STATE OF NEW JERSEY

Forty-second Annual Report

OF THE

State Board of Agriculture

1915

Printed by Order of the Legislature

TRENTON, N. J.
MacCrellish & Quigley Co., State Printers.
1915

STATE OF NEW JERSEY

Forty-second Annual Report

OF THE

State Board of Agriculture

1915

Printed by Order of the Legislature

TRENTON, N. J.
MacCrellish & Quigley Co., State Printers.
1915

Letter of Transmittal.

To the Hon. James F. Fielder, Governor of New Jersey:

SIR—In accordance with the act creating the State Board of Agriculture, adopted April 22d, 1884, and with the provisions of the law approved June 15th, 1895, I have the honor to present the report of said board for the year 1914.

FRANKLIN DYE,
Secretary.

Dated Trenton, February 1st, 1915.

State Board of Agriculture.

OFFICERS AND EXECUTIVE COMMITTEE FOR 1914.

PRESIDENT.

JOS. S. FRELINGHUYSEN, ...Somerville, N. J.

VICE-PRESIDENT.

JOHN T. COX, ...Three Bridges, N. J.

SECRETARY.

FRANKLIN DYE, ...Trenton, N. J.

TREASURER.

J. HARVEY DARNELL, ...Masonville, N. J.

A. J. RIDER, ...Hammonton, N. J.
GEORGE E. DeCAMP, ...Roseland, N. J.
THEODORE BROWN, ...Swedesboro, N. J.

STATE CHEMIST.

CHAS. S. CATHCART, ...New Brunswick, N. J.

Board of Directors of State Board of Agriculture.

CLASS A.

ARTHUR P. SEABROOK,	Bridgeton,	Geological Survey.
HON. D. D. DENISE,	Freehold,	Board of Visitors, Agricultural College.
HON. E. T. GILL,	Haddonfield,	Board of Visitors, Agricultural College.
DR. J. G. LIPMAN,	New Brunswick,	Prof. of Agriculture.

CLASS B.

GEO. W. F. GAUNT,	Mullica Hill,	Master of State Grange, P. of H.
JOHN T. COX,	Three Bridges,	Sec'y of State Grange, P. of H.

CLASS C.

HOWARD F. DECOU,	Merchantville,	State Horticultural Society.
W. D. TROWBRIDGE,	Pattenburg,	Bergen County Pomona Grange.
BENJ. M. HAINES,	Moorestown,	Burlington Co. Pomona Grange.
MARTIN SCHUBERT,	Laurel Springs,	Camden & Atlantic County P. G.
JOSEPH CAMP,	Pierces,	Cape May Co. Pomona Grange.
M. B. HUSTED,	Cedarville,	Cumberland Co. Pomona Grange.
E. OSCAR DECAMP,	Roseland,	Central District Pomona Grange.
T. WOOD WYNNE,	Thorofare,	Gloucester Co. Pomona Grange.
		Hunterdon Co. Pomona Grange.
J. T. ALLINSON,	Yardville,	Mercer County Pomona Grange.
		Middlesex & Somerset Co. P. G.
HENRY W. HERBERT,	Englishtown,	Monmouth Co. Pomona Grange.
J. S. AYERS,	Salem, R. D. 3,	Salem County Pomona Grange.
		Sussex County Pomona Grange.
HENRY RACE,	Oxford,	Warren County Pomona Grange.

BOARD OF DIRECTORS.

NAME.	ADDRESS.	TERM.	COUNTY.
JOHN H. HUENCKE,	Egg Harbor City, R. F. D.,	2 years.	Atlantic.
J. L. PURZNER,	Egg Harbor City, R. F. D. 1,	1 year.	"
FREDERICK M. CURTIS,	Harrington Park,	2 years.	Bergen.
A. I. ACKERMAN,	Fair Lawn,	1 year.	"
EDWARD ROGERS,	Medford,	2 years.	Burlington.
CHAS. B. JESSUP,	Riverton,	1 year.	"
WM. HORNER,	Merchantville,	2 years.	Camden.
X. F. OTTIGER,	Berlin,	1 year.	"
L. D. COMPTON,	South Dennis,	2 years.	Cape May.
RALPH SCHELLINGER,	Green Creek,	1 year.	"

NAME.	ADDRESS.	TERM.	COUNTY.
L. Willard Minch,	Bridgeton, R. F. D.,	2 years.	Cumberland.
Wm. Ott,	Cedarville,	1 year.	"
E. R. Conklin,	Verona,	2 years.	Essex.
A. W. Fund,	Essex Fells,	1 year.	"
Amos Kirby,	Mullica Hill,	2 years.	Gloucester.
Henry Edwards,	Mullica Hill,	1 year.	"
Egbert T. Bush,	Stockton,	2 years.	Hunterdon.
H. E. Deats,	Flemington,	1 year.	"
Dan'l Y. Lewis,	280 Fairmount Av., Jersey City	2 years.	Hudson.
T. Loughran, Sr.,	28 Roumaine Av., Jersey City	1 year.	"
Fred. Gardner,	Robbinsville,	2 years.	Mercer.
Richard W. Cook,	Lawrenceville,	1 year.	"
Wm. B. Kurtz,	Bound Brook,	2 years.	Middlesex.
John M. Evans,	New Market,	1 year.	"
Chas. E. Craig,	Freehold,	2 years.	Monmouth.
D. H. Jones,	Freehold,	1 year.	"
S. E. Young,	Rockaway,	2 years.	Morris.
Wm. E. Spargo,	Dover,	1 year.	"
John W. Jamison,	Cassville,	2 years.	Ocean.
R. C. Graham,	Holmeson,	1 year.	"
Jos. J. Nellis,	Paterson, R. F. D. 1,	2 years.	Passaic.
C. Fred. Day,	Paterson, R. F. D. 1,	1 year.	"
H. M. Loveland,	Woodstown,	2 years.	Salem.
Louis Edwards,	Woodstown,	1 year.	"
Luther Martin,	Somerville, R. F. D.,	2 years.	Somerset.
Jacob D. Quick,	South Branch,	1 year.	"
Robert V. Armstrong,	Augusta,	2 years.	Sussex.
T. C. Roe,	Branchville,	1 year.	"
C. T. Woodruff,	Elizabeth, R. F. D.,	2 years.	Union.
E. R. Collins,	Westfield,	1 year.	"
Ernest Race,	Oxford,	2 years.	Warren.
A. Russell Paul,	Belvidere,	1 year.	"

OTHER ASSOCIATIONS.

J. D. Holman, A. J. Rider, ... American Cranberry Growers' Asso.
Walter Garrabrandt, ... N. J. Bee Keepers' Association.
..... Veterinary Medical Association of N. J.
Chas. J. Fisk, ... N. J. League of Poultry Raisers.
..... Princeton Agricultural Club.
J. W. Hendrickson, ... Mercer County Farm Bureau.
A. A. Cortelyou, ... N. J. Holstein-Fresi Association.
A. Engle Haines, ... Mt. Laurel Farmers' Club.

Forty-second Annual Meeting.

STATE HOUSE, TRENTON, N. J., January 27th 1915.

The meeting was called to order by President Frelinghuysen, who said: "This, the Forty-second Annual Meeting of the New Jersey State Board of Agriculture, will be opened by prayer by the Rev. Samuel Polk, pastor of the Lawrenceville Presbyterian Church."

The Rev. Mr. Pope offered prayer.

President Frelinghuysen—It is a great pleasure to welcome the delegates of the State Board this morning, and we meet this year with unusual problems confronting us. Never before in the history of our country were the agriculturalists looked to as so important and necessary agents for the prosperity of our country. And I think as the session develops we will realize that it will call for our best wisdom to meet and solve many of the problems that are to confront us. The first business will be the calling of the list of delegates.

Secretary Dye—Mr. President, we have this year delegates from Hudson county, which county did not formerly send delegates to this Board. I don't know that there is any vote necessary to admit them. They are here by law.

President Frelinghuysen—What is the pleasure of the Board in regard to that? A motion will be in order that they be admitted to this meeting. It is moved and seconded that the delegates from Hudson county, having formed an Agricultural Board there, be admitted. All in favor will vote Aye.

A vote being taken, the motion was unanimously carried.

The Secretary then called the roll, and the roll as called on this and the later calls was then made up as follows: (See list of delegates, page 5.)

President Frelinghuysen—The next business will be the presenting of the Order of Business.

Secretary Dye—In presenting the Order of Business, Mr. President, we have, at 11:15 to-morrow, an address by Hon.

Charles J. Brand, Office Markets and Rural Organizations, Washington. This morning we received a telegram from Mr. Brand, stating:

"I regret to advise recent developments make impossible my attendance your Forty-second Annual Meeting. Have detailed Clarence Q. Moomau, Specialist in Co-operative Organization, my substitute."

With that change, Mr. President, so far as I know, the program will be carried out as it has been printed.

President Frelinghuysen—If there is no objection, that will be the order.

ORDER OF BUSINESS.

January 27th, 1915, Wednesday.

FIRST SESSION.

10:00 A. M.–12:30 P. M.—Prayer.
Calling List of Delegates.
Presenting Order of Business.
Minutes of Last Meeting.
Announcing Committees Appointed: On Credentials; on Resolutions; on Treasurer's Accounts and any other Committees.
Reading of Executive Committee's Report.
Report of Treasurer, Mr. J. H. Darnell.
Report of Committee on Transportation and Freight Rates.
11:00 A. M.—Varieties of Potatoes. (Illustrated.) Mr. William Stuart, U. S. Bureau of Plant Industry.
11:45 A. M.—Spraying Experiments in New Jersey. Dr. T. J. Headlee, State Entomologist, New Brunswick, N. J.

SECOND SESSION.

2:00–5:30 P. M.—Call of the counties for representative of committee on nomination of officers for ensuing year. Each county is entitled by custom to one member of this committee.
Report on State Grange Work, Hon. G. W. F. Gaunt, W. M.
Report of Secretary of State Board, Franklin Dye.
2:30 P. M.—Annual Address of President of State Board of Agriculture, Hon. Joseph S. Frelinghuysen.
3:15 P. M.—Potato Growing. Mr. Serrine, Long Island, N. Y.
4:00 P. M.—Diseases of the Potato. (Illustrated.) Dr. W. A. Orton, U. S. Bureau of Plant Industry.
5:00 P. M.—Business of Potato Growers' Association.

THIRD SESSION.

8:00 P. M.—In State Normal School Auditorium.
Products and Possibilities of New Jersey Agriculture. (Illustrated with stereopticon slides.) Dr. J. G. Lipman, Director, N. J. Experiment Station.

January 28th, 1915, Thursday.

FOURTH SESSION.

9:30–12:30 A. M.—Prayer. Unfinished Business.
New Business. Resolutions.
Second call of list of Delegates.
Report of Commission on Tuberculosis in Animals.
10:30 A. M.—Dirt, Dollars and Sense. Hon. A. P. Sandles, President Ohio Agricultural Commission, Columbus, Ohio.
11:15 A. M.—Markets and Marketing. Hon. Charles J. Brand, Office Markets and Rural Organization, Washington, D. C.

FIFTH SESSION.

2:00–5:00 P. M.—Report of Committee on Credentials.
Breeding and Rearing Dairy Animals for Health and Profit. Dr. John C. Sharpe, Proprietor Meadowbrook Farm, Blairstown, N. J.
3:00 P. M.—Modern Milk Making. Prof. Joseph Hills, Dean, Vermont Agricultural College, Burlington, Vermont.
3:45 P. M.—Resumé of Entomological and Bee Inspection Work for the Year 1914. Dr. Thos. J. Headlee, State Entomologist.
4:30 P. M.—Farming as an Industry. F. R. Stevens, Geneva, N. Y., Agricultural Expert of the Lehigh Valley Railroad, representing the New Jersey State Chamber of Commerce.

SIXTH SESSION.

7:30 P. M.—Progress in Farm Demonstration. Prof. Alva Agee, Supt. State Extension Work.
8:00 P. M.—Crop Production by Dry Farming and by Irrigation on New Jersey Soils. (Illustrated with fine views taken from the fields.) Messrs. Willard Minch and A. P. Seabrook, Bridgeton, N. J.

January 29th, 1915, Friday.

SEVENTH SESSION.

9:30–12:00 M.—Prayer.
Unfinished Business.
Final Report of Committee on Resolutions.
10:15 A. M.—Soil Fertility. Dr. C. G. Hopkins, Urbana, Ill.

11:15 A. M.—Building Communities. Robert S. Seeds, Farmers' Institute and Chautauqua Lecturer, Birmingham, Pa.
12:00 M.—Final Adjournment.

The Chair wishes to announce the following committees:

Committee on Credentials—Howard F. DeCou, D. Howard Jones, S. E. Young.

Committee on Resolutions—J. T. Allinson, H. M. Loveland, Ralph Schellinger.

Committee on Treasurer's Accounts—Theodore Brown, George E. DeCamp, A. I. Ackerman.

Other committees will be appointed later. The next business will be the reading of the minutes of the last meeting by the Secretary.

A motion was made and seconded that the reading of the minutes be dispensed with, which was carried.

President Frelinghuysen—The next business will be the reading of the report of the Executive Committee by the Secretary.

Secretary Dye then read the report of the Executive Committee, which was as follows:

Report of the Executive Committee, 1914.

Since the Forty-first Annual Meeting, January 29th, 30th, 1914, your Executive Committee has held sixteen meetings in the interest of agriculture and its progress in connection with this Board. This large number of meetings was made necessary by the action of the State Comptroller requiring a monthly examination of all bills by the Committee. The requirements of the State Entomologist have claimed more attention than heretofore, owing to the importations of trees, shrubs, etc., from foreign countries, infected with injurious insects or their eggs. Also the threatened and final actual invasion of this State by the Gipsy Moth and the Brown-tailed Moth, from the New England States. Constant watchfulness, with extra assistance as occasion seemed to demand, was necessary throughout the year. To some extent this was the case also with the Plant Pathologist's department. Both these departments have published a number of bulletins of information and warning as seemed to be advisable, with the approval of the Committee.

In relation to the Pan-American Exposition, no overture has been made to the Committee by the New Jersey Exposition Commission to set up an agricultural exhibit of this State at the Exposition, nor has any money been appropriated to this Board to make such an exhibit.

On July 7th the Farmers' Institute work was considered, and as Prof. Agee's duties were so much increased in connection with Extension Work as to make it impossible for him to continue as Director, Prof. Alexis L. Clark was engaged to direct and conduct this work.

On January 12th, 1915, appropriations were made to all the County Boards of Agriculture that had sent their Annual Report for 1913 to this State Board.

In all former years, previous to 1913, these appropriations were made early in the year, immediately following the receipt of the report. The delay in 1913 and 1914 was due to the tardiness of the State printer, which prevented the Committee from examining the reports as required by law, before making appropriations. The reports were received first week in January, 1915.

As representing the State Board of Agriculture, and through it the farmers of the State, your Committee has co-operated with the State Agricultural College and State Experiment Station, and with all the agencies throughout the State, seeking the advancement of the agricultural, horticultural and live stock interests, and have endeavored to use the appropriations made to this Board for its work, by the Legislature, to the best advantage.

Full details of Executive Committee proceedings are available in the office of the Secretary.

Entering upon another year, we turn the work over to our successors in office, and we can but express the hope that the year 1915 may be a very prosperous one to all the farmers of New Jersey.

On motion, the report was accepted and filed.

President Frelinghuysen—The next business will be the report of the Treasurer, Mr. J. H. Darnell.

Treasurer Darnell then presented his report, which was referred to the Committee on Treasurer's Accounts.

President Frelinghuysen—The next business will be the report of the Committee on Transportation and Freight Rates, presented by E. R. Collins, Chairman.

Mr. Collins then read the report of the Committee on Transportation and Freight Rates, as follows:

Report of Committee on Transportation and Freight Rates.

Mr. President and Gentlemen of the State Board of Agriculture:

GENTLEMEN—The question of bridging the gap between the producer and consumer is presenting new angles each year. Our population is increasing, and, strange to say, the increase in the demand for our farm products is increasing in a greater ratio than the increase in population. Whether the people we of the farms supply are eating more, or wasting more, has not yet been determined. The increase in demand, however, does not seem to simplify the problems that arise regarding transportation from the farm to the consumer. Each year seems to see them grow more intricate and complicated and more difficult for the layman to understand.

The new system of express rates and charges put in force last year has proved, so far, to have been a great benefit. The saving to the farm people in this means of transportation has been up in the millions and the system is now working very smoothly, though at first, as in all such cases, there was considerable complaint that arose from misunderstandings. It is doubtful if many large shippers by express would now desire to go back to the old system of either classifications or rates. The present system was only put on trial

for two years and has yet another year of probation. At the expiration of that time it is probable that there will some changes be made as the result of experience, but it is doubtful if the zone system or classifications will be materially altered.

In freight transportation matters have been more unsettled than in express. The railroads in the early part of the year made a general demand for a five per cent. increase on rates in general. As a result of the demands the Interstate Commerce Commission decided to permit an increase approximating five per cent. on all of the railroads between the Atlantic seaboard and the Mississippi river and north of the Ohio and Potomac rivers. The increase did not extend to certain heavy commodities which comprise a large bulk of the traffic such as coal, coke and iron ore, nor was the increase allowed on joint "Lake and Rail" shipments. The increase in the area stated was applicable to all classes of farm products and cement, clay, brick, tile and plaster. This increase in rates the carriers in their application stated would net them $50,000,000. The increase will not disturb the classifications but will be an increase as they stand at present. The new rate will go into effect shortly.

While passenger traffic does not effect this Board to the extent that express and freight do, it is, perhaps, well to note that there has been a very active movement on the part of the railroads in the State to increase passenger rates, and the matter is still pending before the Public Utilities Commission. In the statistics presented by the Pennsylvania railroad, in its application for the increase in passenger rates, it is stated that 300,000 monthly or sixty-trip tickets were sold by the railroad in this State in 1913. An increase of twenty-five cents on each ticket was asked for, which would add $75,000 to their revenues. An increase was asked on school tickets of which 30,000 were sold. A twenty-cent increase on these was requested which would add to the income of the road $6,000. Similar advances have been asked for all along the line and it is probable that some advance will be allowed by the commission. The railroad states that it is its dire necessity that requires the increase.

The matter of the transportation of freight and express matter by suburban trolley lines, remains as it has for several years past. The traction companies contend that they will not attempt to put the service in operation so long as the law on the matter remains as it now stands. The duty imposed of securing the consent of each municipality through which it is proposed to carry merchandise, makes it practically impossible to secure a comprehensive service. This matter has been gone into more fully in former reports of your committee and about all there is to say is that so long as the present law prevails there will be no prospect of trolley transportation to any extent.

Reports on the operation of the parcels post show that it is proving very popular and the business of this department is increasing each month. The trend of merchandise by parcels post is greater from the city to the farm than from the farm to the city. It has proved a great convenience in getting small merchandise to the farm but not of as much value as expected in getting farm products to the consumer. The system is not yet out of the constructive period, and the parcels post may yet meet our hopes in regard of the flow from the farm to the consumer.

Your committee has been called upon in several matters of proper rates and claims, all of which have been adjusted satisfactorily. The shippers along the Trenton Division of the Pennsylvania railroad complained last summer that they were suffering loss through the irregularity of the train service over that division and the irregularity of the time at which the train reached Jersey City. An investigation by your committee showed that the complaint of the shippers was justified, that the delivery in Jersey City was very irregular and caused not only annoyance, but actual loss to them. In order to be united in the matter of seeking better service and in keeping a general oversight in transportation matters concerning them, the shippers formed the Farmers' Transportation Association, and acting for this association your committee drew up a complaint asking for better service over this division and filed it with the Public Utility Commissioners. The railroad replied to the complaint saying in substance that the service was the best that they could give under the conditions and that they saw no way to improve it. The company disclaimed that there was any great irregularity in the service while the schedule of the arrival of the train in Jersey City during the month of July, filed with this committee, showed a difference of from 10:30 P. M., the earliest, to 4:40, the latest, during the month, and the time of placing the car on the team tracks for delivery, from 12:20 A. M. to 5:15 A. M., these being the extremes, other deliveries during the month ranging at all hours between. It is easy to understand how a schedule as irregular as as this works hardship on the shipper. Speaking from personal experience, the writer knows that it is as easy a matter to transport freight on a definite schedule as it is to transport passengers. This matter was not pressed to a conclusion. Either through a misunderstanding or some other reason, the request of this committee for a meeting of the association, to get in shape for a hearing before the Public Utility Commissioners, was not responded to and the commissioners dropped the complaint.

Should the same conditions prevail the coming season, this committee would undoubtedly be willing to take the matter up again.

In looking over the facilities offered for water transportation of farm products in our State, it seems that this means of transportation is very much neglected, and is open to considerable development. While water transportation is not so rapid, the rates are so much lower where it is available that it more than makes up for the time lost. A good base for considering freight rates is the relation of the cost of transportation to the farm price. An inquiry into rates where water and rail parallel as, for instance, between Trenton and Philadelphia, or Trenton and other towns on the river, shows that where the water rates are from six to eight per cent. of the farm value of the commodity shipped, the all-rail rates are from twelve to fourteen per cent. of the value. A difference that is worth considering. It is suggested that some concerted action be taken to develop water transportation where it is available.

A great part of all transportation troubles comes from improper preparation of the commodity for transportation. Poor packing in poor containers leads to more losses than any other one cause. Anyone who has had experience at a large terminal station can verify this. It would seem as though the

object of the shipper is in many cases to expend the least possible care and attention on the container, turn it over to the transportation company and wish it good luck. If it has good luck, all right; if it gets too hard a bump, then it is shipment refused and a claim for damages. Shippers complain of petty thieving from their shipments. Many packages are so slovenly shipped that they invite theft. If the shipper does not think enough of his goods to pack them carefully and cleanly, the traffic handler cannot be blamed if he does not have much respect for them. There would seem to be room in Institute work for instruction in preparing products for transportation and also for instruction in how to classify and apply the various rates to the multitude of classifications. There is no use denying the fact that the farmer is a poor shipper and thereby a looser. Can he not be helped in that respect?

Respectfully submitted,

E. R. COLLINS,
J. T. ALLINSON,
W. H. TAVERNER.

On motion the report was received and made a part of the Annual Report of the Board.

President Ferlinghuysen—Will the Chairman of the Committee on Credentials come forward and take the credentials? The Secretary wishes to make an announcement.

Secretary Dye—I want to make this announcement, friends. That, although our report has been very late coming from the printer, it is available now, and if anyone wishes a copy, they may leave their names and post-office addresses at this desk and we will be glad to have them sent immediately.

President Frelinghuysen—From now until the recess the potato men are going to have their innings, and I want to call Dr. Mel. T. Cook to the platform to preside at this part of the meeting.

Dr. Cook's Address.

Gentlemen, you will recall that a year ago a committee was appointed to go to Washington to a hearing of the Federal Horticultural Board for the consideration of the quarantine against Europe and parts of Canada, owing to a disease of the potatoes known as powdery scab.

I wish to say that the committee, in accordance with instructions, went to Washington. We met delegates from a number of State, some from as far west as Montana. I believe that you are all familiar with the results of this hearing before the Federal Horticultural Board. The quarantine was established against the greater part of Europe and also against Canada. Since then, the quarantine against Canada has been modified, so as to allow potatoes to come into this country from those parts in which the disease does not exist.

Another point that came up in connection with that hearing was that potatoes from infected districts in Europe were sometimes sent to uninfected districts and reshipped to America. At this hearing steps were taken which would prevent the reoccurrence of this practice.

Now, as has been stated to you by Secretary Dye, the program for to-day was partly arranged by the Potato Growers' Association. The Association, as many of you know, was formed about two years ago. We have not succeeded in getting as large a membership as we had hoped for, but at the present time we think the indications are good for an increased membership in the near future.

Do you know that the potato industry in this State brings in more in dollars and cents than the orchard industry of the State, and yet you do not hear as much concerning it? The orchardists of the State have the State Horticultural Society, which holds a three-days' meeting, and gives great publicity to the orchard work of the State. The orchardists have set an exceptionally fine example for us.

I wish to call your attention to the work that is being done in other States. In the State of Wisconsin the Potato Growers' Association recently held a three-days' meeting. They had a very fine program and big exhibits of potatoes. The discussions were well worth hearing. There is a good organization in Colorado. A few days ago I received, from Colorado, a large placard, which is being distributed throughout the State by the Denver and Rio Grande railroad. These large colored placards give pictures of the potatoes and show the diseases which should be guarded against in potato growing.

We extend an invitation to you all who are especially interested in this potato work to become members of the Association.

Secretary Dye has just suggested a question which he wishes to have discussed, *i. e.*, "The Control of Diseases Where the Organisms Live Over in the Soil from Year to Year."

There are certain diseases of potatoes in which the organisms live over in the soil. In some cases these organisms will attack other crops. I have a very excellent specimen of potato scab growing on turnips. In the southern part of the State, where the industry is highly developed, a grower removed his crop of potatoes and sowed the turnips on the same land. The specimens sent me were from this grower. Of course, the fact that the scab organisms attack both potatoes and turnips has been well recognized for a long time.

Some of these diseases which live over in the soil present very interesting problems, and we may be proud of the fact that Dr. Halstead, of the New Jersey Agricultural Experiment Station, was one of the first men in the United States to conduct experiments for the purpose of controlling those diseases of the soil. His work along that line has, in a way, become classic. One of the things which he used for that work was sulphur, and two years ago we returned to the work with sulphur in this State. We now have, in the New Jersey Experiment Station, a man who is devoting practically all his time to experimental work along this line. This work will be carried on for another year, and probably longer, but we hope to be able to give you some results that are worth while next year.

A Delegate—I would like to ask one question: Does not the use of sulphur have a bad effect upon the following crop?

Dr. Cook—Yes, sir; we have had some bad results. That is one of the difficulties, one of the problems that must be solved. We are hoping that we may be able to do two things: give a treatment to the soil which will reduce these soil organisms, and therefore enable the return to growing potatoes earlier than we would under the ordinary system of crop rotations. And then, too, by following this sulphur with an application of something else, we hope will overcome its bad effect.

A Delegate—How is that sulphur used?

Dr. Cook—We have used it in different ways. We have made fall applications and have also made spring applications; we have applied it broadcast and we have put it in with the drill; and in broadcasting we put it over the entire land, and in other cases on top of the row. We get better results with spring than with fall application. Our best results thus far have been with six hundred pounds to the acre. This amount cannot be used continuously with profit, but it may be possible to use this amount occasionally and follow with small, annual applications.

Mr. A. S. Applegate (Cranbury)—Mr. Chairman, I will say for the information of the growers that I have been growing potatoes for twenty or twenty-five years, and in all that time I don't think I have had in the many thousand bushels that I have raised a bushel of what you might call scabby or diseased potatoes; and I think the only reason is that when I cut the fresh seed I pour flower of sulphur over it and stir it up. That is all I have ever done and I have never had a bushel of diseased potatoes.

Mr Cook—What varieties do you grow?

Mr. Applegate—Last year, Gold Coin and Norcross; and previous to that Green Mountain and State of Maine. My potatoes are sought for by the dealers because they run uniformly smooth.

Dr. Cook—Do you get your seed from one source only? The same place every year? Or do you grow your own seed?

Mr. Applegate—Well, mostly from the same dealer; not always. There is no doubt in my mind but that the use of sulphur on potatoes after they are cut is an exceptionally good thing.

Dr. Cook—Are there any other questions?

A Delegate—What effect will the application of sulphur have on clover following potatoes?

Dr. Cook—I cannot give you the figures on that because this this is carried on by one of my assistants, but I know of one place where clover followed the potatoes there was scarcely any clover where the sulphur was used.

Mr. Applegate—It may be that there are others here who wish to become members of the Potato Growers' Association, but are as ignorant as I am. Would you mind stating the general objects of your association?

Dr. Cook—The Potato Association movement grew out of the problem of the purity of seed, seed that was true to type and free from disease. A part of that problem has been overcome by the establishment of the potato quarantine. We have a number of potato associations in various parts of the United States and also a National Association, which have been organized to work for the advancement of the potato industry as the circumstances may demand in the various localities.

Mr. Applegate—I thank you, Mr. Chairman, and you may consider me as a candidate for membership.

Dr. Cook—Thank you. Now, I wish to say a few words in regard to the program to-day. It has been necessary to make some changes. We have arranged to have a man from Washington who will speak to us upon the varieties of potatoes, and in that connection I wish to say that I regret that we do not have an exhibit. If this meeting of the potato growers could have been held last fall then it would have been possible for our men to bring in potatoes from all over the State, so that we could have had specimens here for examination in conection with the discussion.

This afternoon we will have a talk by Professor Orton, of Washington, on the subject of potato diseases.

I will take this opportunity to say in regard to the powdery scab, that since we had the last meeting in Washington the quarantine has been extended so as to cover the State of Maine and two counties of New York. Dr. Orton will explain that to you this afternoon. So far as I know we do not have the powdery scab in New Jersey at this time. Last spring there were two shipments into the State that were affected with powdery scab. There may have been others, but if so, we failed to locate them. I am very much surprised that we have not had an outbreak of the disease in this State. Investigation in the seed houses of Philadelphia showed a few powdery scab potatoes and the disease may have come into the State through these channels. But if it is true that we do not have the disease

in this State, we have some reasons to be thankful, and it is to our interest to work to keep it out of the State.

I have just turned over to the Board of Agriculture of the State a manuscript, which we hope to have published in the very near future, describing the powdery scab. This will be distributed all over the State. It will be sent to the granges, to the newspapers and to the farmers exchanges. Large numbers of copies will be sent to exchanges so that it can be distributed through them.

Mr. Dye—I am so glad that Dr. Cook is conducting experiments whereby we can have our soils cleansed and purified, so that we can grow potatoes in New Jersey without fear of these soil diseases. This coming year, if my life is spared, I expect to plant potatoes on soil that has never had potatoes, and I want to plant clean seed. I expect to get them through the Monmouth County Farmers' Exchange, inspected by the Government, and if the seed does not do well on that ground I shall be discouraged. I don't know whether Brother Rogers can help us out or not. I will say that the seed I got from Maine last year was from Brother Rogers and did very nicely. They were freer from any trouble than any other variety that I tried. I treated them with the formaldehyde also, but it does not matter where we plant the seed the pesky common scab will come.

Mr. Kurtz—Mr. Chairman, I notice our Committee for Freight and Transportation did not mention the Morris Canal. I would like to know if they have made any investigation of that waterway running from one side of the State to the other.

Dr. Cook—If you please, Mr. Stuart is now ready to begin, so will you please carry that question over until this afternoon. As I go about the State I meet with a great many inquiries concerning varieties; a great many people complain that they cannot get the varieties which they want. Sometimes the varieties are mixed, etc. In my work with potato men in this State and other States and at Washington, I have learned that one of the best informed men of this country on the subject of the varieties of potatoes was Mr. Stuart, of the United States Department of Agriculture. I now take great pleasure in presenting him. He will talk to us on the varieties of potatoes. (Applause.)

Mr. Stuart—Mr. Chairman, ladies and gentlemen, I am surely very glad to come here this morning and have the opportunity of discussing this matter with you.*

* This paper was illustrated with lantern slides, but it has been necessary to omit the illustration in the publication.

Potato Varieties and Their Relationship.

BY WM. STUART.

For the past twenty-five years I have given a great deal of my time to the study of potato varieties, and while I have hardly made a beginning on the subject, I have come to recognize certain characters in varieties which serve to associate them with or separate them from certain other varieties. These studies have been found very helpful in experimental work where careful comparative tests were being made between varieties with respect to their commercial value. One soon learns to his sorrow, or otherwise, that occasionally varieties offered by the seedman are not true to name.

The campaign for good seed potatoes which has recently been inaugurated by several of our leading seed-producing States, has served still more forcibly to emphasize the necessity of recognizing leading commercial varieties, if they are to be kept free from admixture with other varieties. As varieties become better known, and as their relative merits for table purposes are more keenly appreciated, the grower will be more and more disposed to restrict his operations to one or two varieties. The aim of each grower should be to find a variety that succeeds well on his soil and then proceed to grow it under the most approved cultural methods. At the present time, there is no one publication in which may be found descriptions of any considerable number of varieties, and in none of them has any very workable scheme of classification been presented. During my talk to you, this forenoon, I propose, by means of the lantern slides and brief descriptions, to call your attention to a scheme of classification which is soon to appear in print as a U. S. Department of Agriculture Bulletin, No. 176. In this bulletin eleven groups of potatoes are discussed. A classification key is first presented in which the following three characters serve as the basis of determination:

1. Shape of tubers.
2. Color of sprouts in the dark.
3. Color of flowers.

Each group is then rather fully described, its economic value discussed, and a list of varieties presented which are regarded as belonging to the group.

The following is a complete classification scheme:

Group 1.—Cobbler.

Tubers—Roundish; skin, creamy white.
Sprouts—Base, leaf scale and tips more or less deeply suffused with reddish-violet or magenta. In many cases the color is absent.
Flowers—Light rose-purple; under intense heat may be almost white.

Group 2.—Triumph.

Tubers—Roundish; skin, creamy white, with more or less numerous splashes of red, or carmine, or solid red; maturing very early.
Sprouts—Base, leaf scale and tips more or less deeply suffused with reddish violet.
Flowers—Very light rose-purple.

Group 3.—Early Michigan.

Tubers—Oblong or elongate-flattened; skin, white or creamy white, occasionally suffused with pink around bud-eye cluster in Early Albino.
Sprouts—Base, light rose-purple; tips, creamy white or light rose-purple.
Flowers—White.

Group 4.—Rose.

Tubers—Roundish oblong to elongate-flattened or spindle-shape flattened; skin, flesh-colored or pink, or (in the case of the White Rose) white.
Sprouts—Base and internodes creamy white to deep rose-lilac; leaf scales and tips, cream to rose-lilac.
Flowers—White in sections 1 and 2; rose-lilac in section 3.

Group 5.—Early Ohio.

Tubers—Round, oblong, or ovoid; skin, flesh-colored or light pink, with numerous small, raised, russett dots. (Lenticels.)
Sprouts—Base, leaf scales and tips more or less deeply suffused with carmine-lilac to violet-lilac or magenta.
Flowers—White.

Group 6.—Hebron.

Tubers—Elongated, somewhat flattened, sometimes spindle-shaped; skin, creamy white, more or less clouded with flesh-color or light pink.
Sprouts—Base, creamy white to light lilac; leaf scales and tips pure mauve to magenta, but color sometimes absent.
Flowers—White.

Group 7.—Burbank.

Tubers—Long, cylindrical to somewhat flattened, inclined to be slightly spindle-shaped; skin, white to light creamy white, smooth and glistening, or deep russet in the case of section 2.
Sprouts—Base, creamy white or faintly tinged with magenta; leaf scales and tips usually lightly tinged with magenta.
Flowers—White.

Group 8.—Green Mountain.

Tubers—Moderately to distinctly oblong, usually broad, flattened; skin, a dull creamy or light russet color, frequently having russet-brown splashes toward the seed end.
Sprouts—Section 1, base, leaf scales and tips creamy white; section 2, base, usually white, occasionally tinged with magenta; leaf scales and tips tinged with lilac to magenta.
Flowers—White.

Group 9.—Rural.

Tubers—Broadly round-flattened to short oblong, or distinctly oblong-flattened; skin, creamy white, or deep russet in the case of section 2.
Sprouts—Base, dull white; leaf scales and tips violet-purple to pansy violet.
Flowers—Central portion of corolla deep violet, with the purple growing lighter toward the outer portion; five points of corolla white or nearly so.

Group 10.—Pearl.

Tubers—Round-flattened to heart-shape flattened, usually heavily shouldered; skin, dull white, dull russet, or brownish white in section 1 or a deep bluish purple in section 2.

Sprouts—Section 1, base, leaf scales and tips usually faintly tinged with lilac; section 2, base, leaf scales and tips vinous mauve.
Flowers—White.

Group 11.—Peachblow.

Tubers—Round to round-flattened or round-oblong; skin, creamy white, splashed with crimson or solid pink; eyes usually bright carmine. Includes some early-maturing varieties.
Sprouts—Base, leaf scales and tips more or less suffused with reddish violet.
Flowers—Purple.

The first and the eighth of these groups are the most important to New Jersey potato growers, as they embody the varieties most extensively grown in the State.

The Cobbler group is interesting because it includes early-maturing, round-tubered, white-skinned varieties, extensively grown throughout the trucking centers of the South Atlantic States, and is also grown rather largely in the northern States, both for seed purposes and for table stock. The description of the group is as follows:

Matures early. Vines medium, to above medium in size, with somewhat spreading habit of growth. Stems dark green, stocky, and rather short jointed. Leaves large, flat, more or less flaccid, and a medium dark green. Flowers numerous, rather large, light-purple, or rose-lilac; under intense heat the color may be practically unexpressed. Tubers roundish, with blunt ends, the stem end often being notched rather deeply and giving a shouldered appearance to the tuber. Eyes medium in number, varying from shallow to rather deep, particularly in the bud-eye cluster. Skin smooth and of a light creamy-white color. Sprouts short and rather stubby, varying in color at the base from a very faint reddish-violet, or magenta, to a perceptible coloration; the tips and leaf scales are usually tinged with the same color. Occasionally, the color seems to be almost, if not entirely, absent.

The following varieties are included in this group: Early Dixie, Early Eureka, Early Petoskey, Early Standard, Early Victor, Extra Early Eureka, Flourball, Irish Cobbler, Potentate.

In the Green Mountain group, we have a class of main crop varieties of potatoes, generally of high table quality and very productive. They seem to be well adapted to northern latitudes, where the rainfall is abundant, and the summer temperature is not excessively high. As a rule, they do not succeed as well in localities where they are subjected to unfavorable conditions of growth, during the time they are forming tubers, as do the members of the Rural group. The varieties in this group are divided into two sections, according to whether they have white or slightly colored sprouts.

Description.—Vines large, strong, healthy and well branched. Stems nearly upright in early stages of growth, but gradually assuming a spreading habit toward the latter end of the season. Flowers white, abundant, rarely producing seed balls except under very favorable climatic and soil conditions. Tubers broadly roundish, flattened to distinctly oblong flattened; ends usually blunt, especially the seed end. Eyes medium in number, rather shallow, with strong, bud-eye cluster. Skin dull, creamy-white, more or less netted, frequently with russet-colored splashes toward the seed end. Sprouts rather short and stubby. In section 1, they are white. Those in section 2, with the exception of Twentieth Century and Late Puritan, are mostly without color at the base, while the leaf scales and tips are usually faintly tinged with lilac or magenta.

The following varieties are believed to belong to the white sprout division:

Section 1—Bethel Beauty, Blightless Wonder, Carman No. 1, Clyde, Delaware, Empire State, Farmer, Freeman, Gold Coin, Green Mountain, Green Mountain, Jr., Gurney's White Harvest, Keystone, Late Blightless, Long Island Wonder, Norcross Pride, Snow, State of Maine, Uncle Sam, White Mountain.

Section 2—Charles Downing, Idaho Rural, Late Puritan, Rust Proof, Twentieth Century.

In my opinion it is not necessary for us to concern ourselves with more than one variety in either of these two groups. The Irish Cobbler, Early Eureka, Extra Early Eureka, Petoskey, Early Victor, and Flourball, are practically identical. Some growers favor one variety, some another. The thing of most importance is to make our selection and then proceed to grow it to the best of our ability. The same advice holds for the Green Mountain varieties. The Green Mountain, Norcross, Snow, Gold Coin, Delaware, and Carman No. 1, are all valuable varieties and not sufficiently different to be easily recognized.

It is important that we carefully study the varieties we are growing. We ought to know whether or not the seed we select conforms to the general type of the variety, and we ought, further, to be able to recognize any off-type plants in the field, provided, of course, we are growing our own seed potatoes.

Size of Seed Tubers.—There seems to be considerable difference of opinion regarding the best size of tubers to use for seed purposes. I have with me some Irish Cobbler tubers of six ounces in weight, others of five, four, three and two, and one and one-half ounces, all of which I regard as desirable. If I could have tubers running from 2 to 4 ounces in weight, that I knew had been produced from late planted, strong, healthy and productive plants, I would prefer them to those of larger size, provided the type was all right. The danger of using small seed of unknown origin, is that you are likely to get a considerable percentage of weak, or diseased stock. My advice to all inquirers regarding the advisability of using small tubers has invariably been against their use, unless their origin was known.

A Delegate—I would like to ask if it is worth while to change from one variety to another variety of the same type. In certain groups there are a great many different varieties, and we can not get clear which one to adopt unless we find, perhaps, a difference in the yield. Is there any great difference in the yield of the different varieties?

Mr. Stuart—Many people claim that there is. For instance, some will find that the Snow, or the Norcross, gives them better yields than Green Mountain. For similar reasons, some people like the Gold Coin. I think we could put them all together in a car and nobody would know the difference. So far as satisfying the market conditions is concerned, I don't think it makes any difference whatsoever. There will be that individual variation in behavior of varieties in different conditions. Some will succeed better with one variety and some with another. But I

think each community, if possible, ought to grow a certain group of varieties. They ought to decide on whether they can best grow the Green Mountain type of potatoes, or the Rural New Yorker type, or some other.

Mr. Applegate—Do I understand that you advise the using of a medium sized potato for seed?

Mr. Stuart—Yes, sir.

Mr. Applegate—Why?

Mr. Stuart—Well, I think it is more practical, in the first place, and I think you get just as good results in the second place. Our experiments have not gone far enough, but I am satisfied from their trend at the present time, that we are going to get better results from three and four-ounce seed, or even down to two-ounce, than we are going to get from the larger seed.

Mr. Applegate—I don't know why it is, but I think that my neighbors and I get better results from the largest seed that we can possibly buy, because when the sprout starts it must derive its nutrition from the juice that is in the piece. But after the roots start, and it begins to feed, then we do not care anything about the size of the nourishing parent, so to speak.

Mr. Stuart—Generally speaking, a seed that is somewhat immature will give better results than mature seed. I am well aware that one can select a type better when the variety is developed to its normal size; then you get the true expression of the variety, and it is much easier to select your type. But when they are small, they may or may not express the type; but if they have been produced by a well selected strain, then I think you are safe in using the smaller seed. Where we do not know the history of the seed, it is better to use the large seed.

