by roughing the surface while soft with pick or shovel, or the concrete may be so rammed as to present a rough and uneven surface. Wooden blocks or scantling are sometimes embedded several inches in the work and removed before the concrete hardens, thus forming holes or grooves to be filled by the next layer.

Retempering.

As stated before, it is important that concrete be tamped in place before it begins to harden, and for this reason it is proper to mix only so much at a time as is required for immediate use. The retempering of concrete which has begun to set is a point over which there is much controversy. From tests made in this laboratory it would appear that such concrete suffers but little loss of strength if thoroughly mixed with sufficient water to restore normal consistency.

The time required for concrete to set depends upon the character of the cement, upon the amount and temperature of the water used in mixing, and upon the temperature of the air. Concrete mixed dry sets more quickly than if mixed wet, and the time required for setting decreases

as the temperature of the water rises. Warm air also hastens the setting.

Concrete Exposed to Sea-Water.

Portland cement concrete is well adapted for work exposed to seawater, but when used for this purpose it should be mixed with fresh water. The concrete must be practically impervious, at least on the surface, and to accomplish this the materials should be carefully proportioned and thoroughly mixed. It is also of great importance that the concrete be well compacted by tamping, particularly on exposed surfaces.

Concrete Work in Freezing Weather.

Although it is advisable under ordinary circumstances to discontinue cement work in freezing weather, Portland cement may be used without serious difficulty by taking a few simple precautions. As little water as possible should be used in mixing, to hasten the setting of the cement. To prevent freezing, hot water is frequently used in mixing mortar or concrete, and with the same object in view salt is added in amounts depending upon the degree of cold. A common practice is to add 1 pound of salt to 18 gallons of water, with the addition of 1 ounce of salt for each degree below 32 degrees F. Either of the above methods will give good results but it should be remembered that the addition of salt often produces efflorescence. It seems to be a fairly well-established fact that concrete deposited in freezing weather will ultimately develop full strength, showing no injury due to the low temperature.

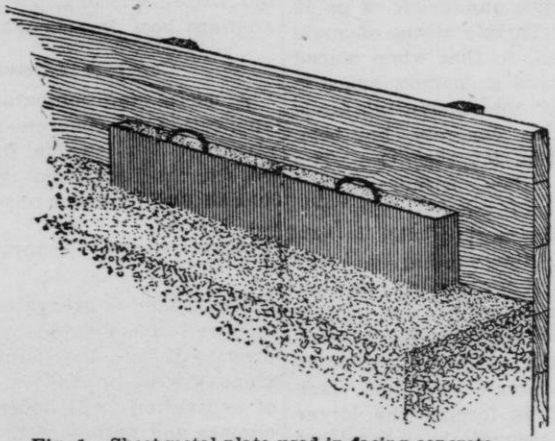

Fig. 1.—Sheet-metal plate used in facing concrete.

Rubble Concrete.

In massive concrete work considerable economy may often be introduced by the use of large stones in the body of the work, but only in heavy foundations, retaining walls, and similar structures should this form of construction be permitted. In placing these large stones in the work the greatest care must be exercised to insure each being well bedded, and the concrete must be thoroughly tamped around them. Each stone should be at least 4 inches from its neighbor and an equal distance from the face of the work.

To Face Concrete.

A coating of mortar one-half to 1 inch in thickness is frequently placed next the form to prevent the stone or gravel from showing and to give a smooth and impervious surface. If in preparing this mortar finely crushed stone is used instead of sand, the work will more nearly resemble natural stone. A common method employed in facing concrete is to provide a piece of thin sheet metal of convenient length and about 8 or 10 inches wide. To this pieces of angle iron are riveted, so that when placed next to the mold a narrow space is formed in which the cement mortar is placed after the concrete has been deposited behind it (fig. 1). The metal plate is then withdrawn and the concrete well tamped. The concrete and facing mortar must be put in at the same time so that they will set together. If the concrete is fairly rich, a smooth surface can usually be produced without a facing of mortar by working a spade up and down between the concrete and inner face of the mold, thus forcing the larger pieces of the aggregate back from the surface.

Wood for Forms.

Lumber used in making forms for concrete should be dressed on one side and both edges. The expansion and distortion of the wood due to the absorption of water from the concrete frequently make it difficult to produce an even surface on the work, and unless the forms are accurately fitted together more or less water will find its way out through the cracks, carrying some of the cement with it. A method sometimes adopted to minimize the effect of expansion is to bevel one edge of each board, allowing this edge to crush against the square edge of the adjacent board when expansion takes place. In the case of a wooden core or inside mold, expansion must always be taken into consideration, for if neglected it may cause cracks or complete rupture of the concrete. Sharp edges in concrete are easily chipped and should be avoided by placing triangular strips in the corners of molds. To prevent cement from sticking to the forms they may be given a coating of soft soap or be lined with paper. This greatly facilitates their removal and enables them to be used again with but little scraping. A wire brush answers best for cleaning the forms.

Concrete Sidewalks.

A useful and comparatively simple application of concrete is in the construction of sidewalks, for which purpose it has been used with marked success for a number of years.

Excavation and Preparation of Subgrade.

The ground is excavated to subgrade and well consolidated by ramming to prepare it for the subfoundation of stone, gravel, or cinders. The depth of excavation will depend upon the climate and nature of the ground, being deeper in localities where heavy frosts occur or where the ground is soft than in climates where there are no frosts. In the former case the excavation should be carried to a depth of 12 inches, whereas in the latter from 4 to 6 inches will be sufficient. No roots of trees should be left above subgrade.

The Subfoundation.

The subfoundation consists of a layer of loose material, such as broken stone, gravel, or cinders, spread over the subgrade and well tamped to secure a firm base for the main foundation of concrete which is placed on top. It is most important that the subfoundation be well drained to prevent the accumulation of water, which, upon freezing, would lift and crack

the walk. For this purpose it is well to provide drain tile at suitable points to carry off any water which may collect under the concrete. An average thickness for subfoundation is 4 to 6 inches, although in warm climates, if the ground is firm and well drained, the subfoundation may be only 2 to 3 inches thick or omitted altogether.

The Foundation.

The foundation consists of a layer of concrete deposited on the subfoundation and carrying a surface layer or wearing coat of cement mortar. If the ground is firm and the subfoundation well rammed in place and properly drained, great strength will not be required of the concrete, which may, in such cases, be mixed in about the proportions 1—3—6, and a depth of only 3 to 4 inches will be required. Portland cement should be used and stone or gravel under 1 inch in size, the concrete being mixed of medium consistency, so that moisture will show on the surface without excessive tamping.

The Top Dressing or Wearing Surface.