A Delegate—If you have a potato that is not developed to its full size, would you advise planting it the following season?

Mr. Stuart—I think that would depend somewhat on the variety. We are experimenting along that line. Where we have tried it the most extensively, down in the Norfolk district, we had an unusually dry season, and we figured that the whole tubers did not give us as much yield commercially as the tubers of the same size cut in two. That is, two-ounce tubers were planted whole, and cut in two. This was repeated in three-ounce, four-ounce, etc. In every case, our cut seed gave us better results than the whole seed. Perhaps, another year, with more favorable conditions, for growing, we may have opposite results, so we are going to continue the experiment for a number of years. We may find that our results from whole and cut tubers will vary

with different varieties. Some varieties start a much larger number of sprouts than other varieties. Now with such varieties as start but one strong bud, you may get and probably will get better results from the whole seed.

A Delegate—The Cobbler or Green Mountain?

Mr. Stuart—The Green Mountain, I think, would start too many sprouts; the Cobbler might do.

A Delegate—If the Cobbler loses its shape, is it necessarily due to our conditions?

Mr. Stuart—No, it is not necessarily due to your conditions; that is not the only thing that will modify its shape. There are other things which may be at fault.

A Delegate—Suppose the seed came from the same lot of seed and some grew like Cobblers and some grew like Giants, all in the same field.

Mr. Stuart—I always advise discarding those. In selecting seed, we ought to adhere as closely as possible to type of variety.

Mr. Applegate—Can you give us the reasons why our Early Rose stock, for instance, has so deteriorated, that we have, in this section, been obliged to abandon its cultivation almost entirely, when formerly it was the biggest producer?

Mr. Stuart—It has been the history of practically every variety that has been developed, that sooner or later the variety seems to lose its vigor, and it is practically impossible to keep it up. There are some sections where the Early Rose is largely grown and fairly successfully, but in the majority of cases, the growers of Early Rose have been obliged to abandon it on account of its unproductiveness and on account of its not developing tubers of good marketable shape.

Mr. Applegate—Yes; but my question was, why would that effect come to us, what would produce that effect? Was it our fault or the fault of the potato naturally? Original sin in the potato, we will say?

Mr. Stuart—Not necessarily. I suppose in a great number of cases, it has been accentuated by improper selection of seed and improper handling of the ground. I think any variety will hold out longer under favorable conditions, especially where good selection had been exercised, but I think it is a fact that all varieties, sooner or later, will fall by the wayside through lack of vigor.

The firm of Vilmorin & Company, in France, about 1804 or 1805, started growing a collection of the then commercial varieties of potatoes, for the purpose of studying their behavior. As new varieties were introduced, they were added to the col-

lection. Of the numerous varieties studied in this manner, only four or five have shown sufficient vigor to maintain themselves. All the others have fallen out.

A Delegate—Have you made any comparison of the yield taking the seed from the seed end and from the stem end? If so, what was the result?

Mr. Stuart—No, we have not gone into that very much. That has been a subject of investigation by almost every Experiment Station in the country, and I think if you were to examine the different data, you would find them very nearly equally divided on the subject.

A Delegate—New York State has taken that up extensively, and I did not know whether you had taken it up and whether the results were the same.

Mr. Stuart—In some varieties, I am convinced that we get better results from the seed end. In other varieties, it does not make so much difference. Where the eyes are well distributed over the tuber, for instance, like in the Early Rose or the Early Ohio, you have good strong eyes, toward the base of the tuber; in other varieties, like Rural New Yorker, where there are fewer eyes, the stronger eyes are at the seed end and you would probably get better results if seed end pieces were used.

Prof. Cook—I am sure we all appreciate that there is a good deal about potatoes that we do not know, and that we have a great deal to learn. Mr. Stuart would be very glad to talk with you; he has come all the way up here to talk to you, but the hour for recess has arrived. The Secretary wishes to make a statement, which will necessitate our stopping this discussion preparatory to the noon recess.

Secretary Dye then calls attention to the time for which the afternoon session is set, and begs the delegates to be on hand promptly at that time, as there is a busy program for the afternoon.

The Board took a recess until two o'clock.

AFTERNOON SESSION.

The Board was called to order by President Frelinghuysen.

President Frelinghuysen—The first business before the session will be the call of the counties for the nomination of a Committee for the Nomination of Officers for the ensuing year, each county being entitled by custom to one member. The Secretary will call the roll, and each county will announce its member.

Secretary Dye called the roll of the counties, and the following named gentlemen were appointed on the committee from the floor:

Nominating Committee—Atlantic, J. L. Purzner; Bergen, A. I. Ackerman; Burlington, Benjamin M. Haines; Camden, E. T. Gill; Cape May, L. D. Compton; Cumberland, L. Howard Minch; Essex, E. O. DeCamp; Gloucester, T. Wood Wynne; Hudson, Daniel Y. Louis; Hunterdon, E. T. Wood; Mercer, J. T. Allinson; Middlesex, A. C. Clark; Monmouth, D. Howard Jones; Morris, S. E. Young; Ocean, R. C. Graham; Passaic, C. F. Day; Salem, Henry M. Loveland; Somerset, Luther Marsh; Sussex, (No answer); Union, Charles T. Woodruff; Warren, A. R. Paul.

President Frelinghuysen—The Chair requests that there be a meeting of this committee at the close of this afternoon's session, so that they can elect their chairman and organize, here in the Speaker's room in the rear of this desk.

Secretary Dye—May I at this point suggest that the Bergen County Farm Bureau has sent a request here that they be admitted to membership. These bureaus and outside organizations are entitled to one delegate. I see no reason why they should not be admitted.

A motion to that effect was made, seconded, and, on a vote, carried.

President Frelinghuysen—The next business before the meeting will be the report of the State Grange work, by the Honorable J. W. F. Gaunt, Worthy Master. (Applause.)

Senator Gaunt—Mr. President, and members of the State Board, it seems to me that it is almost useless for me to make a report at this time, because, as a general proposition, I find that the State printer does not believe that the State Grange has any interest or any part in this report. However, I will say, briefly, that the State Grange of New Jersey is still doing business at the old stand, and its influence for good throughout the State

is greater at the present time than it ever has been before in the history of the organization, and the relationship between the State Grange and the State Board of Agriculture remains the same as it has for the past fifteen or twenty years, both of them working together constantly for the best interests of the agricultural interests of New Jersey.

We have been making strides, not by leaps and bounds, but conservatively. We have been moving along so that we are able to report that we are all the time doing something that will advance the cause of agriculture, and we believe when we are doing that that we are fulfilling the mission for which the organization was created.

I will file a report with the Secretary of the State Board of Agriculture later on, and will not take your time at the present to bring up any more points. I thank you. (Applause.)

Secretary Dye—Mr. President, I move you that the report of the State Grange made, and that which will be made by the Worthy Master, be accepted and printed in full in our proceedings.

This motion was seconded, and, on a vote, carried.

President Frelinghuysen—The next business will be the report of the Secretary of the State Board, Mr. Dye. (Applause.)

Secretary Dye read his report, which was as follows:

Report of Secretary Franklin Dye.

The Angel spoken of by the Apostle John has not yet said "Time shall be no more," so the opening doors of opportunity, while turning the year 1914 back with its predecessors, invite us to enter upon and utilize as best we may the year 1915. None can prophesy what its days and seasons have in store. But for the farmer, the promise still stands "Seedtime and harvest shall not fail." The promise is sure, but *the reward will be in the measure of the intelligence and diligence used in seeking it.* Favored are they who have the ability to plan wisely the successive stages of a year's work, the various branches of the farm industry, and still more favored if they are able to carry their plans through to a successful issue. That eminent preacher, Rev. J. H. Jowett, D.D., said in part, in a recent sermon based on a text connected with ancient agriculture, "We have been watching the logical and progressive processes of agriculture and what have we seen? We have seen that the farmer's life is not a collection of isolated and unrelated events. The farmer's varied labors constitute a process, inspired by reason, governed by purpose, with an intelligent and orderly adjustment of means to ends. The farmer does not stumble along in blind and stupid movement. His movements have eyes. His work to-day has its eyes on to-morrow. One act reaches forward to another act. And so the succession becomes a living sequence,

and everything is joined to everything else in vital and reasonable communion." Dr. Jowett is right, and not only do the wise farmers' plans cover all the operations of a single year, but they reach forward in outline to the years that are to follow. Only so can increasing yields be secured, while at the same time *improving the soil.* This latter point *should never be lost sight of.* The soil is the farmers' mainstay, hence the growing importance of knowing more and more of its requirements for the production of the crops we attempt to grow, and the use of such materials as will contribute to *crop roduction* AND *soil improvement.* These questions lie at the foundation of modern agriculture. To ignore them is to invite failure. Our farmers, the farmers of New Jersey, are utilizing the knowledge, both scientific and practical, that is now being so widely diffused, and the rewards in the yield of the various crops for 1914 have, in the aggregate, been equal to the previous year. And this is said notwithstanding the various adverse influences of drought in some sections and too much rain in others, of insect and plant disease pests, of too great a yield of some crops and yields reduced in others, from whatever cause. *Therein lies the field of uncertainty* in all agricultural endeavor, and it seems to be widening and is becoming more difficult to control, if indeed it will be effectively controlled, notwithstanding the investigations of scientific men.

Take one example only, that of the potato, in the language of the street, "Where are we at?" While we are trying to overcome one enemy another assails, meanwhile various recruits are waiting in ambush for a new attack. But the farmer is not accustomed to surrender. If he lost in the game of 1914, he will renew his efforts in 1915, and so the business of crop production goes on year after year. If it were not so, the outlook would be gloomy indeed.

Cost of Production—Profit.—A just estimate of the cost of production is essential to every manufacturer, and the farmers and the dairymen are both manufacturers. Out of elements and substances not available for general use they are constantly manufacturing, creating indeed, those commodities on which both man and beast depend to sustain life. Although it is not possible, for reasons not necessary to name here, to determine the exact cost of producing most farm crops, an approximation sufficiently near to exact data can usually be made from which the per cent. of profit or loss can be clearly ascertained. In general, the method of making up the yield and value of the various crops annually produced on the farms of the country, the acreage devoted to each crop, the yield per acre, and the market value per bushel, pound or ton are given. The cost of production varies so much with each crop and each farm, a general average only could be given, and that would not be usable for every farmer. There are some products, however, that can be figured more definitely; milk is one. Our Experiment Stations and men engaged in producing milk on a large scale for city markets, keep close records.

For example, our own Experiment Station at New Brunswick places the cost of milk production per quart as they produce it, milk of superior grade, at 4½ to 4¾ cents per quart. If the cost to milk producers in the northern

part of the State, who sell their milk at the creameries, is the same as that given for our College Farm dairy, it will not, at the price they receive at the creamery, take much figuring to find the profit.

In our estimates of the total value of the milk product of the State hitherto, we have taken the retail value per quart. But considering the number of creameries in the State, the total quantity of milk delivered there, and the price per quart paid the farmer, it would seem that a valuation based on the retail price would be too great. The Dairy Commissioner, Mr. Geo. W. McGuire, gives the total number of quarts of milk delivered at the creameries per day as 578,099. We estimate the total number of milch cows in the State as 147,600. The government figures are 146,000. We have added recently 16,000 by importation. Estimating the yield per cow per day at five quarts, gives 269,370,000 quarts per year.

Delivered at creameries,	211,005,135
Sold at 4c. per quart, equals,	$13,153,018.92
Balance, 58,364,865 quarts, sold at 8½c., equals,	4,961,013.52
Total value of milk product of the State,	$18,114,032

If it costs our milk producers who sell their milk at the creameries as much to produce a quart of milk as it does our College Farm managers, their profit, if any, must be found in some by-product and not in the milk, or not at all. Our contention has been, and we still maintain, that the general price paid producers for their milk is too low, and this applies in a special manner to our creameries. The farmer assumes the risk and carries the burden of daily toil all the year, they take the profit. At the price paid for the milk the deal is not equitable.

Crop Estimates.—Utilizing all available sources of information, as the U. S. Bureau of Crop Estimates, the Secretaries' Reports of our County Boards and replies from the Directors of this State Board, the following estimates are given. It will be seen that notwithstanding the reduction in acreage of some important crops as hay, the total yield exceeds that given last year in Table II, based on acreage given in U. S. Crop Reporter by $325,915.00. We are not falling behind our previous good records.

TABLE I.

	Acreage.	*Yield Per Acre.*	*Total Yield.*	*Price Per Bushel.*	*Total Value.*
Corn,	272,000	39	10,608,000	$0.78	$8,274,240
Wheat,	79,000	19	1,501,000	1.10	1,651,100
Rye,	70,000	18	1,260,000	.86	1,083,600
Oats,	67,000	30	2,010,000	.50	1,005,000
Buckwheat,	10,000	18	180,000	.83	149,400
Hay,	361,000	1½ tons.	541,500 tons.	19.50 ton.	10,559,250
Alfalfa,	5,000	3 tons.	15,000 tons.	20.00 ton.	300,000
White Potatoes,	92,000	126	11,592,000	.61	7,071,120
Sweet Potatoes,	22,000	100	2,200,000	.96	2,112,000
Milk,					18,114,032
Fruits and market garden crops,					12,000,000
Poultry and eggs,					5,172,000
Wool,					26,255
Total,					$67,517,997

TABLE II.

Showing acreage devoted to some general farm crops in U. S. Census of 1910, and that given by Bureau of Crop Estimates U. S. Dept. of Agriculture, 1914.

	Census Acreage, 1910.	*U. S. Bureau Crop Estimate, 1914.*	
Corn,	265,441	272,000	Increase.
Wheat,	83,637	79,000	Decrease.
Rye,	69,032	70,000	Increase.
Oats,	72,130	67,000	Decrease.
Buckwheat,	13,155	10,000	Decrease.
Potatoes,	72,991	92,000	Increase.
Sweet Potatoes,	.....	22,000	
Hay,	401,315	361,000	Decrease.

TABLE III.

Number and value of farm animals in New Jersey, January, 1915. From U. S. Department of Agriculture Bureau of Crop Estimates.

	Number.	*Value Per Head.*	*Total Value.*
Horses,	92,000	$146.00	$13,432,000 00
Mules,	4,000	169.00	676,000 00
Milch Cows,	146,000	68.00	9,928,000 00
Other Cattle,	70,000	31.50	2,205,000 00
Sheep,	31,000	6.00	186,000 00
Swine,	161,000	14.00	2,254,000 00
Total,			$28,681,000 00

Alfalfa.—I have made special inquiries as to acreage of alfalfa now seeded throughout the State, but did not get replies definite enough to make an estimate for the State. A general guess places the acreage at 5,000 acres. Middlesex county, on the Walker-Gordon Farms, Plainsboro, Mr. Jeffers, manager, has the largest acreage in the State, exceeding 500 acres.

When the great producing power of this legume is considered, with its exceedingly valuable food constituents, its power to penetrate and explore the subsoils and reach up into and draw down from the atmosphere its stores of nitrogen, it is remarkable that so few farmers seem to realize its value and are so slow in introducing it into their crop rotation. We should have at least one hundred thousand acres of it within the next three years.

Reports of our County Secretaries give an average wage for farm work per month with board, $23.25, without board, $38.50.

The same reports show the wholesale price paid for milk to be 4½c. per quart, retail 8½c., at creamery 34⅘ cents.

Value of horses per head between 3 and 7 years of age, $180.00. Mules, $206.00. Milch cows, $78.00.

Back to the Land.—In my report of 1899 I devoted a short space to the "Trend Cityward," one paragraph of which I quote as follows:

"It is clear that a much smaller proportion of the population employed on the land—the basis of all industry—is sustaining a very much larger propor-

tion of the industrial population engaged in other pursuits. How long this condition and tendency of population to the cities will continue none can tell. But, so far, it has not been detrimental to farmers as a class."

Fifteen years have passed since the above was written, and the tide has turned. All eyes seem to be turned to the land, to its possibilities, its products, marketing of the same with greater facility, wider distribution, less expense—more profit to the farmer, and reduced cost to the consumer. Organizations are being formed throughout the country to facilitate this work, city and country co-operating. A leading part is managed by Mr. Chas. J. Brand, head of the Bureau of "Markets and Rural Organizations, U. S. Department of Agriculture." It would seem that some practical and helpful conclusions will follow this widespread movement. Investigation will discover the obstacles to progress, and with these removed, it is reasonable to assume that a way will be found to market not only a portion of our crops as now, but substantially the entire product, and thus reach all those in our congested centers of population, with the products of the farm comparatively fresh from the field.

Not only in the matter of marketing is wide interest shown, but also in finding homes for city people who desire to settle in the country and for city workingmen who seek employment on farms. For such and for worthy immigrants, the State of New Jersey has ample room.

Unimproved Land.—Self-interest sometimes prompts to action when nothing else will, and with more than one million acres of land practically undeveloped agriculturally, it would seem that our State government should take some action by legislation whereby a start at least might be made in opening up such portions of our Pine Belt as may be suitable for horticultural and other crops, establishing thereon homes of worthy, industrious settlers, who, in time, would add very much to the taxable value of those now almost valueless lands, and thus to the revenues of the State. Furthermore, forest fires would be decreased by clearing up the scrub forests and replacing this by farm crops. There is no better land for poultry and egg production than those lighter soils, and all green crops suitable for poultry feeding, including alfalfa, can be produced on such soils.

Markets.—A further encouragement to this proposition is the proximity of increasing markets. Seaside resorts, from Sandy Hook on the north to Cape May on the south, with their hundreds of thousands of summer and winter boarders, New York City, Jersey City, Newark and other cities in the north, with Philadelphia on the west, with State road and railroad transportation not found in any other territory of equal size, would give the producers of farm crops there an unusual opportunity for marketing what they produce.

*We have been collecting from the assessors in the southern counties the acreage comprised in certain holdings there. Of these we have summarized the acreage from 200 acres up as follows:

---

* See Minutes of Executive Committee, August 4th, 1914.

	200–500.	500–1000.	1000–5000.	5000 and up.
Atlantic, ...	6,167 acres.	9,758 acres.	8,876 acres.	19,300 acres.
Burlington, ...	5,715 "	8,110 "	10,450 "	18,730 "
Cape May, ...	5,561 "	3,765 "	1,000 "	
Ocean, ...	12,358 "	13,624 "	29,023 "	62,881 "

A total in this lot of 215,318 acres, equal to 4,286 farms of 50 acres each, which should, in a short time after development, be worth at least $500 each, a total of $2,153,000, and in time twice that sum.

Farmers' Institutes.—Beginning November 16th, 1914, and ending with January 26th, 1915, forty-two meetings have been held with varying degrees of interest as affected by local conditions. There are yet to be held ten more, beginning February 1st, and ending February 12th. As is generally known, the Institute work for the past season has been in charge of Mr. Alexis L. Clark.

Notwithstanding the advent of County Demonstrators or County Advisors, and State Extension Work, I believe the Farmers' Institute—the pioneer in carrying needed information right to the farmer—has yet a place to fill in the forward movement for more intelligent practice, and thereby more profitable farming. Success in the Institute can be secured only when those whom it is intended to benefit co-operate fully with the State officials having this work in charge, and with the speakers from the Experiment Station or elsewhere, who have a message to deliver.

County Boards of Agriculture.—There are now twenty-one County Boards of Agriculture in this State, auxiliary to the State Board. This is the first time we have been able to report every county with a County Board. Our friends in Hudson county interested in agriculture organized a County Board on December 27th, 1914, and elected two delegates to this meeting.

Some of the older Boards are doing excellent work for advancing the agricultural interests within their bounds. I note among these Mercer, Burlington, Cumberland, as having had in connection with their County Board meeting, a special feature interesting the boys and girls of the farm in agricultural affairs. At the Mercer and Burlington county meetings, the exhibits of the Boys' Corn Growing Clubs and the Girls' Needlework and Baking, were exhibited and prizes awarded. The attendance at these two meetings was very large and enthusiastic. So also at Shiloh, Cumberland county, at the meeting of the reorganized County Board. The young people, as well as their elders, were interested in the proceedings, a part in the program being assigned to them, and the attendance was unusually large. I speak of these in particular, believing that a similar course might be adopted in other counties with advantage. A Farmers' Institute and Boys' Club Exhibit was held at Toms River, November 27th, in which the County Superintendent of Schools, Mr. Chas. A. Morris, has shown much interest, taking, in fact, the lead in arousing interest in agricultural matters there. The County Board of that county, Ocean, having lost its President by death, has been reorganized, and new energy should be injected in the organization. Some of the older County Boards, like Monmouth, Gloucester, Bergen, Union,

Atlantic and some others are active for the improvement of their rural interests. There are a few Boards, however, that need a revival in numbers and interest, in order to fulfill their mission and the purpose of the law under which they are constituted.

Farmers' Week.—An extended program of social and practical subjects covering six days was arranged by Prof. Alva Agee, for the Farmers' Week course of 1914–15. Those who attended any or all of the lectures in the list know something of their value. A large number of the questions that confront the amateur, as well as the experienced farmer, were here discussed, and the fund of information thus made available by the State is of great value. Its influence should be manifest on the farms of the State whose owners or managers attended the lectures. It would seem from reading the program of subjects that there are a very large number of intricate questions, problems indeed, connected with farm life. So much so, it is evident that the day is past when it can be said "any fool can be a farmer." The attendance during the six days was very encouraging, hundreds being present each day.

Summer Meeting.—The eighth Annual Summer Meeting was held at the College Farm on August 11th. The day was fine, the attendance large, the addresses good, the social intercourse the most cordial. It was a day of uplift. New friendships were formed and old friendships strengthened. Neighbor met neighbor in a day of recreation, observation and recuperation of mind and body. With the extension of the College Farm area, the new buildings erected and the work of the College and Station transferred there, this annual visit by the farmers of the State to their State Agricultural College should become increasingly attractive and profitable from year to year.

County Farm Demonstration Superintendents.—There are five counties that have secured a Farm Demonstration or Superintendent of Farm Demonstration Work, Sussex being the first, with Mercer, Bergen, Monmouth and Atlantic following. Other counties are looking with favor on this proposition and will no doubt soon apply for the appointment of a superintendent. Prof. Alva Agee, who is in charge of the State Extension Work, will speak on the progress of farm demonstration and the future outlook for this work. While we congratulate Mr. Gilbertson on his call to a larger field of usefulness, we regret his withdrawal from the work he was doing so well in Sussex county.

Reports of This Board.—For the Annual Reports of the New Jersey State Board of Agriculture there is a wide demand, and no one regrets more than your Secretary the past delay in printing the proceedings. The various papers and reports presented at the Forty-first Annual Meeting were delivered to the Commissioner on Reports and by him forwarded to the printing company having the contract, June 5th, 1914. The cloth bound reports were delivered here the first week in January, 1915. This will explain why they were not sent out to the farmers of the State at an earlier date.

Report of Feeding Stuff Inspections.

BY CHAS. S. CATHCART, STATE CHEMIST.

The report of the last inspection of feeding stuffs found in this State was published by the New Jersey Agricultural Experiment Station as Bulletin No. 271. This report contained the detailed results that were secured by the authority of the law which was approved March 28th, 1912. An examination of this law will show three requirements that are of particular importance to the dealer and consumer, and they may be briefly state as follows:

1. Registration of the guaranteed analyses and ingredients of the feeds which will be offered for sale.
2. Statements on the packages showing the guaranteed analysis, the specific names of the ingredients used in preparing the feed and the name and address of the party responsible for the sale of the material in New Jersey.
3. An inspection and publication of the results obtained, with such other information as may seem necessary.

Registrations.—Three hundred and forty-one manufacturers registered during the year represented by the last report 1,575 brands of feeding stuffs. As this was practically the first year of the operation of the new law, it was expected that a number of brands would be sold before the requirements of the law had been complied with in regard to the registration. During the inspection 242 brands were found in accordance with this expectation, and of this number 169 were prepared by residents of New Jersey. In each instance the party responsible was communicated with, and as a result 212 of these brands were duly registered by the parties responsible for the sale, and in seven other cases the particular shipments were attended to by the parties who had made the purchases.

Although these registrations were finally made, attention is called to the necessity of attending to this requirement at the date prescribed in the law, which is January 1st. If unregistered materials are found in the future by the inspectors, some delay may be caused until the materials have been properly registered. In order to avoid this trouble the purchaser should ascertain whether the party selling the feed has attended to the registration and to bear in mind that a registration made by a manufacturer only covers those shipments made by him and that it does not satisfy the requirements when a jobber in a foreign State resells the brand in this State. Feeding stuffs sold by jobbers must be registered by them and the shipments must be accompanied by a tag giving the name and address of the actual shipper.

Statement of Ingredients.—One of the most important requirements of the law is in regard to the statement of the ingredients used in preparing the feed. A knowledge of the guarantee of protein, fat and fiber should not satisfy the purchasers, since they can be obtained in sufficient quantities from various materials which have a different digestibility. By noting the ingredients used and the guarantees as given, the purchaser will secure information that is valuable.

Inspection.—According to our records, about 200,000 tons of feeding stuffs are sold annually, and the necessity of a careful inspection does not need

any argument. Realizing the importance of this work, our inspectors collected about 900 samples which represented the stock of 252 dealers and consumers. Seven hundred and forty of these samples were analyzed and the results were duly reported; 131, or 17.7 per cent., did not satisfy the guarantees as given. These samples required 2,220 different guarantees which should have been satisfied by the material delivered, but there were 154 of this number which were not satisfied. These deficiencies consisted of the following: Protein, 61, fat 40 and fiber 53. One hundred and twelve samples were deficient in one nutrient, fifteen were deficient in two and four samples were deficient in the three elements.

Although the above results are not worse than found in other States, they do not indicate that the feeds sold in our State, if taken as a whole, are entirely satisfactory, and if the condition is to be improved it is necessary that the purchaser should insist upon receiving material that is equal to every guarantee given.

(During the reading of the Secretary's Report, President Frelinghuysen relinquished the Chair to Vice-President Cox.)

On motion, the report was received and made a part of the proceedings.

Vice-President Cox—This Board will now be favored with the Annual Address of its honored President, who needs no introduction to this audience, I know. President Frelinghuysen. (Applause.)

President Frelinghuysen—Mr. Chairman and delegates to the State Board, ladies and gentlemen, I wish I could make the kind of address that Senator Gaunt did and get away with it; but every year it has been the custom for the President of the Board to read his address and make pertinent suggestions and point out the results of the work for the past year.

President Frelinghuysen then read his annual address, as follows:

Annual Address of J. S. Frelinghuysen, President.

This time-honored organization, the State Board of Agriculture, at its annual meeting convenes with unusual problems confronting the delegates from the various counties—problems that call for our careful thought and deliberation.

The farmer must feed the world, and we farmers of New Jersey have a part in this great work. May we not ask ourselves if we have accomplished the best results with the means we have at our command? I do not believe that we have. With more than a million acres of land in New Jersey still undeveloped, with large areas in South Jersey waiting for the tiller of the soil, with fertile farms in North Jersey lying idle, some means must be devised whereby better results can be obtained for the State.

President Taft time and again called the attention of Congress to the

need for increasing agricultural areas. President Wilson has made it the burden of several messages. Governor Fielder in his last message to the Legislature called attention to the ravages of disease among the cattle in the State, and urged that New Jersey should devote its attention to stock breeding and should become a cattle-raising State as well as a dairy State.

Therefore, in my address to-day, I intend to make certain suggestions for the consideration of this body, and I hope they may have your careful attention. I do not claim that mine is the best thought on the subject, but I want to bring home to you, and through you and your legislative committee, to the Legislature, the necessity for careful consideration. This, I believe, will bring about a solution of the problems that confront us, and which will better equip New Jersey to produce more and thereby increase the prosperity of the people of the State.

We have a Legislature, in my opinion, composed of right-minded, able, intelligent men, who are competent to meet and solve these problems without the aid of or the guardianship of any lobby or any individual.

This does not mean that nonpartisan individuals or legislative committees cannot suggest from time to time laws and amendments thereto, but that in the final judgment as to how these laws should be framed and carried out, the people of New Jersey are safe in the hands of their representatives and chief executives.

Therefore, approaching this great subject with entire confidence in the delegates of the State Board of Agriculture, and in the Legislature and the Governor of our State, I intend to-day to give my views as to how greater efficiency can be brought about in the agriculture of the State, and greater production procured from the land. To do this the State must be equipped with the proper organization, having sufficient authority and power to carry out progressive policies and to inaugurate a new system and method. Such an organization should be nonpartisan. It should be controlled by the farmers themselves. Its goal should be one of service, and not political exploitation.

Those wise men who created this State Board of Agriculture, an organization controlled and formed by the farmers themselves, at whose head are men serving from a sense of public spirit, whose only reward is the self-consciousness that comes with the performance of a public duty, did their work well, and I would not say that the organization which they planned is not the best when its limited powers and resources are borne in mind.

The Economy and Efficiency Commission has indicated a desire for a Director and an Advisory Board, though it has not as yet formally made such a recommendation. The men who compose this commission are actuated only by a desire to improve conditions and benefit the State. Therefore, serious consideration should be given to their views.

I cannot say that I recommend their plans. In some respects it is right. Before any enterprise can be undertaken or accomplished, we must have authority and power created by law. We must have proper equipment, and we must have the money to carry out the policies adopted. To bring about what Governor Fielder desires, more production of cattle, to bring about what is an economic necessity, the tilling of every inch of soil in the State of New Jersey, two things are requisite.

First—We must know where the land is available that can be tilled. This can only be brought about by ascertaining what land is available, where it is, what its condition is, what it is adaptable for and how it can be brought under cultivation.

A Land Bureau or Bureau of Information showing where and how land can be obtained should be established. This cannot be done with the present organization of the State Board of Agriculture. It requires men. It requires greater office facilities, money and a proper organization and authority under law.

Secondly, while to-day the banks of the State are encouraging by their loans to the greatest extent possible the farmers, a new credit system must be established. Any one can borrow money if he has the proper security. If we are to induce desirable settlers or worthy farmers to settle in New Jersey, we must provide them with the proper means and facilities to finance their operations. In fact, the State must take a chance on the integrity and ability of men without money. We must provide credits to encourage men who can only give as security their character and their energy. In fact, we must capitalize their brawn and muscle, and loan money on it, believing that actuated by a desire to create a home and better themselves they will earn enough to repay the loan. In other words, we should provide a system of rural credits in this State that will enable the newcomer on land to procure the funds to purchase the land and to buy the implements necessary to cultivate it. Naturally, these must be long-time loans, and can only be brought about through a rural credit system. We must also provide a system of agricultural education, so complete and so thorough that the children of our farmers will be equipped with scientific and practical knowledge that will inspire them to stay on the land and become homemakers.

Therefore, I must divide my suggestions into four four parts:

First—How should the new State organization be created?

Secondly—How can the land be scheduled?

Thirdly—How can rural credits be established?

Fourthly—How can better agricultural education be brought about?

To these subjects I will confine myself briefly.

ORGANIZATION OF NEW BOARD.

To provide for the change contemplated I suggest that the law which created the present State Board of Agriculture be repealed, and the present Board go out of existence; that provision be made for the formation of a new organization to be known as the State Board of Agriculture, and that an office be created to be known as the Secretary of the State Board of Agriculture at a salary of say $5,000 per year. This Secretary should, under the advice of the State Board, have charge of all matters relating to agriculture in the State. He should have an office sufficient in size to contain all of the records, information, statistics and data pertaining to the agricultural industry of the State, and accommodations for the various departments under the assistant secretaries, who should be appointed by the State Board of Agriculture. The Secretary of the State Board of Agriculture should have com-

plete authority, subject to the advice of the State Board, over all matters pertaining to the agricultural interests of the State, and all of the departments under him.

There should be an assistant Secretary of the State Board of Agriculture, who should act in the absence of the Secretary. He should also have charge of the police work of the State through the Agricultural Experiment Station, or directly as the occasion may demand. The Assistant Secretary should, under the direction of the Secretary, have charge of the plant inspection; the insect extermination; mosquito extermination; the examination of fertilizers, the object being to co-operate in the work in conjunction with the Agricultural Experiment Station. His salary should be $3,500 a year.

There should be a second assistant Secretary of the State Board of Agriculture, who should have charge of the farmers' meetings and institutes. There is no intention in connection with my plan to curtail or abandon the various meetings of the agricultural societies of the State, but, rather, to give them all the benefit of the expert advice that the State Board of Agriculture will have at its disposal at all times. The second assistant Secretary should also have charge of the various branches of the work relating to the grangers, poultry raising, cranberry growing, horticultural work, florists and dairy inspection. The salary of the second assistant Secretary should be $3,000 a year.

There should be a third assistant secretary of the State Board of Agriculture to be known as the Secretary of Animal Industry. He should have charge of all matters relating to animal industry and diseases in animals; tuberculosis, hoof and mouth disease, hog cholera; horse and cattle breeding; stallion registration and the promotion and development of the breeding interests of the State. His salary should be $2,500 a year.

There should be a fourth assistant secretary of the State Board of Agriculture to be known as the Secretary of Forestry. This department should have charge of the forestry interests of the State; the protection of the forests of the State; the establishment of a land bureau and of the rural credits system. Under this plan the present department known as the Bureau of Forestry would be absorbed as would also the Live Stock Commission and the Tuberculosis in Animals Commission.

The State Board of Agriculture should consist of twelve active members elected from the Congressional districts and four members-at-large, who shall act as ex-officio members in an advisory capacity. Each year there shall be held an annual meeting of the State Board of Agriculture, as now provided by law, consisting of the delegates from the various agricultural boards from each county, who shall be entitled to vote, and they shall select the members of the State Board of Agriculture to serve for a period of six years beginning after the first annual meeting. If this plan for a new Board shall be adopted, there shall be elected at this meeting two members for one year; two members for two years, two members for three years, two members for four years, two members for five years and two members for six years; and thereafter two members shall be elected for six years.

In the selection of the twelve men to constitute the State Board of Agriculture it would be well, if possible, to have the following industries repre-

sented: One general farmer; one prominent dairyman; one horse breeder; one florist; one cranberry grower; one poultryman; one truck gardener; one forester; one bee man; one potato grower; one cattle breeder, and one fruit gardener.

These men shall not be selected with any idea of political party, but the politics of the man shall have no consideration whatever, his fitness for the position receiving the first consideration.

The four members-at-large shall consist of the Director of the State Agricultural Experiment Station; the Master of the State Grange; the Deputy Superintendent of Education having charge of vocational and industrial education, including agriculture and the President of the State Horticultural Society. These four members-at-large shall have a vote on all general questions of agriculture, but shall not be entitled to vote on the selection of officials of the State Board.

The members of the State Board of Agriculture shall serve without emolument or salary, but shall be entitled to their traveling expenses. They shall elect a President and Vice-President. The Secretary of State Board of Agriculture shall act as their Secretary.

I wish to point out in the composition of this Board of Agriculture the present policy of the State Board is maintained in the election of members, and while there is a broadening of its activity and power, the farmers, who are so vitally interested, will still retain the control of and form its policy.

It is necessary to have represented on the Board a large number of special interests; otherwise it would seem that a board composed of eight members, somewhat along the lines of the State Board of Education, would be more practical. However, if you wish to decrease the size of the Board, it is within your power to do so, and the matter is left with you for consideration and disposal.

As an alternative proposition I suggest that the Board of Agriculture as constituted at present should be retained; that there be delegates from the county boards to the meeting of the State Board annually, and that these delegates elect a president, vice-president and treasurer; that there shall be an executive committee to be composed of the president, vice-president, the master of the State Grange, the president of the Horticultural Society, and the professor of agriculture of the State Agricultural College; that this executive committee elect a secretary for a term of five years, to be known as the Secretary of the State Board of Agriculture; that the executive committee appoint all other officers upon the recommendation of the secretary, that while the questions of policy are to be determined by the Board, the power to sign requisition and approve bills be given to the Secretary, subject to the later approval of an auditing committee.

The scope of the work should include several divisions; three, at least, and perhaps more, as follows:

1. Animal Industry, which should embrace both the work of the present tuberculosis commission and the present live stock commission, and should take in some of the work relating to animals now under the control of the State Board of Health.

2. Publicity division, which should include information as to farms for sale in New Jersey, the distribution of labor, immigrants, etc., agricultural statistics, farmers' institutes and other publicity work.

3. The division of control or inspection, which should include the inspection of nurseries, insects, plant inspection and bee inspection.

The salary of the Secretary should be at least $5,000. The salary of the man in charge of the Animal Industry work should be at least $3,500; the salary of the publicity man should be $3,000 and the salary for the secretary to have charge of the division of control and inspection should be $2,500.

To develop the resources of the State we must have efficiency. To have efficiency we must have organization. To have organization we must have authority by law, and money to enforce the laws.

The following plan that I suggest is only a crude outline to form a working basis. This plan contemplates two things: First, the absence of politics; second, control vested in the farmers themselves through the delegates from the counties.

Nothing should be done that would eliminate from public service without due recognition those two servants of the State who have labored so faithfully for the interests of the farmers. I refer to Franklin Dye, Secretary of the State Board, who for years has served the agricultural interests of this State. His wealth of experience, his devotion to his duties, and his splendid abilities and service which the State has had so many years, all demand that he should have a permanent position. I will oppose to the last any plan that has for its purpose the removal of Franklin Dye from activity in agricultural matters. Charles McNabb is another faithful official, whose efficient work on the tuberculosis commission, and the stamping out recently of the hoof and mouth disease warrants his retention in the service of the State.

I suggest that the present law which created the State Board of Agriculture be repealed and the present Board go out of existence to be succeeded by a new State Board of Agriculture also to be provided for by law, and in accord with such recommendations as this State Board may adopt.

As you know we have had under consideration for some time the development of a land bureau in the State Board of Agriculture. Tentative plans have been made to list land and to establish a bureau of information. There has been a great demand for this. The plan had to be abandoned temporarily owing to the fact that we had no equipment, lacked proper authority and were without funds for this work. It was finally decided that it would be better to wait until a department could be properly organized and arrangements made to take care of the work in an efficient manner.

Under the plan as outlined this land bureau would be in charge of the fourth assistant secretary to the State Board of Agriculture. Having charge of rural credits, bulletins and land registration, this official should be empowered to obtain statistical information showing all vacant land for sale, its adaptability ascertained by having the bacteriological laboratory of the State Experiment Station examine it; all farms now abandoned and for sale; and all farms under tillage and for sale.

This information should be on file at the office of the State Board of Agriculture at Trenton, and should be available to all citizens. It should be printed in several languages so that worthy immigrants could readily understand where available land might be obtained; and so that aliens already in the State could transmit this information to relatives and friends in Europe who wished to come to this country.

We must avoid dishonest land agents and those vultures who hover around every incoming steamer to prey upon the unwary aliens. We must stop the operations of land sharks and real estate speculators. The State cannot enter the real estate business. With the growing suburban villages and rural homes we must not check building development. We must inculcate in the minds of our citizens the principle that they must be producers. The man who has a good garden in his back yard is a producer. So by missionary work we must induce every one to take an interest in producing from the soil.

There are large areas of land in the State along the lines of the big railway systems crossing the State, owned by New York and Philadelphia real estate men, and this large acreage should be made to produce for the common good. A law should be passed to prevent fake development of town lots that are being exploited by city real estate dealers on land remote from railroads, and on land only available for farms; yet out of tillage forever by reason of dishonest speculation, sales to owners who will never use it, and which sooner or later made impossible to identify the title or to trace the owner. The absorption of land in this manner is a great detriment to the growth of the State, and the evil, which is far-reaching in its effect, should be immediately rectified by the Legislature.

All of these important matters and many others too numerous to enumerate, could be attended to by the Department which has already been outlined.

RURAL CREDITS.

I have suggested that there be a deputy assistant secretary of Agriculture who shall have the power to establish a system of rural credits in New Jersey. If we are to encourage our natural resources and bring about a greater cultivation of the land, we must finance the farmer who has no money, but who has the character, ability, energy and strength to create a productive value out of land. This is the only security that he can offer, but elsewhere it has proven a good security.

We must also finance the farmer who will have a certain amount of capital available, but has not enough to fully develop his land. We must, through this department, establish a rural credit system, which will go beyond the banking system, and give to the small farmer sufficient credit not only on his land on a long term loan, but also to buy implements, seeds and fertilizer to produce from the land.

I have only recently taken up the study of this subject. I am not yet well informed sufficiently to devise what is the best system to establish. I am convinced, however, that some system is highly essential at this time, if we intend to prosper in agriculture in New Jersey.

I have consulted with my friend, former Ambassador Myron T. Herrick, who made an exhaustive investigation of the subject while in France. He has been urging rural credits through the National Government, and some of the ideas that I now express have come from him and from the book which he has written upon the subject; so that much of what I am saying on rural credits is quoted from this work. I have asked Mr. Herrick to come to New Jersey at some future time and address the farmers of the State upon this subject. He has promised to do so.

In a financial sense credit is the confidence reposed in a person which enables him to obtain from another the temporary use of a thing of value. It may be accorded on the security of real estate, personal property, or mere character, and so is classified in three general forms, deriving their names from the kind of security taken. Credit may be either consumptive or productive. The purchase on time of a luxury or of an unnecessary thing, or the renewal of an old debt on more onerous terms is called "consumptive," because such acts decrease the wealth of the debtor. The man who borrows in this manner sooner or later falls into the hands of the usurer.

Productive credit is that which is employed to stop a loss, effect an economy, or create something materially valuable. The savings or gains which result ought eventually to equal the debt, hence no one need be afraid of this form, provided the amount and extent be judiciously limited to ability for prompt repayment. As is popularly said, productive credit makes its own security and liquidates itself.

A German named Frederick W. H. Raiffeisen established a system of local co-operative associations organized entirely for the benefit of its members—a mutual plan of self-help—or a union, it might be called. The object was to provide for long-term loans on land or short-term loans on farm implements, seed and other necessary articles for those who started farming. It had been confined entirely to the farming classes. Both the rich and well-to-do joined with the poor in becoming members and taking shares in the society. Raiffeisen was not afraid to have the wealthy in the societies, as the organization was such as to prevent them from exercising any undue influence in its management.

This system provided for a small membership confined to an area of not more than two thousand inhabitants. The management was rendered by gratuitous service, the only salaried man being the secretary who was the bookkeeper. There was no distribution of profits. The association had the simplest kind of a transaction with long-term loans on land, and if necessary an amortizable or repayable plan by installments thus permitting loans to be granted for productive purposes only.

There were no divisible profits whatever, the earnings being held for a guaranty found to provide for bad losses or to be used for mutual benefit or social purposes among the members. The aim of the society was humanitarian not materialistic. Each society was a center of education and moral influence in the community as well as a source from which its members might obtain credit and money for improving their farms and carrying on improvements of an agriculture nature.

Mutual confidence and mutual self-help was inspired in the members of

these societies, and the officers of the associations watched the welfare of the borrower and was in constant touch with their activities. There was a central bank, and when a local bank failed or a society had any surplus the funds were turned over to it.

The management of a local society consisted of three members elected for four years, two or three retiring every two years. It met once a month, and the Board of Supervision consisted of from three to nine members, one-third retiring each year. Retirements from the society were allowed on six weeks' notice to take effect at the end of the year.

I have had compiled for distribution a bulletin giving the history and complete details regarding this system. The Raiffeisen society has a wonderful record in Germany of never having lost a cent, and is unparalleled in the history of finance. It is so marvellous as to be unbelievable by those not acquainted with the facts. Hundreds of millions of dollars have been put in circulation during that period, rescued the German farmers from usury, poverty and despair, and raised them in the scale of life and put them in the way of helping themselves and their neighbors.

With the various methods of credit and the multiplicity of banks the possibilities of the future have been capitalized and drawn upon in every conceivable manner for the benefit of present enterprise. But the use of credit within reasonable limits is commendable, and should be encouraged in honest and capable persons who have more ideas than money of their own. The man who borrows to set himself up in business, to buy a farm, and increase its yield, to cheapen the cost of the growing and marketing of crops, or for any other productive purpose, does exactly what he should do, because the transaction enables him to take advantage of his opportunities, and give full play to his talents, and puts him in the way of doing a possible good to himself and family and of becoming a useful member of society by adding to the nation's wealth.

The machinery for credit in the United States is defective and inadequate from the point of view of agriculture. In this State we have no machinery for credit for the farmer. There is plenty of money for well-to-do farmers, who are able to meet all requirements by the lender, but there are no means whatever for granting long time loans, no arrangements except in a few local and special cases for promoting the movement of the people back to the land, no outside sources for short-time credit, nor any system whereby agriculture may have first use, as it should, of the wealth it creates for financing itself.

About the only facility of which farmers avail themselves at the bank is the straight loan on promissory note. They depend too much on the mortgage to carry them over from harvest to harvest, and on this indirect credit, always expensive, of installment purchases and running accounts they are paying extensive interest in all localities remote from financial centers, and their unfructuous debt is increasing with no prospects of immediate reduction.

I am not going to burden you with figures. I might elaborate on this subject for a long time and tire you, but when we realize that the farmers' debt in 1910 was six billions of dollars and that the farmers' debt bears an avarage of interest of 7¾%, we realize that something must be done to cheapen the available money to farmers. Although stupendous this debt does

not necessarily indicate an unhealthy condition. Most of it lies in the newer sections of the country and in States where agriculture is most flourishing, and it may be reasonably inferred that it was contracted mainly for productive purposes.

The enormous funds which agriculture continues to require are of two kinds. The first is the fixed capital to be sunk permanently or for a long period in the acquisition and improvement of the land and in the purchase of equipment.

The second, in the circulating capital to be used for short periods in growing, harvesting and marketing crops. As to short-term loans for circulating capital, it must be borne in mind that the chief and proper use of the sums borrowed by farmers is for production, for the creation of something that did not exist before. Agriculture, when considered from year to year, and over extended areas, is, in its returns, the surest of all operations. Agricultural wealth and production in the United States are greater than in any other country. The figures are stupendous.

In 1910 farm property was valued at $41,000,000,000 of which $28,000,000,000 was in land. If this capital were mobilized, the credit needs of farmers could be supplied for all time to come. The annual returns are $8,500,000,000. As regards short-term credits, the best banking system ever devised for enabling farmers to utilize their own funds and revenues for their own purposes is a co-operative system.

The object of the movement which has been set on foot to improve farm credit facilities is the introduction of these principles and practices. Europe furnishes the best models to be studied. Some of these are defective. Germany is the only country in which the ideal has been approached. Hence, the study of the work which has been done, and the results obtained, will assist the solution of the problems arising in the reorganization of land and rural credit in the United States.

Rural credit itself is a banking and currency system, as well adapted to agriculture as our present system is to commercial business, providing, first, for long-term payments on land; second, for short-time credits on supplies, so as to escape time prices, and, third, provisions for marketing crops, so as to avoid congestion and panics.

The credits on land should be on the amortization plan, the best definition of which I have read is, "A plan for paying back money in broken doses." "For example, if a man borrows $1,000 at 6%, and agrees to pay $70 a year to the lender, it is evident that the first year the interest paid will be $60, and that the amount of principal extinguished will be $10. The tenth year $53.11 will be paid on interest and $16.89 on principal, and so on, until in thirty-four years the entire debt is paid."

In other words, if you buy a $1,000 farm, 6% on the $1,000 would be $60 a year, and under present conditions you might pay this amount for thirty-four years and still owe as much as when you started. Under the amortization plan, however, by paying just $10 more, that is to say, paying $70 a year, for thirty-four years, you would pay all interest and principal, and own the place.

Or let us give further illustrations on a farm bought under the amortiza-

tion plant at 6% interest: You could pay for it in sixteen years by paying $100 a year, this $100 covering interest, principal and rent. Or the place would be yours by you paying $90 a year for nineteen years, or $80 a year for twenty-four years, or $75 a year for twenty-eight years. Of course, for a $2,000 farm these annual payments would be twice the amounts here indicated, for a $3,000 farm three times as much, and so on.

In Europe you can buy a home almost anywhere on this plan—the "amortization plan," while at the same time, remember, you are left free to make bigger payments any time you wish, or pay off the whole debt at once if you wish. It is easy to see how such a plan would encourage home-ownership, and home-ownership is almost the basis of civilization.

The question arises what system is best, and how can this be brought about in a practical way. I can only outline the scheme to you. The farmers of the country are capable and independent men, and they should have the right under the laws to organize themselves as best suits their own ideas or circumstances, whether it be in associations with shares or without shares, or with collective liability limited or unlimited. Moreover, they should be able to decide for themselves whether they will have syndicate local association or one Raiffeisen credit system for each neighborhood.

They have no choice under any of the present laws, and thus the play of private initiative and freedom of action is blocked. The first step to be taken in order to extend co-operation and to introduce co-operative credit among farmers is, of course, the enactment of proper legislation. We have the experience of co-operative associations in other States, and these ought to be procured and studied.

Ambassador Herrick's book should be studied, and this Committee should formulate a law for New Jersey which they, in their good judgment, consider the best adapted. The farmers of our State do not need any special privileges or State aid. "If methods were simplified and technicalities eliminated, co-operation or organized individualism based on private initiative and mutual self-help would eventually be applied to all other activities. They would accomplish this most quickly and successfully by starting with a credit system as a local unit formed and operated on the principles of Raiffeisen."

TUBERCULOSIS COMMISSION.

Governor Fielder has spoken of the great loss to the State by reason of disease in cattle, and has urged that the farmers take more interest in live stock breeding, particularly in cattle.

The disease feature in farm animals constitutes one of the greatest losses that the farmer has to face. It is almost a total loss, although the State reimburses in a partial way for loss, but the expense attached to procuring other animals and the loss of the product and time in replacing the animals makes cattle breeding and dairying a very discouraging department in the management of a farm.

The policy of the State has been to endeavor to stop the prevalence and increase of diseases in cattle. Several years ago the newspapers severely criticised the State for the law on Tuberculosis in Animals, and the Com-

mission was criticised for not properly carrying out the laws. It was not the fault of the Commission. The trouble was that the Legislature had not given them sufficient authority, and could not control the veterinarians who examined the cattle. Certain veterinarians in Newark were doing a land office business in trafficing in tuberculosis tests, which showed that the cattle had been tested and were clear of tuberculosis, and, in reality, they were not. Thousands of cattle were sent to herds in the State spreading infection and bringing more loss to the farmers.

Your president was in the Legislature at the time, and, with the assistance of Senator Gaunt, had the law amended, and a law enacted creating a new commission with proper authority to systematize it, and place a protective patrol against diseased cattle brought into the State, secured honest veterinarians as inspectors, and I think every one will agree that very few, if any, infected animals have passed the border of the State since that time. New Jersey is looked upon to-day as one of the strong States, having very strong laws on this subject. Of course, we have never entered the home herds of the farmer except by request, but in doing missionary work, and urging the farmer to keep tuberculosis stamped out, we have made great headway. My own experience over a period of three years shows that if you keep the herd free from tuberculosis and raise your own heifers that there will appear but an extremely small percentage of tuberculosis.

During the year an outbreak of the hoof and mouth disease occurred in Michigan and spread throughout many of the Eastern States. As soon as it became known that this disease was prevalent, I instructed the inspectors and veterinarians of the Tuberculosis Commission to immediately make a search for any evidences of the disease. They found quite a number of cattle that had been brought into the State recently infected with the disease. Through the State Board of Health the places were quarantined.

At that time it seemed as if there was no provision in law to reimburse the farmers for the slaughtering of the animals, yet many valuable dairy and breeding herd in the State menaced by this disease made it necessary to take action and slaughter the cattle. Finding that the State had no funds, I asked through Inspector McNabb of the Attorney-General if we had not the right in the Tuberculosis Commission to slaughter the animals, and was informed that we had no right, and if we did do it, and expended the money without appropriation, we would be subject to indictment.

I then called on the Governor of the State to call a special a special meeting of the Legislature to take care of the matter. He stated he did not wish to do it, and thought that the farmers could take the word of the State that eventually they would be paid, and said that they might do so if they could be assured in some manner, and I then offered to procure the money to either guaranty the amount to the farmers or raise the funds necessary to allow these diseased animals to be immediately slaughtered, and the farmers reimbursed.

At that time I again appealed to the Attorney-General and stated that I thought that the State had the right to slaughter the animals on the ground that any one harboring them was maintaining a public nuisance. Secondly, that under the clause in the Commission on the Tuberculosis in Animals, it

provided we could co-operate with the National Bureau of Animal Industry in eradicating infectious and contagious diseases in animals, and we had the right to do so. After the offer was made to reimburse the farmers, the Attorney-General ruled that under this section in our law we had the right to slaughter and pay for the animals, which was done.

We have the word of the Governor and certain legislators that the State will see that the Tuberculosis Commission is reimbursed for the money that they expended for other purposes, so that we can continue the work of exterminating tuberculosis in cattle. I have spoken of this in connection with the suggestion of Governor Fielder that cattle breeding be revived in New Jersey. I have urged this for many years, and it has been demonstrated that such a plan was extremely difficult unless some encouragement was given the farmer as it is very expensive to raise cattle, owing to the high cost of feed and the low price of milk, the lack of pasturage and the fact that New Jersey is not a State entirely adapted for raising cattle for meat. I have, however, attempted to make certain suggestions in the previous portion of my speech, which may be a solution of the problem.

CONSERVATION OF NATURAL RESOURCES.

In regard to agricultural education, we have a department under the State Board of Education presided over by the Deputy Superintendent of Industrial and Vocational Education. This includes also agricultural education. At the present time there is no provision in the law for compelling the schools to teach agriculture. It would seem as if wherein in the judgment of the Commissioner of Education agricultural education was needed or sought, it should be established.

I will read an extract from the Commission on National Aid to Vocational Education, as follows:

"Agricultural education is the one way in which we can develop the resources of the State. As the asset of natural resources lessens or falls in the scale, the asset of human labor rises in importance. American agriculture has prospered in the past because it rested upon the basis of the richest soil in the world—a fertility which, with the usual prodigality of this people, has been treated as if it were inexhaustible. This favorable condition itself has delayed for a century too long in the United States, the co-operation of the National Government with the States in the systematic training of the American farmer. Only thorough-going agricultural education, making the farmer an intelligent user of the natural wealth with which Providence has blessed us as a people, can restore and preserve our boasted agricultural supremacy. A virgin fertility of soil is no longer available for unintelligent exploitation over any considerable area in the United States, and in the future a permanent and increasingly productive and profitable agriculture can be achieved throughout the country only by scientific culture. In agriculture, science has advanced far beyond practice, and it has become essential for the welfare of our increasing population that the farmer be made an expert. For intelligent farming our soils are an inexhaustible source of wealth."

Germany's great progress and the adaptiveness of her working classes have been attributed largely to her system of vocational education. Vocational education we consider a wise business investment and I think there is an overwhelming public sentiment in favor of it in this country. The kind of vocational education most needed is that which prepares workers for the common occupation in which the great mass of our people find useful employment. In agriculture what should be taught is general farming, dairying, poultry raising, truck gardening, horticulture, bee culture and stock raising.

In 1910 there were thirteen million persons in the United States engaged in agriculture. It is probable that less than 1 per cent. of these had adequate preparation for farming pursuits. This means that over twelve million engaged in agriculture in this country were not trained to deal with the soil so as to secure the most profitable results.

Our State law does not compel rural schools to teach agriculture. Many of them, however, are doing this. In Atlantic and Morris counties great strides have been made in this direction and I feel that during the coming year many districts will take up the work, especially as in many districts a start has been made by having corn-growing contests. Morris, Atlantic and Middlesex counties have developed rapidly this class of education.

One of the most promising experiments which is now taking place is the vocational work in agriculture which is being done in Atlantic county. All over the State great numbers of boys' and girls' agricultural clubs have been organized. The County Superintendents have been active in promoting this contest work. Several of the County Superintendents have organized and introduced home garden work in connection with the schools.

The State Department has issued monographs or guides how to introduce agriculture, trees and forests, corn-growing, elementary agriculture, a statement of standards. This shows that we in New Jersey are alive to the need of progressive education in agriculture, and I urge on this Board the careful consideration of the needs of the State in this direction. I ask for your cooperation, your words of encouragement, in order that this great work may be continued and extended and broadened.

I suggest that you urge that amendment be made providing that in agricultural districts the teaching of agriculture be introduced in the rural schools. I consider this for the improvement of New Jersey's agricultural progress one of the most important recommendations or suggestions that I have to make.

We know, deep down in our hearts, that knowledge is power, and we wish to give our children the power to use this intelligence for the benefit of the profession of their fathers—the cultivation of the soil. Let us, therefore, be broad-minded and through the sources and resources which the State affords give to the coming generation the benefit of the light of intelligence in agricultural education.

In closing, I wish to say that the great question before us in New Jersey is how to bring about increased production. In this connection no better illustration can be given than the present condition in regard to the production of wheat. We will send, probably, 250,000,000 bushels of wheat to Europe without creating an actual food shortage of wheat here. Our 6,361,000

farms last year raised nearly 900,000,000 bushels of wheat. At the present price of wheat in New York of $1.51 a bushel, the crop was worth, comparing with prices of one year ago for a much smaller crop, $480,000,000 more. This is simply an increase in the values. The war in Europe has brought to the American wheat-growers the brightest future they have ever had. This prosperity means prosperity for everyone as it brings more money to this country. It will not be a matter of one season, as Russia, the greatest granary in the world except the United States, sows wheat in the autumn and it is now too late to secure an average crop. France, the third producer of wheat, is in the same plight; she sows in October and February. Australia and the Argentine, where it is now midsummer, cannot produce their output.

We are made a rich nation by our great western domain and its inexhaustible resources, not by the skill with which we till our soil nor by the wisdom of our Government nor by the thrift with which we use the gifts of nature.

Now comes the practical part of the illustration which I am trying to bring forcefully to your attention and I am going to cite Germany, not from any desire to unduly laud that great country or take any position regarding the present conflict, but simply to show what conservation of her natural resources and intelligent attention to economic problems has done in scientific farming.

Quoting from the American:

"Germany is now reaping the reward of her science in farming. In wheat growing per acre, as in banking and commerce, in municipal government and in her system of farm loans, Germany has been more progressive than any other nation. Our Department of Commerce reports show that Germany by new scientific fertilizing has increased the fruitfulness of all her wheat farms from an average of 24 bushels an acre in 1890 to an average of 35 bushels an acre in 1913. The United States, with newer, richer land, raised only 13 bushels of wheat to the acre twenty years ago and it raises only 14 to the acre now.

"The productiveness of Germany's farms is due almost wholly to scientific instruction of her farm colleges and to cheap farm loans, governmentally aided, which enabled farmers to buy fertilizers and agricultural implements at a low rate of interest, 4½ per cent., on long-term notes. If American wheat farms produce the same per acre as Germany, our production would be increased one thousand million bushels and we might easily feed ten nations of Europe besides ourselves.

"England must import for her own people an estimate of 220,000,000 bushels of wheat this year. Germany, owing to her own wonderful farming, has to import only 68,000,000 bushels annually, although her population is 70,000,000 against England's 45,000,000. With a much greater population than England, Germany has by thrift, foresight and her system of protection, made herself much more independent of the world outside her borders than her richest opponent."

When we met last year the world was at peace. To-day the great nations of Europe are involved in one of the most horrible wars in the annals of

history, a war unthought of a year ago, taking the civilized world by surprise, and bringing untold suffering to millions of human beings.

We are devoutly thankful that this nation is still at peace, and we pray that whatever the future has in store for the human race, the people of America will be spared the dread disaster of being involved in this awful conflict.

For the nations at war we have the most profound sympathy, and in the words of the great Lincoln, "With malice toward none, and charity for all," our prayer to Almighty God to-day is that to these great people of the earth may speedily come an everlasting peace coupled with justice and mercy.

Here at home we men of New Jersey, as well as the citizens of other States, must show greater patriotism and public spirit in order to meet the growing needs that this conflict has brought to our very doors. Such public spirit and patriotism should be shown not only for our welfare and hapiness, not only for the welfare and happiness of the people of our State, but for the welfare and happiness of our great country and the entire world. This conflict has crippled the financial, manufacturing and agricultural interests of a large section of the world. It has affected the homes in many lands, the homes of laborers, of farmers, of financiers, and millions of people will look back upon this year as one of darkness and desolation.

Because large agricultural areas have been devastated as a result of this awful contest, great attention is being paid, and particularly in this country, to the products of the soil. The world is confronted with the problems as to how the world's armies and the great mass of people of some of the European countries shall be fed. This problem is made more acute in many instances by the crippling and almost entire destruction of transportation facilities in these nations, while in other countries the great railroad sytems have been taken over by the Government for military purposes and the feeding of the hungry people receives but little consideration.

Some parts of this country will benefit by the war, notably the wheat growers of the west, and to these the future appears bright. In other sections, however, particularly in the South, with its immense cotton crop and large areas of land uncultivated, the future prospects for these people are not so promising.

I want to see the farmers of New Jersey reap the benefit of the era of prosperity which will surely come with the cessation of this terrible conflict. I want them to have the great increase in business activity that will result in a greater demand for farm products. I am anxious that they shall all be prepared for the better times that we will enjoy, that they shall have the necessary equipment to handle bigger crops, the capital to finance their operations, and then I want to see the State Board of Agriculture organized in such a manner that it will do its share towards aiding the farmers of our State and in carrying on this great work. The members may then feel that they have given their service to some purpose.

Progress is what we want to see for the farmers, and greater efficiency in the organization devoted to their needs means that progress will be attained, and not only attained but maintained far into the future.

Vice-President Cox—You have listened with great attention to the address of your honored President. What do you wish to do with it?

A Delegate—I move that it be referred to a committee, appointed by the Vice-President, for consideration and report back.

This motion was seconded, and, on a vote, adopted.

This committee, appointed later, is as follows: Mr. Egbert T. Bush, of Hunterdon; Hon. George W. F. Gaunt, of Gloucester; Hon. Edgar G. Weart, of Mercer; Mr. Charles B. Jessup, of Burlington; Mr. Joseph Camp, of Cape May.

A Member—When will that committee make its report?

Vice-President Cox—Not before to-morrow.

The time has now arrived for the introduction of the Potato Question, and it affords we great pleasure to make way now for Professor Cook, who will take charge of this Potato matter in which you are all so vitally interested.

Mr. Cook then takes the chair.

Dr. Cook—This afternoon we have three subjects for consideration, first the address by Dr. Headlee on "Spraying Experiments in New Jersey," which was postponed from this morning, which is to take the place of Mr. Serrine's address on "Potato Growing"; and then an address on the "Diseases of the Potato," by Dr. W. A. Orton, and, lastly, the business session of the Potato Growers' Association. The subjects for consideration this afternoon are of vital interest to every one of you who are interested in getting good crops of potatoes.

You all know that it has been for a number of years recommended that we should carry on a careful system of spraying potatoes in order to improve our crops. It has appeared that the results from this were much better in Northern States than it was in New Jersey, and during the past two years we have been carrying on experiments with the idea of determining whether it would be profitable to conduct spraying experiments in this State or not.

Dr. Headlee's Address.

Gentlemen: In New York, Vermont and Maine the subject of potato foliage treatment has received a large amount of attention. So great has been the interest and so well has the work been done and the knowledge of it disseminated that we felt at the outset of our study in New Jersey further efforts along the same lines would hardly be worth while. The problem of potato foliage treatment in this State has been attacked from a different

standpoint. A very considerable portion of our potato growers do not spray at all, although they are more or less familiar with the results. This is partly due to ignorance and partly to lack of initiative, but largely to be charged to the fact that remunerative potato crops can be raised by use of arsenical foliage treatments.

An important factor rendering the allegiance to mere arsenical treatments firm is the difficulty with which sufficient water for spraying operations can be obtained and the celerity and low cost with which arsenicals can be applied.

Thus it appears that the rare occurrences of blight in the main potato sections of the State has permitted the grower to obtain good crops without the use of Bordeaux Mixture and that this fact, together with the contributing factors of difficulty in mixing the Bordeaux and of obtaining a sufficient supply of water, has led a large part of our growers to disregard the increased returns that follow the stimulation which properly made Bordeaux imparts to the plant.

The problem of potato foliage treatment was therefore one of finding a substance cheap enough to be practicable which could be applied without the addition of water and which would not only afford protection from insects and the occasional inroads of blight, but would afford that stimulation to the potato plant which results in increased yields comparable with those following proper Bordeaux treatment.

The nature of the problem led us to pick from the dry fungicidal substances available very finely ground sulphur and to combine it with powdered arsenate of lead. The first year of trials was devoted to testing various proportions of the arsenate of lead and sulphur against home-mixed Bordeaux and arsenate of lead. The tests showed clearly that the lowest percentage of arsenate of lead used—25% (1 part of arsenate of lead and 3 parts of finely divided sulphur)—gave quite as good or a little better results than did the higher percentages. The cost of even the 25% mixture was, however, still too great for practical work.

The second year (1914) it was planned to cheapen the dust and test the cheapened form against properly made home-mixed Bordeaux. The cheapening process took two directions—decrease in the proportion of the arsenate of lead and decrease in the proportion of sulphur, substituting for the latter an inert dilutant (finely ground gypsum). The second year the amount of territory covered by the experiments was largely increased. Instead of the 11 acres covered by the 1913 experiments about 60 were involved, and instead of one locality three were utilized, each in a representative potato-growing section. The places selected were the farm of J. Harry Kandle, near Elmer; the farm of Frank P. Jones, at Freehold, and the farm of Robert M. Dilatush, of Robbinsville. About 11 acres were involved at Elmer, 24.5 at Freehold and 24.5 acres at Robbinsville.

The results of the different treatments at Freehold were so much alike that a discussion of them would not be profitable. The returns from Elmer and Robbinsville are, however, quite distinct and will repay study.

Place.	*Treatment.*	*Yield in Bushels Per Acre.*	*Gain in Bushels Per Acre.*	*Cost of Application.*
Elmer	Bordeaux (5–5–50) + lead arsenate (3),	275.6	62.9	$6.20
	Sulphur (11.5) + lead arsenate (1), ...	233.5	20.8	8.67
	Kil-tone, ...	214.5	1.8	8.56
	Lead arsenate, ...	212.7	....	....
Robbinsville	Bordeaux (5–5-50) + lead arsenate (3),	290.3	41.4	$5.11
	Sulphur (5) + zinc arsenite (1), ...	266.44	17.54	6.03
	Electro Bordo-Lead, ...	265.98	17.08	5.94
	Zinc arsenite (1) + gypsum (5), ...	248.9	.....	....

This table clearly shows that the dust mixture devised and tried gave increases of 17 to 21 bushels per acre, as compared with from 41 to 63 bushels per acre from treatment with properly home-mixed Bordeaux. In considering the value of these results it should be remembered that the experiments were projected and carried out on a field scale. No plot involved much less than an acre.

Two investigations incidental to the dust mixtures were undertaken. One dealt with the value of zinc arsenite and the other with the value of some of the better known commercial Bordeaux arsenical preparations. The upshot of the test of zinc arsenite indicates that, pound for pound, that substance is about equal to arsenate of lead but apparently no better. As the table shows, the commercial preparations so far tested are more expensive and much less effective than the home-mixed Bordeaux and as expensive and hardly so effective as the dust preparations.

A Delegate—How about the cost for the treatment—the Jones treatment, the Freehold treatment?

Dr. Headlee—The cost of home-mixed Bordeaux, which was the only substance used at all places, was at Freehold a little less than elsewhere.

A Delegate—It don't cost Jones much; he is a good farmer; I know him. I don't know about the others.

Dr. Headlee—You can understand that a farmer, who is spraying potatoes on a large scale and has the complete control of the work, would be able to perform the operations more cheaply through various savings in purchasing materials and various arrangements for facilitating mixing and applying. A certain amount of additional time is required when the treatments are intended to constitute a test.

Mr. Applegate—If there was an entire lack of blight, would the treatment with Bordeaux make any difference then?

Dr. Headlee—It did.

Mr. Applegate—Where there was an entire absence of blight?

Dr. Headlee—There was not enough blight of any sort in any of these treatments to be considered worth while.

Mr. Applegate—Perhaps you killed it before the blight began to show.

Dr. Headlee—That may be. But we had checks where we did not have Bordeaux at all, and those checks did not show it.

A Delegate—Does it make any difference in the top growth of the plant, where no Bordeaux was used, and where it was? I know some plants where the Bordeaux checks the foliage growth very decidedly; not particular potatoes I speak of, but I know some plants it does that very decidedly.

Dr. Headlee—Bordeaux seems to affect the potato foliage. It does not check it but stimulates it in some way. Perhaps it is an irritation that results in the production of a darker green leaf. Applications of Bordeaux seem to be the type of stimulant which the potato plant needs. The treatment results in a better potato plant and larger crop of tubers. Different plants naturally respond differently to the same substance.

Dr. Cook—After this session we will have a short business session of the Potato Growers' Association. That session need not require over five or ten minutes, and I would like you all to remain to attend to that business.

I am glad to introduce the next speaker to you this afternoon, for a number of reasons. One reason is, because in case you should have any troubles with your potatoes or other crops in this State which would necessitate a government quarantine, it is very likely that Dr. W. A. Orton, of the United States Department of Agriculture, would have something to do with the quarantine regulations. He is a member of the Federal Agricultural Board, and that would come as a part of his work. It might be a good idea for you to get acquainted with him. More than that, Dr. Orton is the man who has charge of the laboratory for the study of the diseases of potatoes, and he is one of the best informed men on the subject in America. I take great pleasure in introducing him.

Dr. Orton's Address.

Mr. President, ladies and gentlemen: It is a great pleasure to me that I am to have this opportunity to address you farmers of New Jersey this afternoon, and particularly because I shall present to you a proposition relative to the improvement of seed potatoes which, I think, offers a real opportunity to the growers of potatoes in this State.

In discussing the diseases of potatoes, I wish to deal principally with those which are carried on seed potatoes, for one of your greatest problems is to get the best seed potatoes, free from the serious defects which they now possess.

I will, however, endeavor to leave out the unnecessary technical descriptions of these diseases and speak more of their control, in order to confine ourselves to those considerations which affect the value of potatoes for seed and in order to consider more thoroughly the diseases which are bred on the seed potatoes.

I am going to vary the usual procedure. Ordinarily we come before farmers advising them how they may control potato diseases by treating their potatoes. I am going to advise you how you may control potato diseases by having somebody else treat them. In other words, the plan is that many troubles of the potato may be controlled at the source of the seed supply.

For example, let us take the late blight, a disease which is relatively rare in New Jersey potato fields, except perhaps in the northern part of the State. Yet it is a trouble which has considerable significance to all you potato growers, because you must obtain your seed potatoes from the districts where this disease occurs.

Now the late blight is primarily a disease of the foliage, and secondarily of the tuber. It attacks the foliage, causing a rapid blighting, with abundant production of spores, which are carried to the tubers and cause a dry rot. It is that dry rot in your potatoes which constitutes your primary interest in this late blight disease, because, when you secure seed from the north that has become infected with late blight, the dry rot prevents germination and you have an imperfect stand.

Now, it may seem that you have no control over this situation, but I wish to show you that you have. There is a movement going on for the betterment of potato seed growing which you can support by demanding freedom from all diseases, including this late blight. The farmer in Maine has it almost entirely in his power to prevent late blight; and more than any other potato grower in this country he is controlling the disease by spraying with Bordeaux Mixture. Potato spraying in Maine has reached a higher stage of development than anywhere else. One finds in passing through that wonderful Aroostook county that the principal agricultural instrument in evidence is a potato sprayer, well covered with Bordeaux.

So, having the means in their power to control the disease, we should insist on it that our friends in Maine send us seed potatoes as free from any trace of late blight dry rot as thorough spraying will permit. We hope that a higher degree of perfection in the control of late blight will come in future years out of the work of Prof. Wm. Stuart, through the breeding of new resistant varieties, though there are perhaps none as yet which can be recommended for commercial use.

Not all potato diseases are introduced in seed. The dying of the foliage which you describe as blight in New Jersey is not often the same as that which we find in Maine. It is occasionally the Early Blight, but more frequently still is Tip Burn, which is the result of the action of the sun and heat upon the potato plants.

Passing then to other potato diseases which are important for the buyer of seed potatoes, let us consider for a moment the common scab. Here we

have a disease which is present almost every where that potatoes are grown; it is almost impossible to find a large quantity of seed potatoes entirely free from it. The cause of scab is a soil organism, now classed with the bacteria, and belonging to a group that may be expected to be present in nearly all soils. The development of scab requires, in addition to the presence of the parasite, that soil conditions shall be favorable to its development, through their neutral or alkaline reaction. Relatively little scab is found on the more acid soils which explains why you may occasionally plant potatoes that are very scabby and harvest a clean crop, and why it is that when you have limed your soil you have so much more scab.

We should still insist on having seed potatoes delivered to us relatively free from scab, but it is not reasonable to expect them to be entirely free. In the standards that have been suggested it is provided not more than ten per cent. of seed potatoes shall show any trace of scab and none of them should be badly covered or deeply pitted.

Should we treat seed potatoes? I say yes. I wish to advocate the treating of seed potatoes with formaldehyde, or, still better, with corrosive sublimate, because by the use of the corrosive sublimate we can rid the seed of the scab and also of this russet scab or Rhizoctonia, which is perhaps a still more serious enemy. But I want to emphasize that seed treatment has been rather overestimated. Seed treatment is not a panacea or cure-all. There are many more important things in connection with potato growing than seed treatment. I think it pays to treat seed potatoes every year, as one of the precautions which we take in producing the crop, but we cannot look forward to the control of all diseases to which the potato tuber is subject by this means.

It is important that the potatoes be dried after the treatment, otherwise they are likely to become injured. But, in general, if the directions are carried out, there is no danger whatever to potatoes unless they are very badly handled. Seed potatoes may be treated a long time in advance of planting, weeks, or even months, provided they are not exposed to reinfection by placing them in the old barrels or in old contaminated bins.

The formaldehyde treatment consists in soaking the potatoes for two hours in a solution of one pint to thirty gallons of water; the corrosive sublimate treatment consists in soaking them for an hour and a half, or an hour in a solution of four ounces of corrosive sublimate to thirty gallons of water.

More lately we have heard a great deal about powdery scab. Quarantines have been established barring the importation of potatoes from Europe on account of this disease, and quarantine has been placed around the principal potato districts of Maine because of an infection of powdery scab which has been found there. More recently still, two counties in the State of New York, Clinton and Franklin, have been quarantined for powdery scab.

Powdery scab is a disease somewhat similar in appearance to common scab but caused by a very different parasite. The small, roundish pustules are, in the early stages, covered by the epidermis of the tuber; later this breaks away and reveals a cavity filled with powdery brown sporeballs. If

the potato is wet the powdery scab spots turn black, a character that helps us to distinguish it from common scab, which does not change color when wet.

Powdery scab was placed under quarantine because it appeared to be a dangerous disease, new to the United States, introduced thus far only in a few limited sections and possible to restrict or exterminate.

The qualities feared as more dangerous than common scab were (a) the reported tendency to increase in the soil from year to year, (b) the occurrence of a canker stage which entirely ruins the tuber, (c) a secondary dry rot due to other fungi which enter through the scab spots, (d) the fear that it would be more serious in America than in Europe.

In the absence of knowledge on the above points, a policy of extreme precaution was justified. To New Jersey and the South the quarantine against Maine and New York potatoes is of particular interest in its relation to the seed potato question, affecting, as it does, the districts upon which we have come to rely to produce the best potatoes for southern planting.

As a quarantine problem, the situation in Maine involved the inspection of over twenty million bushels of potatoes in an area where mild cases of powdery scab were pretty well scattered. The first object of the Federal Department of Agriculture was to safeguard the farmers of other States, which buy so largely of seed potatoes. A special grade of seed potatoes was established. To receive the certificate potatoes were required to come from farms free from powdery scab, to have been grown from healthy seed, and to be found on inspection at point of shipment to be free from powdery scab. A white label was placed on seed potatoes, contrasting with the yellow card on the "table potato" grade, which, while required to be free from scab, might have been exposed to the disease.

At first the inspection appeared to work well, but later it was found impossible to guarantee freedom from powdery scab, because inconspicuous cases proved so widespread that it was not humanly possible to detect them all in a commercial inspection. The seed certificate has, therefore, been withdrawn, as the government will not certify anything open to suspicion, and still other means are being tried out. In the meantime, evidence is accumulating which suggests the possibility that powdery scab may not be able to establish itself in the South, and experiments along this line are being pushed.

The experiences of the year have much significance to the better seed movement. They show that there is a demand for inspected and certified seed. Contracts between growers and dealers specified that the potatoes should bear the White Federal certificate, and sales were made on the representation that the stock would be "government inspected." Apparently the purchasers expected that this certified seed would be first grade in every respect, and many complaints arose from findings of common scab and other troubles. As a matter of fact, the white label covered freedom from powdery scab and nothing more. The quarantine law did not authorize the inspector to reject for other defects, and there might be mixtures of varieties, black leg, dry rot and bruised or cut tubers to an extent rendering the stock really unfit to be called "seed potatoes."

It has proven difficult for the public to make the distinction.

There is a means of safeguarding against disease and bettering the general conditions of the seed potatoes, based on the fact that nearly all potato troubles can be controlled more easily and more effectively by the northern grower of seed stock than by the southern purchaser of that stock.

I have already spoken of the late blight dry rot. Another example is the black leg, a disease common in New Jersey, but always brought in on the seed, since it cannot live over in the soil. It has been shown in numerous tests, carried out on large fields, that it is possible to rid northern fields of black leg by a relatively simple method of seed treatment and by destroying all diseased hills. It is, therefore, perfectly practicable for them to ship you seed stock free from black leg, and you should insist on it.

Other diseases are introduced by seed. Some newly recognized and not yet fully understood maladies known as leaf roll, curly dwarf and mosaic are serious enough to excite apprehension and lead the buyer of seed potatoes to inquire rigidly into the character of the stock.

These diseases cannot be detected at all by an inspection of the seed potatoes. The tubers from diseased plants may appear to be perfectly normal, but they will produce a diseased crop. The only way to guard against those troubles is to have your potatoes that have been grown for seed inspected in the summer in the field. Field inspection is by far more important than cellar inspection. Many potato buyers have already sent representatives up to the north to look at the fields of potatoes. The chances are that they have overlooked many of these troubles which we have found to be significant in their influence on the southern crop. So we are recommending that an organization be created that will enable the growers of seed potatoes to secure an inspection of their crop by experts, and that will enable the buyers of seed potatoes to secure a guarantee from a disinterested party that they are free from diseases.

At the suggestion of the United States Department of Agriculture such a field inspection service has been organized during the last year in four great potato States, Maine, Michigan, Wisconsin and Minnesota, and tried out on a practical scale, involving the inspection of hundreds of farms and the certification of many thousands of bushels of seed potatoes. It is about this plan particularly that I want to talk to you this afternoon.

There is at present a great lack of seed potatoes of high quality.

Last summer, in connection with a large party of potato specialists, plant pathologists, potato breeders and others, I went all over the principal potato sections of the United States, starting here in New Jersey, going up to Maine, then across the country to New York, Wisconsin, Minnesota, Colorada, Utah, Idaho and to California, spending nearly three months in a careful inspection of potato fields, to determine the presence or absence of disease and the general situation with reference to seed potatoes and where they should be grown.

With the possible exception of Maine, where a good deal of attention has been paid to growing seed potatoes, I believe it is safe to say that we did not find any place where you could send and buy carloads of potatoes that were really seed potato quality. In whole States such things as seed potatoes did not exist; that is, potatoes free from varietal mixture, and free from disease. They cannot be had except in limited quantities.

A large part of what you have been buying for seed are just common potatoes. The same kind of potatoes that everybody used for table purposes, raised on the same farm, and by the same methods, and sold without much selection in the same markets. The private business has not been organized. It has no standard for seed potatoes. You might describe what your idea of a seed potato would be, but there is nothing official which can be put down as a basis for a contract between buyer and seller. This deficiency should be remedied by the adoption of uniform rules covering varietal purity, size, quality and freedom from disease. Such a standard means specialization on the growers' part.

There is a most remarkable awakening to the importance of improving our potato growing in all potato States. Several States have their Potato Associations. I would direct your attention especially to what the State of Wisconsin is doing for the improvement of potatoes through their Potato Association, which is working for the limitation of their culture to a few of the best varieties, the growing of these varieties in communities so that they may ship in carload lots and trainload lots, and establish a reputation in the market, the control of diseases, and so on. More recently, since they have added the certification of seed, Wisconsin will be able to supply seed of this high quality.

In nearly all of the principal potato States this awakening is going on; farmers and potato specialists are improving their stock and are growing better potatoes.

The procedure in these States where the system has been organized is for the farmer to first request his State Agency to make an inspection; that State Agency is usually the State Department of Agriculture, or a branch of the State Experiment Station. They send experts to the farmers' fields, twice during the summer, once while the potatoes are in bloom, which is the best time to detect varietal mixture, black leg, leaf roll and some of the other diseases; again in the fall, before the potatoes are harvested, when they again look for varietal mixture and other diseases, and when they harvest some of the hills and see that the variety is uniform in production, of the right shape and type, and of the variety claimed. The third time inspection is usually made in the cellar. There is issued as a result of this inspection a State certificate, which guarantees that the potatoes have come up at least in the standards established by the certification system. It is then required that every sack or barrel be sealed, and the tag of the inspection service be attached to it.

The expense of this is all borne by the seed growers. They pay a fee for the service which they naturally pass on to the buyers. The cost, however, is not very great per bushel. But it costs more to raise that kind of potatoes, and it must be expected that buyers who actually want the best potatoes that can be grown will have to offer a bonus in price.

We may sum up the situation by saying that the certification of seed potatoes has been started, agencies have been created in five States to certify seed potatoes, and the farmers in those States are inquiring whether it will really pay. The answer must come from the southern users of northern seed. If you want that kind of potatoes you must make your demands for them felt at once.

The quantity of certified seed potatoes in existence at the present time is small, quite insufficient for this year's planting, but in order to have an adequate supply for the next year you ought to take action soon, before the northern crop is planted.

Now, what have you to gain by it? Possibly some of you have made estimates as to the losses which you suffer from the defects which are inherent in your seed. Possibly you have figured out how much you have lost from the mixture of Green Mountains and Cobblers. Possibly you have figured out how much you have lost from Black Leg.

We have done a little of that, too. For example, the year before last we started with a Maine field which contained about four per cent. Black Leg, which is not an excessive amount. We eliminated the Black Leg disease by taking out all of the diseased hills. That has proved to be a very effective method and a very simple one. We took from the selected stock a few barrels down to Virginia. We took a corresponding number of barrels of unselected stock. The latter gave 207 hills of Black Leg; the selected stock gave only three hills. The yield from the non-selected was ninety bushels per acre; the yield from the selected was a hundred and fifteen bushels per acre. Ninety against a hundred and fifteen bushels per acre accomplished without a stroke of work on the part of the grower, simply by using the best seed.

Another experiment carried out in a similar way was very interesting, because the results showed at the end of the season that from the selected seed the product was well over thirty dollars an acre more than from the unselected seed.

Dr. Orton—I would now like to answer any questions you may wish to ask which I can answer.

A Delegate—I understood you to say the government inspection guaranteed the potatoes to be free from certain diseases. Is that an absolute guarantee or only that they are brought up to a certain standard of purity? Those tags I think said that they are found to be thus and so?

Dr. Orton—That is the usual form of certification in nursery stock inspection.

The Delegate—Is it any stronger than the tag presents it?

Dr. Orton—No damages will be paid you if you find the scab after the inspection. The certificate says those potatoes have been inspected and are believed to be free from the scab. We have endeavored to satisfy the requirements that they are beyond suspicion. The certificate of inspection is really a little stronger than what you find on the tag. We have done our very best to guarantee you against the presence of that disease.

A Delegate—In cutting those diseased potatoes, such as you described, would your knife become so infected as to injure the next potato you cut?

Dr. Orton—In the case of the late blight I think not. It has been recommended for the Black Leg that the man who cuts the potatoes have two knives, one soaking in a pot of formaldehyde, and to change knives if he cuts a diseased potato. But I might say that while that is a good theoretical recommendation, it is more important to buy disease-free seed.

A Delegate—Is the term certified seed a protection in any way? Can anybody sell seed and call it "certified"?