To give a neat appearance to the finished walk, a top dressing of cement mortar is spread over the concrete, well worked in, and brought to a perfectly smooth surface with straight edge and float. This mortar should be mixed in the proportion 1 part cement to 2 parts sand, sharp coarse sand or screenings below one-fourth inch of some hard, tough rock being used. The practice of making the concrete of natural cement and the wearing surface of Portland is not to be commended, owing to a tendency for the two to separate.

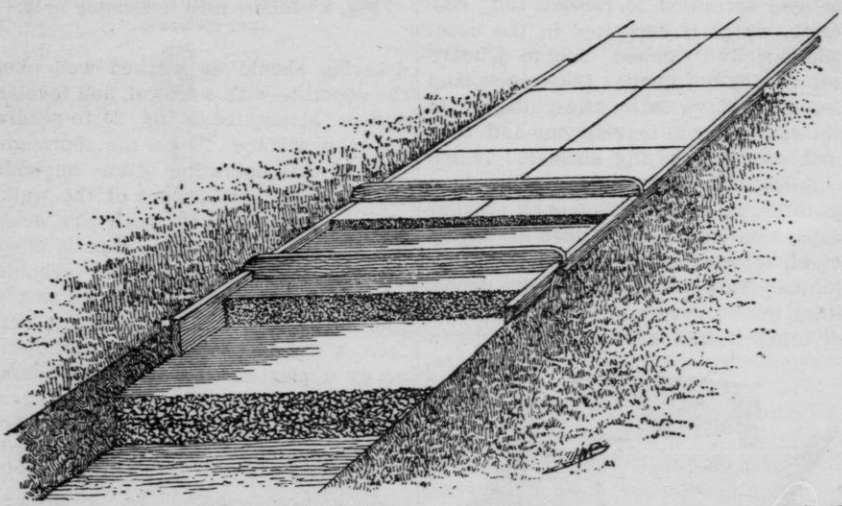

Fig. 2.—Details of concrete walk construction.

Details of Construction.

A cord stretched between stakes will serve as a guide in excavating, after which the bottom of the trench is well consolidated by ramming, any loose material below subgrade being replaced by sand or gravel. The material to form the subgrade is then spread over the bottom of the trench to the desired thickness and thoroughly compacted. Next, stakes are

driven along the sides of the walk, spaced 4 to 6 feet apart, and their tops made even with the finished surface of the walk, which should have a transverse slope of one-fourth inch to the foot for drainage. Wooden strips at least 1½ inches thick and of suitable depth are nailed to these stakes to serve as a mold for the concrete. By carefully adjusting these strips to the exact height of the stakes they may be used as guides for the straightedge in leveling off the concrete and wearing surface. The subfoundation is well sprinkled to receive the concrete, which is deposited in the usual manner, well tamped behind a board set vertically across the trench, and leveled off with a straightedge as shown in fig. 2, leaving one-half to 1 inch for the wearing surface. Three-eighths inch sand joints are provided at intervals of 6 to 8 feet to prevent expansion cracks or, in case of settlement, to confine the cracks to these joints. This is done either by depositing the concrete in sections, or by dividing it into such sections with a

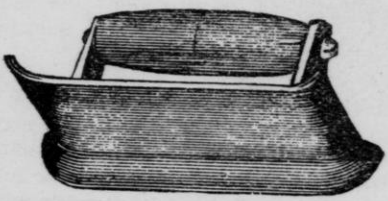

Fig. 4.—Tool used in rounding edges.

spade when soft and filling the joints with sand. The location of each joint is marked on the wooden frame for future reference.

Care must be exercised to prevent sand or any other material from being dropped on the concrete, and thus preventing a proper union with the wearing surface. No section should be left partially completed to be finished with the next batch or left until the following day. Any concrete left after the completion of a section should be mixed with the next batch.

It is of the utmost importance to follow up closely the concrete work with the top dressing in order that the two may set together. This top

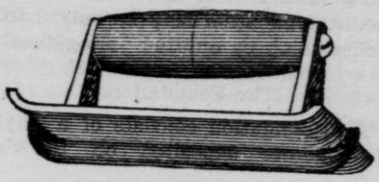

Fig. 3.—Jointer used in dividing walk into sections.

dressing should be worked well over the concrete with a trowel, and leveled with a straightedge (fig. 2) to secure an even surface. Upon the thoroughness of this operation often depends the success or failure of the walk, since a good bond between the wearing surface and concrete base is absolutely essential. The mortar should be mixed rather stiff. As soon as the film of water begins to leave the surface, a wooden float is used, followed up by a plasterer's trowel, the operation being similar to that of plastering a wall. The floating, though necessary to give a smooth surface, will, if continued too long, bring a thin layer of neat cement to the surface and probably cause the walk to crack.

The surface is now divided into sections by cutting entirely through, exactly over the joints in the concrete. This is done with a trowel guided by a straightedge, after which the edges are rounded off with a special tool called a jointer, having a thin shallow tongue (fig. 3). These sections may be subdivided in any manner desired for the sake of appearance.

A special tool called an edger (fig. 4) is run around the outside of the walk next to the mold, giving it a neat rounded edge. A toothed roller (fig. 5) having small projections on its

face is frequently used to produce slight indentations on the surface, adding somewhat to the appearance of the walk. The completed work must be protected from the sun and kept moist by sprinkling for several days. In freezing weather the same precautions should be taken as in other classes of concrete work.

Concrete Basement Floors.

Basement floors in dwelling houses as a rule require only a moderate degree of strength, although in cases of very wet basements, where water

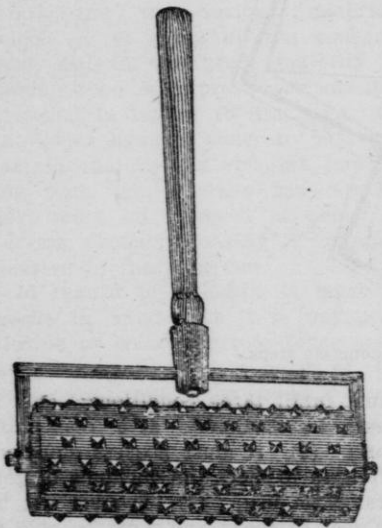

Fig. 5.—Roller used in finishing surface.

pressure from beneath has to be resisted, greater strength is required than would otherwise be necessary. The subfoundation should be well drained, sometimes requiring the use of tile for carrying off the water. The rules given for constructing concrete sidewalks apply equally well to basement floors. The thickness of the concrete foundation is usually from 3 to 5 inches, according to strength desired, and for average work a 1—3—6 mixture is sufficiently rich. Expansion joints are frequently omitted, since the temperature variation is less than in outside work, but since this omission not infrequently gives rise to unsightly cracks, their use is recommended in all cases. It will usually be sufficient to divide a room of moderate size into four equal sections, separated by one-half inch sand joints. The floor should be given a slight slope toward the center or one corner, with provision at the lowest point for carrying off any water that may accumulate.