Dr. Orton—The misuse of the federal tag or the federal certificate is penalized by fine and imprisonment. The State seed certification is not thus protected as yet, but it will be.

A Delegate—In the State certification is a certificate necessary to make it certified seed, that is, necessary in order to have strictly certified seed?

Dr. Orton—Yes, sir.

A Delegate—Is it necessary to have the State tag as well as the federal tag showing the freedom from powdery scab?

Dr. Orton—That is correct.

A Delegate—May I ask what the limit was to the number of Black Legs allowed?

Dr. Orton—One-half of one per cent.

A Delegate—That is one in two hundred?

Dr. Orton—Yes. And those should be taken out before the potatoes are dug.

A Delegate—That is what I mean, in the field inspection?

Dr. Orton—If the field had five per cent., at the first inspection, it would not be considered even if the growers were to take them out.

A Delegate—Does not that allow the dealer in the general trade to buy potatoes anywhere and have them inspected, and allow inspectors to put the tag of inspection on, and say that they are apparently free from powdery scab?

Dr. Orton—No. Our inspectors must trace every bag of potatoes and see that they have a certificate on before they go. A dealer cannot secure a certificate for his potatoes unless our inspector has the grower's affidavit that he grew them in healthy land and from clean seed.

The Delegate—I mean the general certificate of inspection.

Dr. Orton—For seed potatoes or table stock?

The Delegate—For seed potatoes.

Dr. Orton—For seed potatoes we try to establish a guarantee that puts them above suspicion. Those dealers who buy from a great many farmers, buy them intending to use them as seed stock, and each farmer brings in his affidavit of the growth and

the inspection is made then and there; if it is put in a bin our inspector keeps a record, a certain bin or warehouse is known to be filled with such a certifiable quality, and then when loaded in cars the certificate of the inspector is issued.

By far the larger part of the potatoes you are buying at present are not seed potatoes. They are common potatoes. They come from fields affected by a number of diseases. I am here to recommend every grower in New Jersey to buy nothing but the purest and best seeds they can buy, because it will be the most profitable.

Secretary Dye—I move you, Mr. Chairman, that a vote of thanks be extended to Professor Orton for his excellent and comprehensive address given us this afternoon. (This motion was duly seconded, and, on a vote, carried.)

Dr. Cook—I hope that we can arrange, another year, to have a meeting earlier in the season, probably in November, at which time we can have an exhibit of the potatoes grown in New Jersey and at the same time have an exhibit showing the result of the experimental work. Dr. Headlee has told us something to-day about the experimental work carried on last season, and we have a great deal more projected for next than we have had for the past season.

Is there any other item of business? If not, the meeting stands adjourned.

The meeting then adjourned till the evening session.

EVENING SESSION.

IN THE AUDITORIUM OF THE STATE NORMAL SCHOOL.

The meeting was called to order by Vice-President Cox.

Vice-President Cox—On behalf of the State Board of Agriculture, I want to express our satisfaction and pleasure for your generous hospitality, as well as for the kindness and generosity of your admirable head here, Dr. Green, and I want to express the appreciation of the State Board for the attendance of such a beautiful and delightful audience here to-night. (Applause.) As has been our custom, the State Board of Agriculture comes to you here once a year to gladden your hearts and increase the enthusiasm among your members in this school for the dear old farm.

Agriculture was the first calling of man. The farming occupation is the oldest occupation in the world, and there is one thing that you might overlook which I surely want you to remember, and that is, when the occupation first started here on earth there was a man and a woman engaged in it, and thus it has been ever since. The farms of the land have been maintained by the men and the women, and the farmers of our State must be the men and the women of the future, and some of them who are going to farm our lands in the future I see before me here to-night.

We come to you with this old interest, now a little stronger, if possible, in the dear old farm. We would like to have you all love the farm as these farmers loved the farm, and, if you cannot do that, do the next best thing, and love a farmer. (Applause.)

Before bringing before you the lecturer of the evening, I am credibly informed that Dr. Green has a statement that he would like to make to the membership of the State Board of Agriculture, and Dr. Green will now have that opportunity. Dr. Green. (Applause.)

Dr. Green—I should like to have the visitors who are here realize that we have paid to you the best compliment we know how to pay. We have sung for you, first, our school song, which is very near to us; and, secondly, our State song, which includes us all. And when I say to you that these are the songs of which we think most, you will realize that we are doing the best we can to make you feel welcome among us.

We want you to realize that we appreciate the great and historic occupation of which you have spoken in a very sincere way. We regard that subject from two points of view, one is its own direct and special point of view; the other is, the point of view of its inter-relations to all other occupations. We think that those two points of view give us a better opportunity to judge of the value of agriculture and to appreciate it than would looking at it from the one point of view alone.

We are striving, as I have said to you before, to make the education of this school come just as near practical life as we can. We welcome you cordially. We want you always to come. Come not only when you have your assemblages, but come at other times.

There are two or three things that I would like especially to impress upon your minds. One is that it is your children who are here; the children of the State of New Jersey who are here. And the State is always interested in its children. Another is,

that this property is your property. This institution is now coming to have something of a historic character. It has been here more than a half century and has seen the development of all of the branches of sciences and of industry in our State, and very much of our social welfare; and it is your institution, and we want you to feel at home in it.

One year ago this winter the Legislature made us an appropriation of eighty-five thousand dollars for enlargement and better equipment, and the result is here, and the Legislature of the last winter appropriated eight thousand and some hundred dollars for the furnishing of these rooms, making in all nearly a hundred thousand dollars that we have been able to add to our equipment. We have not the furnishing quite all completed. Our proposed new library is not yet furnished. The completing of the building was late this fall, and we could not get in the interior to set the rails and so on. But many of the rooms are now furnished and are being used. We are able to add a story to our gymnasium. It is our proposition to have two rooms where we can exercise, where we can take what are known as the health lessons of the State. We want this institution to be sending out a supporting influence to the development and the enlightenment in the general lines of health for the commonwealth.

On the other side, in the new wing, better equipped rooms than any we have had for the sciences and particularly the botany and zoölogy—two branches which are closely related to the great agricultural interests. And we are aiming to learn something of the things that concern us all most. The insects that are destructive and the birds, etc., that are friendly; the bacteria, the serious science in this great department.

Our progress, of course, must be slow, but it will be sure, because these great sciences, as they come to be appreciated, will be understood to reveal most of the real significance of life and of the industrial values on the farm, and, perhaps we might remember that all our ethical and æsthetic values largely grow out of our industrial values. (Applause.)

Vice-President Cox—Now, friends, we have come here, as I said before, upon different occasions; we have brought to you beautiful scenes of foreign lands, and we have interested you with landscape views of ornamentation of different kinds to be found in distant countries of the globe. To-night we bring to you a question directly at home and we bring to your attention to-night views of New Jersey, and I am delighted at this time to introduce to you the speaker of the evening, Dr. Lipman, the

Director of the New Jersey Experiment Station. Dr. Lipman. (Applause.)

Dr. Lipman then delivered a delightful and instructive lecture on New Jersey Agriculture, illustrated with many lantern slides. This is not reported, owing to the impossibility to properly represent it without the printing of the slides.

SECOND DAY.

TRENTON, N. J., January 28th, 1915.

The meeting of the Board was called to order by Vice-President Cox, who said: "Our meeting this morning will be opened with prayer by the Rev. Mr. Curry, pastor of the Fourth Presbyterian Church of this city."

Mr. Curry then offered prayer.

Vice-President Cox—The first item in order this morning is Unfinished Business; is there any unfinished business to come before the Board at this time?

Is there any New Business?

If not, we will pass on to Resolutions. Are there any resolutions to be introduced?

Mr. Charles J. Fisk—Mr. Chairman, as delegate from the New Jersey State Poultry Association I would like to introduce this resolution:

We, the members of the State Board of Agriculture, representing the combined agricultural interests of the State of New Jersey, wish through this resolution to express our wish that the poultry industry of our State be fostered and supported to the utmost, especially on account of the heavy investment in this section in poultry, and the great growth in poultry farming which is now under way. We therefore concur in the following resolution in support of our Agricultural College and Experiment Station:

WHEREAS, The present equipment is not sufficient to meet the rapidly increasing demand for instruction in poultry husbandry at our State College;

WHEREAS, Additional facilities are needed for scientific investigational work along the lines of breeding, feeding, hatching, rearing and marketing;

WHEREAS, Owing to the great demand for a larger and better equipped poultry farm for demonstration and experimental work, there is an urgent need for funds to develop such a farm since the land has already been set aside for that purpose by the College;

WHEREAS, Appreciating the work already accomplished by the Poultry Department during the past four years, along educational, investigational and extension lines with the equipment and funds available, and believing that this work so ably begun should go on along more extensive lines; be it

Resolved, That we heartily endorse the action of the College in its efforts to secure increased appropriation for poultry work from the present Legis-

lature, and that we lend our combined and personal efforts to the securing of said appropriations; furthermore, be it

Resolved, That a copy of this resolution be sent to each County Board of Agriculture, to each subordinate Grange, and also that a copy be sent to the chairman of the Appropriation Committee of the present Legislature.

Mr. Fisk—Mr. President, I would also like to offer in connection with that resolution, this explanatory statement, viz.:

Appropriations for Poultry Husbandry asked of the Legislature: (*a*) $5,000 on supplemental appropriation bill for maintenance; (*b*) $8,000 on regular appropriation bill for maintenance; (*c*) $10,000 on regular appropriation bill for buildings, roads, fences and equipment for the new poultry farm of twenty-three acres which is now under construction.

* * * * * * * * * * * *

The amounts asked for, as outlined, have already been cut to the lowest point possible by the institution, with the idea of being as economical as possible in their requests from the Legislature. Any cutting of the amounts asked will materially impair if not make it necessary to stop many lines of effort.

Vice-President Cox—The resolution will be received and referred to the Committee on Resolutions.

Are there any other resolutions to be presented? If there are no further resolutions, the Secretary has a communication which he wishes to read.

Secretary Dye—I have received a letter from ex-President Denise, who was President of the Board years ago, and who is kept at his home by an attack of rheumatism. He has attended thirty-three consecutive meetings of this Board, and up till now regularly. He says in closing, "I extend to the State Board my good wishes for its continued success."

Vice-President Cox—The communication will be received.

President Frelinghuysen then assumes the chair.

President Frelinghuysen—We are now ready for the second call of delegates.

The Secretary called the roll, resulting in the completed roll as it appears in the fore part of these minutes.

Mr. Brown—The report of the Auditing Committee is ready, Mr. President.

President Frelinghuysen—You can present it.

Mr. Brown reads report of committee, as follows:

Your Auditing Committee report that they have examined the checks and vouchers of A. J. Rider, former Treasurer, and find them correct, and that he received and paid out from October 31st, 1913, to January 26th, 1914, $5,252.19. –And we have examined the checks and vouchers of Treasurer J. Harvey Darnell, and find them correct, and that he has received and

paid out from January 26th, 1914, to October 31st, 1914, $6,220.13. A total for the fiscal year of $11,472.32.

(Signed) THEO. BROWN,
GEORGE E. DeCAMP,
ALBERT I. ACKERMAN.

On motion, the report was accepted and ordered printed in the annual report.

Mr. Brown—Mr. President, the Committee on Farm Bureau, appointed by President Frelinghuysen at the last session, is ready to report.

President Frelinghuysen—If there is no objection, the report will be received.

Mr. Brown then read the report, as follows:

The question of the establishment of a Farmers' Bureau in the office of the State Board of Agriculture as outlined by our President in his last annual address has been carefully considered by your committee.

We have interpreted the duties of this proposed bureau to be the getting and distributing of reliable information about the farm lands and resources of New Jersey. We believe this project may be divided into two distinct lines of work. A Farmers' Bureau might, first, have to do with the lands for sale now under cultivation.

It might have, in the second place, to do with lands for sale at the present time unfarmed. The first line of work, we believe, is already adequately, even if in a few cases not truthfully, taken care of by the real estate men. One of the evils in this State is the trading of farm lands at prices which are set not by what the land is producing or can produce, but what it will bring as a city man's country residence. We do not believe that it is necessary for the State Board of Agriculture to increase this sort of trading. Farmers in the market for farms are usually able to obtain information through the regular channels.

Neither do we think the second line of work should be undertaken at this time. The profitable occupation of the idle lands of New Jersey is greatly to be desired. The attraction of ambitious pioneer farmers, perhaps from foreign countries, is undoubtedly one factor in the occupation of these lands. We believe, however, it would be wrong to attract settlers to this territory until, first, demonstration farms have been successful; and, second, until some sound and reasonable means of rural credit has been established. We recommend, therefore, that the State Experiment Station and Agricultural College, through its Extension Department, take steps at the first opportunity to establish demonstrations of profitable types of agriculture on these abandoned lands, such types of agriculture to be suited to farmers of small means.

In speaking of the Farmers' Bureau question, our President called attention to the frauds practiced by some unprincipled real estate men in the selling of land. To provide a means of correcting this evil your committee, with the assistance of Mr. Nelson B. Gaskill, drew up an amendment to the "Crimes Act," enlarging its provision to include the sellers of land as well

as mortgages. We are glad to report that this amendment was passed by the last Legislature, and that at the present time a man who fraudulently misrepresents real estate for sale is guilty of a misdemeanor, and is liable to a fine of a thousand dollars or a year imprisonment, or both.

(Signed) THEODORE BROWN,
FRED LIPPINCOTT,
ARTHUR LOZIER,
WILLIAM HAMILTON,
JOHN H. HANKINSON.

President Frelinghuysen—You have heard the report of this committee; what will you do with it?

A motion was made and carried that the report be received and printed as part of the minutes of this meeting of the Board.

President Frelinghuyson—The next matter will be the report of the Commission on Tuberculosis in Animals. This report will be read by the Secretary of the Commission.

Secretary Dye then read the report of the Commission on Tuberculosis in Animals, which was as follows:

Report of Commission on Tuberculosis in Animals, 1914.

The Commission on Tuberculosis in Animals has prosecuted the work committed to it with all diligence. Since the last report was made and up to October 1st, there were imported from other States into New Jersey, 13,460 cows. This is about the same ratio as prevailed during 1912–13. The total number imported in 1912 was 16,085, in 1913, 16,388, a total of 45,933 for two years and nine months. This number of animals at a price of $85 per head to the dairymen of New Jersey, gives a total of $3,904,305. We believe there is a less expensive and better way to maintain our dairy herds, and that is by breeding and raising our own dairy animals. Dr. John C. Sharpe, of Blairstown, who has been doing this with his Meadowbrook Farm dairy, has been requested and will give his experience along this line of dairy husbandry at this meeting. The following tables give the details of number of cows imported, tested locally, etc., with expenses. (See Table I.)

It will be noticed that our report dealing with cattle importations under the tuberculosis law seems to close with October 1st, and so it does, in large measure, for about that time Foot and Mouth Disease was discovered in Michigan, and from there spread quite rapidly so that New Jersey, with some other States, was caught by government quarantine, owing to several outbreaks having been discovered within our borders. Your Commission, however, notwithstanding the prohibition against importing cattle, was not idle. For immediately on the announcement that this disease was again discovered in the United States, the President of this Commission, Hon. Jos. S. Frelinghuysen, on November 7th, gave instructions to our Chief Inspector, Mr. Chas. McNabb, to put all of our veterinarians on the hunt for any cases that might have found their way into this State before quarantine was

established, and report the same to the State Board of Health. Following these directions the first cases discovered were by Dr. Wm. H. Lowe, Inspector for the First District, and his assistant, in North Bergen, Hudson county, November 8th. Other cases were subsequently located at the following places and dates. (See list.)

How to deal with this outbreak was the next important question. Primarily this work belonged to the State Board of Health, by law, in co-operation with the U. S. Bureau of Animal Industry. It was found, however, that the State Board of Health did not have sufficient funds at its disposal to effectively deal with the several outbreaks. It is a very expensive campaign as required by the U. S. Bureau of Animal Industry. At this juncture the question was presented, could the funds appropriated by the Legislature to the Commission for its work be used to control and eradicate the Foot and Mouth Disease, and reimburse the owners of slaughtered cattle in the State's proportion as required by the United States law? The law of the Commission was examined and was submitted to the Governor and the Attorney-General for their opinion. It was decided that the Commission could co-operate with the U. S. Bureau of Animal Industry and the State Board of Health in this work, and this course was followed.

It will be seen from the above showing that the Commission on Tuberculosis in Animals will need to be reimbursed for this absorption of its funds by special act of the Legislature at the present session, or its work will be suspended.

Approved by the Commission.

FRANKLIN DYE,
Secretary.

TABLE I.

REPORT OF CHAS. M'NABB, CHIEF INSPECTOR, TO COMMISSION ON TUBERCULOSIS IN ANIMALS.

Fiscal Year—October 31st, 1913, to October 31st 1914.

Inspector.	*No. of Imported Cattle Tested Before Entering State.*	*No. of Cattle Imported and Tested After Entering State.*
1st Dist.—Dr. William H. Lowe, ...	6,777	2,365
2d Dist.—Dr. W. Gray, ...	959	972
3d Dist.—H. B. Richman, ...	156	1,959
5th Dist.—Dr. H. H. Bair, ...	1,878	1,205
Total, ...	9,770	6,501

Inspector.	*No. of Imported Reacting Cattle Slaughtered.*	*Appraisements of Native Cattle Slaughtered.*
1st Dist.—Dr. William H. Lowe, ...	85	31 head, $1,333 00
2d Dist.—Dr. W. Gray, ...	28	169 head, 7,600 00
3d Dist.—H. B. Richman, ...	39	35 head, 1,329 00
5th Dist.—Dr. H. H. Bair, ...	42	167 head, 7,605 00
Total, ...	194	402 head, $17,867 00

Inspector.	*Amount Received From Meat and Hides Sold Slaughtered Under Inspection.*	*Amount Received From Shippers of Imported Cattle For Testing.*
1st Dist.—Dr. William H. Lowe, ...	$375 00	$1,890 50
2d Dist.—Dr. W. Gray, ...	629 21	658 00
3d Dist.—H. B. Richman, ...	374 98	1,267 00
5th Dist.—Dr. H. H. Bair, ...	2,765 69	825 00
Total, ...	$4,144 88	$4,640 50

Remarks.—Our charts of the above 9,770 imported cattle, tested before entering this State, show 272 animals condemned in their respective States. The charts of the above 6,501 imported cattle, tested after entering this State, show 194 condemned and slaughtered.

Domestic Cattle.

Number of herds tuberculin tested, ...	118
Number of animals in above herds, ...	2,547
Number of animals condemned in above herds, ...	240
Number of herds physically examined, ...	148
Number of animals in above herds, ...	2,687
Number of animals condemned on physical examination, ...	162

Secretary Dye (in supplementing the report)—The amount of funds taken from the Tuberculosis Commission were over $30,000, and a bill has already been introduced by Senator Gaunt, and I think a corresponding bill in the House of Assembly, to reimburse the Commission by act of the Legislature for the money expended, so that the Commission can go on with its regular work and not be crippled for the lack of funds.

We had hoped up to a few days ago that this entire outbreak throughout the country was ended, and so hemmed in and quarantined and gotten under subjection that we would have no more cases, but another outbreak has been discovered in Chicago. Shipments have been made to Philadelphia, and the probability is that we are going to have another spread of this disease. We know not how far extended, nor how long it will continue. It is very expensive work.

President Wilson has put his signature to the special appropriation for the U. S. Department of Agriculture for this purpose of $1,500,000 for the United States.

The trouble is we farmers sometimes become too inquisitive. We hear that neighbor Jones has an outbreak of foot and mouth disease, and we want to go over and see how it looks, and possibly handle the animals. One man actually did that. He went over to his neighbor's farm and put his hand in the mouths of the animals and upon their feet, and then went over to his own cows and, of course, gave the disease right to his own animals.

We are apt, as I say, by our inquisitiveness, to carry the disease to our own herd or our neighbor's. It is very communicable.

The Commission will work on this line with the co-operation of the United States Department of Agriculture, as long as our funds last.

President Frelinghuysen—You have heard the report of the Commission on Tuberculosis in Animals. Is there any question anybody desires to ask touching upon this matter?

The Secretary—I would like to have any questions asked, and if it is necessary I will send for Mr. McNabb, who has the whole matter in hand.

A Delegate—Is the disease controlled in Morris county, do you know?

Secretary Dye—I think so. I think it is entirely so. If you would like questions answered in detail, Mr. McNabb, who is Chief Inspector, has the full details. We can send for him and he will answer questions.

President Frelinghuysen—Perhaps we had better do so, and this matter can be postponed until Mr. McNabb appears. Is there any further business to come before the Board while we are waiting for Mr. McNabb?

A Delegate—Mr. President, I would like to offer the following resolution:

SUPPLEMENT to an act entitled "An act to establish in this State Boards of Health and a Bureau of Vital Statistics, and to define their respective powers and duties," approved March thirty-first, one thousand eight hundred and eighty-seven.

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey.*

1. Every member, agent or servant of a local board of health shall, at the time of taking any sample of food for examination under authority conferred by any ordinance of such local board of health, divide such sample into two or more parts, and forthwith deliver to the person from whom such sample is taken one of said parts, sealed in a suitable container and marked for identification; *provided, however,* that it shall not be necessary to divide such sample and deliver one of the parts thereof to the person from whom the same is taken unless, at the time of the taking thereof, such person shall make request for such duplicate sample.

2. If any member, agent or servant of a local board of health shall fail to substantially comply with the provisions of the first section of this act during the taking of any sample under authority of any ordinance of any such local board of health, the result of the analysis or other examination of the sample so taken shall not be admitted as evidence in any court, and shall not be used by said local board of health, or its servants or agents, for any purpose whatever.

3. This act shall take effect immediately.

President Frelinghuysen—The resolution will be received and referred to the Committee on Resolutions for later report.

Mr. Bush—Mr. President, the Committee to whom was referred the President's Address, is ready to report.

President Frelinghuysen—That report may be received now, if there is no objection.

Mr. Bush read the report of the Committee on the President's Address, as follows:

The Committee on President Frelinghuysen's Address respectfully make the following report:

1. We heartily endorse the sentiments and general recommendations expressed by our President. We believe that a thoughtful reading of this thoughtful address will be profitable to all who are interested in the agricultural or the general welfare of New Jersey.

2. We urge upon this body and others a very careful study of his special recommendations, as we believe them to contain many valuable suggestions. We look upon these recommendations as so important and so far-reaching that they should be neither accepted or dismissed hastily; therefore, we recommend

3. That a committee of five be appointed by the State Board of Agriculture to coöperate with the Executive Committee of the Horticultural Society and the Executive Committee of the State Grange of New Jersey, as a committee to confer with the Committees on Agriculture of the Senate and House of Assembly of the State of New Jersey for the consideration of such recommendations as demand or may suggest legislation.

EGBERT T. BUSH,
G. W. F. GAUNT,
EDGAR G. WEART,
CHAS. B. JESSUP,
JOSEPH CAMP,
Committee.

President Frelinghuysen—You have heard the report of this committee, what is the pleasure of the Board?

A Member—I move that the report of the committee be adopted.

The motion was duly seconded.

Mr. Woodruff—Mr. President, I beg leave to be heard in regard to this report. As I understand it, the various committees that have that in hand are to confer with the legislative committees representing agriculture.

That takes it, as I see, out of the hands of the various Boards of Agriculture throughout this State, and it would be a very radical change to confer with these various committees and to go before the people at large before the various agricultural interests of the State have become acquainted with the changes recommended by our worthy President yesterday. Would it not be better for the changes proposed to be printed and transmitted to the various Boards throughout the State before any radical action is taken in this matter?

Mr. Loughran—Mr. President, I entirely agree with the young

man who has just spoken. I think it is a little too radical, too sweeping, and I think reference to the various Boards, in fairness, for consideration there, would be one of the points necessary.

In the next place, I would say this, that we have been passing through, in fact we are already in, an era of political extravagance. Everybody knows that, and now there seems to be a wise and insistent demand for retrenchment, and therefore this bill calling for this expenditure of money would be met with that objection.

Also, this change is so radical that it would not be in keeping with the best that there is in this organization, to establish anything like that after conference with the State Boards and not with the agricultural interests very fully.

I know how those matters are approached, for I have been a member of this house several times, and I am one who has given a great deal of attention to the matters involved in these recommendations. It is deplorable, in my judgment, the way things have gone on in this State. If any part of the Senator's statements there are correct, and I have no doubt but what they are, because he has given a great deal of time and attention and is a man, you know, who has written a serious of articles that appeared in the *Trenton Times* exposing these deeds, I don't want to go into them; you know them all.

Now, I hope that the farmers of this State are not going to put themselves in the position of paying high salaries for this work that we can have done for a great deal less, in my judgment, and have well done. The farmers can do it, and they won't ask any such rate as that. Now what we would do in that line would create a sentiment and would give rise to something else, to political manipulation, and then it would be a question of the struggle for the position.

Now, we ought to take the lead, we ought to assume the initiative in doing that which is right, and not only in suggesting and recommending, because I know they are only intended for recommendations. But, at the same time, the Senator is an influential man in this State; he has done good work and he feels possibly, I know, from a conscientious standpoint, that something ought to be done. But I would say this, that we ought to go slowly in this matter. Because there is enough log-rolling in this State, and there is a revulsion of the sentiment, and it is time there was a revulsion, and this thing now would be along lines which would be in opposition to the very spirit that pervades the State.

Now, we know that there is a method, I don't care what

partisan politics are, I believe there is a method, and a righteous method, to do something for the people of this State, and I hope the matters mentioned in this report will be brought about in a way that there is nothing done that will in any way bring odium on this splendid organization, or what ought to be a splendid organization. (Applause.)

Mr. E. T. Bush—Mr. President, I heartily agree with the sentiments expressed by the gentleman, and I think the only weakness in the discourse of the gentleman who last spoke is that he is directly discussing the recommendations of our President instead of discussing the report of the committee. Now, if you will listen to this report carefully, I think you will find that we have taken care to safeguard the organizations of farmers of New Jersey against the very objection that he makes. We do not propose to put this in the hands of politics at all, but if you will listen to the report carefully you will find that we propose to leave the discussion of it to a committee of five from this organization, a committee composed in part of the Executive Committee of the Horticultural Society of New Jersey, and the Executive Committee of State Grange of New Jersey, and we recommend those three committees, as one committee, to confer with the Committee on Agriculture from the Senate and House of New Jersey to discuss this matter and see whether it is advisable. To look into it.

Now, we think that we have a strong committee to protect the farmers if this thing is likely to be taken up, and if there is any danger in it it will have very hard work getting through before a committee of that kind, in connection with the Committee on Agriculture from the two houses of the Legislature of New Jersey.

I think that you are safe in adopting this report, so far as that part is concerned. I don't know whether it covers all you want done with it or not, but I think so far as that is concerned you are safe in adopting. I do not personally care whether you adopt it or not. It makes no difference to me. But I cannot recommend the adoption of the President's recommendations at all. The report simply lays before you that said recommendations be given before these committees for action.

Mr. Lewis—Mr. President, I am opposed to the adoption of the report of the committee for the simple reason that it seems to me the proposition is to unload the responsibilities of this Board of Agriculture upon some committee, a committee to be appointed. I do not believe in unloading my responsibilities upon anybody. I believe that the gentleman who first spoke on

this subject (Mr. Woodruff) has stated the matter, that it should be considered by the agricultural bodies in full. In fact I have been impressed with the fact that at these meetings we are occupied all the time, so much so that we have not got the time to discuss the matters which are most important matters to us farmers, the questions of proposed legislation. We are working all the time under such a schedule. I am going to offer a resolution on this matter simply because I am impressed with the very fact that there is no time to properly discuss matters of legislation and other important matters. And in reply to the remarks of the gentleman who preceded me I would say that the proper course to pursue would be to have the reports printed and referred to the different counties so that they could properly discuss them and confer with the State Board.

Mr. Kurtz—Mr. President, this is an important matter, of course, and it is a radical matter, not alone important and radical as it affects the farmers directly, but it will also affect everybody in the State indirectly. I don't think there is a committee can be named of five persons, who will represent, even in this Board, the farmers of the State and profess to understand all their wishes and needs. I think it is a matter for discussion in the Farmers' Institutes and in the counties. The meetings at those institutes and other meetings, it is said, will not average twenty-five persons, consequently we represent here only twenty-five persons from each county. We have other organizations in this State which represent farmers also. I think the recommendation is a good one. I think the report of the committee is a good one, but I think it is a matter that should be supplemented by this instruction from this Board that this matter be printed and put into the hands of every agricultural organization of this State and that they report to this committee their views, and in that manner the committee can go before the other committees and express the views of the farmers of the State, not the twenty-five that are represented in the Agricultural Board, not the few members represented in the Agricultural Board, but by all the organizations of the State.

Mr. Curtis—Mr. President, I agree with what has been said here in regard to the capability of the farmers of this State to attend to their own affairs, as far as legislative work is concerned. It appears to me that in our President's address and the recommendation of this committee that we do not know exactly what the report was, what the duty of this committee to be appointed by our Board here is to take up.

The recommendations of our President do not set forth the

proposed bill which will be before the Legislature for discussion, and I understand that it is expected that we will endorse this movement without knowing more about the bill which is proposed to be introduced. It is barely possible that we might endorse every portion of this measure if we knew more about it, and I for one do not feel like going back to my colleagues and telling them what I know about this bill, because I know very little about it, and, as far as the organization of our Grange and our State Agricultural Board is concerned, by voting for this resolution or for this report we are simply voting for the endorsement of any bill whatever it may be.

Mr. Bush—I would like to suggest to my friend on the other side, the last speaker, that this report will in no way commit this body to the recommendations of our President. I think the presiding officer will so rule. It could not possibly commit this body to those recommendations. We do not recommend at all for adoption the matters brought up in the report, but we simply recommend to put this matter in the hands of those committees. Whether this is a wise thing to do or not I don't know, but as for saying that we sustain any bill of which you or I know nothing, I would say no. Until we know just what is in it we will not. Then we will look into it. That is the very purpose of this report, that we will not endorse anything until we have the report of our able representatives, as we know will be and hope will be on this committee, and know what that measure is, what it does cover, before we endorse it at all and before we, on the other hand, condemn it at all. We do not want to condemn anything hastily, but we do want the matter thoroughly understood and sifted, to have it put into the hands of the committee who can look into it and give us a chance also to look into it.

Now, the suggestion of having this matter printed is a very good one, an excellent one, and we hope that the organization can get the matter before them and discuss it in order that they may tell their representatives what their impressions are and what they want. That is the best thing to do, undoubtedly, in case that can be done. That is a very fine suggestion, but it in no way conflicts with the report of the committee. It simply adds something to it, that is all.

Secretary Dye—Mr. President, replying in part to Mr. Curtis, so far as I know, no bill has been introduced in either house affecting the interests of the State Board of Agriculture or the agricultural interests of the State. This recommendation of this committee, you will notice, calls for a strong, large commit-

tee, to have the whole thing under consideration, and that will be done and will be done before any action is taken which may result in decision; but if any action is taken it will be the opinion as advanced by this joint committee for the action of the Legislature. There will be plenty of time for discussion and going over the whole question. It seems to me we can safely leave it there.

Mr. Woodruff—Is this report open to amendment?

President Frelinghuysen—The report of the committee is subject to amendment, surely.

Mr. Woodruff—May I offer an amendment?

President Frelinghuysen—You may.

Mr. Woodruff—I should like to offer an amendment, subject to grammatical correction, that all radical changes proposed by the committee mentioned be printed and referred or remitted to the various Boards of Agriculture and other boards interested in agriculture throughout the State, and that no legislative action be taken until it is endorsed by the various Boards throughout the State.

Mr. Loughran—Mr. President, I second the motion, and I do it for this reason, that I have gained the impression from the discussion here that that is the sentiment prevailing in this Society, and I am glad it is so. I second the motion because I believe we should have a full and complete discussion of all these questions that so widely pertain to the interests of the farmers. Error may creep in, we don't care anything about that. Let us have free and open discussion, and plenty of it, on vital matters of this kind. Let us charge one error against another, each destroying its opponent, and then we will have an evolvement of rectitude and justice.

That is the reason I have always believed in free and open discussion. I do not mean to say we have not got it here, I do not even mean to insinuate that in the slightest way, but with the committee reports and the volume of business here it seems to be almost impossible to have an hour on this subject or anything else. The gentleman who promises to introduce that resolution, I think, must have been inspired by this same desire to have the important matters discussed. Now, give us a chance to come on the floor here and discuss these matters and that will only add interest and satisfaction to the work and make it more truly representative of our number. That is the reason I second the amendment.

President Frelinghuysen—One unfortunate circumstance in connection with this amendment is the fact that the State Board

of Agriculture has no authority nor any funds at is disposal to print and distribute over the State the matter that is requested here. The duty of publication rests in another Board here at the State Capitol, and if we were to make an effort to get their approval and consent to the printing of this matter and sending it to the various County Boards in the State it might be possible that it would reach those County Boards some time during the latter part of the year. The recommendation of this committee is that this matter be referred directly on behalf of the Board of Agriculture to the committee to comprise a sub-committee from the State Board of Agriculture, from the Horticultural Society and other kindred organizations in agriculture, and I think the amendment to the report of the committee would be entirely inoperative and ineffective if it was adopted.

Mr. Brown—Mr. President, I would like to say that in the adoption of this report we really bring the proposition entirely in the control of the farmers of the State and give them time to make their views known to this committee, and I think the referring of it to the County Boards would be no more advantage than to this committee, where it can be acted upon at once. I hope the report will be adopted as read.

President Frelinghuysen—The question is on the adoption of the amendment. As many as are in favor of the adoption of the amendment to the report will vote aye.

A vote was taken on the amendment to the report, and it was declared lost.

President Frelinghuysen—The question is now on the adoption of the report. As many as are in favor of the adoption of the report of the committee will please vote aye.

A vote was taken on the adoption of the report of the committee, and it was carried.

President Frelinghuysen—Mr. McNabb is with us now, and if there are any questions you desire to ask him touching upon this foot and mouth disease matter, I know he would be glad to answer them to the extent of his ability.

A Member—Is the disease under control in Morris county?

Mr. McNabb—There are three kinds of areas in New Jersey, in fact in the whole United States; one is the closed area, the other is the modified area and the other is the free area. Morris county is all free area. There is nothing hinders the shipping to and from Morris county if you do not interfere with the federal law or the federal quarantine.

While you are thinking of these questions, I will just say a few words. I know there has been a good deal said against killing

well cows or cows that are not affected. But that has been necessary; if you do not do that the federal authorities would take away their help and draw a line all around us, such as a quarantine, the same as other countries have done around Holland. The cattle in Holland are just as valuable as ever, and only the week before last there were some high grade cattle bought there, but they could not be brought out of Holland to-day for the very good reason that they cannot ship even those standard animals out of Holland because they will not kill or slaughter the animals that have foot and mouth disease; and the same thing would be done here in New Jersey to us. I have often said it was an awful thing, a crime. We killed 726 cows, most of them I don't doubt cost $85 to $90 apiece, from the very best herds, but if we did not do that the United States would have pulled away their help, and they spent $55,000 to our $33,000, and they helped us very much. Now, they cast that line around us and we cannot ship cows until we eradicate and abolish the foot and mouth disease.

Now, I am ready to answer any questions.

President Frelinghuysen—Are there any questions now that you wish Mr. McNabb to answer?

A Delegate—These cattle you killed, were they infected?

Mr. McNabb—Yes, they were infected; but if there were ninety cows in a herd and only three infected, we killed them all. If we did not do that the Government would not have anything to do with us. They would have taken away the federal help and kept us absolutely quarantined, and although a man might have a hundred thousand cattle in his hands which were well, he could not ship a hoof out of New Jersey nor could he receive any cattle at all. You might have a $25,000 bull and we would have to kill him if the disease appeared in your herd.

A Delegate—They are not doing that out in Chicago, are they?

Mr. McNabb—That is a special case. And I am glad it is, for if we were to kill $25,000 cattle our funds would be quickly used up. I may also say that I do not believe that we will ever see another great outbreak, unless it comes very quickly. I think there will be an antitoxin. The Rockefeller Institute has sent its very best men among the diseased cattle here in New Jersey and they think that they can bring out an antitoxin for the inoculation of animals that are suspected or infected.

A Delegate—Have they succeeded in curing any case yet?

Mr. McNabb—That will be a hard question to answer because it reinfects itself every two or three months and all of the calves, born and unborn. Where are you going to land if you cannot

use your cattle? You might better kill them, even if they are worth $125,000, than have a quarantine around your place and have a State quarantine by the Government, and have yourself quarantined so that you cannot go to church, you cannot hire any men, you cannot do anything. Your best thing to do is to kill them. I was opposed to it at one time, but I have come around by this time and I say the quicker the animals are killed that have been exposed to the infection the better.

A Delegate—Do you know of any that have ever been cured?

Mr. McNabb—None that I ever heard of. Germany lost $130,000,000 in twenty years. England lost $85,000,000 in four years, and they quarantined a herd of forty-two head in Massachusetts, quarantined them for a year and a half, and then they sent for the authorities at the end of the year and a half, and the farmer said, "Come and kill my cattle and end this suspense."

Now, what they are going to do with this herd in Chicago, they will be kept there for a year and three months, and by the time they are done paying fifty or sixty dollars a day I don't think they will disagree with me, but they will say they had better have killed them the first day they came on.

A Delegate—Do you know of any similar cases of foot and mouth disease, years ago, that were cured?

Mr. McNabb—I know only on hearsay that they are doing it in Holland.

A Delegate—Twenty-five years ago they said a whole herd in Pennsylvania had the foot and mouth disease, and most of them that were not serious were all cured.

Mr. McNabb—Well, all I can say is, I have great respect for your report, but you ought to report it to the United States Bureau of Animal Industry. They don't seem to say so.

A Delegate—I have just that report?

Mr. McNabb—Twenty-five years ago?

A Delegate—Yes.

Mr. McNabb—I am not going to dispute your word at all. There have been cases that were not foot and mouth disease. Sometimes the foot and mouth disease will get better for a while and go away, and then in twenty days it will come right back at you. About the time you are getting ready to get fairly started again selling, you will have a quarantine around your place.

Mr. Woodruff—I would like to ask if the disease has been stamped out in Union county, also how much loss there has been there?

Mr. McNabb—The loss in Union county was sixty head, and you can figure that out at $75 apiece; $4,500. Union county is not in the free area. That is a modified area.

A Delegate—What about Warren county?

Mr. McNabb—In Riegelsville there was something there, I think.

A Delegate—Are there any more there?

Mr. McNabb—No.

A Delegate—How many were there in that herd?

Mr. McNabb—Six.

A Delegate—How about Ocean county?

Mr. McNabb—That is safe.

A Delegate—Is there any change in the quarantine situation since the reported outbreak in Philadelphia?

Mr. McNabb—There might be now, because two hours might make a great change in the federal quarantine, because it was just discovered yesterday in twenty-three cattle at Little Falls, New York, and also in Chicago, and also in the Chicago Stock Yards, and it has been observed and cleaned up, and I think there is danger all the way from Chicago to Pittsburgh, and from Pittsburgh to Philadelphia. I would not be a bit surprised to see a quarantine put by the federal people again over those sections. The federal people have handled this thing carefully. They know what they are doing. They know the danger.

A Delegate—I was just about to ask if you are troubled to get veterinarians to know it just as soon as they see it?

Mr. McNabb—There is the trouble; among the veterinarians of the State of New Jersey, there were not four men who knew really what the foot and mouth disease was when it broke out. That is why the federal people sent eleven men here. I do not say that the federal people are any better than our State people. Not at all. I only say that they have had better and more opportunity to observe and know and control the foot and mouth disease than our State people ever have, because they have had the whole country to work over.

A Delegate—What happens to cattle on the road, now being shipped?

Mr. McNabb—They could not come into New Jersey, except for immediate slaughter. They will be held in quarantine. You mean shipped to New Jersey, of course?

The Delegate—Yes.

Mr. McNabb—They could not come into New Jersey except for immediate slaughter.

A Delegate—Weren't there cows driven over into the United States from Canada?

Mr. McNabb—Not very extensively. They came through from Canada, under the care of the United States Government, in sealed cars not to be opened at Buffalo.

A Delegate—What effect would that have on the plague if they were diseased?

Mr. McNabb—I would not want to predict. They would not be free of it under a year.

A Delegate—When the disease is discovered, a man is not allowed to get other cattle?

Mr. McNabb—Yes; this man will be allowed to take on another dairy of cattle in sixty days, but then they must be examined by a veterinarian. Don't leave anything to communicate the disease. Burn it up. Not even manure. We want you to cart it away so it does not infect anything. Don't lease anything from which infection can come.

A Delegate—Is Monmouth county in the free area?

Mr. McNabb—Yes, sir.

A Delegate—How about hay, the hay and corn from those farms?

Mr. McNabb—That would not be held after sixty days, because hay or grain does not really come in contact with the cattle, I mean where it has been in the bins or loose in the barn, but if it had been down on the floor by the cattle we would not allow them to use it, but we would burn it up and would pay for it.

President Frelinghuysen—Are there any further questions you wish to ask of Mr. McNabb while he is here. If not, we will pass on, thanking Mr. McNabb for his kindness in answering our questions.

Mr. Curtis—Mr. President, I was not here when the call for resolutions was made. I have a resolution which I would like to have passed on by this body to-day, there has been a similar resolution passed by our State Grange in regard to better education for our young ladies, and up in our county we think just as much of our young girls as we do of our boys, and I would like to have this resolution passed on, viz.:

WHEREAS, At the present time no means are provided within our State by which young women may secure education such as is provided for young men at the New Jersey State College at New Brunswick;

WHEREAS, There is immediate need that such instruction, other than that already provided by the existing State Normal Schools, should be provided for the young women of our State; therefore, be it

Resolved, That the New Jersey State Board of Agriculture request that the New Jersey State College of Agriculture at New Brunswick shall proceed

to provide such instruction at the earliest possible moment; and be it further

Resolved, That this State Board of Agriculture pledge itself to do all in its power to aid in the securing of the necessary appropriations from the New Jersey State Legislature to make such instruction possible.

President Frelinghuysen—The resolution will be received and referred to the Committee on Resolutions. Are there any further resolutions to come in just at this time?