Concrete Stable Floors and Driveways.

Concrete stable floors and driveways are constructed in the same general way as basement floors and sidewalks, but with a thicker foundation, on account of the greater strength required. The foundation may well be 6 inches thick, with a 1-inch wearing surface. An objection sometimes raised against concrete driveways is that they become slippery when wet; but this fault is in a great measure overcome by dividing the wearing surface into small squares about 4 inches on the side, by means of triangular grooves three-eighths of an inch deep. This gives a very neat appearance and furnishes a good foothold for horses.

Concrete Steps.

Concrete may be advantageously used in the construction of steps, particularly in damp places, such as areaways and cellars of houses; and in the open, where the ground is terraced, concrete steps and walks can be made exceedingly attractive. Where the ground is firm it may be cut away as nearly as possible in the form of steps, with each step left 2 or 3 inches below its finished level. The steps are formed, beginning at the top, by depositing the concrete behind vertical boards so placed as to give the necessary thickness to

the risers and projecting high enough to serve as a guide in leveling off the tread. Such steps may be reinforced where greater strength is desired or where there is danger of cracking, due to settlement of the ground.

Where the nature of the ground will not admit of its being cut away in the form of steps, the risers are molded between two vertical forms. The front one may be a smooth board, but the other should be a piece of thin sheet metal, which is more easily removed after the earth has been tamped in behind it. A simple method of reinforcing steps is to place a half-inch steel rod in each corner, and thread these with quarter-inch rods bent to the shape of the steps as shown in fig. 6, the latter being placed about 2 feet apart. For this class of work a rich Portland cement concrete is recommended, with the use of stone or gravel under one-half inch in size. Steps may be given a half-inch wearing surface of cement mortar mixed in the proportion 1 part cement to 2 parts sand. This system, as well as many others, is well adapted for stairways in houses.

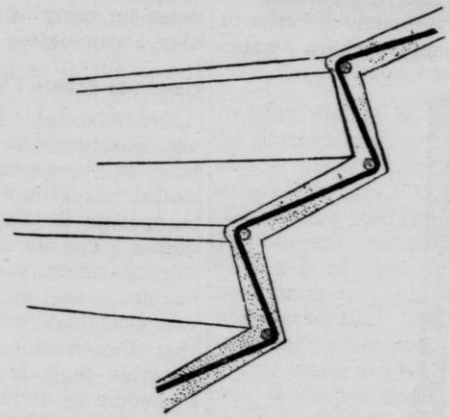

Fig. 6.—Reinforced concrete steps.

Reinforced Concrete Fence Posts.

Comparison of Different Post Materials.

There is a constantly increasing demand for some form of fence post which is not subject to decay. The life of wooden posts is very limited, and the scarcity of suitable timber in many localities has made it imperative to find a substitute. A fence post, to prove thoroughly satisfactory, must fulfill three conditions: (1) It must be obtainable at a reasonable cost; (2) it must possess sufficient strength to meet the demands of general farm use; (3) it must not be subject to decay and must be able to withstand successfully the effects of water, frost, and fire. Although iron posts of various designs are frequently used for ornamental purposes, their adoption for general farm use is prohibited by their excessive cost. Then, too, iron posts exposed to the weather are subject to corrosion, to prevent which necessitates repainting from time to time, and this item will entail considerable expense in cases where a large number of posts are to be used.

At the present time the material

which seems most nearly to meet these requirements is reinforced concrete. The idea of constructing fence posts of concrete reinforced with iron or steel is by no means a new one, but on the contrary such posts have been experimented with for years, and a great number of patents have been issued covering many of the possible forms of reinforcement. It is frequently stated that a reinforced concrete post can be made and put in the ground for the same price as a wooden post. Of course this will depend in any locality upon the relative value of wood and the various materials which go to make up the concrete post, but in the great majority of cases, wood will prove the cheaper material in regard to first cost. On the other hand, a concrete post will last indefinitely, its strength increasing with age, whereas the wooden post must be replaced at short intervals, probably making it more expensive in the long run.

In regard to strength, it must be borne in mind that it is not practicable to make concrete fence posts as strong as wooden posts of the same size; but since wooden posts, as a rule, are many times stronger than is necessary, this difference in strength should not condemn the use of reinforced concrete for this purpose. Moreover, strength in many cases is of little importance, the fence being used only as a dividing line, and in such cases small concrete posts provide ample strength and present a very uniform and neat appearance. In any case, to enable concrete posts to withstand the loads they are called upon to carry, sufficient strength may be secured by means of reinforcment, and where great strength is required this may be obtained by using a larger post with a greater proportion of metal and well braced, as is usual in such cases. In point of durability, concrete is unsurpassed by any material of construction. It offers a perfect protection to the metal reinforcement and is not itself affected by exposure, so that a post constructed of concrete reinforced with steel will last indefinitely and require no attention in the way of repairs.

Reinforcement.

No form of wooden reinforcement, either on the surface or within the post can be recommended. If on the surface, the wood will soon decay, and if a wooden core is used it will in all probability swell by the absorption of moisture and crack the post. The use of galvanized wire is sometimes advocated, but if the post is properly constructed and a good concrete used, this precaution against rust will be unnecessary, since it has been fully demonstrated by repeated tests that concrete protects steel perfectly against rust. If plain, smooth wire or rods are used for reinforcement they should be bent over at the ends or looped to prevent slipping in the concrete. Twisted fence wire may usually be obtained at a reasonable cost and is very well suited for this purpose. Barbed wire has been proposed and is sometimes used, although the barbs make it extremely difficult to handle. For the sake of economy the smallest amount of metal consistent with the desired strength must be used, and this requirement makes it necessary to place the reinforcement near the surface, where its strength is utilized to greatest advantage, with only enough concrete on the outside to form a protective covering. A reinforcing member in each corner of the post is probably the most efficient arrangement.

Concrete for Fence Posts.

The concrete should be mixed with Portland cement in about the proportion 1—2½—5, broken stone or

gravel under one-half inch being used. In cases where the aggregate contains pieces smaller than one-fourth inch, less sand may be used, and in some cases it may be omitted altogether. A mixture of medium consistency is recommended on the ground that it fills the molds better, and with less tamping than if mixed quite dry.

Molds for Fence Posts.

Economy points to the use of a tapering post, which, fortunately, offers no difficulties in the way of molding. All things considered wooden molds will be found most suitable. They can be easily and quickly made in any desired size and form. Posts may be molded either in a vertical or horizontal position, the latter being the simpler and better method. If molded vertically a wet mixture is necessary, requiring a longer time to set, with the consequent delay in removing the molds.