Mr. Lewis—Mr. President, I should like to offer the following resolution:

WHEREAS, There are many measures brought before our State Legislature which are often opposed to the best agricultural interests of our State;

WHEREAS, We believe that a full and complete discussion of those measures by our State Board of Agriculture would provide a means whereby our Legislature would receive a clear understanding of the wishes of the farmers of our State with regard to such proposed measures; therefore, be it

Resolved, That one day of the annual meeting of the State Board of Agriculture be set apart by the Executive Committee for the discussion, among the members, of such proposed measures.

President Frelinghuysen—The resolution will be received and referred to the Committee on Resolutions. Are there any other resolutions to come before the Board just at this time?

Secretary Dye—I was very desirous, Mr. President, to have the Commissioner of Motor Vehicles of this State address the Board during this meeting, but there did not seem to be a place on the program that we could find to put him in. I have just received a telegram, however, from Mr. Sandles, of Ohio, that owing to the legislative meeting and important matters pending there he would be unable to get here this morning, and so I used the opportunity to make arrangements with the Commissioner of Motor Vehicles. He has kindly consented to say a few words and will appear before the Board if it is your pleasure.

President Frelinghuysen—It affords me pleasure to introduce to you Commissioner Lippincott, who will now address you.

Commissioner Lippincott's Address.

Mr. President and members of the State Board of Agriculture: This is the third opportunity which I have had to address this Board. I feel a certain amount of diffidence in speaking before the State Board of Agriculture, because, if you will recollect, a few years ago your distinguished President, Senator Frelinghuysen, was the introducer of the first automobile law in the State of New Jersey. We regard Senator Frelinghuysen as the father of motor vehicle regulation, and for a newcomer like myself to stand up here before you and discuss motor vehicle regulation after the distinguished services of your President seems almost an impertinence.

But the question of motor vehicle regulation is one of those questions which is new, and, therefore, it presents new and unconsidered phases each

year. It is a modern problem, it has not been solved, and those of us who happen to be charged with the work of regulation do not claim that it has been solved; nor do we claim that our system of handling the question is the best; but we can say this, that we know the law under which motor vehicles are regulated, and which was introduced by your President, Senator Frelinghuysen, a number of years ago, is the best automobile law of any automobile law in any State of the Union. It affords greater centralization of control. It gives the authorities charged with its enforcement a wider scope of action and a greater authority than any other motor vehicle act. It has been changed and amended, but the general scope of the act has remained intact.

Modern conditions have brought very forcibly before every one of us the need of a complete reorganization of the relation the government must hold to traffic in this State. It was only a few years ago that the farmer was regarded as the enemy of the motorist. That condition has changed. From an examination of our records it is shown that at least one-quarter of the automobiles registered in New Jersey are owned by farmers. That is a large proportion when we consider that a great many machines are owned and registered in New Jersey by persons who do not live in the State at all, but who are only visitors to the summer resort section.

An increasing proportion of the residents each year who own and register automobiles are men engaged in agriculture and agricultural pursuits. So that the question to-day has ceased to be the question where one element in the State is allied against another element, and we are all at this time ready to coöperate in the proper solution of every problem incident to the regulation of motor vehicles.

To my mind one of the most important questions which is before the State to-day applies to the relation of all vehicles on the road one to the other. I refer to the movement which was inaugurated when Governor Fielder appointed in August a commission of three men to investigate the question of traffic regulation and the methods under which traffic regulation is conducted in this State. I happened to have been one of the men selected on that committee, and we are about to file our report with the Governor. The report goes in detail into the relationship of traffic, both horse-drawn and motor-driven. There should be no distinction when regulating traffic between the one and the other, because traffic of all kinds on our roads interlaces, and we cannot treat one class of vehicles one way and another class of vehicles another way. In insuring safety on our highway all classes of vehicles must be guided by the same regulations.

We desire to protect the horse-drawn vehicle from injury by the motor vehicle, and we desire to protect the motor vehicles from inconvenience or injury by horse-drawn vehicles. Our investigation of this subject has been conducted with the idea of insuring safety on our highways.

One question, which is not a part of the report, which I can discuss with propriety, and which came very forcibly before the Department, and which I think everyone of us is interested in, is the question of proper lighting, not alone of the motor vehicle, but of the horse-drawn vehicle. You will all recollect that a number of years ago a law was passed requiring that every horse-drawn vehicle should carry a light visible in both directions, and that after the passage of that law it was very generally disregarded.

It did not come within the powers of my Department to enforce any regulation against horse-drawn vehicles, but so many complaints came to us of horse-drawn vehicles on the roads at night without lights, and the consequent danger that occurred not alone to the motorist from this, but to the driver of the vehicle which was unlighted himself, that we took action this last year and demanded that the local authorities of each community enforce the law.

At the same time I appreciated that the dazzling and glaring headlights that are used by motor vehicles, especially since the introduction of electrically lighted cars, was a source of danger to every driver of horses in our country districts, and not only a danger to every driver of horses, but a danger to every driver of motor vehicles coming in opposite directions, because those direct rays of light shine in the eyes of the other users of the road, and have made road conditions unsafe. So that this year the Department will recommend to the Legislature a law which prohibits the use of glaring searchlights or glaring headlights on automobiles.

Cars should be so equipped that there is no lessening of the intensity of the light on the road, but that there is a complete elimination of the direct rays or dazzling rays from the eyes of the others users of the road.

But it is equally important for safety that every horse-drawn vehicle be lighted. It is more important in this day and generation possibly than it was years ago. We can all remember the time when the old country road was not built of patent pavements or of any material except the ordinary gravel or sand, and the road extended in front of us, even on dark nights, like a white ribbon through the black border of the highway, and it was easy enough to see everything in front on the road. To-day the patent pavement is a dark pavement, which absorbs the light and causes the road to be dark. It is also the custom in a number of portions of the State to oil the roads, which further darkens them. Consequently it is more and more important for every user of the road to carry a light of some character, in order that he may be safe and in order that other drivers may be safe.

Now, incident to the question of traffic regulation comes the new use to which our roads are being applied. A few years ago the highway was used simply for the horse-drawn vehicle and for a few pleasure automobiles; a narrow road allowing two vehicles to pass was possibly all that the conditions of that time demanded. But to-day that has been completely changed. Almost one-fourth of the short-haul freight of the country is carried over our public roads, which was formerly carried on the railroads of the State. This condition has been brought about by improvement in the manufacture of commercial vehicles. They are growing larger and larger every year, and wider and wider. And, in order to carry those tremendous loads of freight to which our main highways are subject, it is increasingly important that those main highways be built wider and of more durable material. Our roads are main freight lines, and they are fast becoming main passenger lines. I venture to predict that you will not find another suburban trolley line organized or constructed in this State. The suburban trolley line will pass out of existence gradually, and its place will

be taken by the motor bus. It is already being taken. Almost every small town is now connected with a larger community near it by a motor bus line; so that your highways are not alone becoming freight highways, but highways for passenger travel. The problems incident to the proper regulation of the traffic are complex.

In this State, to operate bus line the only requirement is that you obtain a license for your car. You are not compelled to obtain a franchise. While some communities have demanded that you obtain consent to go through them, I doubt very much if a test case were brought in the courts whether any community under our present law would be able to enforce such a requirement. In fact, you can now start a public utility in New Jersey with nothing more than a fifteen-dollar-a-year registration, or may be only the payment of a $7.50-a-year registration. The result of that has been that we are beginning to find in different parts of the State that two bus lines are operated upon the same highways. The result is that one bus line will try to steal the other fellow's schedules and steal the other fellow's passengers, and up in Passaic county we find that they try to run over each other's passengers every now and then.

Such a condition cannot continue. The question of the organization of auto bus lines must be reduced to a franchise, and the control of that franchise must be brought to the Board of Public Utility Commissioners in exactly the same way that the franchises of all trolley lines or of any other public utility are regulated.

This is another new problem for New Jersey. It is not, however, a new problem for New York City, or for England, or for other parts of the world. The bus line on Fifth avenue pays in the neighborhood of $485 a year to the city of New York for the privilege of operating every bus, on the basis of five per cent. of its gross receipts. The same requirement covers the bus lines of Paris, and a less percentage of the gross receipts covers the bus lines of London. So that we have models upon which we can base a proper franchise act covering suburban or city bus lines in New Jersey.

One thing that should be kept firmly in mind is that nothing should be done which will place so heavy a charge upon the operators of these bus lines that they will be forced to abandon the business. The charge should be slight at first, possibly increased later, when this class of public utility becomes fixed as a part of the transportation system of our State. I believe that if a public utility is operated it should pay a proper return to the State government for the privilege of such operation. It is unfair to charge the high franchise tax to the trolley company and allow the motor bus, which is a user of the highways built at State expense, to operate free. That is one of the new problems which is confronting the department for proper solution.

Another matter which is of vital importance to highway safety has become the grade crossing. We have been shocked in this State by numerous and gruesome accidents at these crossings. It is my opinion that the fault has generally rested with the motorist, who has not used due care in approaching those crossings. But a certain obligation rests upon the railroads and upon

the State government, from the fact that a great many crossings at grade that should be eliminated have not been eliminated, and proper precautions have not been placed at every grade crossing.

I believe, too, that the speed law of the State for motor vehicles, when approaching a grade crossing, should be changed. I believe that the motorist should be required, when traveling in the open country, to reduce his speed to twelve miles an hour when crossing a grade crossing, and when in a city where there are grade crossings, and where the speed limit is twelve miles an hour, that the speed should be reduced to eight miles an hour when crossing a grade crossing. If we had such a law I think we could enforce it. I know, for one, that on the passage of such an act by the Legislature, I would put every inspector we had, for two or three weeks, at the different important grade crossings and simply arrest everybody that did not comply with it. The result would be that it would immediately be understood that the law was not simply placed on the books for decoration, but for enforcement.

The question of the legal enforcement of the Motor Vehicle Act has been one that has tried the Department very severely. With the limited number of inspectors which we have I am very frank to say that we have not given New Jersey the strict enforcement of the law which is necessary. But we have done this: We have worked every inspector to the very limit of his capacity, and done the very best that we could with a difficult problem.

This work could be very largely supplemented and aided if the local justice of peace, the local constables or, in the larger towns, the recorder, or magistrate of the police department, would co-operate with the Motor Vehicle Department in the enforcement of every portion of the Motor Vehicle Act. If we could obtain such co-operation I believe that the number of accidents in the State of New Jersey would be largely decreased. Of course, there would be a great howl of protest raised. There is a great howl raised anyway. Our inspector very rarely arrests a man for speeding that he does not say that the inspector was trying to race with him. That became the fashionable excuse last year. The fashionable excuse the year before was that the inspectors had a grudge against him. So each year we have a new fashion in excuses. But we must expect that. In the enforcement of the law you must expect criticism, and possibly from some portion of your local community; but I believe that the agriculturalists of this State are vitally concerned with the safety of our highways, and I believe that your influence in each one of your communities will, if exerted toward reasonable and same law enforcement, will tend to aid my Department very materially. I desire at this time to ask that co-operation and in return I will give the assurance that we will do everything in our power to aid the local authorities in the discharge of their duties.

Mr. Lewis—I move you, Mr. President, that a vote of thanks be given to Mr. Lippincott for his very able address.

This motion was seconded, and, on a vote, adopted.

Mr. Fithian—Mr. President, is it in order to ask any questions?

Mr. Lippincott—I am perfectly willing to answer any questions that I can.

Mr. Woodruff—I would like to know, in view of action taken in the Union County Board of Agriculture, in discussing the question of the rights of horses, in regard to the traffic of motor vehicles, if the Commissioner of Motor Vehicles has considered in that report anything in regard to the salvation of the horses?

Mr. Lippincott—Yes.

Mr. Woodruff—We find in our particular part of the State, especially in the direction of Essex and Union, that a great number of pavements are of such nature that no horse can travel on them the certain parts of the year when they become wet and the automobiles have traveled on them. The President for the S. P. C. A. of Essex and our own President have gone into that question. I would like to know if there is any way likely in the future that the interests of the horse will be conserved and in what way, if it is possible.

Mr. Lippincott—Well, I think that the commission that you refer to was the special commission appointed by the Governor, as I take it, which I mentioned in the first part of my address. That commission had to do simply with the question of the regulations on the highways with reference of one vehicle to another and to pedestrians, or other users of the road. I can say to the delegate in confidence that the report deals somewhat extensively with the protection of the horse-drawn vehicle, more extensively probably than it does with any other class of vehicles. The rules and regulations proposed in it would tend to make the horse-drawn vehicle a much safer vehicle on the road than it is.

You understand, of course, outside of your cities, there is no traffic rule, practically, except the old law of 1813, the keeping to the right; that is practically the only traffic regulation the State has ever placed in the horse-drawn vehicles, except in cities that have passed general ordinances for the benefit of the horse-drawn vehicle, but they have not very strictly enforced them. Now, the object of this commission has been to provide a system of traffic regulation not alone in towns and cities, but everywhere, so that the rights of the horse-drawn vehicles on the roads and highways will be just as clearly and even more clearly defined than the rights of the motor vehicles are defined at present.

As to the question of the construction of the road, while I made a general recommendation on that, it could not apply to a road which was improperly constructed. We did not go into that question to any extent, because that is properly in the Highway Department and not properly in that commission.

Mr. Fithian—Several farmers in our section have wanted to know about the law governing accidents in the case of a machine running into a wagon. They had an accident and went to a lawyer, who is a judge in the court, and paid him five dollars, and he said there was no case, and they went to another lawyer and got the same, and he said in the case of the accident we should report it to the office of the Attorney-General and he would attend to the matter, and he would bring the witnesses and everything. Now, I would like to know, have you any power in regard to such things whatever. They told us to go to Commissioner Lippincott or to the Attorney-General and he will adjust the matter for you. Is that the fact?

Mr. Lippincott—I don't want to criticise the lawyer you selected, but I should not think his advice was sound, as you state it.

Mr. Fithian—I should like to know about the law in the case of an accident.

Mr. Lippincott—There is only one way to adjust a damage matter, that is either by private agreement between the counsel of the two people or—

Mr. Fithian—I want to know what we can do.

Mr. Lippincott—If you cannot adjust it by a private arrangement, which is purely a mutual matter, then your only recourse is an action.

Mr. Fithian—What is the action? Where do we come?

Mr. Lippincott—If it is under $300 you go before the District Court.

Mr. Fithian—We do not come before your court at all?

Mr. Lippincott—I have nothing to do with damages.

Mr. Fithian—That is in connection with the road.

Mr. Lippincott—Yes, we have the police regulations.

Mr. Fithian—This is in a township.

Mr. Lippincott—It don't make any difference where it is. Our Department is a police department in its effect. If by reason of that accident you have suffered damage, you have an action at law for damages. If you come to me and ask me to revoke the license of a driver in the case of an accident, and I can find the facts to be such that it should be done, I can revoke that license. You can arrest the driver of the motor vehicle for a violation of the Motor Vehicle Act and have him penalized.

Mr. Fithian—He says you cannot arrest him for that—the lawyer says.

Mr. Lippincott—I don't know who your lawyer is.

Mr. Fithian—He says you cannot do it. I found the license number and wrote the name down and went right to the police commissioner there and told him that that machine ran my wagon down and he saw the number, and he says he could not do a thing for me; that is our police commissioner at the township. I understood that other men could go before a magistrate and swear out a warrant, and he said he had no authority. It was Police Commissioner Hughes, of Bridgeton, New Jersey. He said he could not do it because it was in a township, and he did not do it.

Mr. Lippincott—Did you allege a violation?

Mr. Fithian—I did.

Mr. Lippincott—What was the violation?

Mr. Fithian—Running into a wagon and damaging the wagon and the horse.

Mr. Lippincott—Was he on the right side of the road?

Mr. Fithian—Yes. He ran right over the horse, ran right into me, as he turned to go by; and he said he could not do anything for me.

Mr. Lippincott—He could have been charged with reckless driving, and he could have been charged with being on the wrong side of the road, I suppose; or, if he did, he could have been charged with exceeding the speed limit, any of those.

Mr. Fithian—He ran into the horse and turned me out on the road, and when I went to them for redress they said they could not do anything for me. They said if I came up to your office I could get it fixed. I wrote you about it, and they put the trial off three times and then I could not come and bring my witnesses.

Mr. Lippincott—That was on the revocation of the man's license?

Mr. Fithian—Yes, that was three times, and I live in the southern part of the State.

Mr. Lippincott—What you should have done was to simply have gone to the magistrate and sworn out a warrant for the arrest of the driver of the motor vehicle on any one of the three charges which I have indicated, then when he was served with that warrant he would have been brought before the court and tried, and the judge could have fined him or sentenced him to the county jail if he had desired to. Another thing you could have done, if you suffered damage, would have been, if you could prove damage, and the damage was suffered from the wrong action of the driver of the motor vehicle, you could have entered suit against him in any one of the courts, the Supreme Court or the Circuit Court, there, or, if it was within a city you could have

obtained service on him and gotten him in the jurisdiction of the United States Courts, and then you could have obtained damages. The question of damages, the recorder of your town would have nothing to do with, nor would this Department. We are regulating traffic from the police standpoint. You will easily see the distinction.

Your lawyer should have advised you that way. Of course, if the damage was slight, it would not be worth the expense of an action at law, and probably it wuold have been ill-advised to start it, but if the damage was considerable you should have proceeded that way.

Mr. Fithian—All he claimed was it was in a township and not in a city.

Mr. Lippincott—That does not make any difference.

Mr. Kurtz—I live on the main road in Middlesex borough and the new main road, and on Sunday afternoons a great many automobiles drive through our borough at fifty miles an hour. We have timed them with a stop watch and they are going forty anyway, and we can't stop them.

Mr. Lippincott—Have you got a justice of the peace or constables?

Mr. Kurtz—We have, but they do not do anything.

Mr. Lippincott—Well, you can do this: You can write me a letter sometime when the season comes on, when it comes the time of the year that vehicles will pass over that road to any great extent, and we can give you an inspector, but we cannot give him to you for more than one day, and he will make arrests and bring them before your justice of the peace, whoever he is, and if he will then proceed with them properly, all right; and if he fails to proceed with them properly we will refer the matter to the Prosecutor of the county and start impeachment proceedings. That is what we are doing when they won't act.

Mr. Curtis—I would like to ask Commissioner Lippincott if the speed of trolley cars has been considered by this same commission?

Mr. Lippincott—Yes, in that report we make recommendations on that very question.

Mr. Loughran—I would like to ask the Commissioner whether the recommendations made on speed are for a higher speed than is allowed now?

Mr. Lippincott—I recommended in my annual report that the speed in the open country be changed from twenty-five to thirty miles an hour, and in the towns and cities that it be changed from twelve to fifteen miles an hour. I did that because I found

on actual investigation that the local police authorities, and the police authorities in fact anywhere, were not assisting in the enforcement of the law, they were not arresting anyone for driving faster in the cities unless they got up to twenty miles an hour, and in the open country unless they got up to thirty-five miles an hour, and it was my opinion that that was too great a stretch from the actual law, and that as a matter of fact with the modern constructed motor vehicles a speed of thirty miles an hour in the open country, if strictly enforced, was the proper speed, but if not strictly enforced was an improper speed. Twenty-five miles an hour, strictly enforced, with a modern constructed car, is properly a little too strict, because you have got to consider that the motor has been very much perfected, and that the usual speed in the country to-day is thirty miles an hour, and if that is the usual speed, and that speed appears to be enforced, and the law under thirty miles an hour seems not to be enforced, then it seemed to me to be proper to do what I recommended, to have the speed thirty miles an hour in the open country and fifteen miles an hour in the towns. That is my conviction. I am not absolutely certain that I am right about it. I always believe that the most immoral law that you can have is the law you cannot enforce. That protects neither the man enforcing the law nor the man it is enforced against. We should have laws that are based on common sense and practical, and they will be enforcible and enforced.

Mr. Hulsart—I would like to ask about the rights of a driver in the case of this kind. I think there is a lame spot in our law, and I want you to tell me whether I am right or wrong. A driver is traveling in this direction, and at that point there is a blind corner, covered by a grading and also fourteen feet below there is a cut, and we are right on the top of the grade at this point, it is down hill in either direction; and coming this way at right angles is another road that empties in here and goes no further, and then coming from this direction, close on that side of the road that you could not roll a wheel between there and the bank, in other words, by measurement within four inches of where the water comes around the corner; now, the car going in this direction has nothing else to do but turn to the left of the car going over the road, and I was driving the car, and I was there before the car came to the corner, came into the first highway which is the main highway coming up to the corner, and I came up ahead of him and then he turned right into me, when he damaged my car, and then I found out that he lives in New York. Now, where am I at?

Mr. Lippincott—If the owner lives in New York and the car is registered in New Jersey, he has signed a power of attorney when he got his license, appointing the Secretary of State of the State of New Jersey as his attorney to receive process, and you can proceed against him and serve the process on the Secretary of State.

Mr. Hulsart—In any court?

Mr. Lippincott—Yes, in any court.

Mr. Hulsart—I am glad to know that, and he will hear from me.

Mr. Fithian—You spoke of changing the law because they go at the greater speed. I go in a car almost every day and they overspeed, and you must not change the law for that reason. Now that don't help the farmers with their wagons any if they speed up any more, if we do not have the chance to punish them before our magistrates.

Mr. Lippincott—You had better elect the proper magistrates, then.

Mr. Fithian—And as for putting a light on wagons, I know you cannot put a light on a wagon and keep it lit, it will be constantly going out and you have no lights.

Mr. Lippincott—I disagree with you, that you cannot keep a light on any wagon. If you put the proper kind of a light on you can keep it there.

Mr. Fithian—If you will give us some lights to put on our wagons we will be glad to know them.

Mr. Lippincott—Leave me your address and I will recommend you to people who can give them to you.

Mr. Fithian—They will on smooth roads, but not on our rough roads.

Mr. Lippincott—You could have the same argument for the motor truck, and say that the vibration on the motor truck is so great that you could not keep a light on it, and that would give you the same results.

Mr. Fithian—No, they are running a dangerous machine and are liable to kill somebody, and they are bound to keep a light burning for that.

Mr. Lippincott—Your machine is just as dangerous to the fellow going the other way, if you have no light, if you have not got the proper signal on it.

Mr. Fithian—No, it is not.

Mr. Applegate—Yes it is; for I have been upset by your infernal wagons without any lights on them.

Mr. Charles Foreman—I would like to know just how much

of the roads the motor vehicles have a right to—just what part of the road? Whether they have a right to more than one-half or not, provided there is ample room. The greatest difficulty I have in passing motor vehicles, or when they pass me, if we are going in opposite directions, if my horse is kind of shy I give them all the room I can, but the motor vehicle always wants two-thirds or three-fourths of the road, and they force your horse way into the gutter and even further if they can. Now, there seems to be a certain amount of suction about a horse that draws a motor vehicle right over towards him. I want to know whether he should not keep on his side of the road. We go in the gutter for our own safety, and yet we find they come after us over there, as if to push us further in.

Mr. Lippincott—The motor vehicle has no more right to a greater portion of the road than the horse-drawn vehicle. The old law of the road, passed in 1813, was re-enacted in the Motor Vehicle Act, and applies equally to motor vehicles as to the horse-drawn vehicles. That is, they each have the same right when passing one another, to one-half of the road. The trouble between the horse-drawn vehicle and the motor vehicle is that one is a slow moving vehicle and the other a fast moving vehicle; one is subject to very quick control by the steering wheel and the other is not subject to that quick control by the driving line. The motorist, as he becomes expert, seems to feel that he can take greater chances than anybody else, and then those fellows become road hogs. If you will send me their numbers I will send them a letter and try to bring them to a realization of the right of things. It is pretty hard to keep track of them.

Mr Lewis—My own experience has been that the greatest difficulty lies in the men who profess to be able to make repairs to machines and who do not know how to make them. I think that a greater portion of the accidents and the largest loss of life is occasioned by the repairs to machines by men who do not understand them. That has been my experience, not once, but a dozen times, that my life has been endangered because I have my car at some man's place to repair who does not understand it.

Mr. Lippincott—Of course, that is outside of the regulation of the traffic. It is a fact, as you say, that a good mechanic is a very rare thing to find. The only way to bring about your suggestion would be by the licensing of garages or repair places and bringing them under the supervision of someone. I am not clear in my own mind just the position the garage man is going to take in our jurisprudence. It is a new business. He is a storehouseman in a way, combining that business with the repair

business. It is a difficult problem. There is nothing at the present time that would allow us to regulate them. Of course, you could have an action, I imagine, against the owner of the garage, if it could be shown that he allowed your valuable car to be injured by incompetent service. Those are often very hard things to prove. If something could be done along that line it would be worth considering.

Mr. Wynne—In the case of a team in the road, and an automobile behind trying to pass him, how long can they hold the road?

Mr. Lippincott—A team can only hold the road, I suppose, under a reasonable construction of the act, long enough for that team to turn out by bearing to the right, and allowing the other vehicle to pass on the left.

Mr. Wynne—I mean a car coming behind the team, and the roads being narrow.

Mr. Lippincott—You would bear to the right and the motor car would pass you on the left.

Mr. Wynne—How long can you hold the road?

Mr. Lippincott—Ahead of the motor car?

Mr. Wynne—Yes.

Mr. Lippincott—Well, until you hear his calling, and he is supposed to give you a reasonable time to turn out.

Mr. Wynne—Suppose you cannot, unless you stay there when you turn out. Our great trouble is, if we have a heavy load and have a hill to climb that we have got to stay on the hard road. It seemed to me always that there should be some regulation when we are coming up a hill and a motor car comes behind, that we can expect to get a hoot from the car behind and to get a hoot from the driver when he gets alongside, and yet we cannot turn.

Mr. Lippincott—If the character of the road on which you are driving is such that your moving out on the side would endanger your team or your load, I don't think you are required to put yourself in that position. The whole question comes back to the question of our roads; we are not able to accommodate the travel we have now on our present roads. They should be wider. And if you are going to endanger your team or your load or yourself by turning out, you would be perfectly justified in holding the road.

President Frelinghuysen—The next subject on our program for this morning is a talk on "Markets and Marketing," by Hon. Charles J. Brand, Office Markets and Rural Organizations, Washington, D. C. We have a telegram from Mr. Brand, as follows:

"I regret to advise recent developments make impossible my attendance your forty-second annual meeting. Have detailed Clarence W. Moomaw, specialist in co-operative organization, as my substitute."

And we have a letter this morning from Mr. Brand confirming that telegram, and stating that he has sent Mr. Moomaw. That gentleman will now address us.

Mr. Moomaw—I regret that Mr. Brand found it impossible to be here at this meeting to present this subject. At a very late moment, as your Secretary can testify, it devolved upon me to fill Mr. Brand's appointment, and if you will submit to a manuscript in the presentation of this subject, I shall endeavor briefly to give you some comprehensive information about the marketing situation in the United States, and what is being done by the Federal Department of Agriculture in the introduction of economies and improvements.

Markets and Marketing.

CLARENCE W. MOOMAW, SPECIALIST IN CO-OPERATIVE ORGANIZATION, OFFICE OF MARKETS, DEPARTMENT OF AGRICULTURE.

The subject of Markets and Marketing, upon which Mr. Brand was engaged to address you, is large and comprehensive.

Not many years ago, and probably within the recollection of some of you, man produced all things necessary for his individual wants. He grew upon the land, on farm or in garden, the things necessary for his sustenance. From the neighboring forest, clay bank or quarry he brought the materials necessary for housing himself and his creatures. His clothes were homespun and his equipment was homemade. He lived upon what he produced and did not bother about the surplus. His establishment was a complete circle of home industries that were operated for direct ministration to the creature wants of the family and farm circle. Facilities for travel and for communication with the balance of the world were cumbersome, and so the balance of the world was practically an outside world.

Changes in Economic Conditions.—With the development of railways, steamships, telegraph, telephone, the wireless and all the great appliances for harnessing the streams and converting their energy into heat, light and into power for driving the wheels of industry, all parts of the world have been brought into close communication. Great enterprises involving millions of dollars and embracing the world have been suddenly created. Vast cities have grown as the bee swarms, and economic conditions have made one part of the country dependent upon the other for its supplies. Those same conditions have required specializing in production, and as we specialize the old lines of our self-sufficiency are rapidly broken down, and we find ourselves a community of collaborators in production, manufacture and exchange. This is modern commerce, in which the majority of the human race is engaged.

This interchange of commerce has created great channels of trade, and as producers who supply the world with its food you can no more escape its demands, exactions and tolls than you can thrive independently of the other industries. All commerce is largely based upon agriculture. They who till the soil are the bone and sinew of prosperity, and yet of all industrial classes they have been most backward in responding to the economic demands of this modern age. For the most part throughout the country they attempt to operate along the old lines of their ancient independence, each man dealing alone with the great problems that are common to all.

As the result of these rapid changes and the failure of producers and distributors to solve these problems economically, there is great unrest throughout the country among practically all classes. The farmers claim there is small profit in the business of agricultural production, and it is to be admitted there has been much grief in certain communities as the result of low prices received. On the other hand, there is a wail from consumers about the high cost of living, and it is to be granted that these complaints are partially due to an extravagant, wasteful system of distributing and marketing food products.

This unrest and an apparent determination to improve these conditions are evidenced in many ways: through the medium of the newspapers, trade journals and magazines; through meetings and growing organizations of farmers; through the activities of housewives' leagues and the development of co-operative purchasing; and in the part being played by the business men in many communities, who begin to realize that agriculture is the primary industry, and that anything affecting its economic status severely affects the prosperity and happiness of the entire community.

In a great many cases one of the greatest difficulties surrounding the farmers' marketing problems is his inability to get short-time loans on anything like reasonable credit. No matter how useful the purpose to which he intends to devote the money, the banker is loath to give him credit, and his factor exacts a high rate of interest. There is a great need for some co-operative rural credit system, controlled by the borrowers, whereby farmers can secure long-time mortgage loans at a low rate of interest, payable in minute annual installments extending over a period of from twenty-five to fifty years. In connection with this, and perhaps that which is most needed by the greatest number of farmers to-day is, means whereby the securing of personal credit or short-time loans, at a reasonable rate of interest, is made possible.

Some attribute our marketing difficulties to the presence of so many middlemen and speculators. These agencies have come into existence by the failure or inability of the farmer to perform these duties himself. If he is unable to personally distribute his crops and deal direct with the consumer, he must employ agents or commission men to do this work for him. It is no doubt true, however, that there are entirely too many middlemen engaged in the distribution of agricultural products. Under our present system of marketing some of these intermediary agents are a necessity, but a great number are a burden to both producer and consumer.

In recognition of the whole problem of marketing farm products, Congress

appropriated, on March 4th, 1913, $50,000 for the establishment of the Office of Markets in the Department of Agriculture. In pursuance of the act, the Secretary of Agriculture, on May 16th, 1913, created the Office of Markets. This office is under the direction of Mr. Charles J. Brand.

At the last session of Congress the appropriation was increased to $200,000 for the present fiscal year and the scope of the office broadened to include rural organization, with an additional appropriation of $40,000. This work is now being carried on by the Office of Markets and Rural Organization and for administrative purposes is divided into the following various projects:

1. *Co-operative Purchasing and Marketing.*—The general work of this project is to strengthen associations already organized and to make their work more efficient and guide them along safe and business-like methods and away from the mistakes of the past, to arouse public interest and a spirit of co-operation, and to emphasize the essentials for the successful application of that principle to the farmers' business.

An extensive survey of the status of co-operation in the United States was made during the past year, from which considerable information of value was secured. From this survey data relating to over 7,500 co-operative organizations has been secured. We find over 2,300 Farmers' and Co-operative Elevators doing an annual business of from $15,000 to $500,000 each, over 2,600 Farmers' and Co-operative Creameries and Cheese Factories, which in the State of Minnesota alone marketed over $22,000,000 worth of dairy products in one year. There are some 1,000 fruit and truck associations whose annual business ranges from $1,000 to $15,000,000 a year. In addition to these there are hundreds of farmers' warehouses and miscellaneous organizations. From this it will be seen that co-operation in the marketing of agricultural products in this country is rapidly assuming large proportions. Compared with the opportunities, however, this movement is in its infancy. It is the purpose of the Office of Markets to promote the principles of co-operation in the marketing of agricultural products and in the purchasing of supplies wherever deemed practicable and possible.

The individual grower of agricultural products cannot stand on equal ground with the buyers of his products, in that he does not have the knowledge of market and crop conditions, nor selling experience sufficient to hold his own in striking a bargain. Production and marketing are essentially different and special ability is required to do either well. This is an age of specialization; all large commercial and industrial enterprises are divided into departments managed by experts in their given lines. The sales departments have their sales agents who have spent years in study in order to become expert salesmen; purchasing departments have their expert buyers, while the factory or producing end has another corps of experts. The necessity of separating the producing force from the selling force has been realized by manufacturing concerns. Why is it not necessary to separate the producing from the selling force in agriculture? The farmer is a specialist in production and generally not skilled in marketing.

A new faith has developed on the part of the American farmer, that the co-operative plan of doing farm business is the most satisfactory method. In fact, the American farmer is being driven to co-operation by necessity.

There are over 7,500 organizations in this country which are co-operative or owned by producers engaged in the marketing of agricultural products and in the purchasing of farm supplies. Over a billion dollars' worth of products will be marketed by these organizations this year. From this it will be seen that American farmers are beginning to realize that by selling co-operatively they will not only be able to offer a standardized product and reduce the cost of marketing, but they will be able to furnish this better article to the consumer at the same, or even at a lower price, thus stimulating consumption. In fact, any system of marketing that does not give better service or better prices to the consumer and at the same time secure for the producer a greater net return, is founded on improper principles.

Co-operation in the marketing of agricultural products includes the establishment of grades and standards and, where possible, the adoption of brands and trade-marks, the securing of capital and credit, proper advertising to encourage consumption of the meritorious but little known product, discovery of new and extension of old markets, securing information as to crop and marketing conditions, the equitable division of profits, adapting production to meet market requirements and the utilization of by-products, securing cold and common storage facilities, the co-operative buying and manufacturing of supplies, securing of lower freight rates, more equitable refrigeration charges and more efficient transportation service, the securing of more and better labor and the general cultivation of a spirit of co-operation and uplift in all community affairs.

2. *Market Surveys, Methods and Costs.*—The purpose of the work under this project is to determine the normal marketable quantity of specific products within certain trade areas, with the possibility of increasing such supplies, as well as determining the immediate prospective supply at given periods or to be marketed within specified periods of time. Studies of the supply and demand of the various agricultural products, of consuming centers and the mapping of areas usually drawn upon for the supply of these products, time when these areas ship, normal prices and prices in periods of scarcity and of over-supply, are being carried on. It is the plan to secure, after the shipping season, accurate and complete figures covering the car-lot movement of each of the various crops from all sections, and with the aid of these figures and reports of field men and correspondents, forecast the market surplus. The object is to acquaint each producing territory with the conditions existing in competitive areas and to furnish prompt information to each concerning shipments from the other, with such data as it may be possible to secure on destination and on prices prevailing at terminal markets.

In connection with this work it is planned to determine the feasibility of some form of market news service. The value of prompt and accurate information concerning market conditions and available supplies should also be determined. Accurate figures of handling and distributing costs under the present system of marketing are necessary in order that we may determine where economies may be effected, either by more direct dealing or by the elimination of unnecessary and expensive handling.

3. *Market Grades and Standards.*—Standardization is of the utmost im-

portance. Only when products have been properly graded can they be traded in to the advantage of both the seller and the buyer. Second only to the importance of standards is the living up to them. There is a need for a great deal of educational work among producers relating to the standardization of their products. It is necessary for the farmer to learn, as practically all manufacturers have learned, that only the highest quality brings the highest price, and that rigid adherence in spite of obstacles to the established quality is essential to business success.

Our study relating to market grades and standards includes economy of various sizes, suitability of packages and containers, methods of preparation of perishable and other products for market, demonstration of results obtained by the best of the methods used, and all necessary work contemplating the utimate establishment of official market grades and standards for farm products. Co-operation on the part of the producing and distributing organizations toward this end will go far to making it successful. The Department has already issued official grades of cotton and corn. While these have not yet been universally adopted, it is believed that the sound, scientific method by which they were established, especially in the case of corn, will commend them highly to the trade, and the spirit of fairness by which they have been arrived at, together with their true reflection of trade requirements, will result in their ultimate adoption.

During the past year the office has secured valuable data relating to the State and National laws and commercial customs and requirements concerning weights, measures, grades and standards of farm products, standards for packages and containers, and cold-storage regulations and requirements. From this it was learned that a great lack of uniformity exists among the various State laws governing each of these different subjects. In fact, many so conflict as to interfere considerably with the marketing and distribution of farm products to the best advantage. This clearly indicates the necessity for the standardization of agricultural products on a uniform basis throughout the country.

4. *City Marketing and Distribution.*—The line of work contemplated under this project is the investigation of the uses and limitations of farmers' municipal wholesale and retail market houses, curb markets, huckstering and other systems of city distribution, including the study of the problems of terminal distribution involved in the provisioning of metropolitan populations, and to promote the direct dealing between producers and consumers, through parcel post, express shipment, family hamper and other methods, and aid in the development of rural and urban marketing systems.

In the city we find the greatest per cent. of middlemen dealers and the greatest number of consumers all contributing their share toward perpetuating the many wasteful methods, which it is the mission of the Office of Markets and Rural Organization to seek out, and, if possible, remedy. It is not difficult to find where the waste lies, but to devise a successful remedy is the task. Habits and customs have grown up with the life of the country and the city, and these cannot be thrown over by night. It is necessary to carry on investigations, followed by a campaign of education in order to bring about reforms in our uneconomic dealing and the lax habits which

call for more and more expensive service in our plan of distribution. In a great many of our cities there is a demand for well-designed and educationally-instructed produce markets, with modern storage equipment in connection. The proper location of such a market will often save considerable by eliminating two or three drayages and several handlings, all of which add to the expensive waster.

5. *Transportation and Storage.*—It is the purpose of this work to investigate and aid in the solution of the marketing problems which are involved in the transportation and storage of farm products by demonstrations to producers, publicity and co-operation with common carriers, producers, owners of storages, and others engaged in the distribution and handling of such products; to study and devise methods to improve the present inadequate terminal and transfer facilities, which form important factors in freight congestion; to aid shippers and shipping sections in securing proper car supply and in solving their transportation difficulties; to help bring about an equalization of rates or a possible reduction for certain growing sections to encourage their development; to study the proper adjustment of car-lot weights; to devise remedies to overcome car shortages; and to study the effects of allowing cars to be held on demurrage, the rate of charge involved, etc. Suggestions will be made relating to improvements in the car construction for specific purposes.

We shall investigate and promote, through co-operation with railroads, express companies, interurban lines and producers, the use of ice or ventilated pick-up cars, and especially scheduled market trains to be operated through sufficiently productive districts adjacent to good markets for the handling of package perishable freight. We shall also work for improvements in refrigerator cars and encourage the increase of this supply, and endeavor to equalize freight rates according to the actual cost of transportation of different products at different seasons of the year and in different localities. We shall also aim to improve and extend commercial storage facilities over growing sections, through to consuming centers, as well as experiment in small storage plants suitable to homes, apartment houses, etc., and to study the economic functions and effects of commercial storage.

Most of the large marketing associations maintain their own traffic departments with experts who handle the transportation problems of the business exclusively. What these traffic departments accomplish for their respective associations, the office hopes to accomplish for the individual and the smaller associations. This shall be done, not by actual handling of the transportation question for the producer, but by educating him to handle them for himself.

6. *Miscellaneous Problems in Marketing and Co-operation.*—This work is designed to enable the office to co-operate effectively with government agencies which are already conducting investigations in the marketing of specific products, and to take over such activities pertaining to these investigations which these agencies may release; to take up specific projects relating to consumption and distribution to be transferred from the Bureau of Crop Estimates, and to modify the nature and widen the scope of certain of these activities; to develop foreign markets where practicable, especially by a study of foreign marketing methods.

7. *Marketing by Parcel Post.*—The purpose of this work is to determine to what extent the parcel post may be utilized to advantage in marketing farm products from the producer to the consumer direct, including the study of containers and the methods of packing, and to devise means for establishing satisfactory contacts and systems of exchange between producers and consumers, and to demonstrate the facts obtained. Similar investigations will be made in regard to marketing by express.

In this work more than 800 dozens of eggs have been shipped for experiment from producer to consumer by parcel post, containers and methods of packing have been thoroughly tried out and the results have been so satisfactory that a bulletin on this subject has been issued. (Farmers' Bulletin No. 594—Marketing Eggs by Parcel Post, by Lewis B. Flohr.)

Investigations relating to the shipping of butter, as well as all kinds of vegetables, are being carried on, and there is very good reason to believe that the result will be no less satisfactory than with eggs.

It is necessary to keep in mind in this connection that there are limitations to the use of the parcel post for direct marketing. Its greatest usefulness will be local or within the first and second zones. Eggs, butter, and vegetables, such as lettuce, can be obtained by the consumer direct from the producer, where the distance of shipment is not too great, in a far better condition by parcel post than by the ordinary methods.

8. *Grain Marketing Investigations.*—Studies will be undertaken of the primary marketing of spring and winter wheat, including especially the uses and abuses of the dockage system in the first sale, and the comparison of results in the costs of grain passing from the farmer to the line elevator and to the farmers' mutual elevators. The problem of dockage is one of the greatest which confronts the producer in most of the wheat sections. This year in some States wheat with a dockage of as high as six to eight pounds per bushel was shipped several hundred miles to the terminal market. For each pound of foreign matter in a bushel of wheat the price per bushel falls in proportion. Foreign matter which is considered dockage consists of barley, oats, flax, mustard, buckwheat, pigeon grass and other weeds. The terminal elevators separate the grains and grind the weeds and oats into feeds so that the price for grain which is taken in the form of dockage and feed less the cost of separating is a clear profit to the terminal elevator. The farmer not only loses the grain which is shipped as dockage but the freight from the elevator to the terminal market as well.

The various methods of marketing grain, both in the domestic and export trade, will be studied and compared.

A study of future grain transactions and exchange practices similar to that which has been conducted in future cotton markets will be undertaken. This involves, among other things, the determination of the relation of cash prices of wheat to future quotations, the effect of the character of the future contract on prices and especially a study of the benefits of hedging.

The advisability and desirability of uniform grades is apparent. (A long step in this direction has already been made in the pending grain grades act.) Investigation will also be made of the "Inspection in" as compared with

"Inspection out," also as to the efficiency of farmers' co-operative elevators as compared with private and line elevator systems; warehousing practices in the grain trade, track selling, and the cost of marketing grain by the various methods in vogue.

9. *Cotton Handling and Marketing.*—Work under this project was formerly carried on by the Bureau of Plant Industry and is therefore further developed than some of the other projects of the office. The purpose of this work is to investigate the present systems of ginning, handling, grading, marketing and utilizing cotton and its by-products, with a view to improving the same by educational and demonstrational methods and to bring about an extension in cotton handling and to assist individual growers and associations in the handling and marketing of their product, and to develop economies and save wastes in the handling of the cotton crop. The results of the detailed survey made in Oklahoma in the preceding year have been published in Department Bulletin No. 36, entitled "Studies of Primary Cotton Market Conditions in Oklahoma."

The relation of marketing prices to supply and demand are being studied, both from the standpoint of efficiency and timely marketing of farm live stock and with reference to the more rational selection of meats on the part of consumers. To illustrate some specific problems that have been submitted by practical stockmen and efforts that have been made recently to better the market facilities in some localities a few instances may be cited. Live stock shippers' associations have been formed and successfully operated in a large number of localities, and this movement is rapidly spreading, especially throughout the Middle West. In one instance at least a farmers' co-operative packing house has been established upon a comparatively large scale within recent months and has made an auspicious beginning. Municipal abattoirs have been established in a number of places, more especially in the South, and the success of the plan has led to a proposal to extend the idea so as to place such abattoirs upon a county rather than a municipal basis, thus placing them directly at the disposal of the farmers for the slaughtering of their hogs and cattle and furnish cold-storage facilities for the curing and keeping of the meat, especially pork, at any season of the year. At another point a farmers' stock yards company has been organized under the auspices of the Board of Trade of a small city in order to answer the argument of the farmers that raising live stock was not profitable unless a sufficient number was raised by each farmer so that they could ship in carload lots. A great many letters have been received from stockmen urging the department to determine definitely the prices realized in the retail and wholesale sale of meat on the ground that it sells on the market at but little above, when not below, the cost of production, while meat sells to the consumers at prices almost out of their reach. Frequent and pronounced fluctuations in prices at the central markets are demoralizing effects upon the operations of stockmen. Inadequate transportation facilities, inaccessibility to markets, also limit the live stock development of many localities.

10. *Market Business Practice.*—The work under this project relates to the business side of marketing. Systems of accounts are being devised for

various farmers' marketing organizations, rural business organizations and other agencies engaged in the marketing of farm products. Assistance in the installation of these accounting systems wherever practicable is given, and methods relating to the auditing, plans of financing, and the general business practices of these organizations are being recommended. It is intended to prepare syllabi for courses of instruction in accounting and business practices as related to associations engaged in the marketing of agricultural products, such instruction to be given in co-operation with State universities and agricultural colleges in the winter short courses and to aid in all ways possible in the dissemination of information which will improve the general business methods in the marketing of farm products; to discover wastes due to lax business methods, and making such recommendations as appear to be best for the elimination of the same.

A system of accounts has also been perfected for produce exchanges and co-operative fruit organizations and the material will soon be available for distrubtion in the form of a bulletin. It is hoped that the system will aid materially in increasing the business efficiency of the great number of small produce and fruit exchanges throughout the United States. A general bulletin relating to the business methods of co-operative marketing organizations is now on the press. This bulletin will no doubt be of great help to managers of co-operative organizations throughout the United States and is one of the series which will be issued relating to the business side of marketing.

Constructive conservatism is the policy of the Office of Markets and Rural Organization. The indispensability of the producer and the necessity of profitable markets for his products, the legitimate and proper functions of the middleman, and the rights and needs of the consumer, are all kept in view and weighed in the consideration of every project. In the words of Mr. Brand, "There are three classes of reformers along marketing lines—optimists, pessimists and rationalists; we are trying to be rationalists."

Mr. Brown—Mr. President, may I make a statement in regard to this matter, or ask a question?

President Frelinghuysen—Yes.

Mr. Brown—This talk of co-operation in grading and standardization in the marketing of farm products in a very important proposition, but there is one very important part that has not been touched upon, and that is the education in standardization and grading of the customers. Of what avail is it to standardize and grade the product unless the customers appreciate it, and that seems to be one thing in which the city people are almost entirely ignorant. It certainly is a loss to undertake to put a first-class grade before a third-class customer. It seems to me that if this marketing proposition is going to be taken up at all it wants to be taken up from a practical standpoint, and while the farmers need a great deal of education on this line, the city consumer needs a great deal more education in this line. If we

are going to have the product standardized and graded, we also want the consumer standardized and graded to appreciate it. (Applause.)

Mr. Lewis—Gentlemen, there is something that should be done in a practical way. I don't know what has been done in a practical way, but I represent a county whose problems seem to be different from those of almost any other county in the State. Coming from Hudson county, we have a population of almost a million people. Within the past year apparently, through the instrumentality of the County Board of Agriculture, we have established a market, and our great difficulty so far has been to get the goods to sell. In our market the crowds of purchasers have been so large that we have had to call the police department out to regulate them.

Mr. Brown—How about the prices?

Mr. Lewis—The prices were pretty good, and we have found the greatest difficulty in getting the farmers to bring their produce to the market. And we have had another difficulty to contend with and which comes back to this, and that was the purchase of fish in order to reduce the cost of living, and they have sold as high as five tons of fish in a few hours, selling the fish at four, five and six cents a pound. But, to their surprise, when they went to the fishermen to buy the fish, the fishermen did not want to sell them any fish. And the result was that they had to go to Massachusetts to buy fish. The fish were caught in the State of Massachusetts and sold in the State of New Jersey, simply because the fishermen of the State of New Jersey would not sell them any fish.

And some of those farmers that we have induced to come to our market to sell their produce, were told by the commission dealers that if they persisted in coming to our market that their produce would not be received by them, if they persisted in bringing their produce to our market for sale, that they need not go to them with any of their produce. That is the trouble we have to contend with; and it seems to be time that something was done in a practical way by the State Board of Agriculture and County Boards of Agriculture in the different sections of the State to help along and change such a condition as that.

We in our county are ready to buy and to pay good prices, and we would like to have you gentlemen help us get the goods to the market, and I think that is one of the duties of the State Board and one of the duties of the officials, to come along and help us to get the produce. Our Board is doing all it possibly can in getting the market. I don't believe there is a market

better located in the United States to-day, and I know of many other locations, too, but in that particular market it seems to be harder than usual. Wherever they try to establish a market there seems to be something arises that keeps the farmer away. Even the newspapers are against it. It looks to me as though certain interests were organized and so organized that they could prevent the bringing of produce to the market. I believe that is a very important problem.

I, as a representative from my county, ask the State Board of Agriculture to help us to get the produce to that market and to make it a success. The produce men don't want the farmers to go there, because they want to get the produce themselves to sell, and they want to get the profits on it. Now, the farmer ought to get paid for his produce what it is worth to the consumer. He is working fifteen or sixteen hours a day all the time, and I think the average income of the farmer in New Jersey is $750 a year. In the dairy business we work fifteen to sixteen hours a day. I know how long my people have to work and how rarely they get a holiday. The farmer is working hard enough. I am inclined to think the farmer receives only about thirty cents on every dollar for what he produces.

There is something radically wrong right there, and there must be some practical solution of it, and it is up to a Board like this to find out the solution and to give the farmer a chance to make a living, and if that is once accomplished, there won't be any more prosperous State in the Union than the State of New Jersey.

Mr. Loughran—Some of our counties are not in a strict sense agricultural counties, but they are consumers, large consumers, and what bothers us, the problem that bothers the people here, is how to get the consumer and the producer into closer relationship. Now, that is always prevented and blocked and stopped in some way. They have got up to that point in New York. The mayor there sent up to Massachusetts to find out the workings of a market system there in order to do the same thing for New York. Now, they have tried there for years to establish a market, and they established a market on democratic lines, and after a few months those middlemen go to work through any means they know how and get control of the market. That is what they are up against in New York.

Here only recently there were 18,000 signatures to a petition which was presented to Mayor Mitchell to stop them from starting a market known as the Fort Lee Market on the New York side opposite the Fort Lee ferry. Mr. Lewis wanted to know

where they came in, well, that 18,000 explains where it comes; they worked that up.

In Jersey City, of course, Hudson county is not in a strict sense an agricultural county, although there is considerable truck raised there, especially in the Secaucus section. We are interested more especially in bringing the purchasers, the buyers, the consumers, to the farmers, the producers.

Down in Hoboken when the market there was started, these organizations, interested parties and dealers, etc., got up their fight and they pretty soon put them out of commission. They have done the same thing in Jersey City, and what we want to do is to have the farmer control those markets.

Now, the point is to make it practical to get at the consumer, that is, how to practically bring the consumer right at the door of the farmer, bring the farmer right at the door of the consumer; and there is ample market there for all. There is no reason why produce should be raised here and sent to Jersey City or New York and kept there for three or four weeks, and then brought back to the State where it is raised and sold at extra charge for the expense of hauling it around. There is something radically wrong there. I don't want to condemn the middleman, but they have got a compact organization. There has got to be a practical solution of this thing, and it can be done.

This is very interesting, but in a sense it gets us nowhere. Now, the thing is to get the farmers close to the consumer, and let there be reciprocity between them, and if it does away with the middleman I don't think there is any harm done.

The hour for closing the morning session has arrived and we will therefore adjourn for the noon recess. We will meet again at two o'clock.

Recess.

AFTERNOON SESSION.

The meeting was called to order by President Frelinghuysen, who said: Yesterday the potato men had their innings; this afternoon we cow men and dairy men are going to have ours. The first item on the program this afternoon is an address from Dr. John C. Sharpe, the proprietor of the Meadowbrook Farms, Blairstown, N. J., and his subject is "Breeding and Rearing Dairy Animals for Health and Profit." I take great pleasure in introducing to you Dr. Sharpe.

Address of Dr. John C. Sharpe, Proprietor of Meadow Brook Farm, Blairstown, N. J.

Mr. President, ladies and gentlemen: Mr. Dye wrote me some time ago and asked me to speak here to-day on the subject of the rearing of dairy animals for health and profit. He did not say whether it was for the health and profit of the man or the health and profit of the cow, but I take it that the two things are closely related. He also asked me to anwer such questions as I should like to have answered when I began, twelve years ago.

Now, I do not propose to answer all the questions that you could ask, or all the questions that I could ask, but I would like, to-day, if possible, to get before you some of the general aspects of the breeding and rearing of dairy cattle, and in order that we may have an appreciation of our advantages and of the subject in general, without talking anything about statistics, I think I may make the general statement that New Jersey is the most favorably located territory in the world for the purpose of raising dairy cattle. We have the largest population that can be reached by any one State, New York, and when we say New York we are mentioning a very great city, and around New York we have other great cities, Jersey City and Newark, and all the contiguous cities, and down at the other end we have Philadelphia, and across the river, Camden. And there is the great population down along the sea-coast in the summer time that consumes the increased production of milk in our State in a way that can hardly be equalled in any other State.

I think we have a splendid location. The State of New Jersey is a State that has a good average rainfall, we have good crops on good fields, we have good pastures. We have no drought in this State as they have up in New York where they are raising such splendid cattle. Suppose we do have a dry month. There is just one thing to do, and that is prepare to meet that dry month. You feed your cattle without pasture for six months in the year; you can add another month in the summer, if you wish, and you can very easily take care of them, and in a better way in August than they would be likely to take care of themselves if they had pretty good pasture, not supplemented by some other provender and by care.

Now, it is interesting to raise the question about what we are doing, and I tried to find out some things.

How much milk do cows give? Nobody knows and no one can find out. Exact statistics are impossible.

I wrote to the Dairy Division of the Agricultural Department of the United States for statistics, and I have this answer: "The average milk per cow in the United States is 3,149 pounds." That seemed remarkably low. The United States Dairy Division advises me that the average milk per cow in New Jersey is 4,437; nearly a half more than the average per cow in the United States.

But 4,437 pounds of milk is pretty poor, even though we are talking about thousands. I asked the Secretary of Agriculture of New Jersey, and he says the average milk per cow, as far as he can find out in New Jersey, is 3,878 pounds. I asked the New Jersey Experiment Station and they say

the average milk per cow is 3,951 pounds. I think it would be fair to add the four together and divide by four and get the average, which is 3,854 pounds.

Now, I have translated that into quarts, because you usually talk about how many quarts your cow gives, and how many quarts you sell. Taking the 2⅛ pounds to the quart, then the average from those four amounts gives us 1,818 quarts. The price of milk varies in different places, but in order to have some fixed factor for comparison as we go along, we will say that it is four cents. I know that some of the retailers get eight and a half cents at retail, but the people who keep cows do not retail, they have to sell their milk wholesale, and they get four cents a quart, so that those cows are yielding $72.72 as a gross receipt. Not as much as a cow should yield, but even then, if the cows were kept right, there is a profit in $72.72 per cow.

Now, I would like to ask a question: How much would it mean to us if we could increase the production of each cow by one quart of milk a day? What is a quart? A quart is not much. But, a quart is a whole lot. We may have 140,000 cows or 150,000 or 154,000 or 156,000 in New Jersey. If we have 140,000, the lowest number that anybody suggests from any census, the increase of one quart per cow will increase our yield $1,660,400 in the year.

And it is just as easy to do that as it is to get up in the morning, and a great deal easier, too, and you can get up at the same time in the day you do now and realize this increase by proper methods.

And I have a further report, a report from the New York Dairy Division. I wrote to Mr. VanAlstine up at Albany. He says that they have selected nineteen dairies in a cow-testing association, and the average there is 4,958 pounds. Not such a very big increase above our general average of about 3,854. It goes, however, to 4,958 pounds, which does not seem to be so very much, and yet it is about a thousand pounds; it is about five hundred quarts; it is about $20 a cow; and if you could bring all your cows up to that it would amount to a great deal of money. He also reports that twenty-three dairies in one association averaged 5,999.6, not quite six thousand pounds. That is a considerable increase.

I am glad to give you a report from one place in the State of New Jersey—the Sussex County Cow-Testing Association reports an average per cow of 8,318 pounds. It is one association. It has not been running long. Perhaps they will not maintain that production. Of course, when people enter into an association they are usually the progressive people, the people with the best cows, the people who are trying to find out what a cow can do and trying to realize results. They report a net profit of $83.10 per cow, and that is a good deal. The farmer who is doing that is making money. And, more than that, he is gaining his self-respect and the respect of his neighbors, and he is satisfied and thinks life is worth while, and I am very glad that we have that association in the State of New Jersey, because that is the largest average of any association or any group of dairymen any place in the United States.

Sussex county is not a specially favored part of our State. It does not have better soil, nor as good soil, as some other part of the State. The

difference must be found in the men who keep the cows, and they must be keeping a pretty good kind of cows. After all it is the man, but it must be the man with the right kind of a cow.

Suppose we could get up a propaganda through the State of New Jersey so that the dairymen of the State would come up to this 8,318 pounds of milk in a year for each cow, and compare that with the average I have given here, 3,951 pounds, how much would that increase the profit at four cents a quart? You want to take your pencil and figure it, and see whether I am right. I may not have figured it right, but as I figure it, it would increase the profit $12,247,200 in the State of New Jersey.

Well, there are lots of cows in Sussex county that have not been admitted to that association, and a lot of them would not be allowed to live if they had got into it; so I suppose that is the reason that they did not care to go.

Now, then, the question is: Can we bring about this increase?

I would like to say we can, for good reasons. What I shall state may surprise some of you. I cannot give you the details here, but I can give you the reference, so that you can confirm my statement. The best cows in the United States are in the State of New Jersey. The best cows in the world are in the State of New Jersey. The best cows in the world have been developed in the State of New Jersey. Only, we have not developed enough of them.

Do you know that the first forty-pound cow in the world was developed in New Jersey? Now, in order that you may understand the terms that we are using here and that I expect to use, I want to tell you just exactly what is meant by a forty-pound cow. I have been talking about the average dairy cow as given by the United States, by the Dairy Division of the United States, by the Secretary of Agriculture of New Jersey, by the Experiment Station at New Brunswick, and they do not agree so very well except on the one thing—that production ought to be a great deal larger. And they are all working to that end.

When I want to buy a cow I want to know about her. I don't want to know what the owner thinks about the cow. I want to know just exactly what that cow's capacity is, and I want it in figures, and confirmed in such a way that there can be no doubt about it. Now, there are different breeding associations in the country. I know more about one than I do about the others. But their methods are substantially the same. I have a cow and I think she is a good one, and I want to sell progeny from that cow, particularly bulls. And I don't want a man to come and say I said thus and so, I want to have an official test made. I apply to the Superintendent of Registry in our Division, giving the name of the cow and when she will be tested; he sends back a permit to me and he advises our Experiment Station when they ought to be ready to send a supervisor; the supervisor comes, I have to pay him, but I will get the money back, before we are through. The supervisor comes and sees the cow milked dry. Then after that he is present standing beside the cow and the man every time she is milked during the test. He weighs this milk, takes out a sample, then tests the sample by means of the Babcock tester, and the Babcock test in the hands of a man who is careful and qualified, will give absolutely to the very lowest decimal, the amount of butter fat

in that particular milk. He goes through this for a period until the seven days' test is completed. He figures out the entire amount of milk, the entire amount of butter fat, then he changes that by calculation into eighty per cent. butter, or whatever standard is employed.

Now, I say, New Jersey produced the first forty-pound cow in the world, and she was not a forty-pound cow for she was a forty-one-pound cow. New Jersey produced the second forty-pound cow; and there are only three forty-pound cows known since the world began. New Jersey produced the first Junior three-year-old thirty-pound cow; the first Junior three-year-old thirty-five pound cow; the first Junior three-year-old thirty-seven pound cow; the first thirty-four pound cow in the world, without reference to age; the first twenty-nine pound cow; the first Junior four-year-old twenty-eight pound cow; the first Junior two-year-old twenty-three pound cow, and the first yearling twenty-three pound cow, and many others making world records.

New Jersey possesses the best bred bull in all the world; his dam has a record of over forty-one pounds and his sire's dam has a record of over forty-four pounds. What does it mean? That means an average of about forty-three pounds for the dam of the bull and his sire's dam. Twelve years ago when I got my herd and I began to read in the papers the performances of the various breeds, men were then wondering whether there would ever be a thirty-pound cow. And then a thirty-pound cow came. Now, that is the kind of cows we have in New Jersey—a few of them. New Jersey to-day owns the cow that has produced more milk and more butter in two successive lactation periods than any cow in the world. And those cows are not very far away from us to-day.

The question is, can all of us do these things? I don't think we can, not just right away. But it does not make any difference. We can come up towards that.

But if we are thinking about a cow that can produce two pounds of butter a day, and that is a big lot, there is nothing like that in the list that produces only 3,951 pounds per cow per year, or about one-half pound of butter a day, or three and one-half pounds in seven days. If we are thinking about that then we are thinking down instead of thinking up. Then I don't believe that we shall advance as we ought to.

Now, I want to give you three illustrations from one herd. These heifers are not remarkable at all. They are just nice good cows of their particular breed, cows such as you can get, cows that you can raise if you take the time to do it; but you cannot raise them in a year. You could not go and buy cows like them if you had the money, because there are not enough of them. But we can get a start at them, and we would like to have this list much larger. If you have any question about the records you can write to M. H. Gardner, Delavan, Wisconsin, and he will give you the records.

Meadow Brook Prilly Grietjé freshened at 2 years and 4 months. She was subjected to two 7 days' official tests, one early in her lactation period and the second 330 days later. Average per day, 43.2 pounds milk, 2.05 pounds butter per day. Taking the average for her yearly production, she produced

15,768 pounds of milk and 748.25 pounds of butter. She was tested as a three-year-old eight months after freshening and produced 44 pounds of milk, 2.615 pounds of butter, per day. This is probably a good deal less than her average for the year, but if it is taken as the average she will produce 16,060 pounds of milk and 954.5 pounds of butter.

Meadow Brook Prilly Janet freshened at 3 years and 1 month, and was tested early in her period and 285 days after freshening with an average record of 48.14 pounds of milk and 2.266 pounds of butter, or 17,571.1 pounds of milk and 827.09 pounds of butter.

Meadow Brook Prilly Daisy, freshening at 2 years and 3 months, was tested early in her period and again 269 days after, and yielded per day an average of 43.61 pounds of milk and 2.369 pounds of butter, equivalent to 15,926.7 pounds of milk and 864.69 pounds of butter in a year.

In order to show that these heifers were not hurt by the year's production, I might say that Meadow Brook Prilly Janet produced in her next period 25.60 pounds of butter in seven days' official test, and Meadow Brook Prilly Daisy 560 pounds of milk and 30.125 pounds of butter in seven days.

The average of the three heifers as given is 16,404 pounds of milk and 813 pounds of butter at the average age of two years six months. If the averages of these three heifers is set over against the average of the cows of the United States, or even of New Jersey, the difference will answer one of our early questions—we can greatly increase the production of our cows. The general average given is 3,854 pounds of milk per year. The average of the heifer at two years and six months 16,404, more than four times 3,854. The increase per two-year-old heifer over the production of the average cow is 12,550 pounds, or about 5,900 quarts, valued at four cents per quart or $236 increase.

Now, you may say that they had special care. They do not get any better care than any decent cow should get. They do not get any better care than you ought to give your grade cows or your scrub cows. They were just in the old barn, with lots of fresh air in it and plenty of food, and not milked with the milking stool, but with gentleness.

Now, how are you going to get such cows? You can buy them, perhaps, if you have money enough. But, if you have money enough to go and buy a whole herd of that kind of cows you don't need to keep cows; you can have lots of fun without that. You cannot buy the cows I refer to here without some considerable money. I know the owners would not put a price on the cows I have mentioned. I like my friends, I like my horse, I like those cows, and I like a great many things, and I am not going to sell those things which I like just because people want them. You can raise them; and that is the point of what I wish to say to you here to-day. I just wish you to get an idea of what we are doing; what we can do and what we ought to do.

How are we going to raise them? In the first place you have got to select your breed. It would be real interesting to know what breed you like, which one you prefer. There are about three or four breeds you can pick from: Jersey, Guernsey, Ayreshire and Holstein. Or you can take

something else if you are not very particular, but, if you are particular, you will take one of those four breeds.

Now, you can go and buy up a herd of Jerseys or Guernseys or Ayreshires or Holsteins, but before you begin you have got to decide which breed you are going to have. You may have to begin with native cattle, that we call scrubs; but you have got to know what you are going to work to. You cannot mix blood in cattle any more than you can mix water and oil. You will be going back all the time if you try it. There is what we call the reversion to the original. Whenever you are mixing breeds you are going back to original type. You will have to mix blood to begin with, but you will begin with the right kind of sire and work up to what you are striving for.

Now, one word about what breed you will select. If you are very much predisposed towards the Holstein, and you would say she gives very much more milk than the Jersey, I just want you to pause a little and ask how much milk a Jersey cow gives? She gives a big lot of milk and she gives good milk. Before you buy Holsteins you had better just go and see how much milk the Jersey cow will give.

If you are very much disposed towards the Jersey cow, and you think the Holstein cow cannot make butter, then you had just better pause a little and go and see how much butter the Holstein cow will make. She will give more milk and she will make more butter than any cow in the world. The records show that. She will not make the larger amount of butter out of the equal amount of milk, the percentage is not so high.

The main thing for you to do is to conform to your market, and then your taste, and if the market won't conform to your taste don't buy any more cows. Be sure you know what you are going to buy, and when you go to buy, buy what you are going to buy, and do not go about it haphazard. But you must first make your choice.

If you have a very good cream market and if you think you have a good market that is going to last and you can sell to the right people who will buy all the cream you make at a good price, and who will want nice, yellow cream, then you will buy the Guernsey cow. For no other cow will give as yellow milk and cream as the Guernsey cow.

If you are going to live in New Jersey and going to send your milk to New York or Philadelphia, don't buy a Jersey cow, for you will be paid just as much as the men are paid who keep Holsteins, and no more.

So you make your selection. Then what do you do? Begin with the cows that you have, or, better still, sell three or four of your cows, unless you know they are good, and then you go and buy one or two more and begin to breed up a herd in the line in which you wish to go, but be sure that you put in some pure breeds.

I know what some people say: "Oh, the grade cow will just give as much as the pure-breed cow." Well, if she will, I never saw her do it. I bought ten pure-bred cows, and thirty grades. I bought the best grades I could buy, and I only got one grade cow, whose yearly production was equal to the average pure-breds. I got rid of the grades pretty fast, and

I must have had fifty or sixty of the grades cattle within the first two or three years.

Now, raise the best calves from the best cows, but be sure that you put in one or two pure-breds, and you will find in three or four years that the number of pure-bred cows in your herd exceeds the number of grades that you have raised, and in two or three years more the grades will all be gone and you will have a pure-bred herd, and you will be doing just as well every bit as the owner has done with the three heifers which I have described. But you come now to the really most important part of it; you have got to select the bull with lots of vitality and vigor. He is not to be a pet. He ought to be of the aggressive kind, one that will keep your inquisitive neighbor where he belongs. Don't follow the theory that you must get one with a nice head like a cow and a nice thin neck—you want a bull that is a bull, and won't necessarily be very pretty. Don't bother about the color; that has nothing whatever to do with it at all. He ought to have no very great defects. He ought to be straight, with well-sprung ribs; he ought to have a long neck, even if it is a little thick, and he ought to have a good big head, too. You don't want bulls with little heads. The brains are in the head, and brains are as necessary in a bull as in a man. Demand vitality and constitution. The heifers will bring beauty enough to the herd.

Now, how are we going to get such a bull? Well, now, I think it is not so difficult a thing if we will only go about it in the right way.

You must find the bull of the description I am giving you, and then you must find a man that you are sure is all right, and you had better be careful about the man as well as about the bull. Always do that in any business that is worth while.

But you can buy the finest blood in your chosen breed without putting in very much money. Remember that half of all the calves that are dropped are bulls, and that there are a lot of them for sale; but you must be sure that you are buying from a man who knows about cattle, and who can understand where they come from, and how they are bred, and who can advise you what to expect. The main point is to choose a bull of the highest prepotency. He must be qualified to pass on to his progeny the high producing quality of his ancestors, and that implies that they, in turn, must be of large producing quality.

Now, just what do we mean by prepotency? You cannot see anything in a bull calf that would indicate that quality, except his general vigorous constitution. Therefore, we must inquire about his ancestry. First, his sire ought to be a proven sire; that is, he should have a number of officially tested daughters of good records, and his grandsires ought to have daughters of still better records, for they are more mature. The sires dam ought to be a proven cow of large milk and butter records—official records. Private and hearsay records are not of much value.

Second, the dam of the bull calf should be of still better breeding, but a bull calf from a high record cow will cost a lot of money—more, perhaps, than you can spare in the beginning of your enterprise. There is a way to meet and overcome this difficulty, provided you are not bent on buying a son of a

thirty-pound cow. (I am supposed to be speaking to men who are about to begin to develop a herd.) If you will visit some good herd owned by a reliable man, and tell him just what you are looking for, and the price you can pay, he will probably show you a bull calf sired by a bull such as I have described, and from a heifer that has produced about 300 pounds of milk and about fifteen pounds of butter in seven days' official test, and he will ask about $150.00 for the calf. Then you must inquire about the sire and the dam, the grandsires and granddams of the heifer. If the account is satisfactory in regard to their breeding and producing qualities, you may safely buy the bull calf and take him home with full assurance that you have bought one of the best bulls of the breed, but you must be sure to see that he is strong in every particular I have mentioned. Finally, I wish to emphasize one thing: Be sure to go to see the sire and the dam of the calf. Try to see the dam before she is milked, and just after, to determine her udder capacity. It is better to spend money to go to see the calf, the sire and dam, unless you are dealing with a man whose judgment and honesty you can absolutely depend upon.

If you are going to buy Holsteins, subscribe for the Holstein papers. If you buy Jerseys, take the Jersey papers. Get the yearbook for your breed, and trace out the breeding of the family you have chosen. Keep largely to one line, and you are sure to succeed, provided you are interested in cows not merely as a money-making proposition, but in cows as animals, the most beneficent of all animals. They are not machines, they are living beings, and most responsive to care and gentle treatment.

However, the shelter, the feeding, the care of the cow are great subjects that time does not permit me to touch upon. You can read that in the books, and particularly in the dairy papers.

Let us remember that we in New Jersey are most fortunately situated, with the greatest market in the world at our door, with a most congenial climate, with the very best bred and highest producing cattle in the world, and that all the advantages are with us. Our soil needs the dairy cow; our millions of neighbors, with ready money, need our dairy products; our State needs the millions of increased revenue that our cattle can furnish; our families need the support that our dairy cows can furnish. I believe we have only begun to realize our possibilities. Let us possess the land. (Applause.)

Mr. Lewis—Mr. President, may I be permitted to ask a question? The problem seems to be very interesting to me, it touches my own conditions. I would like to ask the speaker what he would sell me a cow for for foundation purposes, adapted to the producing of heifers such as he has produced?

Dr. Sharpe—Good foundation cows can be bought for from $250 to $400; heifer calves, from $150 to $300, good enough to start the finest kind of a herd.

Mr. Lewis—That is the question that has been a problem to me for some time. I keep now the best cattle I can afford to buy. I have been trying to keep up my herd, and I have been

considering the question of purchasing pure breds. My problem is the same problem as that of every man here who is in the dairy business, we are not in a position, very few of us, to go to the market and buy pure-bred dairy herds. We might buy a few cows and try to reproduce their qualities.

President Frelinghuysen—If there are no further questions to ask of Dr. Sharpe, we will now proceed with our program.

Mr. Hulsart—Mr. President, I have a resolution I would like to offer at this time, if it is in order? It is as follows:

WHEREAS, The so-called Full Crew Law of this State has cost the railroads $750,000 during the twenty-one months that it has been in force; and

WHEREAS, This mandatory expenditure has not brought a corresponding benefit to the general public or the employes of the railroads; and

WHEREAS, But for this law the Board of Public Utility Commissioners could regulate the railroads in this respect with fairness alike to all; therefore, be it

Resolved, That this body go on record as favoring the repeal of this law and recommending that all matters of railroad regulation be vested in the Board of Public Utility Commissioners, and that the Legislature of the State of New Jersey be petitioned to that end.

President Frelinghuysen—If there is no objection this resolution will be referred to the Committee on Resolutions.

President Frelinghuysen—The next item on the program is an address on "Modern Milk Making," by Prof. Joseph Hills, Dean, Vermont Agricultural College, Burlington, Vermont. I now take great pleasure in introducing to you Prof. Hills.

Modern Milk Making.

J. H. HILLS, DEAN, COLLEGE OF AGRICULTURE, UNIVERSITY OF VERMONT.

Mr. President, ladies and gentlemen: Milk making has vastly changed within the past generation. Formerly largely a spring, summer and fall business, it is now a year-round proposition. Sold as milk, butter and cheese only, it is now sold in multitudinous forms, as market milk, pasteurized milk, certified milk, inspected milk, modified milk, baby milk, dried milk; as cream of varying richness, sub-standard, standard, and super-standard; as butter, creamery, dairy, sweet, ripened, unsalted; as cheese of more than 57 varieties; as ice cream, and in divers other ways. The consumption per capita has vastly increased of late years, the demands of local and State health officials have become more exacting and the industry is becoming increasingly centralized and standardized. Yet, fundamentally, the success of modern milk making depends now as formerly upon certain basic considerations, to wit: the cow, her housing and care, her feed, the preparation and marketing of her product, although we look at these items in a different way than did our fathers, and stress certain matters which they did not stress.

THE COW.

What breed shall be kept? What about her ancestry? Shall pure breds or grades be kept? Does she score well? How much does she make in terms of milk or butter and of profit?

Breed.—There are good and poor individuals, desirable and less desirable strains in all breeds. One of the dairy breeds should be chosen, carefully with full understanding as to their relative merits. If one is making market milk for the general market, one would hardly use exclusively the rich milking breeds which give relatively small flows, but would choose those breeds which yield more largely. If, however, one is making milk for a special market which pays a special price, the Jerseys or Guernseys may well be considered. If one is making butter, the richer milking breeds are apt to be advantaged over those giving thinner milk; but this rule, if rule it can be called, is full of exceptions. In fact, considerations of breed may be—usually are—less important than those of performance.

Ancestry.—Oliver Wendell Holmes—the author-poet, not the judge—well said that in educating a child the start should be made with its grandparents. The worthiness or worthlessness of a cow is largely a matter of its ancestry. Particularly in the choice of the bull which is "half the herd," ancestral performance should be carefully studied and given much weight in the matter of selection.

Pure-breds or Grades.—The child creeps before he walks, walks before he runs. Many, perhaps most, dairymen cannot afford pure-bred cows at the outset; few whose herds are of fair size can afford to keep at the head thereof a bull which is not a registered animal, unless it be that a grade of well-known and well-attested ancestry is used for the time being. A pure-bred herd of high merit may well be the goal of the modern dairyman, even though the goal is never reached.

Dairy Conformation.—A show ring winner is a desirable advertising asset to a farm. Furthermore, dairy conformation is usually indicative of dairy performance.

Milk Yields.—"Handsome is that handsome does." The dairyman keeps cows, not for the pleasure of their society, not as objects of beauty, but for profit. The actual evidence the cows afford as to their dairy abilities, the profit or loss statement for each cow, is the final test. How is this determined? By weight and test of milk, by weight of food, by comparing income for product with outgo for feed. To be sure there are many items left out of this account; interest, depreciation, taxes, insurance, labor, for example, on the one side; manure, increase of herd, sales of cows, calves, etc., for example, on the other. If these be allowed roughly to offset each other—it is not claimed that necessarily they do, but such is a common way of figuring—the outcome is clear cut. For instance, let us assume that Betty makes 7,000 pounds of milk, selling at the railroad station at $1.75, and that she eats a ton of hay worth $18, 3 tons silage worth $4 a ton, 1¼ tons of grain worth $30 a ton and that pasturage be rated at $5. The income would be $122.50, the outgo $72.50, the balance on the profit side $50.

Now, dairymen can weigh and test milk and weigh the roughages and concentrates fed each cow; but few will do the former and practically none the latter. Hence the formation of cow test associations.

Cow test associations exist in most dairy counties and most dairy States. There are nearly two score in Vermont. They are simple affairs. Two dozen or more dairymen, owning among them some 500 cows or more, club together, pay a dollar a cow yearly into a common treasury, wherewith they hire a young man, graduate of an agricultural school or short course as a rule, to do this testing and weighing work for them. He is at the farm of each member once a month weighing, sampling and testing the milk of each cow for one day, weighing the feed each cow gets, and then calculating on the basis of one day's data the approximate product and food consumption for the month. He is at Smith's on the first, Jones' on the second, Brown's on the third, and so on on his rounds, returning to Smith's again in due time on the first of the next month. Twelve times at monthly intervals he is at Smith's, weighing, sampling, testing, calculating. As a result, at the end of the year Smith receives an approximately accurate of the milk and butterfat production of each cow and of the food she ate to make the same. Doubtless it is not exact, not as closely accurate as if he weighed, sampled, tested, calculated daily, but it is close enough to truth for farmers' purposes, close enough to enable the detection of unprofitable cows, which is its purpose. The scheme works well and it pays. Members secure not only their records, but the benefit of comparison with their neighbors, of the suggestions and advice of the tester and sundry co-operative advantages.

We have been at it for seven years with 3, 2, 6, 10, 20, 29, 35 associations on our record during these successive years. About half the members drop out at the end of the first year, and one-third are left as a rule at the end of the third year. Those who drop out need the association most, but often do not profit by it, being frequently unwilling to learn by experience. Indeed, the personality of the test operator is often a large factor in this respect.

A few results from some of our older associations may prove of interest. Here are five testimonies from one association:

A. Better balanced and more economical rations have been fed, with better results.

B. Saved money by feeding as the tester suggested and by carload lot buying.

C. A member owned twenty cows. He sold seven and received $4 a month more than from the full twenty, because of better care and feeding.

D. One cow in seven was sold from a herd, and the rest yielded more at less cost.

E. A local cattle buyer said he had never bought so many cows his boss kicked on, and that the — — — cow test associations were the cause of it.

F. One dairy of forty cows gave 1,000 pounds more butter. The owner says it was due to the cow test association and to his $40 investment.

From another association:

A. A college graduate had figured his feeds, fed a balance ration and tested his cows for twelve years; yet he says he has fed a better and cheaper ration since joining the association.

B. A member with twenty-five cows sold thirteen boarders, and made more profit from twelve than from the twenty-five.

C. A member milking ten sold seven and kept the three, which proved profitable.

D. A member found most of his thirty were doing poorly. Feeling that he might be at fault rather than the cows, he is studying his feeding practice, and is on the road to making most of them profitable producers.

E. A member was overfeeding with protein. His cows look and do better on a less concentrated and less costly ration.

F. A member found his creamery test was better after he joined, and he wondered why.

G. In this association the best herd averaged $47.41 per cow income over food cost; the poorest $7.19.

H. In nineteen herds, after a year's work, ten less cows made, in round figures, 4,000 pounds more milk in one month, 250 pounds more fat, at $300 less cost for feed, the fat costing six cents a pound less for feed, and milk twenty-nine cents less per 100 pounds.

The cow test association is of less value, perhaps, in a milk shipping section than in a butter section, but it has great value in either location, and is heartily recommended to the consideration of dairymen as a most practicable modern means of making money as well as milk.

Some dairymen, particularly the breeders of registered stock, stress the value of short-time tests. I decry their value as compared with a year's trial. They resemble horse-racing. Some horses can cover a mile in two minutes. This fact is interesting, but most people who keep horses keep them for working purposes, and their ability to do work day in and day out is of more importance than their ability to show for a short time a burst of speed. A cow's ability to yield well on rational feeding throughout the year is more important than her ability to produce heavily under forced feeding for a brief period. The cow test association accommodates both the short-time enthusiast as well as he who prefers a long-time test.

HOUSING AND CARE.

This is an important item in modern milk making. I do not mean to build your barns for you, but to suggest that certain considerations be borne in mind, to wit:

(*a*) That an annual—perhaps semi-annual—coat of whitewash, with a modicum of disinfectant—say corrosive sublimate—is worth while. It cleanses, disinfects and brightens the tieups.

(*b*) That a dead dog is worth while. Why? Because if he is dead, he does not dog the cows. Excitation of any sort tends to lessen the milk flow.

(*c*) That oxygen is cheap; not in tanks at the drug store, but in the outdoor air; cheap and necessary, and best secured by an adequate ventilation system.

(*d*) That sunlight is cheap and worth while; that window glass is not expensive; that the one let freely into the cow stable by the other is an effective germ-killer, promoting healthfulness and cleanliness and making for self-respect and righteousness on the part of the dairymen.

(*e*) That ample supplies of suitable bedding—sawdust, shavings, straw—perhaps serve to promote cleanliness and to lessen manurial losses.

(*f*) That tieups so constructed as automatically to tend to keep the hind quarters of the cow out of the droppings are an aid to sanitation.

(*g*)That a damp cloth passed swiftly over the flanks and udder before milking will remove much material which otherwise may get into the milk.

(*h*) That a hooded pail keeps out nine-tenths or more of the fragments of hair, dandruff, dirt, etc., from the milk.

(*i*) That thoroughly cleaned, and, if possible steamed, utensils materially help to better results.

It is obviously harder to make the modern milk now demanded by local ordinance, board of health regulations and State enactment than it was to make ancient milk; harder to make it in winter than in summer; but these nine suggestions, none of them prohibitively costly or difficult, will go a long ways toward improving quality.

FEED.

The following condensed and somewhat modified excerpt from a recent Vermont bulletin epitomizes some of the points it were well to bear in mind in connection with modern milk making.

What Roughage Shall I Grow For Feed?

A. *Roughages* form the basis of economical feeding, being: (1) largely home-grown, (2) economically produced, (3) bulky. They may be classified into those furnishing (1) relatively cheap protein and (2) relatively cheap energy nutrients.

B. *Legumes* should be grown extensively, because they (1) are high in protein, (2) usually afford high acre yields, (3) improve the land. (1) *Soy beans;* high in food value, but not always well adapted to the climate. (2) *Alfalfa;* one of the best of dairy feeds, worth trying in a small way until one learns how, then worth while in a large way. (3) *Sweet Clover;* easy to grow, of high food value if cut early, sometimes unpalatable. (4) *Peas and oats;* best legume combination for one year's crop. (5) *Alsike clover;* valuable where red clover does not succeed. (6) *Red Clover;* usually the best legume for New England conditions if cut early. (7) *Mammoth red clover;* later in maturing than red clover and more bulky; not usually as advisable.

C. *Other hay feeds* are: (1) *Grasses* which should be cut early, timothy being the poorest for cows. (2) *Millets* and *cereals,* valuable annuals when cut early. (3) *Straws,* low in food values, often of little or no net value.

D. *Corn* may be fed as: (1) *Fodder;* a good forage but of lower food value than silage and more apt to be wasted. (2) *Stover;* relatively low in food value, but better used than wasted. (3) *Silage;* valuable because of its succulence and as a cheap source of energy. It is the most economical form in which to feed the corn crop.

E. *Summer soiling crops:* (1) *Rye and wheat* for spring. (2) *Clover,* in late June and early July. (3) *Peas and oats* sown several times in succession for July and early August. (4) *Cereals* in succession for July and August. (5) *Millets* in succession for August until frost. (6) *Corn* from August until frost. (7) *Rowen* for September. (8) *Silage* for any time, all the year round, all things considered the best and cheapest soiling crop.

F. *Roots* are valued highly in Europe, but cost more to grow than corn. Large crops may be grown, but they are very watery. Mangels, rutabagas, carrots, turnips and potatoes are used *Apple pomace* is nearly as valuable, pound for pound, as is corn silage.

G. The choice of roughage depends on: (a) the location of the farm; (b) the condition of the land; (c) the available help; (d) the rotation system which is used.

What Grain Feeds Shall I Purchase?