Fig. 7 shows a simple mold, which has been used with satisfactory results in this laboratory. This mold has a capacity of four posts, but larger molds could easily be made on the same principle. It consists of two end pieces (a) carrying lugs (b) between which are inserted strips (c). The several parts are held together with hooks and eyes, as shown in fig. 7. To prevent any bulging of the side strips they are braced as illustrated. Dressed lumber at least 1 inch thick, and preferably 1½ inches, should be used. In fig. 7 the post measures 6 by 6 inches at the bottom, 6 by 3 inches at the top, and 7 feet in length, having two parallel sides. If it is desired to have the posts square at both ends the mold must be arranged as in fig. 8. This latter form of post is not as strong as the former, but requires less concrete in its construction. Great care in tamping is necessary to insure the corners of the mold be-

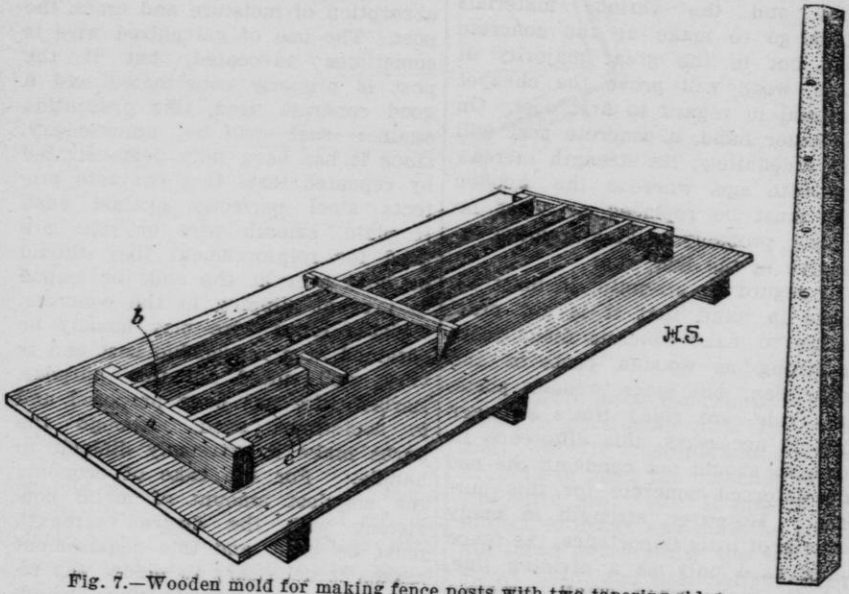

Fig. 7.—Wooden mold for making fence posts with two tapering sides.

ing well filled, and if this detail is not carefully watched, the metal, being exposed in places, will be subject to rust.

Attaching Fence Wires to Posts.

Various devices have been suggested for attaching fence wires to the posts, the object of each being to secure a simple and permanent fastener or one admitting of easy renewal at any time. Probably nothing will answer the purpose better than a long staple or bent wire well embedded in the concrete, being twisted or bent at the end to prevent extraction. Galvanized metal must be used for fasteners since they are not protected by the concrete. A piece of small flexible wire, about 2 inches in length, threading the staple and twisted several times with a pair of pliers, holds the line wire in position (fig. 9).

Molding and Curing Posts.

For proper method of mixing concrete see preceding instructions. It is recommended that only so much concrete be mixed at one time as can be used before it begins to harden; but if an unavoidable delay prevents the posts being molded until after the concrete has begun to set, it is thought that a thorough regaging with sufficient water to restore normal consistency will prevent any appreciable loss of strength, though the concrete may have been standing one or two hours. In using a mold similar to those illustrated in figs. 7 and 8, it is necessary to provide a perfectly smooth and even platform of a size depending upon the number of posts to be molded. A cement floor if accessible may be used to advantage. The molds when in place are given a thin coating of soft soap, the platform or cement floor serving as bottom of mold being treated in the same way. About 1½ inches of concrete is spread evenly over the bottom and carefully tamped, so as to reduce it to a thickness of about 1 inch. A piece of board cut as in fig. 7 will be found useful in leveling off the concrete to the desired thickness before tamping. On top of this layer

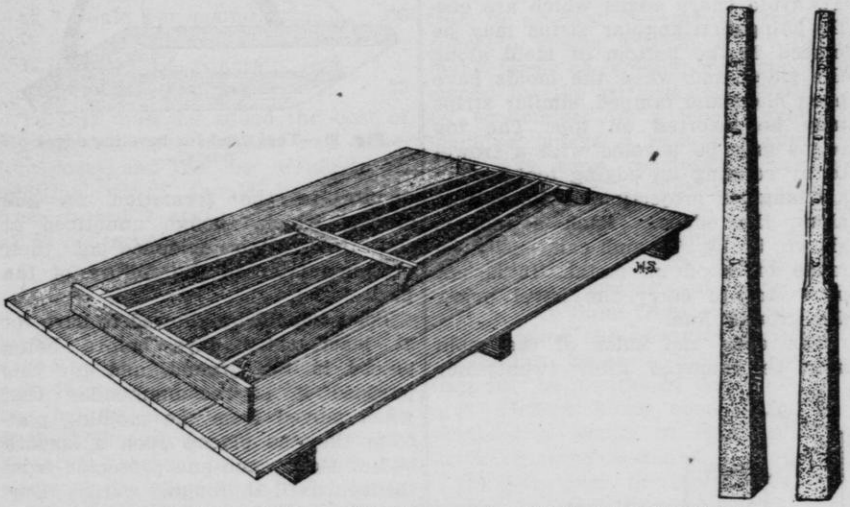

Fig. 8.—Wooden mold for making fence posts with four tapering sides.

two reinforcing members are placed about 1 inch from the sides of the mold. The molds are then filled and tamped in thin layers to the level of the other two reinforcing members, the fasteners for fence wires being inserted during the operation. These reinforcing members are adjusted as were the first two, and the remaining 1 inch of concrete tamped and leveled off, thus completing the post so far as molding is concerned. To avoid sharp edges which are easily chipped triangular strips may be placed in the bottom of mold along the sides, and when the molds have been filled and tamped, similar strips may be inserted on top. The top edges may be beveled with a trowel or by running an edging tool having a triangular projection on its bottom along the edges. Such a tool is shown in fig. 10 and can easily be made of wood or metal. It is not necessary to carry the bevel below the ground line.

The ends and sides of the mold may be removed after twenty-four

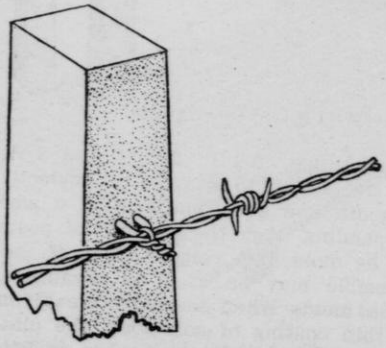

Fig. 9.—Detail showing method of attaching wire to post.

hours, but the posts should not be handled for at least one week, during which time they must be well sprinkled several times daily and protected from sun and wind. The intermediate strips may be carefully withdrawn at the end of two or three days, but it is better to leave them in place until the posts are moved. Although a post may be hard and apparently strong when one week old, it will not attain its full strength in that length of time and must be handled with the utmost care to prevent injury. Carelessness in handling green posts frequently

Fig. 10.—Tool used for beveling edges of posts.

results in the formation of fine cracks, which, though unnoticed at the time, give evidence of their presence later in the failure of the post.

Posts should be allowed to cure for at least sixty days before being placed in the ground, and for this purpose it is recommmended that when moved from the molding platform they be placed upon a smooth bed of moist sand and protected from the sun until thoroughly cured. During this period they should receive a thorough drenching at least once a day.

The life of the molds will depend upon the care with which they are handled. A coating of mineral oil or shellac may be used instead of soap to prevent the cement from sticking to the forms. As soon as the molds are removed they should be cleaned with a wire brush before being used again.

The cost of reinforced concrete fence posts depends in each case upon the cost of labor and materials, and must necessarily vary in different localities. An estimate in any particular case can be made as follows: One cubic yard of concrete will make 20 posts measuring 6

inches by 6 inches at bottom, 6 inches by 3 inches at top, and 7 feet long, and if mixed in the proportions 1—2½—5, requires approximately—

1.16 barrels of cement, at $2..	$2.32
0.44 cubic yard of sand, at 75c..	.33
0.88 cubic yard of gravel, at 75c.	.66
Materials for 1 cubic yard concrete	$3.31
Concrete for one post	.17
28 feet of 0.16-inch steel wire, at 3 cents per pound	.06
Total cost of concrete and metal for one post	.23

To this must be added the cost of mixing concrete, molding and handling posts, and the cost of molds, an addition which should not in any case exceed 7 cents, making a total of 30 cents per post.

Concrete Building Blocks.

Concrete building blocks, or cement blocks, as they are frequently called, are more extensively used now than ever before. These blocks are molded hollow primarily to reduce their cost, but this hollow construction serves other useful purposes at the same time. The fundamental principles governing ordinary concrete work, so far as proportioning and mixing materials is concerned, apply equally well to the manufacture of building blocks, and it should be borne in mind that strength and durability can not be attained by the use of any machine unless the cement, sand, and aggregate are of good quality, properly proportioned, and well mixed. The aggregate for blocks of ordinary size should be crushed stone or gravel not larger than one-half inch. One of the chief causes of complaint against the concrete building block is its porosity, but this defect is in a great measure due to the fact that in an endeavor to economize, too little cement is frequently used. It is not unusual to give the blocks a facing of cement mortar consisting of about 2 parts sand to 1 of cement, while the body of the block is composed of a concrete of sufficient strength, though not impervious. This outside layer of mortar adds practically nothing to the strength of the block, and is used simply to give a uniform surface and to render the face of the wall more nearly impervious to water.

It would not be practicable as a rule to attempt the manufacture of concrete blocks without one of the many forms of molding machines designed for the purpose, nor would it be economical to purchase such a machine unless a sufficient number of blocks were required to justify such an outlay. Blocks in almost any desired shape and size, with either plain or ornamental faces, may be obtained on the market, and in the great majority of cases it is best to buy them from some reliable firm. Among the advantages claimed for hollow concrete block construction may be mentioned the following:

(1) Hollow block construction introduces a saving of material over brick or stone masonry.

(2) The cost of laying concrete blocks is less than for brickwork. This is due to the fact that the blocks, being larger, require a much smaller number of joints and less mortar, and, being hollow, are of less weight than solid brickwork.

(3) A wall constructed of good concrete blocks is as strong or stronger than a brick wall of equal thickness.

(4) Concrete blocks, being easily molded to any desired form, will prove to be a far more economical building material than stone, which has to be dressed to shape.

(5) Experience has proved concrete to be a most excellent fire-resisting material.

(6) Concrete blocks, being hollow, tend to prevent sudden changes of

temperature within a house, making it cool in summer and easily heated in winter.

(7) The hollow spaces provide an easy means for running pipes and electric wires. These spaces may also be used wholly or in part for heating and ventilating flues.

DISCUSSIONS AT ONTARIO FARMERS' INSTITUTES, 1905.

Dairy Cattle.

Q. If turnips taint the milk what can be fed in their place?

A. R. C. Fowler, Emerald: Corn silage or mangels. The very large mangels are rather strong flavored, and there is some danger from them, so it is best to use some of the finer varieties. For example, the Yellow Intermediate.

Q. How do you dehorn calves?

A. D. James, Langstaff: By clipping the hair from about the horn; then putting some Gillett's Lye, reduced to consistency of cream, upon the place.

Q. How would you proceed in selecting dairy cows in a district where feeding cattle is of prime importance.

A. Select cattle that give milk in quantity and quality that will pay well. Have scales in the stable to weigh each milking, and get the milk tested and raise calves for dairying from the best cows thus tested.

Q. When do you feed your cows?

A. Always after milking.

Q. Do you think 6,000 pounds of milk too high a standard for a dairy cow?

A. It is not high enough; better have 8,000 or even 9,000 pounds.

Q. How do you remedy the trouble of not having the butter come in a reasonable time in churning?

A. One way is to have some of your cows freshen during each month of the year.

Q. Have you found that barley meal has a tendency to lessen the milk flow?

A. I have not, but have only fed it one year and then, with plenty of sugar mangels and ensilage.

Q. What time of the year do you prefer a heifer to come in?

A. In the fall. My experience is that the flow of milk is kept up longer.

Q. What do you recommend in the case of a cow that has a tendency to milk fever?

A. Be sparing in feed before calving.

Q. How much salt do you give a cow?

A. About one ounce a day. In summer they should have access to all the salt they want.

Q. What do you do for cows giving stringy milk?

A. A good purgative of salts.

Q. Do you find that dehorning calves makes them rough with each other?

A. I have not. Calves may be teased or so treated when young to make them so. Some cattle are naturally vicious, but I have no trouble.

Q. Would you get rid of a cow giving 5,500 pounds of milk?

A. Yes; if I could get another better to fill her place.

Q. Is separator milk injurious to calves?

A. Not if fed at right temperature, or in proper quantities; skim the froth off. Some give the calves all they will drink, which may be harmful.

Q. Can you give a cure for the Horn Fly?

A. W. C. Shearer, Bright: I gallon

crude petroleum; ½ gallon coal oil; ½ gallon fish oil; 1 cupful crude carbolic acid. Mix all together and apply in a spray over the cattle 2 or 3 times a week.

Q. What is the best breed of dairy cow?

A. There is no best breed, as there are poor milkers in all the breeds; but you cannot go wrong if you select good types of the dairy cow, from the Holstein, Ayrshire, Jersey, Guernsey, or Shorthorns of a milking strain.