A. (1) *Concentrates* are feeds high in their nutrient contents in proportion to their weights.

(2) In purchasing feed, one should find out (a) what nutrients are needed to balance the ration, (b) what feeds furnish the needed nutrients cheapest.

(c) whether the feeds selected according to (a) and (b) are adapted to the animal needs.

(3) Concentrates may be divided into feeds furnishing (a) low-priced protein and (b) high-priced protein.

B. (1) Concentrates usually furnishing *low-priced protein* are, stated in the usual order of their protein contents, (a) cottonseed meal, (b) linseed oil meal, (c) distillers' dried grains, (d) gluten feed, (e) brewers' dried grains, (f) malt sprouts. Several of these are unpalatable, if fed alone. The purchaser should observe the guaranty as attached to each package, as it is variable for these feeds as a class. The first two are heavy in weight.

(2) Concentrates usually furnishing *medium-priced protein* are, stated in the usual order of their protein contents, (a) high-grade proprietary feeds carrying 20 per cent. or more protein guaranty, (b) wheat feeds, as flour and brown middlings, reddog, mixed feed and bran. All these are valuable feeds when offered at reasonable prices.

(3) Concentrates usually furnishing *high-priced protein* are, stated in the usual order of their protein contents, (a) low-grade proprietary mixtures of 8 to 15 per cent. guaranteed protein content, composed of low-grade by-products or cereal feeds often made more palatable by the use of greater or less amounts of molasses, (b) corn and oat feeds, (c) cereal grains, such as corn, oats, barley, rye and buckwheat, valuable when home-grown (corn meal usually furnishes cheapest energy nutrients in concentrates), (d) dried beet pulp, usually offered at a high price as compared with the nutrients it contains, (e) alfalfa meal, a high-priced hay feed, the fine grinding of which does not measurably increase its food value.

C. Suggestions concerning the purchase of feeds:

(1) In buying note the guaranty and ingredient statements full more than names, catchy advertising or apparent low price.

(2) Read the bulletins issued by the Experiment Station regarding feeding values and economy of purchase.

(3) When in doubt, seek advice of the Extension Service or the Experiment Station officials, or of the county agricultural agent.

(4) Co-operate with your neighbor and buy in large quantities, thus saving money.

Twenty Suggestions For Profitable Milk Production.

1. The average cow requires about 24 pounds of digestible dry matter daily.*

2. Roughly two-thirds of this digestible matter should be furnished in the form of roughage and one-third as concentrates.*

3. Not less than two-thirds of the total dry matter eaten should be digestible.*

4. Variety in feeds is required if cows are to yield the best results.

5. The succulence which in summer is found in pasture grass, and which is so desirable a feature in a dairy ration, may be furnished during other seasons by silage, roots and apple pomace.

6. Balanced rations are apt to afford the best results because an animal thus secures nutrients in much the same proportions that she utilizes them. There is no material excess to induce disarrangement of the digestive system or to be wasted; and there is less likelihood of unsupplied deficiencies.

7. Feed all the roughage a cow will clean up.

8. Feed one pound of grain to every three to four pounds of milk yielded daily, varying according to the roughage supplied and the fat percentage of the milk.

9. A good arrangement for feeding is to feed one-half of the grain and silage in the morning and one-half at night after milking, and to feed hay

*Any ration which is properly balanced usually fulfills the condition set forth in the first three suggestions.

after the other feeds are consumed. A little hay may be fed at noon if desired.

10. Vary the amount of the feed according to the size and production of the individual animal.
11. Salt regularly; three-fourths of an ounce daily is sufficient.
12. Water regularly, taking the chill off of the water in the winter.
13. Change from barn feed to pasture feed gradually in the spring.
14. Feed grain in the summer to high producing cows, varying the amount fed according to pasture supplies.
15. Use soiling crops or silage to supplement pasture as far as possible.
16. Keep dry cows in good flesh.
17. Give laxative foods to a cow for a week previous to her freshening.
18. Work up gradually to the full-grain ration after freshening, taking two or three weeks in doing this.
19. Reduce the grain ration slowly as production decreases.
20. Watch your cows and feed according to individual needs.

One matter I want to stress in this connection is the value of a product usually wasted—apple pomace. We have fed it freely for twenty years. We have put it in the silo and fed it all winter long; we have dumped a load on the barn floor, fed it out and then got another load and so on. Either way works well. Fed carefully for a few days till the cows are used to it, it can be fed freely thereafter. We use it in place of corn silage for the morning feed for from four to eight weeks every year and find it by careful experimental trials to be worth two-thirds to three-fourths as much as mature corn silage. It does not injure "baby milk" or butter, and we have yet to find a cow which is not partial to it.

PRODUCTION.

Time was when chemical standards only were enforced. Milk then, if it carried a stated solids and fat content, met legal requirements. Nowadays bacteriological standards must be met; there must be not to exceed a certain number present; dirt is tabooed; and the consumer's right—a clean product—is stressed. Now the cow is the determining factor in meeting the chemical or food standard, while her owner is the determining factor in meeting the bacteriological or cleanliness standard. If the cow has Jersey or Guernsey blood in her veins, she makes richer milk than if Ayrshire or Holstein blood predominates; but regardless of her pride of ancestry, her milk is clean or dirty as her owner wills it to be. Now the most dangerous dirt—dangerous from the standpoint of both the milk itself and its user—is the invisible dirt known as bacteria. Whence do they come? How may their activities be best controlled? They mostly are derived from (1) the udder, (2) the animal exterior, (3) manure, (4) litter, (5) barn dust, (6) hands and clothing of the milker, (7) utensils and strainers, sources which, as a rule, are readily subject to control. Their numbers may be controlled by keeping them out, killing them and checking their growth. A few produce disease; most of them do not. Farmers making milk at relatively low cost cannot take refinements of care; but it is well for them to know what to do and to do as much as seems practicable. Precautions looking to the elimination of disease-producing germs are: veterinary inspection and rejection of diseased animals; and elimination from contact with animals, utensils and buildings of typhoid

carriers and of sewage-polluted ice and water. To reduce the number of milk bacteria, one may wash and scald all milk utensils with great care, keep the cows clean, clip the hair on the udder and hind quarters, moisten the udder and flanks before milking, use covered or hooded milk pails, keep stalls and stables clean, cool the milk to 45 degrees or less as soon as possible after drawing, keep the stable ceiling free from dust and tight, keep hands and clothing clean, discard the fore-milk, and remove the milk from the stable immediately after milking.

Why this stress now lain on cleanliness? Our forefathers lived long and happily and never knew what a bacterium was. It is stressed because of the relation of cleanliness to keeping qualities, to the grade and, consequently, money value of the product, and to the health of the consumer. Infant mortality is largely a matter of milk infection. Many dire diseases are at times thus conveyed, as has been many times demonstrated. Whether he will or not, the modern milk maker must—as he should—take cognizance of these things and make milk which will, as college boys say, "get by" the inspector. He must, as it has been happily phrased, make "milk that needs no washing."

SALES.

Micawber says: Income one pound, expenditure one pound and one shilling —result, misery; income one pound, expenditure nineteen shillings—result, happiness. Modern milk making must be profitable. A recent thorough survey made all over New England by the agricultural committee of the Boston Chamber of Commerce shows clearly that at current prices for market milk New England producers are hardly breaking even. It behooves the modern milk maker carefully to study every detail, to test his cows, to test his feeding practice, to test his housing conditions, to test himself, to study the economics of the whole problem, neither failing to do what he should nor doing more than will pay.

Vice-President Cox—We will pass on to the next item on the program now, which is the report of the Committee on the Nomination of Officers.

The Committee on Nomination of Officers for the ensuing year submitted their report, as follows:

For President—Hon. Jos. S. Frelinghuysen, Somerville, N. J.
Vice-President—John T. Cox, Three Bridges, N. J.
Treasurer—J. Harvey Darnell, Masonville, N. J.
Members of Executive Committee—George E. DeCamp, Roseland, N. J.; A. J. Rider, Hammonton, N. J.; Theodore Brown, Swedesboro, N. J.

Respectfully submitted,

J. L. Purzner, *Chairman.*

A Member—I move that the report be accepted and that the Secretary be instructed to cast a single ballot for the Board for the election of the officers therein nominated.

This motion was seconded, and, on a vote, adopted.

Vice-President Cox—The motion is adopted and the Secretary reports that he has cast the ballot, so that I declare the gentlemen therein named elected as officers of this Board for the ensuing year. I will now have the pleasure to introduce to you again your honored President. (Applause.)

President Frelinghuysen—Gentlemen of the State Board, I want to thank you sincerely for again conferring this honor upon me. During the past three years I have tried to serve the farmers' interests and the farmers' interests only; and during the coming year, inasmuch as you have again seen fit to elect me your President, I shall try to serve your interests faithfully and continuously. I thank you. (Applause.)

I have taken the liberty of changing the program slightly, and placing the next speaker before Dr. Headlee, and I will limit him to twenty-five minutes, if he will consent. I now introduce to you Mr. F. R. Stevens, of Geneva, New York, Agricultural Expert of the Lehigh Valley Railroad, representing the New Jersey State Chamber of Commerce. Mr. Stevens will talk to us on "Farming as an Industry." Mr. Stevens himself is a farmer, and I know he knows a good deal about it, and I am sure you will hear his address with much pleasure.

Mr. Stevens' Address.

Mr. President, ladies and gentlemen of the Board: It gives me pleasure to be with you here to-day to meet with the farmers represented in this Board, and I assure you it gives me additional pleasure to be with you as a representative of the State Chamber of Commerce, that organization which has been formed comparatively recently, but nevertheless is a strong, forcible, growing organization, and, if you will permit me, incidentally, I would like to say just a word or two regarding the formation and scope of work of that organization.

The State of New Jersey as a community has accomplished much, but nothing in comparison with its wonderful possibilities. Its unique locality, great harbors, unrivalled transportation facilities and its varying types of soil makes a combination seldom to be found. It is the work of the New Jersey Chamber of Commerce to bring together all the factors interested in the development of New Jersey, in order that their united strength and wisdom may create and enforce a sound State policy which will bring greater prosperity to every industry.

Such a policy does not mean partisan politics; it should not mean a general policy of you help me and I will help you, but the broad policy of this Chamber is that of an impetus given to one industry gives an impetus to all industries, and of course, conversely, that an injustice to any industry is

an injustice to all industries. That if one industry is allowed an undue gain, it gains at the loss of all others.

I wish to urge that you and your body here give this State Chamber of Commerce careful consideration. Examine it closely. Give it your assistance; give it your influence, and, besides your influence, give it the knowledge of your needs to help it and your views upon a State policy, and if you do this it will be the stronger and the larger and you will be stronger. So much for the State Chamber. The topic.

Agriculture, the foundation industry, is a large factor in the future development in this State and this is the industry in which we are vitally interested to-day.

The industry of agriculture is to-day on a firmer basis than ever before in the history of our country. I do not want that statement to be misinterpreted, for I recognize the fact that students of business and students of farm conditions do not recognize, generally, the extent to which it has gone. I think it is not fully realized, but we seem to have reached a condition wherein one man cannot be scientist, executive manager and financier. The qualities necessary do not seem to exist in any individual. And the very fact that one individual controls all these factors on the farms seems to put the limit on one of the ends and that seems to be the business end.

I was present with one of the most prosperous farmers in a neighboring State, a short time ago, when he was being interviewed by an inspector who came around to see whether or not he was liable to an income tax; it was generally believed he was. The inspector knew him pretty well and said, "Uncle Dave, I have been sent up to find out about your income; I want to find out how much tax you have got to pay." He says, "How much money do you make?" "I don't know." "What is the farm worth?" And he says, "There has not been a farm sold as good as this around here, to my recollection." He asked, "What is your stock worth?" "I don't know." "What are your expenses?" "Well," he says, "I reckon so much; I don't know. I never stopped to figure it out to tell you the truth." And he asked, "How much money have you got in the bank?" And he says, "I can answer that. I will call up Jim, down there, the cashier, and he will know." "Well," the inspector says, "Uncle David, it is believed you earn more than $4,000." "Well," Uncle David said, "I gues maybe I do; I don't know." "Well, I have got to find out." "Well," Uncle David says, "You are just the boy I want to find. I wanted to know that for fifty years, and if you will come in here and find out what I am earning, that will be worth while."

Now, that condition actually existed. You have touched upon the point; that is the foundation stone, the root of this whole matter. There has been altogether too much neglect of this condition of the expense account. I remember when as a young man I started out in an institute, I was trying to show up a particular point that the large majority of cows were being kept at a distinct loss, and an old gentleman sitting in the front seat in the institute raised one point and he says, "Boy, you don't know the conditions at all. You have forgotten a very important thing." I said, "What is that?" And he said, "You have not given that cow one bit of credit for the manure which she produces on that place." (You know that there is a notion abroad

that a farmer should keep twenty cows or twenty-five cows in order to keep going.) I said to him, "Why do you have to have manure on the farm?" "Why," he said, "to make the grass grow. And you have got to keep the cows to make the manure." I said, "Why do you want the grass to grow?" "Why," he said, "to get some more hay." And I asked him, "Why do you want more hay?" And he said, "To keep that darned old cow." As a matter of fact he could not be led to believe that until it was brought home to him in that way.

So, I say, the industry of agriculture is, to-day, on a firmer basis than ever before in the history of our country. The farm values of New Jersey in 1900, including buildings, was $162,591,010, and in 1910 the same values was $217,134,519, an increase in ten years of 74.8 per cent. This increase of values has been partly due to increasing suburban values, partly due to buildings with value beyond the needs of actual farm use, but the study of farm values outside of suburban zones and in purely farming countries and outside of the State of New Jersey, shows a constant increasing value due to increased profits.

The reconstruction period of the last half century during which the science of agriculture has been added to the art and the question of free lands in the West eliminated, is rapidly coming to a close and the sound policy now adopted by our farmers is likely to endure for several generations. In general, this reconstruction period has brought us much that is good. Incidentally, have come with it, fanciful schemes and wild ideas, perverted notions as to the course of agricultural upheaval and dishonesty in the many forms which always takes advantage of the unsettled condition of affairs, but these have largely been brushed aside and the necessary factors added to adapt agriculture to the needs of the time.

While the development of this industry both as an art and a science is not all that may be wished, yet its growth is satisfactory and entirely hopeful. Production is increasing, prices in general are rising, home conditions in general reflect increased prosperity and agricultural gatherings of all kinds throughout the East show by their attendance and by the character of the discussions an increasing realization of civic responsibility.

From a business standpoint agriculture has not made the advance that other lines of industry have and as we look at the situation to-day we are impressed with the fact that the business of agriculture is its weakest point. The general method of buying and selling and the tremendous waste of by-products brings us inevitably to this opinion.

In the same half century of time we have seen tremendous strides in business generally. At the beginning of this period we were in the state of small business, small in that each individual corporation was dependent upon the individuality of its head, unable to buy or sell to advantage and facing the tremendous waste of by-products. Combinations soon began to grow in which the various industries of the same lines were consolidated, thus reducing the cost of production, cost of sales, regulating the amount of product to suit conditions of the trade, utilization of by-products and the promotion of general efficiency by the employment of highly skilled labor, more efficient machinery, thus bringing about the stability of organization far beyond the power of any individual.

The day is practically gone when the elimination of any great corporation leader materially affects the efficiency or policy of that corporation. The agriculture of to-day, from a business standpoint, is in the position of other industries of fifty years ago. Warren, of New York, in a careful survey of the farms of that State, has concluded that farms averaging from two hundred to three hundred acres are the most profitable, other things being equal. Farms of this type show profits that compare favorably with individual enterprises on the old basis. The success of these farms depends to-day upon the individuality of the owner or manager. There is no controlling factor in its earnings beyond his own individuality. Without that factor there is no assurance whatsoever of any profits from these farms. The same condition confronts the average farmer to-day that in the past confronted business. There is a lack of business accuracy and business stability.

We are beginning to meet, to some extent, the demand for skilled, technical knowledge on the farm. In the absence of sufficient business organizations to employ this skilled labor the Federal and State governments have taken it into their hands in co-operation with the farmers and interested corporations generally, to supply the deficiency. This is as it should be and seems to-day to be the only solution of the problem. The question of consolidation for efficiency for the utilization of by-products and for the economic purchase of the produce and the sale of the produce is the future problem of the farmer. In this, he can follow no beaten path, because none exists. The consolidation of industries and the growth of corporations in this country and the consolidation of our farms of the old world can be, to only a small extent, a model.

The farm, besides being an industry, is a home, and this alone prevents absolute consolidation. Efforts have been made in this and in other countries to consolidate many farms into a large working unit, but the sentiment of our people is, and I hope always will be, that the idea of individual ownership of homes is fundamental and must not be disturbed. We have lived too long under the constitution which recognizes the equal rights of men to think for a moment of creating the peasant class. Our form of government would hardly permit of it. It would be dangerous, and I think will never receive serious consideration. In the few favored sections such as Lake Erie Grape Belt and the large Muck Areas, we are already approaching a plan which is successful and which may to a certain extent be copied in general farming areas. Here the question of stock on the farming land is not a factor. Residence is not required on the land in the winter and the farmers live in a convenient center as a village, going out to their farm lands for the necessary work and management. In such sections there has been greater advance in co-operative work. Substantial beginnings have been made toward the consolidation of effort in buying and marketing. At least enough has been done to show the advantage of such consolidation and give us some guidance for consolidation in general farming.

Temporary increases and decreases of farm products cannot be made in order to suit the demands of the market. The immediate health and the future production of our cows, for example, demands the steady production

of milk. The care of our orchards demands uniform production and cannot be made to respond to neglect one year and intense cultivation the next in order to decrease or increase the production. Our scheme for the rotation of crops demands a certain acreage of specified crops each year in order to preserve the unity and build up the fertility of the farm.

Any considerable utilization of by-products is an impossibility in each undivided farm of to-day for the reason that a farm of workable size will not bear sufficient capitalization to warrant the installation of the machinery necessary to convert the by-product into salable form.

The small purchases and the products sold from the individual farm are not sufficiently large to warrant the machinery or necessary organization to buy and sell to advantage, and, consequently, the fact remains that the producer of farm products is receiving about thirty-five cents on the dollar of the final income for his produce, and worse than all this, less than one per cent. of the produce shipped from our farms is standardized. The consolidation of retail grocery stores in the cities has created a large market of which we can take advantage, but which we are to-day unable to serve, because of the size of offerings from the farm and from the lack of a standard pack.

The unit of our farm operations as an industry, must be enlarged, yet our homes must not be destroyed, and the amount of production cannot be materially changed. The only solution is the formation of effective co-operative or co-ordinated unions through which we must increase our business efficiency. Dean Galloway, of New York, recently epitomized this condition when he said, "Unstandardized products are capable of successful salesmanship by co-operative companies." In dealing with this direct trade we must be able to offer in carload lots, potatoes, apples, milk and its products, green vegetables, etc., each in the various sizes demanded by the trade. This means that the products of a large area must be brought together, packed without fear or prejudice by men who understand packing, graded to suit the poor as well as the rich, and thus use all sound, wholesome food products, and this means that we must have sufficient storage in the producing country to hold this material until it is demanded by the consumers. It means that we must have connected with this storage machinery for the utilization of the by-products, it means salesmen and advertising, it means the co-operation of the transportation companies and every essential business interest of the State.

I can see the future for agriculture in no other light. The consummation of this business policy in its perfection is some distance in the future. We must realize that we are facing the psychological as well as a business proposition. Of all trades or professions in this world, the farmer has been the most independent. He can live the longest in complete isolation. He has been and is the most independent thinker. The influence of generations cannot be wiped out by one agreement or statute, and it is not well that they should be. The history of our great consolidations is that they started in a small way and grew to their present strength. Even their organizers probably never foresaw the details of the perfected organization, but if we all agree as to the general necessary trend to which this would be directed, we

can and should begin to work gradually toward that end, forming such small organizations at first with the control of single products, and gradually, as conditions will warrant, bringing the organization together with others and bringing together the organizations closely allied with one another.

In this way we can gradually conservatively build up to our ideal, making few mistakes, and maintaining our independence, reaping the added rewards due us, and becoming year by year a greater civic factor in the construction work that is ahead of us.

There is a need for this business organization, and I am sure that I can pledge to you the earnest assistance and co-operation of the State Chamber of Commerce in an effort to bring about the end that you desire in this matter. And if it is effected, the State Chamber and other organizations of which it is composed will be strengthened in proportion as you are strengthened. (Applause.)

Mr. Woodruff—Mr. President, I beg leave to ask the speaker a question, and if my question is out of order, I most respectfully ask to withdraw the question.

The gentleman in his address mentioned about transportation. I believe in asking this question at this time, that it will come to headquarters perhaps quicker than if it had been put in any other way. The question is this: What is the Lehigh Valley Railroad doing for farmers in New Jersey, at the present time, in transportation? What does the Lehigh Valley Railroad propose to do in the future in regard to transportaion for the farmers in New Jersey?

Mr. Stevens—Transportation of what? What is your question?

Mr. Woodruff—Transportation of merchandise generally in New Jersey over its lines.

Mr. Stevens—You refer to freight now?

Mr. Woodruff—Freight, of course.

Mr. Stevens—Well, I cannot answer the question here. To be perfectly frank, I will take it up and give you an answer by mail, if you will attach your name to that question and bring it in.

Mr. Woodruff—The reason I ask this question is that the interests of the farmers of New Jersey are so vitally connected with the question of transportation, it means so much to them in dollars and cents, it means to them the marketing of their produce, it means sometimes indeed the destruction or decay of their products for need of facilities of transportation at a particular time. Now, if you invite this remark—

Mr. Stevens—Yes, go ahead.

Mr. Woodruff—The shipments from various parts of New

Jersey differ so. We will take from various parts of New Jersey over which your lines operate, the shipments from Flemington to Newark, say, will reach there by one railroad the next morning, early, about six to seven o'clock; over your road it will possibly come the next afternoon or the next day. A shipment from New York City will come about the same time over your road as from any other railroad, the early morning; but from the western parts of the State there is that difference, making it impossible to ship goods that are perishable on your road, with the exception of milk, and I understand you specialize on milk.

Mr. Stevens—I have nothing to do, of course, with the operation of the railroad, but I would be very glad indeed to welcome you or anybody else to take up a proposition like that. If you will address it to me I will see that it will reach the proper channels and see that an answer at least is given to your question. Of course, you understand that another road goes directly through Flemington, whereas we are just a branch.

Mr. Woodruff—The Central is a branch to Flemington.

Mr. Stevens—I would like to get that cleared up for you, if you will address me on the subject.

Mr. Fithian—You speak of the individuality of the farmer. Doesn't that consist mostly of being able to work sixteen hours a day and with cheap help, being his own policeman and all that? That is what it means in our section.

Mr. Stevens—Sometimes it means that.

Vice-President Cox—I think a motion is in order thanking Mr. Stevens for coming here to-day and addressing us, which he has done voluntarily. Such a motion is made and seconded. All in favor will stand up.

A rising vote then being taken it was unanimously carried.

Vice-President Cox—We will now proceed with the next business.

Mr. DeCou—Mr. President, and ladies and gentlemen, your Committee on Credientials would report that they have received all the credentials that have been presented to them, which includes nearly all the delegates, and they are all found correct.

(During the making of this report President Frelinghuysen takes the chair.)

President Frelinghuysen—You have heard the report of the Committee on Credentials, what is your pleasure?

On motion the report was received.

A Delegate—Mr. President, I have a resolution which I would like to offer, as follows:

WHEREAS, The ever-growing agricultural interests of the State of New Jersey demand an Agricultural Experiment Station and College efficiently equipped to carry on investigational and educational work in keeping with the importance of the agricultural industry within the State;

WHEREAS, Certain definite sums of money are absolutely necessary to adequately carry on such investigational and educational work at the New Jersey State Experiment Station and College and throughout the State;

WHEREAS, The agricultural industry of our State has not received in the past the generous support accorded to agriculture in other States; therefore, be it

Resolved, That the New Jersey State Board of Agriculture request of the State Legislature that such sums of money be appropriated for agricultural purposes as may be necessary for rendering effective service to the farmers of the State.

President Frelinghuysen—If there is no objection the resolution will be received and will be referred to the Committee on Resolutions.

Are there any other reports or resolutions to be presented at this time. If not, the next item on the program will be an address by Dr. Headlee, or a report, being a Resumé of Entomological and Bee Inspection Work for the Year 1914, by Dr. Headlee, State Entomologist.

Dr. Headlee's Address.

Mr. President, ladies and gentlemen: I shall try not to detain you beyond the hour set for adjournment. When your Secretary invited me to speak on this subject I felt much pleased to have the opportunity of setting before you some of the really important facts of insect control.

Briefly stated, the business of the insect control service operating under the direction of your board is to prevent the importation and establishment of seriously injurious insects within the State, and to prevent, in so far as may be, outbreaks of such species as are already established.

Prevention of importation of injurious insects involves the closure of the channels through which they come. In the past these channels have been almost entirely nursery stock. Nursery stock comes into New Jersey consigned to private individuals and firms for growing on the consignee's place or for sale and distribution. This fact has compelled the State Entomologist to devise means whereby the stock coming into the State could be kept clean.

Owing to the fact that the nurseryman was likely to plant infested foreign stock among clean stock, which would, after time enough had elapsed for infestation to occur, be sent all over the State, it was recognized at the beginning of the insect control service many years ago that the nurseries of the State must be kept clean. Accordingly, the practice of inspecting all nurseries at yearly intervals grew up. At first some of the nurserymen were hostile, but later, as the advantages of such protection became apparent, that opposition disappeared.

Twenty-six hundred acres of New Jersey soil are devoted to growing nursery stock, 2,400 of which are devoted to ornamental and 200 to fruit stock. At least once each year every nursery is carefully gone over, and all serious infestation which is found eliminated. In addition, the sources from which all dealers in nursery stock obtain their goods are investigated. If the sources are known to be clean, the dealer is licensed to do business; if not, he is denied the right. Thirty-six dealers have thus been investigated and licensed during the past year.

Nursery inspection soon spread over most of the United States, and the work of compelling clean importations became lighter, but did not altogether cease, because it was found that to neglect all importations was to invite the sending in of poor stock.

Nursery stock from foreign countries has been coming into the United States for a number of years, but it was not until about seven years ago that any alarmingly bad species was found on it. At that time the winter nests of the dreaded brown-tail moth were found on pear seedlings from France. This seemed to show the country what danger lurked in stock imported from foreign countries. Examination showed that this stock came without being subjected to any adequate inspection in the place of origin. Measures were taken to examine as nearly all of this stock, which came into New Jersey, as possible.

At the present time practically every case from foreign countries and from brown-tail and gypsy moth infested parts of New England is examined and treated as the condition of the stock dictates. Last year between 12,000 and 13,000 cases of nursery stock came into New Jersey, fully one-half of which came from Belgium and Holland.

The nursery inspections of the present year have shown the oyster shell scale more damage to its native food plants than the San José to its favorite plants.

The present year has seen the discovery of a very limited infestation of gypsy moth egg masses in a small block of evergreens. A perfectly fresh male gypsy moth was taken at an arc light near the point where the infestation was later discovered. The funds of the Board of Agriculture being insufficient I applied to the United States Bureau of Entomology for aid. Experienced scouts, in charge of Mr. L. H. Worthley, were sent in and most carefully covered the entire territory, covering an oval area with an east and west diameter of about three miles and a north and south of about four. Other points at which it was thought infestation might exist were scouted, but nothing was found. The infestation has been eliminated and the planting in which it was found will be kept under quarantine for the coming year.

Unfortunately, much ornamental stock was brought into New Jersey from New England, for the purpose of planting the large estates of northeast Jersey before the New England area infested was placed under United States quarantine, and I therefore bespeak your watchfulness in reporting the prevalence of any suspicious species. Unknown insects should not be disregarded but should be promptly sent to the State Entomologist in order that outbreaks, should any occur, may be found while yet small and stamped out.

We are doing far less toward controlling the outbreaks of insects already

established than in preventing injurious species from becoming established. In fact, I think this condition obtains in practically every State. The prevention of the establishment should receive our first attention, but prevention of outbreaks should not be neglected. It has been neglected primarily because of limited means and secondarily because of its inherent difficulty. To carry on this work successfully it is necessary to know the abundance of each species that is potentially dangerous, to circulate warnings when they are needed, to organize the people threatened, and to lead the fight against the species concerned. The first step without which nothing can be done requires much scouting and this scouting takes more time than we have under present conditions or than our means will permit us to purchase.

The honey bee is not usually thought to be of much importance. When we realize, however, that with an investment of $3,000 a certain beekeeper in New Jersey realizes $2,000 a year for his labor the bee business looks more promising.

For the purpose of controlling that fatal foe of the beekeeper—foul brood—an act providing for bee inspections was passed in 1911. It seemed that the first thing to do was to find out the foul brood conditions. Inasmuch as the means provided were limited it was planned to answer all calls for inspection and to cover as large a connected locality as the balance of the time would permit.

In 1912, 378 yards containing 3,277 colonies were examined and 157 cases of American and 381 cases of European foul brood were found. In 1913, 337 apiaries containing 2,932 colonies were examined and 81 cases of American and 238 cases of European foul brood were found. In 1914, 405 yards containing 4,001 colonies were inspected and 61 cases of American and 147 cases of European foul brood were found. It thus appears that the amount of foul brood has decreased indicating that the campaign of education for its suppression has had some effect.

In 1913 it was decided to take some counties in which the interchange of bees and bee supplies were least, thus reducing the chances of infection coming in from the outside to the lowest possible number, and to attempt to stamp out the brood disease already there and keep it out. Salem, Cumberland, Cape May and Atlantic have been selected and given a thorough going over in 1913. In 1914 all diseased yards were visited. The thorough 1915 examination should show the effect of the work.

It was evident from the beginning that one of the best weapons to eliminate bee disease was education of the beekeeper in better methods of bee husbandry. Accordingly, exhibits have been maintained at various fairs, lectures have been given, articles written for the press and a manual of bee husbandry prepared.

Complete control of brood diseases, however, awaits the time when funds shall be sufficient to permit the examination of each colony once each year and the revisiting of the disease colonies as often as may be necessary to eliminate the disease.

I think that I can truthfully say that the work of preventing the establishment of injurious kinds of insects is rather well done, but that additional funds are needed to render the task of controlling outbreaks of insects

already established and of controlling bee diseases anything like as effective as it should be.

A Delegate—I would like to ask Dr. Headlee whether sulphur and lime will not do to destroy the oystershell scale as well as the San José scale?

Dr. Headlee—In orchards regularly sprayed with winter-strength lime-sulphur the oystershell scale has not, in my experience, been able to do anv serious harm. In dealing with plants infested by this species and not regularly sprayed with lime-sulphur the whale oil soap or linseed oil emulsion treatments are likely to prove the more satisfactory.

Mr. Deats—I would like to ask whether the oystershell scale is a parasite on fruit or ornamental stock?

Dr. Headlee—It is a pest on both, but seems especially bad on young apple, poplar and lilac.

A Delegate—It seems to be worse on the hawthorne, and did not seem to go to anything else except the ash.

A Member—I used whale oil soap and kerosene some years ago.

Dr. Headlee—Yes.

Mr. Wynne—Will not any miscible oil control it?

Dr. Headlee—Yes, properly used.

President Frelinghuysen—Are there any further questions? If not, I would like to call the attention of the members of the Board to the session this evening, which will begin at 7:30.

If there is no further business to come before the meeting I declare the session adjourned until this evening at 7:30 o'clock in this room.

EVENING SESSION.

The evening session of the Board was called to order by Secretary Dye.

Secretary Dye—In the absence of the President and Vice-President, it devolves upon me to call the meeting to order and to occupy the President's chair.

The first business this evening is an address by our friend, Professor Alva Agee, on "Progress in Farm Demonstration Work" in the State of New Jersey. You know this is a comparatively new feature in agricultural progress, and you know, furthermore, that we have got one of the best men in the country

in charge of it, and we shall be very glad to hear Professor Agee. (Applause.)

Professor Agee's Address.

Mr. President and ladies and gentlemen: The State Board of Agriculture is representative of the agricultural interests of the State and it is a pleasure this evening to come before you as State Superintendent of Farm Demonstration and give an account of my stewardship. Agricultural extension work, as connected with the land grant college and experiment station, is the educational work that is done among those who are not students of the institution. Farm demonstration is a phase of extension work. The law makes it the duty of the State Superintendent to carry on work in the various counties of New Jersey. He is assisted by various specialists. One of these men has shown that the treatment of grass lands with commercial fertilizer makes a profitable increase in the crop. He has carried on demonstrations showing the value of the various strains of seed corn used in different localities of the State. He is calling attention to the soy bean through many demonstrations, and visits farms upon invitation to work out plans or to give counsel.

We have a specialist in orchard fruits who is giving demonstrations in pruning and spraying, and is called upon for advice regarding selection of orchard sites, varieties, etc. There is great demand for his service. We have a specialist in market gardening and the room for service in this State is broad. A specialist in poultry husbandry is trying to meet the many requests of poultrymen for assistance. A specialist in home economics has come into great popularity throughout the State, the demand for work coming from housewives' leagues, granges and other associations.

The present number of specialists is inadequate. It is their duty to carry on demonstration work throughout the State and especially in unorganized counties, but as counties are organized the demand for the specialists within the county increases. The people are roused to greater interest in better methods and the superintendent of county demonstration naturally calls upon these men for assistance.

Mr. A. L. Clark, who is well known to New Jersey farmers, is the assistant State leader, spending much time with the various county superintendents of farm demonstration. He has under his immediate supervision the work in six organized counties of New Jersey.

The appointment of a county superintendent is in the hands of the Board of Managers of the New Jersey State Experiment Station and when hundreds of farmers within a county petition for the appointment of a demonstrator the board of chosen freeholders is requested to make an appropriation to supplement whatever money can be appropriated to that county from State and and National funds. The counties now organized for work are Mercer, Sussex, Bergen, Monmouth, Atlantic and Cape May, and we have hundreds of petitions from six other counties in New Jersey. The demonstration work is a distinct success so far as we have gone. The only drawback to extension of this work is a feeling among boards of freeholders that the local contribution should not be as heavy as the present State appropriation makes necessary.

The duty of a county demonstrator is to carry on demonstration work and to help the men who want help. He gives assistance along practical lines and while serving individuals he supports every movement for the betterment of rural conditions in his county. In a certain sense he is the agent of the leading farmers of the county for the promotion of better agricultural conditions; and, therefore, is concerned with market methods as well as methods of productions, and with all means for the improvement of rural life conditions.

The confidence shown by farmers in agricultural science is evidenced by the immense correspondence in the office of the State Superintendent of Farm Demonstration. Letters requesting direct advice increase in number and the office sends out many thousands of replies during the year. We try to reduce the work of correspondence by printed circulars that carry our best information, and as the present appropriation for demonstration work makes no provision for printing we are compelled to use the circulars furnished by the Experiment Station.

The money now being appropriated takes care of part of the salaries of the specialists who are carrying on demonstration work in all counties, and it likewise provides for some contribution to the salaries of county demonstrators. There is great need of increased appropriation so that unorganized counties may begin work. I believe that the contribution from State and National funds should be sufficient to take care of one-half of all the expense of a county demonstrator within every agricultural county of the State. The demonstrator is the representative of the Experiment Station in a certain way, being guided in his teaching by the results of Station research. He connects up the practical farmer with the best science that the State institution possesses, and a share of his salary should be paid by the State as is contemplated by the present law. The returns from such investment are large. New Jersey is admirably situated with respect to markets, and it still has immense areas of land that have not been brought up to one-half their possible production. The agricultural wealth of New Jersey must increase rapidly, and every dollar invested in practical and helpful demonstration work should make a return several fold greater than the investment.

Secretary Dye—Are there any questions you wish to ask Professor Agee?

A Delegate—Does not the fact that counties are organized, and have a demonstrator, increase the work of the extension department? Cannot the specialists do more in organized counties that have a resident scientist on the ground?

Professor Agee—Yes; and this increase in demand is not a thing to be feared. The county demonstrator comes into touch with the needs of men who never would write to us. When the demonstrator meets a man who wants assistance from the specialist he promises the service within a reasonable time, and then usually lines up two or three other men wanting similar service,

Ridging up Asparagus on Minch Brothers' Farms, Bridgeton, N. J.

and the work for all these men can be done within a single day, thus lessening the expense for each item of service. The backward people should have the demonstrator's first interest. The progressive farmers of a county have power to help themselves, and upon them is laid some burden of service to those who do not have such ability. It is their duty to see that the struggling man be given all the chance that science can afford. Working through a county demonstrator they rendered direct aid to those less fortunate than themselves, and at the same time served their county and State through increased efficiency of the men who have been aided.

Secretary Dye—Thank you, Mr. Agee. (Applause.)

Secretary Dye—We, who were at the Normal School last night, were greatly favored with an address by Dr. Lippman, showing some of the products of New Jersey soils. To-day we have had an address, again by a Jerseyman. We hope to have two addresses to-night, by Jerseymen and farmers, showing what can be done by methods of farming other than irrigation, and also what can be done by irrigation. The first address will be by our friend, Mr. L. Willard Minch, from Bridgeton, a dry farmer. Mr. Minch is a plain farmer, he says. We will be glad to hear from Mr. Minch now.

Mr. Minch's Address.

Mr. Chairman, ladies and gentlemen: I think I am a Jerseyman. I am the sixth generation on one side and the fifth on the other. One of my ancestors was named Moses and came from England, the other was named Adam and came from Holland. Both of them settled in New Jersey. I claim I am by name of Biblical origin, and by birth and training a thoroughgoing Jerseyman.

I want to talk to you on what is called intensive dry farming, which was rather dryer than we wanted it this last year. We mean by this that we get along without irrigation. I shall take you to a number of farms controlled by Minch Brothers and show you a number of crops that we grow and some of the things that our neighbors do, and I don't know but what I might entitle it "The Earth and the Fullness Thereof."

(First picture.)

This is an asparagus field of thirty-five acres. If you were to make up a catalogue of what might be called a lazy man's crops, never include asparagus. It is a crop that requires great painstaking, and the profit is according to the care bestowed. For ourselves, to insure the proper variety, we hunt up the man who has got pedigreed stock, and buy the seed and then grow our own roots, and we never use roots after the first year. They are of sufficient size to set the first year. Now, I will show you the same field in the spring. We allow the heavy tops to remain and we break them

by a harrow or by roller, so as to return this vegetable matter to the ground, and then, during the cutting season, we use the riding cultivator to ridge up the asparagus, and then occasionally reverse the process and bring it again to the level. In this way we avoid very much of the damage wrought by the asparagus beetle. We like a crop like asparagus, because it is on that field to stay for the next ten or fifteen years, and enables a man to study economy and encourages a man to look up a market. It is one of the crops that don't require any guessing as to what you will do with the field the next season.

We grow onion seed also, not so much because of the profit in the seed, but we want to have pure stock, and enable our customers to feel that from one year to another there will be no variance in regard to the variety sold. It is too expensive a proposition to get a trade started and to have to change every year to some new variety, and so we grow our own onion seed.

After growing the seed, of course, we raise the sets. We keep a three-fold proposition going all the while. We are growing the sets and planting the seed again for more sets, and then we are setting out the set for onions.

This represents the operation the last of March, putting out onion sets. We get the field in what we call good working condition; I suppose you might call it in most excellent tilth. We have tilled this thoroughly, and we have obliterated all the clods and have plowed the land about four inches deep, and then made rows and run the dotter down these rows, and then come along with the sets; they do not have to worry about the distance, simply insert a set in the openings and then press the ground firmly about it. They set out about four to five acres a day, and when night comes they say they want some Omega oil. By June tenth we use horse cultivation almost exclusively. We have little time on our farms for hand work.

Sometimes I am asked in regard to the onion maggot. I will tell you, philosophy sometimes is better than scientific agricultural knowledge. If he comes, let him come; he will go his way. And one year with another we lose very few with onion maggots. I noticed an experiment carried on on another farm in an endeavor to eradicate the maggot. I asked the question and they said it cost them too much, because it cleared the field of both the onion and the maggot. Well, now, I will confess to this: that we are extensive users of cover crops, and I think the cover crop is nature's great restorer and the farmers' best apothecary.

In our light soil we have no trouble, with our red and yellow onions, if we desire it, to top them one morning and ship them to the market in the afternoon about three o'clock and have a wire of the sale the next morning by nine o'clock. We have done that in a number of cases. On the white onions, of course, we use trays, but these men are topping yellow onions in the fashion you see here. There is a lot just leaving the field, fifty hampers. Their return was $187.50 net for that lot, and we thought that made the onions smell rather pleasant. It was not a sign of poverty last year.

Here we have one of our plowing operations in December, showing you seventeen horses. The first plows are drawn by four each and these three by three each. Here we are using two bottoms of twelve inches each and

Top—Working Hand Cultivators in the Onion Sets. Minch Brothers' Farms, Bridgeton, N. J.

Bottom—December Plowing on Minch Brothers' Farms, Bridgeton, N. J.

Top—Digging Potatoes on Minch Brothers' Farms, Bridgeton, N. J.
Bottom—Cutting Spinach on Minch Brothers' Farms, Bridgeton, N. J.

here three bottoms of fourteen inches each, cutting ninety-six inches in all at a time. We plow about nine inches deep. This is clover sod with some alfalfa distributed among the clover, and we find that is an excellent way of keeping humus in our land, for this farm has had no manure for the last four years, since we bought and owned the farm. This is only good exercise in December for man and horse. Of course, around in March or April that would be rather vigorous work for them, because that is a very heavy clover sod.

This is the same field, showing you what we do the succeeding spring.

Now this is forty-five acres of corn in one field. We raised last year 116 acres. Four years ago, the best we realized on that field was forty bushel of shelled corn per acre, and we have advanced the yield until this year we have eighty-four bushels per acre running over the entire field. I will show you a little nearer view of the same field. This is what we call Johnson County White, and with us it is a most excellent corn. Now we have used no manure whatever on this field, but have used cover crops, and, of course, have used clover and in that way have produced a nice lot of humus.

A Member—Do you use any potash?

Mr. Minch—Yes, we do not use less than five per cent.

A Member—Do you use any lime?