Q. Can you get as much from a cow calving in November as if she calved in March?

A. Yes; I believe we can, as by keeping her up to normal all winter, we get an extra flow again on grass.

Q. Is it a good plan to cross dairy breeds?

A. John Donaldson, Port Williams, N. S.: No, as a rule, though, oftentimes a first cross will give excellent milking cows.

Q. Would you advise buying a Babcock test for ten cows?

A. Yes; if I could not get the skimming done at the factory.

Q. Do turnips injure the flavor of milk if fed immediately after milking?

A. Yes.

Q. Will ensilage injure the flavor of milk?

A. Never with good ensilage, but sometimes with immature corn the ensilage becomes sour and then it may have a tendency to do so.

Q. What is a cheap food on which to raise a dairy calf?

A. Feed with its own mother's milk for three weeks, then gradually change to skim milk with boiled flax seed for another three weeks; then change to grain gradually. After four months old, they will grow equally well on a mixture of 100 pounds boiled oil cake, 25 pounds ground flax, 50 pounds of low grade flour; mix all thoroughly together. Also supply some choice clover hay, bran, or crushed oats daily, with access at all times to pure, clean water.

Q. What do you consider is the best dairy breeds?

A. John Campbell, Woodville: Holsteins, Jerseys, and Ayrshires.

Q. Would you approve of using a Shorthorn bull in breeding for dairy purposes?

A. No.

Q. Would you feed distillery slop and brewer's grains?

A. Yes, but I want them sweet and fresh.

Q. Does it pay to feed slop made of ground grains?

A. No, not if water is before the cows constantly.

Q. Do you recommend the use of stock foods as advertised?

A. No, but at times some may be fed as a tonic with profit.

Q. Do you prefer a cow having a thin narrow face?

A. I like a lean face, a wide muzzle, and a fine appearance.

Q. Do you recommend putting Lucerne into the silo?

A. M. Richardson, Caledonia: No; I believe that since we can grow more bulk of corn per acre that it is best to silo the corn crop and cure Lucerne in the ordinary way.

Q. Can you water cattle cheaper than by growing roots for feed?

A. G. H. Hutton, Easton's Corners: More cheaply, but not so effectively The result of root feeding has been demonstrated over and over again.

Q. Are records made by breeds at shows, a criterion for the farmer?

A. The farmers may not be able to get anything like the results from any one of the breeds tested, still the various breeds are on the same basis and the results would indicate the relative value of the different breeds.

Q. How would you give a pound of salts to a cow?

A. Dr. H. G. Reed, Georgetown: Dissolve the salts in about a quart of warm water, fill a large bottle, elevate the animal's head and pour in the liquid slowly so as not to choke her.

Q. How long may the afterbirth be left before removing by hand?

A. Not longer than 48 hours.

Q. Is it worth a farmer's time to make any attempt to break a case of milk fever?

A. He had better not treat the animal himself. It is now very successfully treated by veterinary surgeons.

Q. I bought a pure-bred Ayrshire cow and crosesd her with a Holstein, and then crosesd the progeny with a Jersey and have got first-class dairy cows.

A. You may have good dairy cows, but it is not because of your extraordinary crosses. Had you bred along the Ayrshire line in which you started you would probably have got just as good milking cows, and by keeping the breed pure, your cows would be much more valuable than your present, very much cross-bred animals.

Q. How do you account for so much waste around the inside of the wooden silo next the boards?

A. Geo. Carlaw, Warkworth: The boards become dry in the summertime and when the green corn is put in in the fall, the boards absorb the moisture from the corn and make it dry and light and therefore will not pack.

Q. Do you prefer a round silo?

A. Yes. In a square silo there is always more or less waste in the corners and in a round silo there are no corners to contend with.

Q. What is the cause for so much moisture running away from the bottom of silos?

A. F. A. Sheppard, Queenstown: A great many people, especially in the northern section, have been raising the large-growing dent varieties of corn, which do not get well enough matured before frost comes. Better to grow Compton's Early, Longfellow, or King Philip.

Q. What variety of corn do you think best for silo purposes?

A. L. E. Annis, Scarboro': Wisconsin's Earliest White Dent, or Leaming Improved, are both good croppers, mature early, and have good ears.

Q. What makes the best silo?

A. W. C. Shearer, Bright: A concrete is most durable and may be even cheapest in the end; but costs about $2.00 to $2.50 per ton of capacity. The round tub silo is filling a good place, preserves its contents equally well, and only costs about $1.00 per ton of capacity.

Q. What is the best method of cooling milk?

A. R. C. Fowler, Emerald: Every man knows his own facilities for cooling better than I do. You can cool with ice or cold water by setting the pails or can in it and stripping the milk so that a thick layer of cream will not form on the top. Whatever method is used, cool as low as possible, using as few implements as possible. Each one must use common sense as regards the best method.

Q. Is airing or aerating milk not better than cooling with ice?

A. No. In nearly all cases airing or aerating is only a means of cooling and is only beneficial to the extent of the cooling. In our hot summer weather the air is not sufficiently cool to bring the milk to a low enough temperature; besides this, airing, if done in an impure atmosphere, or with a larger airer which is not perfectly clean, is apt to do more harm than good

Q. Is milk likely to become contaminated while on its way to the factory?

A. Not very likely, but road dust is a bad source of infection and we are

apt to get some of it into the milk. If the milk is as cool as it should be, germs will not increase until the milk is heated at the factory and then the maker understands what to do.

Q. Is there any way of getting a better quality of tin in our pails and cans?

A. Yes; pay the price. The poor quality of tin used in our pails and cans was brought into use by the price of tin rising, and the people demanding cans at the old price. If we go to a reliable dealer and tell him that we want the very best tin, regardless of the price, we will get it and I think it would pay in more ways than one to do so. First, our can would last much longer; second, there would not be so much danger of little rust spots for filth to gather and spoil our milk.

Horses.

Q. What in, your opinion, are the best breeds of heavy horses?

A. Thos. McMillan, Seaforth: The Clydes and Shires crossed upon the heavy mares of our country.

Q. Is it advisable to patronize Percheron and Belgian stallions?

A. No; these breeds do not transmit the same valuable class of animals when crossed upon the Canadian draft mares. If you have Percheron or Belgian blood to start with it is well to continue in those lines, but the great majority of our Canadian mares are of either Clyde or Shire extraction.

Q. Is it desirable or profitable to work brood mares directly after the foals are dropped, during the suckling period?

A. Not for the first two or three weeks and preferably not for a month after foaling and then only in an emergency.

Q. Do you consider it a mistake to blend the Clyde and Shire strains in our breeding operations?

A. Forty years experience in the crossing of these two strains in Western Ontario, has proved that it is a benefit rather than an injury to do so and that deterioration in no way, neither in size, quality or desirable conformation, results from such a system of breeding.

Q. What other desirable results would accrue from the blending of these two strains?

A. The end would be that ultimately in this country we would be able to establish a distinctive breed of Canadian draft horses which is now represented by 90 per cent of the heavy horses which are in the hands of the general farmers of Western Ontario. We are yet a young country, and if during this generation we did nothing more along this line than lay the foundation of such a breed of animals, so broad and deep that future generations would recognize the wisdom of our action we would have accomplished much.

Q. At what age should young mares be bred?

A. In Scotland, many of their young mares are bred at two years of age, and if fillies at that age are fairly well developed there is more chance of getting started to breed at that age, and I have seen no injurious results from it.

Q. Is it injurious or dangerous to feed horses on barley or pea grain?

A. Yes. In this Province of Ontario horses so fed are much more liable to ailments of colic and indigestion than if fed upon oats or wheat bran, which is the healthiest and safest grain food for the work horse.

Q. Should work horses be fed upon whole or crushed grain, and is it better to mix the grain ration with more bulky portion of fodder?

A. Work horses can be fed more cheaply and safely by breaking the oat grain and mixing with so much cut hay.

Q. Does it pay to fatten a work horse for sale?

A. Yes; many farmers of Western Ontario have found this a profitable business.

Q. What do you consider the best winter fodder for growing colts?

A. Dr. H. G. Reed, Georgetown: A small allowance of roots each day will do all right.

Q. Which is the most injurious food for horses, dusty hay or dusty oats?

A. I think probably the hay would be the worst, but they are both very bad.

Q. Does the feeding of clover hay cured green, cause horses to be soft?

A. T. G. Raynor, Ottawa: No; I believe not. That is the very best way to have it cured.

Q. Have you had any experience in feeding ensilage to horses?

A. F. A. Sheppard, Queenston: Yes, we have been feeding it now to our horses for four years with good results. We feed a small ration of silage night and morning, mixed with a little oat chop and bran to balance it up, and feed clover hay at noon. Our horses keep in good condition and appear perfectly healthy.

Q. I have a mare which has gone blind from repeated attacks of sore eyes. Would you advise me to breed her?

A. She should not be bred, as that form of blindness is certainly hereditary and would likely appear in the progeny.

Q. If a cross is made between a pure-bred Clyde and a pure-bred Shire can the progeny be registered?

A. An animal bred in this way can be registered in the Dominion Horse Breeders' Society but the government stamp is never affixed to this pedigree, neither is it endorsed by the Canadian Horse Breeders' Association.

Sheep.

Q. What line in meat-making on the farm yields the most profit?

A. John Campbell, Woodville: Fat lambs at present, and they do so on the average. Supply and demand make variations in profits.

Q. What kinds of meat cost least to produce?

A. Lambs under ten months, nine times out of ten.

Q. Do you approve of roots in feeding sheep?

A. Swede turnips are the best known for growing lambs in winter. Ewes and lambs should be fed sparingly.

Q. When do you tail or castrate?

A. At 7 to 10 days tailing is done and 10 days later they are castrated.

Q. Compare profits with cattle feeding?

A. I think it is the most profitable of all meat making.

Q. Can you sell winter-fed lambs in limited numbers?

A. A good article seldom fails to find customers, be the number large or small.

Q. When do the finished lambs usually sell at top prices?

A. February, March and April.

Q. Have you ever kept lambs to the following summer?

A. Never, as they are often sold in the States where the duty on lambs is 75 cents, and on all over the year old mark $1.50. Thus on lambs the extra duty is saved, and the fleece on their backs goes in duty free.

Q. How many sheep should be penned together?

A. Twenty to twenty-five.

Q. What breeds are best for fattening purposes?

A. A cross between long wooled ewes and Down rams, preferably Shropshire males, as during the last ten years this strain has secured 90 per cent of the prizes at the show at Madison Square Garden, New York, and the International, Chicago.

Q. What system of feeding do you follow in the winter feeding of lambs?

A. One feed of unthreshed peas, two feeds of turnips and one feed of clover hay each day. I aim to give rather better than 1 pound of peas, in the grain and 5 pounds of turnips per day.

Q. Why is between January and May the best time for market lambs?

A. Because this is the season when the best prices can be secured, and there is room for such an advance over fall prices that to fatten them is a most profitable business.

Q. Is it not more profitable to sell off lambs in late fall?

A. No, by all means, as it is then the best profit is within reach.

Q. What are fat lambs worth at present?

A. Today Toronto markets offer 7 cents per pound, live weight.

Q. What kind of ewes would you recommend for best results?

A. Long-wooled grade ewes of good size and quality.

Q. What breed of ram would you use?

A. A short legged, thick-fleshed, compact, Shropshire ram.

Q. What are the prospects for the near future trade in sheep?

A. The best in thirty years.

Q. How can loss by dogs be prevented?

A. By yarding in dog enclosures in barn or in field.

Q. When should lambs drop for finishing in late winter?

A. In latter part of April and early May.

Q. Do you consider the prospects in the sheep trade encouraging?

A. Thos. McMillan, Seaforth: In my opinion they are. I consider the sheep industry the most profitable line of live stock husbandry at the present time.

Q. What is the best season for the average farmer to have his lambs come?

A. Just about the time the ewes can be turned to pasture in spring or about two weeks before.

Hogs and Bacon.

Q. Should the floor of a pig pen slant towards the trough or the rear of the pen?

A. W. C. Shearer, Bright: To the rear of pen, with the gutter at rear to drain off liquids.

Q. What age do you sell bacon hogs?

A. At from seven to eight months.

Q. Would it not be more profitable to make them go 200 pounds at five months?

A. No; I think that you would make a better bacon type by keeping the pig to seven months old.

Q. What is the best breed of bacon hog?

A. The long Berkshire, the Yorkshire and the Tamworth; or a cross-bred hog of any of those breeds will make a profitable bacon hog, but it is unwise to breed from the cross-bred.

Q. What do you think of artichokes for feeding pigs?

A. T. G. Raynor, Ottawa: They are a good feed but must be kept confined to a place where they will not sprout.

Q. What do you do with ruptured pigs?

A. Cut the pig and sow up the cut with a silk thread.

Q. At what age would you stop breeding a sow?

A. Only when she failed to raise eight pigs at a litter, no matter how old she would be.

Q. Which is the best, a pure-bred or a cross bred sow for raising bacon hogs?

A. G. H. Hutton, Easton's Corners: That all careful breeders use a pure-bred sire is a foregone conclusion,

and when a pure-bred sow is used one stands in greater certainty of securing first-class stock. On no account should a sow be used that is more than once removed from pure breeding.

Q. What is good for indigestion in pigs?

A. When roots or green feed are used, as they always should be, there will be little trouble from indigestion.

Q. What do you use in feeding your pigs?

A. Milk and barley meal are the principal feeds, but a few oats and small wheat are used occasionally with barley meal.

Q. How often do you feed your pigs?

A. Three times a day when kept in pen, twice when they are kept in the orchard and have access to the pen.

Q. How long should pigs be left on the sow?

A. From six to eight weeks, according to the season. Pigs should be allowed the freedom of a separate trough that they may learn to eat well before finally being weaned.

Q. Do you grind grain fine for pigs on the finish?

A. Yes, especially when pigs are being forced the grain should be finely ground, else a loss will be sustained.

Q. Does it pay to feed pigs until eight months of age?

A. D. James, Langstaff: I have found it pays me. I get a better quality of pork by not feeding so heavy, i. e., less fat, and the cost of feed is no greater than when rushed and they are less likely to be diseased.

Q. What do you use to keep pigs in order so that they will not get off their feed?

A. A mixture of charcoal or wood ashes with a small quantity of salt and sulphur.

Q. Do you feed the meal dry or wet?

A. Dry and in a separate trough, but I give them their drink feeding.

Q. How about butter in the general trade? Poor butter brings as much as good; small eggs bring as much as large ones. It is not fair, but it takes time to remedy these evils. There is no encouragement to grow the best.

A. W. S. Fraser, Bradford: Yes, there is the satisfaction of producing that which is helping to build up the market. Every one who is producing hogs of a good bacon type is enabling the packer to secure a better place in the market, by which he can offer better prices. Every one who is producing an unsuitable kind of hog is a hindrance rather than a help. On which side would you prefer to be? The good type is as easily produced as the inferior.

Q. Then the other fellow is getting as much for second-class stuff as I do for first class. It is not fair.

A. I agree with the gentleman, but there are many things like this in the world.

If a plate were passed around here for some charitable purpose you might put on $5.00, while some other person just as able to give would put on 5 cents. That would not be fair, but you would have the satisfaction of knowing that you had done your duty. The other fellow would know he had not. We should try to be helpers. Even in the hog raising we can show our patriotism.

Q. What advantage is there in raising the bacon hog?

A. The product of the bacon hog brings more money and the price of the bacon hog sets the price of all others.

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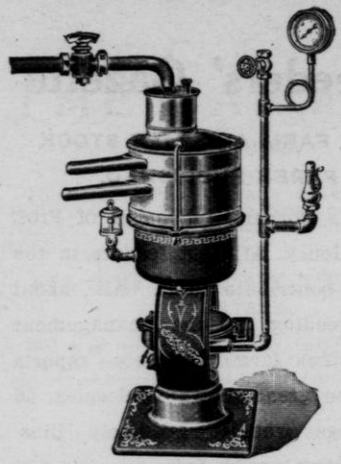
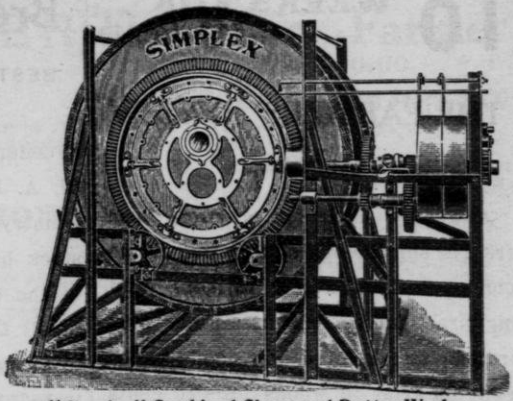


"Simplex" Link-Blade Cream Separator.



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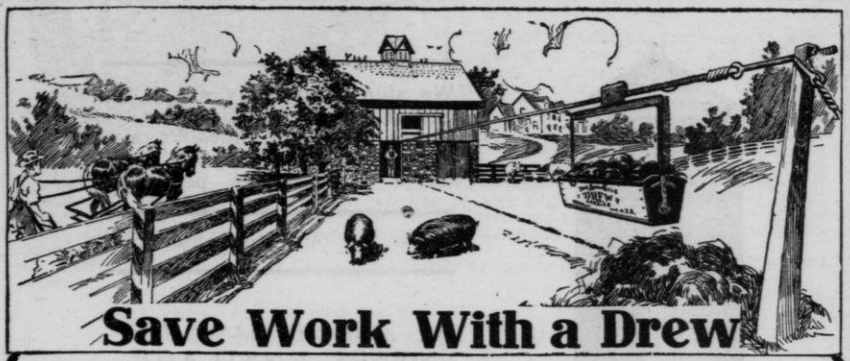

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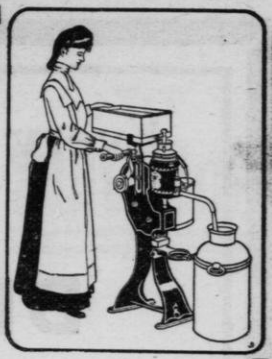

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are built for long service. A solid, low frame encloses **entirely** all the operating parts, protecting them from dirt and danger of injury. The parts are few, simple and easy to get at. Ball bearings at high speed points, combined with automatic oiling reduce wear as well as insure the easiest operation. Such careful and thorough construction is what enables the U. S. to better

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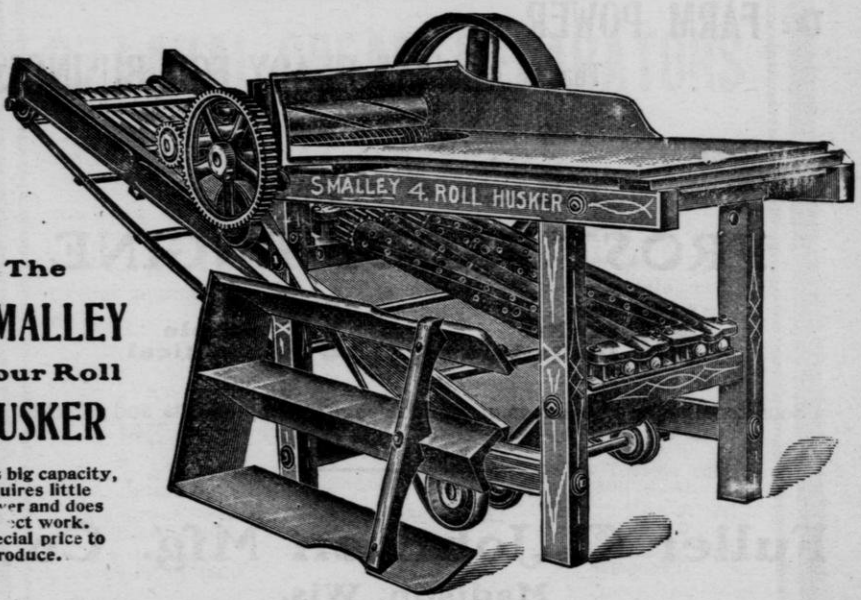

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