Mr. Minch—We use lime always in conjunction with our grass crops, and alfalfa is mixed in the cover crop, also our time for using lime is when the field is sown with grass seed.

Now this is the way our corn fields are after we have harvested our corn. The scientists call it, as I remember, corn stover; but they may call it what they will, it is the same thing, and we sow in our corn, as I suppose the rest of you do, various cover crops, vetch, crimson clover, and then we run the two row cutters drawn by three horses down through the middles and we cut the stalks into bits and that makes an excellent mulch for the field during the winter.

Mr. Fithian—Is it right or is it wrong, when you take those stalks to the barnyard and feed them to the cows and cart the manure back you only get eight hundred pounds out of each ton?

Mr. Minch—You are right. We claim by this process that we practically get a good return of vegetable matter and we save farm labor and that is an item of economy, as saving of labor is a part of our profit.

Now, how about a little potato discussion? We grow two hundred acres of what we call our first planting, a hundred to 125 acres of our second planting, which begins in July and August. After we have plowed under those cornstalks, we plant our potatoes. We follow those cornstalks with potatoes and we have tried it out against New York horse manure fifteen tons to the acre and that method beats New York horse manure and saves the bank account.

This is a scene the latter part of March and we use two-way plows with our operations on potatoes so that we can keep our operations close up to the plow. That plow over on the left represents a two-way plow. Next comes a harrow, then we sow about five hundred pounds broadcast of high

grade fertilizer, then we use this two-row fertilizer drill to put the fertilizer in the row and then we use this planter; and I will tell you, for the good of the boys' eyes, we have discontinued putting fertilizer in our planting machines. We use our fertilizer in this fashion, about 500 pounds broadcast and about 1,500 pounds in the row, using a ton of four-eight-ten, if we can get it. Those rows are a half-mile long.

This shows our method of cultivating potatoes. From the time the potatoes are up they are tilled with riding cultivators, tilled deep when we first begin and more shallow as the operations continue, until finally we put the blades on and hill them up, just a little, not very much.

This is the potato field taken about the middle of June. This represents one of the fields of two hundred acres of potatoes, planted March and the first of April. This is the same field at digging time.

A Member—What variety of potato is that?

Mr. Minch—That is Mill's Pride.

Here is one of a number of teams. We use this kind of wagon; we cart a hundred baskets at a time, always using baskets. We never allow our men to cart in barrels, it bruises them so; and in this way we cart to the station, gathering up the potatoes in the wagon and covering them as loaded.

We have our sacks branded. We always load in sacks 150 pounds net to the sack, and we have those branded and marked, and I will say to you that we were mistaken a little bit about the parties at the other end and their tallies. We have adopted a new method, and load two hundred sacks to the car. We tie the sacks up in bundles, two hundred each, and allow one bundle to go to each car, and then the car is tallied. It is a very easy process, and we have had very few short counts since we adopted this method. So that I think we have been as much at fault as the man at the other end. By giving a pound and a half extra we provide for a little shrinkage that might occur in the few days between the loading and the receiving process.

We try to put up a good grade. We never allow them to go into the sack unless they correspond with the quality known by that mark, and our trade has grown from eight cars until last year we sold over a hundred cars direct.

There is a field of that famous Cape May County Redskin. Our friend Brown, from Swedesboro, says, and he says it right, that we have been hunting for some potato that would be almost fireproof. That is, that would resist the blight and be immune from disease, and we have come as near finding it here as anywhere.

That crop was planted after the onions I showed you a moment ago, on the same field, between the middle and the last of July, and that field yielded from 350 to 600 baskets per acre, this present dry season, 1914, twenty-two acres in the field. Here is the same field a week before Thanksgiving. We use gasoline diggers, but we always have horses as a safety valve, and here, you will see, are two diggers in operation. Here is the process of loading, and here are some men picking up, and here are the baskets just as they were setting around the field of the famous Cape May County Redskin Potatoes, better than which we have found none so far as table quality is concerned.

Now, just a word or two about alfalfa. We have grown alfalfa for years in New Jersey, and there are two or three things that we find by practical

Potato Field on Minch Brothers' Farms, Bridgeton, N. J.

experience. In the first place, we want a productive piece of land that is well drained. In preparing that we crop it a year or two with potatoes or some other crop where we use plenty of plant food, and get it in proper shape. There is no use trying alfalfa unless your ground, as Prof. Agee says, is in pretty good shape.

Now, this follows potatoes. We sow our lime in the potato field before we dig, as a matter of economy. And we have three or four things we always do; the first is to have our land clean, free of wild stuff, weeds and foreign vegetable matter; then we want it sweet, so we use about three tons of fine pulverized limestone per acre, and we then inoculate it with alfalfa soil, and then we are very careful about our seed.

We sow the alfalfa soil, using the smoothing harrow to smoothe the ground. After this the inoculation occurred—after seeding. We use the weeder to scratch it in, completing the process with the roller and the harrow. We have at the present time a hundred acres of alfalfa to crop this year. We think after potatoes is one of the very best times for seeding alfalfa.

There is making hay while the sun shines. It don't pay us to gamble on the weather. If it is reasonably fair, we get the machines out and cut down twenty-five acres at a time. Of course, we get four cuttings in a year, and while it is a little troublesome to cure retaining the color and the leaves, yet sometime during the season we get an extra lot of very fine hay. There is the cutting of an alfalfa field for the fifth season. That is the oldest field we have. It will be six years old this spring, and I cannot see that it is diminishing any whatever in its yield. The finest yield we ever had was six and a half tons per acre in one season, the four cuttings.

A Member—Do you cultivate the alfalfa?

Mr. Minch—Yes; we would rather do that than top dress. We use those alfalfa cultivators that stir up the ground but do not hurt the plants.

A Member—How often?

Mr. Minch—We go over the field thoroughly once; sometimes run it up and down the same place, lap it over; that would be about the same as twice.

A Member—What do you do with your alfalfa hay?

Mr. Minch—Sell it.

A Member—Bale it?

Mr. Minch—No; we have not done that yet. We are getting $25 a ton for our best hay now, and we are selling it to horse dealers and cattle men, and we are feeding fifty-six horses of our own, and that requires some hay.

Now, they call us sand snipes, and they say that South Jersey is all sand, but here is a piece of soil that amazes me. I am sorry that we have not got the high-colored effect we ought to have, but there is a section of this alfalfa field I showed you a moment ago. We have cut that for five years. Those roots are forty-eight inches long. I don't know how much farther they went, but there the hole stopped.

When haying time comes around have the machinery ready. We look over all our hay machinery, the forks and ropes and pulleys, racks and hay loaders, and when the hour comes we are ready for business.

Here is a story now of one farm that will occupy just a few minutes. We

have in South Jersey, as in some other places, some unoccupied farms. This farm had a history; the people gained a competence and moved into town and the son became a lawyer and I forgot whom the daughters were married to, but they left the old home and it was rented out and farmed out, and when we came to it it was considered practically a worthless farm. Well, we bought this farm, which is the first farm we bought together. We examined it and we bought it because we thought it had possibilities and also because it was cheap. When we bought it the hedges and fences were all down, the fields were full of weeds and it was considered a practically worthless farm. That was seven years ago. We call it the Buttonwood Farm.

I am now showing you a scene on that farm two years later. We set out this orchard and we intercropped it with rhubarb, and I am showing you same two springs thereafter; we had to plan to keep the thing going by making it automatic, making the rhubarb pay for the cost of the trees; we knew that if we fertilized it abundantly and cultivated it carefully it would be good for both the rhubarb and the trees.

Two years later; you see the buttonwood there in the distance. These trees are four years old and this is what we were able to accomplish by a little good gumption, by reading trustworthy books of information, and certain correspondence with New Brunswick, and using our own judgment, in the last analysis; we were able to produce this result in four years after. People who knew that old farm when they saw this field, it seemed to them as if Pomona, the Goddess of Fruit, had passed that way and waved her magic wand and made this beauty spring forth out of the ground. There are apples there now, and this is the compensation. It was rather weary waiting, and some days it seemed as though we might lose rather than win as far as expenses went, but the returns came after a while. Last year we sold 400 barrels from that orchard, with a net profit of $1,200, which was really our first money from those six-year-old trees.

There is the William's Red, five years old, and we had 200 barrels out of this orchard. You can pick that apple early and it is a fine fruit for nearby markets, and it has a fine chance for striking a good market with the quality of being early and high colored and a fine fruit. This is the Duchess of Oldenburgh, four years old. We had a pretty clever picking out of this orchard. The Duchess of Oldenburgh is larger than the William's Red, desirable, good color, fairly good to eat and a very good cooker.

This is more of the Buttonwood Farm. Here is a pear orchard four years old. This is a half-mile from this point over to this, where those cedar trees are and by careful calculation if those pepper rows were put in a line they would reach forty-seven miles. I took this just a few days ago for your benefit. This shows the pear orchard at the end of seven years. We are beginning to take out the extra wood. That is one of the kind of trees you can grow fruit and wood at the same time; the one you want, the other you have to take.

Here is a picture of the Sunny Slope Farm. Mr. Fithian passes this every day. He will tell you about three years from now how we are making out with our peaches there. We have between twelve and thirteen thousand

trees on those 120 acres. Here we show you an intercropping of beans in this peach orchard. The trees are only one year old.

A Member—How much land do you have? The whole county?

Mr. Minch—A thousand acres. This is another view of the peach orchard where we have been cutting out the spinach. This part here is cover crop.

A Member—What variety of peaches have you planted there?

Mr. Minch—Carmen, Champion, Elberta, Belle of Georgia, Iron Mountain and we are going to add some Krummells.

A Member—How far apart are they?

Mr. Minch—Sixteen by twenty.

Here is a picture that means something to most of us, a field of cowpeas after potatoes, and they grow very vigorously, drawing the nitrogen out of the air. We allowed those to grow up and to fall down and the vigorous growth prevented the leaves from blowing away and the leaves fell among the vines and made a good cover crop for the winter. I want you to look at this picture because we followed these peas with peppers and went through two droughts, one almost two months long and the second one fifty-seven days, without any dews at night, and I want you to see how the peas helped us out. I call this underground irrigation.

Here is a pepper field set out on the same field after being plowed, of course, and tilled, but no water whatever during that driest spell. There are 250,000 plants in this field, and you can see by my position there just how high the pepper plants came, and the first picking yielded a hundred barrels. Not only did we set them out in the dry spell, but during the second dry spell they were in bloom and we were fearful about the blooms falling off as often does occur in drought periods, but they held firmly and we got an excellent crop, very few, if any, dying.

There is a field of Gandy strawberries. This is native with us. Captain Gandy originated this berry some years ago, within ten miles of this farm, and I think it does most excellent on this heavy land. We use the matted row as you see here, we are viewing the field in bloom. This year we had twenty-five acres and we ran anywhere from fifteen to twenty-five acres every year.

A Member—What kind of fertilizer do you use on them?

Mr. Minch—Well, we always put our berries in a field that is well tilled and well fed, except where we set them in new land, virgin soil. We do very well in the virgin soil with some varieties. But we generally use bone and potash, about a half ton to the acre or eight hundred pounds, and then we top dress a little in the spring, but we use very little nitrate of soda; we think it makes soft berries.

We grow a little wheat. Now, here is a wheat field of sixty acres in southern New Jersey. The best yield is that of Mr. Jacob Ridgway, fifty-seven bushels to the acre, that is the best I know in the State of New Jersey for the season of 1914, but this is verified and it is authentic, and I think it speaks well for our Jersey sand.

There is a second crop after onions, a tomato field after onions. We cropped these and sold some of these ripe and shipped some of them green

to the Southern markets and we netted about a hundred dollars per acre on this second crop after onions. We don't always do it, we did it two years ago.

This shows the Hubbard Squash as a second crop. There is not always much money in it, but it is our policy to keep something moving and keep the money coming in. We use Hubbard Squash as a sort of secondary crop.

Now, this is what we call a seeding testing contest. Just a friendly contest. Prof. Voorhees has gone among many farmers and gotten samples of seed corn and planted on this field under the very same conditions and tested it. The variance in the crop is due entirely to the vitality or lack of vitality in the seed, and it showed a remarkable difference. In some of our tests we have had as high as fifty bushels difference due alone to the seed. Now, Prof. Voorhees has finished his story and the other gentleman, Prof. Agee, is telling his.

Now here is the Experiment Station brought to our doors. We bought this farm. It had some apple trees on it. That is the famous Roadstown Pippin, known in southern Jersey, and you have to hunt a good many days to find a better selling apple along in July. The gentleman there told me that his father put that tree out sixty years ago, and after a lecture given by Prof. Farley and his assistant, Mr. Smith, the men ascended the tree and gave a practical demonstration to the farmers that early day in March, 1914. The tree was carefully trimmed and the other trees adjoining it, and they naturally spread and we had a most excellent crop of apples in the season of 1914, and we think that apple tree is worth as much to us as an acre of land, for it will often yield $20 to $25 ready cash without very much work.

Now, what about our soil possibilities in the future? I think it lies with just such folks as these who are studying these problems.

Here is a sixteen-year-old tree, a Winesap. This year the owner got four barrels of first class fruit from this one tree. I heard him say myself he never had taken a low price for the fruit. The fruit for the last four years netted him $2.50 per barrel for this variety. There is beauty enough here to please the æsthetic, there is commercial possibility enough to challenge the most ambitious and I don't know of any better material to improve those possibilities in New Jersey than our own boys and girls. Taking the boys and girls in partnership and helping them on the farm is a good course to pursue.

I have done nothing if I have not helped you in your own locality. This is my thought: that the same things which hold good in southern New Jersey for Minch Brothers, somewhat also hold good for you in your part of New Jersey; and the fundamental thing we have discovered as we have gone along is that there must be some knowledge of farm life; the boy and girl must have some acquaintance with farm conditions; they want to be brought up intelligently. Take them into partnership, if you please. This fundamental knowledge will come from experience, and then supplement that in all ways possible by worthy living, by conversation, and by, if you can, an agricultural course at one of our institutions. Anyway, there must be some knowledge or we cannot succeed in any of these lines of work.

And, secondly, you must have an abundance of patience. That means enduring under trial. It don't wear away. We cannot afford to lose our tem-

pers, or we will lose out in the successful operation of the soil. We need to have a great deal of patience in these undertakings.

Thirdly, we must have good common sense. I said to that old planter eighty-four years old, "What do you think a farmer needs most?" "Well," he said, "I think good sound common sense." And he was right. I have told you a lot of things in the hope that what is good for you, and what fits the case, you will have the common sense to take, and reject the rest.

And then we have got to have some money. I don't believe in bringing people into this State or getting our young generation to take up this land work unless they have got some money and some credit; they will certainly have some trying times, and if they are to endure and win, they must have some money.

Now, this is the maternal homestead of the Minch family. Five generations ago my ancestors were born on this farm, and every succeeding generation since have been engaged in farming or fruit growing. Now, I have talked sufficiently long, and will only say that this home is well known, and I invite you to come in for a little time and partake of its hospitality. (Applause.)

Mr. Dye—I did not say when I introduced Mr. Minch how many acres he had under cultivation. I think you have mistrusted that he has many. How many acres, about, Mr. Minch?

Mr. Minch—One thousand.

Secretary Dye—We don't have to go West, gentlemen, to find big farms, nor farming done on a large scale, as is evidenced by what Mr. Minch has shown us to-night. We now come to another feature of farming in the neighborhood of Bridgeton, South Jersey, and Mr. A. M. Seabrook is going to show us what can be done by irrigation. Mr. Seabrook. (Applause.)

Mr. Seabrook's Address.

Mr. Chairman, ladies and gentlemen: Billy Sunday, who is conducting that big revival down in Philadelphia, is represented to have made the statement a few days ago that we have three methods of communication, telephone, telegraph and tell-a-woman. There are times, however, when we can take off our limitations and restrictions and get into a meeting just like this, men and women too, when we can have a heart to heart talk, as we might call it, upon the things in which we are engaged and in which we are interested. And so I am here to-night to tell you a few things which we have accomplished in the way of vegetable growing by means of overhead irrigation.

I am very sorry I have not a photograph of the homestead farm that was purchased by my brother about twenty years ago; a farm that was very much run down, and which was sold for less than forty dollars an acre. This farm is the farm from which the bulk of our produce has been sold during the past year. We have three other farms adjacent, which were purchased two years ago, and which we are building up, and expect eventually to make

just as fertile and productive as this home farm. There are a great many farmers whose farms are more conveniently located than ours. The nearest station is two and a half miles distant. All our manure, fertilizer, all our incoming freight has to be hauled that two and a half miles, and in order to have a late afternoon freight and to get our crops into the early market in New York we have to haul all our produce three and a half miles.

This, ladies and gentlemen, is a photograph of the old homestead farm as it appears to-day. In the distance there you see the white brick building and the mansion house and other brick buildings. (Next were shown pictures of the general purpose building, machine shop, garage, pumping plant, wash house and storage room, teams, etc.)

This is a picture of dry farming. I don't know the date when it was taken, but it is a field of growing beets. There were twelve acres in that field, and notwithstanding the extremely dry weather that we had during the past year, we dug from that field about 160 tons of beets. That includes tops and all, as they were taken to the factory, and sold.

This is a photograph of what we sometimes call "making it rain." It is quite difficult to get a photograph that will show off well with the irrigation in operation—it is hard to get a background; but this photograph shows our plant in operation.

In reference to our irrigation plant, we have about eighty acres at the present time under irrigation. We get our water supply from a pond, and this water is conveyed by gravity into a well twenty feet deep and ten feet in diameter, at the pumping station. We have there a fifty-horse power oil engine; we have one pump with a capacity of a thousand gallons a minute and one with a capacity of 450 gallons a minute, and operating the two together gives us a capacity of 1,450 gallons per minute. We still have another pump of 250 gallons capacity which we can attach and use if necessary. A large part of the time, during the very dry weather, during last summer, this plant was running to its full capacity, and yet we always had an abundant water supply.

This picture is a very plain ordinary picture, but I am presenting it to you to-night for a special purpose. Some three or four weeks ago I picked up a prominent agricultural paper and found a picture of that tank on the front page, with the statement that it was an important part of the equipment for a South Jersey Irrigation Farm. Some six years ago when we began irrigation, that tank was for a short time used for irrigation purposes, but at the present time it has no connection whatever with our irrigation plant. It holds five thousand gallons and it is used for the water supply for the pump in our greenhouse, for household purposes, for the water that we need in the wash-house and for the stock upon the farm. There seems to be an impression among a great many people who are not familiar with irrigation, that it is absolutely necessary to have a tank in which to pump your water and then feed it to the pipes. In order to get a pressure of fifty pounds at the nozzle, it would require the lifting of your water 115 feet high, and so you see, to get the fifty pounds pressure, if you used a tank, your tank would have to be 115 feet high and you would have to pump your water into your

tank, requiring just as much power as it requires to force it directly into your mains, and then you must take into consideration the kind of a tank that would be necessary for use to operate our irrigation plant, using 1,450 gallons of water a minute. A tank is not only unnecessary, but it is an added expense, from which no benefit whatever can be derived.

This photo shows a field of parsley. Like all other crops, parsley is sometimes a very profitable crop, while at others it is not. Two years ago we had rather an open winter, and a field of parsley was carried over for spring cutting, and very little of it was winter killed. It proved a very profitable crop. Last winter, however, parsley froze out and we had to depend upon the spring sowing for our crop, and, of course, losing the early market it was not as profitable.

This picture shows a field of growing leek. We sow the seed early in the spring and later the plants are transplanted into the field, and before freezing weather the leek is taken out, put away in trenches where it is kept until well along in the winter. We have not yet commenced to make shipments of this crop.

This is a photograph showing our men working the cold frames. We have something over seventeen hundred cold frames. At the present time most of those frames are either sown in lettuce for spring planting, or in cabbage, which we winter over to be set out for the early cabbage crop in the spring. This shows the cold frames, most of them with the glass or the lids upon them. Our cabbage plants we cover with board lids instead of glass.

This photograph was taken two years ago. It is a field of Golden Blanching Celery and you can see about where it reaches to the gentleman who is standing in the field, and judge about its size. It was a very excellent crop.

This is a field of green celery that was grown this year. This piece of ground was set in cabbage in the spring and this celery was set out about the twentieth or twenty-fifth of July. It was intercropped with spinach, and we got from this ground a very heavy crop of spinach, which was shipped and placed on the market before any cultivation was commenced with the celery.

The past year we sowed our celery seed about the middle of May; we did not spray in the bed, nor did we spray any at all in the field. We had no blight whatever in this field of green celery, and only a very little in the field of Golden Blanching.

This field on the upper end shows a piece of Escarole. Further down is head lettuce and Cos Lettuce, and on the lower end there is a piece of what we call Chinese Cabbage or Celery Cabbage. Perhaps some of you have read something or seen something of this vegetable. It is practically a new vegetable and has been grown very little prior to the past season. We had a small amount of it, tried it out, and we were quite successful with it, and it seems to promise to be a very productive and profitable crop.

The men shown in this photo are engaged in setting out onions. This contrivance over here is an onion marker. It is a homemade concern, and is pulled across the field by two men. You will notice there are five wheels on this machine, and there are pegs in those wheels, three and a half inches

apart, and as the machine is pulled over the field it makes a hole in which to place the set. It is a great convenience, and by that method the onions are planted very evenly in the row.

This photo gives a view of a field of onions that was grown the past year without irrigation. It was taken on the ninth day of June. From the time those onions were put in the ground until they were harvested we did not have a good soaking rain. They never made sufficient growth for the roots to get down to the fertilizer, and you can see the result, scarcely any top.

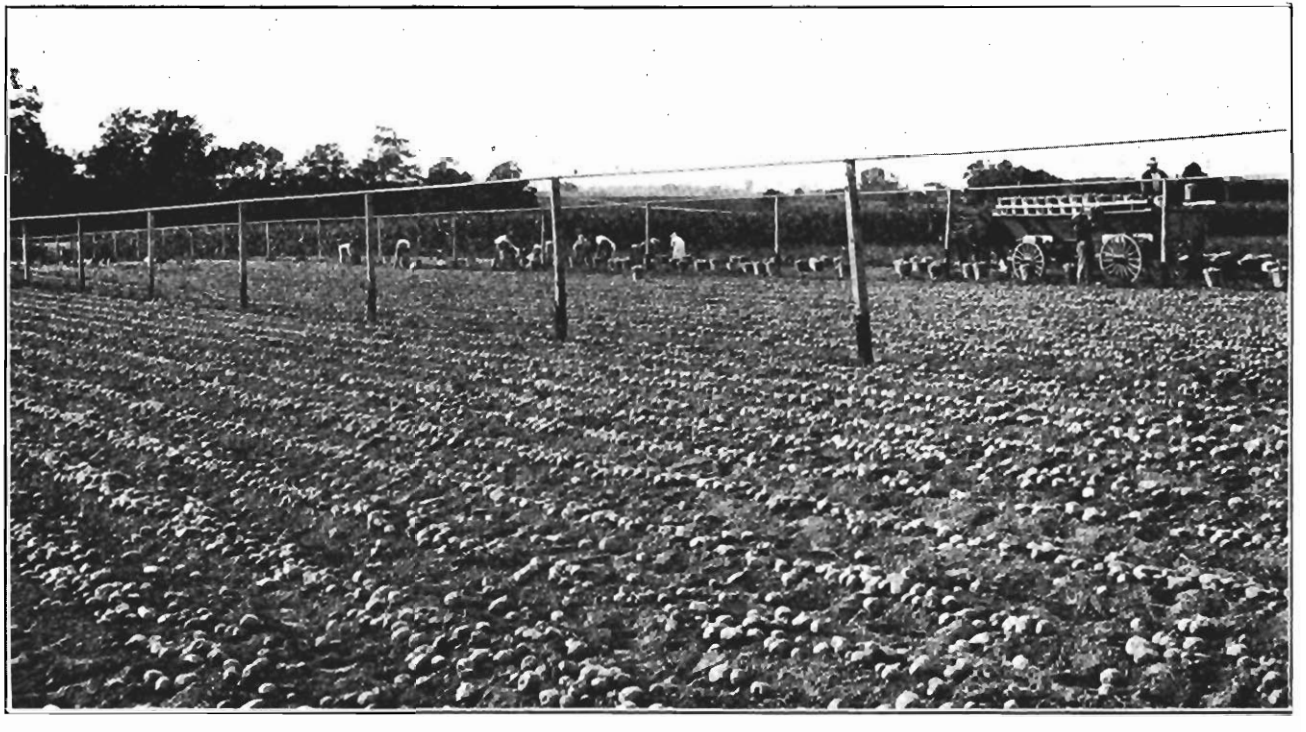
In contrast to that I want to show you a field that was grown by irrigation, and the photograph was taken the same day. You will observe that there are no ravages from the maggot, while in the other field, where we had no water, the maggots partially destroyed the crop. We had an abundant yield from this field, while the other field gave only a very light yield; and, of course, the other onions being inferior in size and quality, did not bring the price that these brought us in the market. The first shipment of onions that we took out of this field sold in the New York market at $3.25 per hamper.

This is a photograph of our 1913 potato crop. In 1912 a gentleman from the Experiment Station from New Brunswick came down and measured off an acre of ground, and the potatoes from that acre were dug and weighed under his supervision. From that acre 993 baskets were harvested, 34 pounds to the basket. If you will figure that out, you will find it is a yield of about 562 bushels per acre. Across the lane, where there was no irrigation, the yield was less than three hundred baskets.

I use this photograph of the 1913 crop because it is a better protograph than we have of the crop for the previous year. This yield was not quite so heavy, but it probably averaged for the field over nine hundred baskets per acre.

We are not only engaged in the growing of field crops, but also in the growing of greenhouse products. This is a photograph of our greenhouse, and the boiler-room attached. This greenhouse is of steel frame sixty feet wide and three hundred feet long, thus covering two-fifths of an acre. It is equipped with a hundred horsepower Keeler boiler, high pressure steam vacuum system of heating. That boiler is capable of heating another house of the same size, and the boiler-house has been built large enough so that we can install two more boilers of the same size should we wish to increase the plant. The boiler from the greenhouse also furnishes heat for the general purpose building, which stands the other side of the yard.

This photograph gives a view of sterilizing in the greenhouse. The soil in the greenhouse must be sterilized every two or three years, as the necessity may arise. There are two methods of sterilizing, the formaldehyde process, which is pretty expensive, and the steam process. You will notice here that there are five steam pipes. These are laid about a foot deep in soil, and there are holes at certain intervals in those pipes and the steam is turned on at a pressure of about ninety pounds, and that pressure is kept on the soil for about one hour, which heats the soil to above the boiling point and kills out all disease and germs and all insects, worms, etc., that may be in the soil, and



Potatoes under Irrigation—Crop of 1913. Seabrook Farms, Bridgeton, N. J.

if you go into our greenhouse to-day and see the growing crop, you will not find a weed anywhere.

Last year we grew radishes in the early season and until along in the middle of the winter and then a portion of it was set to lettuce and plants. After taking out the plants one end of the greenhouse was set to cucumbers. You will notice that there is a rack and that the cucumbers are set along at the edge of the rack and that they are trailing up over this rack or trellis. That photograph shows the cucumbers about half way up the trellis. This is a photograph that shows the vines entirely covering the trellis growing over the walls and extending to the ground on the other side.

This is a view of the same trellis, only it is a photograph showing the interior. You will notice here that we have a hive of bees. We had three of those hives set in that end of the greenhouse and you would be astonished at the number of people who came and wanted to know why we had those bees there. Bees, you know, are necessary in order to fertilize the bloom in a great many crops. I have known instances where they were growing cantaloupes in the field, where they have taken out a hive or two hives of bees in the field to fertilize the bloom.

The other half of the greenhouse after the plants were taken out was set in tomatoes and this phograph shows the tomatoes partially grown. You will notice that there are strings tied down here. Each plant is trained up on a string and they are kept well pruned. This picture shows the tomatoes in a further state of growth, with the clusters of tomatoes hanging. Those tomato vines are about six to six and a half feet high.

This picture shows the same tomato field, as we might call it, and you see the men gathering the crop. The tomatoes are sorted and made into two grades and are shipped in 10-lb. baskets. Off of one-half of the greenhouse last year we shipped over nine thousand pounds of tomatoes, which is a pretty good showing for one-fifth of an acre.

We have here a view of one bench in the end of the greenhouse in cantaloupes. We grew these not to market particularly but for the purpose of trying out the varieties. You will see that some of them are resting on flower pots, and others of them are fastened up in a sort of a basket made with raffia in order that they may not break their stem and fall off. They grew very successfully, cropped well and were of a delicious flavor. They came on a considerable time ahead of those grown in the open field.

One of the most important crops we grow is lettuce. This is a photograph of our men drilling lettuce. This soil is pulverized and made just as fine as possible before we start to drill.

Lettuce seed is a very peculiar seed in some respects. You may drill it, and if it lies in the ground, even for two days, in a hot dry soil, and then there should come a rain, some of that lettuce seed will come up perhaps in three or four days or a week; but there is something in the dry soil that deteriorates the germinating power of the seed and it will keep on coming up irregularly in spots. Some of your lettuce in the field will be ready to cut while some of it will still be coming up. I was in a field only last summer a year ago that was grown without irrigation, and the lettuce, some of it, was ready to cut and some was just coming through the ground. Our irrigation

pipes are fifty feet apart; we drill one of those "Middles" with seed, and as soon as the "Middle" is drilled, we turn the water on and wet it right away, and that seed will germinate inside of forty-eight hours.

This is a picture of our men setting out lettuce. For the spring crop we use lettuce plants, while for our fall crop we sow in drills and thin it, except where we have some other crop growing that we cannot get off in time to sow it, and in that case we take the plants that we thin out and transplant them into the field.

Nearly all of our vegetable crops are planted in rows twelve inches apart. That necessitates all hand work in cultivation. While the plants are small we can use a wheel hoe, and then the work has to be done entirely by hand with a hoe.

This picture shows a force of men hoeing lettuce. Men usually like to go forward through the world and see what is ahead of them; but when our men go into the field to hoe lettuce or other crops, where the rows are close together, they walk backwards, and these men have hoed this end of the field, and if you were to go there and look you would not find a footprint; they are faced this way but going in the opposite direction.

We here show a contract picture, you might say. That is a photograph that was taken two years ago, of a field of lettuce where we had no irrigation, and I want to call your attention to the large amount that is missing in the field, and I would say further that this field runs above the average that you can get in lettuce growing without artificial watering.

Here is a photograph of a field of lettuce grown by irrigation. It is not necessary for me to comment upon that. You will see that practically every plant is standing in that field, and it is nearly to the heading point and practically every plant is heading. We had a field of lettuce this year from which ninety-nine per cent. of the crop was fit to go to market.

A Member—How far are your pipes apart?

Mr. Seabrook—The pipe lines?

The Member—Yes.

Mr. Seabrook—The pipe lines are fifty feet apart.

A Member—How large are the pipes and how high?

Mr. Seabrook—The size of pipe will depend upon the length of the line. The nearer to the pumping plant they are, the larger they are, and they decrease in size as they extend further away.

This picture shows the gathering of the lettuce crop. We never, if we can possibly help it, cut lettuce while it is wet. We wait until it dries off. The fancy lettuce we put in boxes, two dozen in a box; we put it in boxes right in the field and haul it from there direct to the station. "Second," as we call it, we put in hampers.

We always put our name and trade-mark on our fancy stock, and we have no difficulty in getting a fairly good price, even with a fluctuating market and low prices prevailing.

Here is a photograph taken two years ago, where the lettuce has been loaded in the field and the wagons are lined up ready to go to the station. This is the old way of hauling produce. As we extended our farm operations

Strawberries Intercropped with Romain under Irrigation, Seabrook Farms, Bridgeton, N. J.

and increased our crops, we found it absolutely necessary to use the truck. As I stated a few moments ago, we haul our produce three and a half miles to the shipping point. With sufficient help to load and unload quickly, we can haul, on an average, one load an hour with the auto truck and it carries about two hundred boxes to the load; so you see we can handle in five hours a thousand boxes of produce.

A Member—How much do they weigh?

Mr. Seabrook—Those boxes weigh about thirty-five pounds to the box as a rule; they won't average very far from that.

Last year, you know, we had an open winter, and it did not freeze up until along the first or the second week of February, but just before that freeze up that piece of ground was sown with spinach. We cut the spinach crop as soon as it was large enough in the spring and then a portion of the plot was planted in potatoes and a portion of it was set out in Bonny Best tomatoes. After we dug our potato crop and the tomato crop was gathered, we set this in strawberries. Those rows of berries are set about three feet apart; they were set out about the seventeenth or the twentieth of August; they were set in a double row, six inches apart and put six inches apart in the row. With our irrigation they had plenty of water and started off at once, and, at the time this picture was taken, on the seventh day of October, they had made considerable foliage.

This outer crop is Romaine or Cos lettuce. This was set out the fourth or fifth of September and from this we gathered a heavy crop so that from that piece of ground we got a crop of spinach, a crop of potatoes or tomatoes, a crop of lettuce and we are ready for a crop of strawberries next June.

This is a photograph of a piece of ground that two years ago was in timber. It was cleared, the stumps were blown out, the ground levelled and put in good condition, irrigation was put on it and it was set out in strawberries along the latter part of April, 1913. That photograph was taken some time in August. This is a photograph taken from the same field, showing one of our Italian berry pickers. We have our picking done almost entirely by Italians. This photograph shows her tray with five of her boxes full and another one partially filled. You can see from that photograph how those berries run for size.

This is a photograph of the Chesapeake berry. The photograph was taken on the ninth day of June. You will see that there are sixteen berries on the top of that box. Those berries were not selected for size. In fact, they are second-size berries. But they were picked out for uniformity, and you will notice that practically every berry on the top of that box is a perfect berry.

This is a photograph of another box, taken on the same day. That is a box of our fancy berries. Now don't understand by that that these are the biggest berries that we grew. We picked those out for perfect berries. You will observe that twelve of them cover the top of the box. There were thirty berries in that box, although we have grown berries where six would cover the top of the box.

These berries are of the Chesapeake variety. We had last year seven acres

of these berries that were set out in the spring; that is, the spring of 1913, and were under irrigation. We had five acres that were set out in the latter part of August, and we had two acres that were set out the preceding spring on which there was no irrigation, making fourteen acres in all. The berries that were set out in August we set in single rows, the ordinary distance apart, and so they made very little foliage. They grew very large berries. From that fourteen acres we gathered over 74,000 quarts of berries, and from the seven irrigated acres that were set out in the spring of 1913 we got a crop of 8,500 boxes per acre.

I might add that we have at the present time over thirty acres of strawberries under cultivation for the coming year, and they are all of the Chesapeake variety. We have found it a heavy yielder and a splendid shipper, and a berry that commands the very highest price on the market. A few of those berries sold for twenty-five cents per quart; a great many of them for eighteen cents, and the average price was right around fifteen cents per quart.

If any of you have any questions I won't promise to answer them, but I will answer them if I can. (Applause.)

A Member—Were the posts for those pipes permanent?

Mr. Seabrook—Yes, they are permanent.

A Member—How high were they?

Mr. Seabrook—The pipes are six and a half feet above the ground.

A Member—Not more than that?

Mr. Seabrook—No; six and a half feet above the ground.

A Member—Are the holes horizontal?

Mr. Seabrook—We turn the pipe and throw it either way, and if, after throwing it on both sides it does not wet the ground beneath the pipe we throw it directly overhead. Of course, it depends a little upon the amount of wind and how it is blowing, as to whether it will wet the entire space by simply throwing it on each side.

A Member—How much pressure do you use?

Mr. Seabrook—We run about fifty pounds at the nozzle, sixty-five pounds at the pump.

A Member—What does it cost per acre to irrigate?

Mr. Seabrook—The cost, of course, varies somewhat. We estimate that it costs anywhere from a hundred and twenty-five to a hundred and fifty dollars per acre, not including your pumping plant. It depends a little on whether you have men in your employ who can put up the pipe, so that you do not have to hire plumbers and have to pay them big wages. I would also state that a great many strawberry growers in our section were troubled very much with the strawberry weevil last year, and lost fifty per cent. of the crop. We kept ours liberally wet and

I think we did not lose two per cent., and really what we lost was a benefit, because the vines were too heavily laden. The water reduced the ravages of the weevil to a minimum.

A Member—Is the water usually turned on in the night or by day, with the pump?

Mr. Seabrook—At any time; we run our plant sometimes all day, from five o'clock in the morning until eight or nine o'clock at night, and on some occasions, with extremely dry weather, we have run it all night.

A Member—Do you have any damage from scalding by the hot sun?

Mr. Seabrook—No; but we do not apply water to lettuce where it is almost headed, it would be very apt to burn it.

Mr. Woodruff, Union County—Is growing tomatoes profitable by that method?

Mr. Seabrook—We only tried it out in a small way. We really have not tried it out sufficiently for me to say whether it would be profitable on tomatoes. We had a very heavy crop, and we got about a dollar a crate for a great many of them, and then the price got very low and we ran all the rest into the cannery. I think we came out on them very well, because it was a catch crop. It was in between one crop we took out and another that we wanted to put in, and as a catch crop it pays, but whether it would pay to make a business of it or not, I can not answer that question.

A Member—How about cucumbers?

Mr. Seabrook—Cucumbers are a profitable crop. We did not begin to ship our cucumbers until about the tenth of June. It would be better to have them somewhat earlier.

Secretary Dye—It is now time for the people who go to theatre to go home, and I feel that we have had an extension, a very marked and broad extension, of the topic presented last night, the Products and Possibilities of New Jersey soil. I am sure we have all been benefited, and we like to have a fall meeting of the farmers once in a while; sometimes we go out to the President's place, sometimes to New Brunswick. Now, if there should come an invitation to go down to Bridgeton this next summer and look around there, perhaps you would be willing to accept such an invitation. Look out now that you don't get one. I am ready to hear a vote of thanks to the gentlemen for their excellent, painstaking addresses.

Mr. Woodruff, Union County—Mr. Chairman, I move that a vote of thanks be extended to both gentlemen for their kindness.

A rising vote was taken on this motion and it was unanimously carried.

The meeting then adjourned to January 29th, 1915, at 9:30 o'clock A. M.

THIRD DAY.

TRENTON, N. J., January 29th, 1915.

The meeting of the Board was called to order by Vice-President Cox.

Vice-President Cox—The meeting will be opened this morning with prayer by the Rev. Mr. Clare, of this city

Mr. Clare offered prayer.

Vice-President Cox—We will now take up the Unfinished Business.

Secretary Dye—I have a couple of resolutions to offer, Mr. Chairman, which I would ask to be acted upon immediately, as follows:

Appreciating the efforts of the Custodian of the State House, Mr. John Smith, to make the members of the State Board of Agriculture comfortable during the Forty-second Annual Meeting; it is hereby

Resolved, That the thanks of this Board be and are hereby extended to the Custodian for his kindness.

Secretary Dye—I offer the resolution, and move its adoption.

This motion was seconded, and, on a vote, carried.

Secretary Dye—I also have another resolution, which I offer for immediate adoption, as follows:

Realizing that very much of the value of the Annual Report of this Board to the farmers of the State is lost by the exceptional delay in printing it, as has been the case for the year 1913 and 1914, we hereby earnestly and respectfully request the State Printing Board to exercise their power to have future reports printed within a reasonable time after the delivery of the manuscript to the printer by the Commissioner of Reports.

Secretary Dye—I move the immediate adoption of that resolution.

This motion was seconded, and, on a vote, carried.

Vice-President Cox—Is there any other unfinished business to come before the Board?

Is the Committee on Resolutions ready to report? That is the next matter on the program.

Mr. Allinson—Mr. Chairman, on behalf of the Committee on Resolutions I beg to report as follows:

Resolution printed on page 82 was read.

Mr. Allinson—Your committee approve this resolution and favor its adoption.

Vice-President Cox—Gentlemen, you have heard the report of the committee favoring the adoption of this resolution. What is your pleasure?

A Delegate—I move the adoption of the resolution.

This motion was duly seconded.

Mr. Gaunt—Mr. Chairman, I don't just object to the wording of that, but that is placing the Board of Agriculture on record as favoring appropriations by the Legislature, is it not?

Vice-President Cox—Yes.

Mr. Gaunt—I don't believe that is the right idea. We are most unanimously in favor of this proposition. I am in favor of a woman's college, but I don't know whether we are in a position at the present time to take action of that character, because we just passed a resolution here asking the Legislature to make sufficient appropriations for the agricultural industries. I am just calling attention to it, I am not against the proposition. I don't know that I object to the wording of the proposition. May it be read again?

The resolution is read. On a vote, the motion to adopt was carried.

Mr. Allinson—Mr. Chairman, I also have to present, on behalf of the Committee on Resolutions, the following:

Resolution printed on page 83 was read.

Mr. Allinson—Your committee, Mr. Chairman, also approve of that resolution, and favor its adoption.

On motion, the report was concurred in and the resolution adopted.

Mr. Allinson—Your committee further reports the following:

Proposed law printed on page 116 was read.

Mr. Allinson—Your committee approve this resolution and recommend its adoption.

On motion, the report was concurred in and the resolution adopted.

Mr. Allinson—Your Committee on Resolutions further reports the following:

Resolution printed on page 131 was read.

Mr. Allinson—Your committee recommend that this resolu-

tion be not adopted, because at this early date no one knows what bills will come before the Legislature.

On motion, the report of the committee was concurred in.

Mr. Allinson—Your committee also report the following resolution:

Resolution printed on page 65 was read.

Mr. Allinson—Your committee recommend the reference of this resolution to the Executive Committee of the State Board for their action.

The report, on motion, was concurred in, and the resolution referred to the Executive Committee.

Mr. Allinson—I have to report also the following resolution:

Resolution printed on page 71 was read.

Mr. Allinson—Your committee approves of that resolution and recommends its adoption.

On motion, the report of the committee was concurred in, and the resolution adopted.

Mr. Allinson—That is all from your committee.

Mr. Cox—If there is no further business to come before the Board at this time, we will now take up the subject of "Soil Fertility," to be treated by Dr. C. G. Hopkins, of Urbana, Illinois, whom I have now the pleasure of introducing to you.

Dr. Hopkins' Address.

I surely appreciate very much, gentlemen, the honor of being invited to address your session.

I think you will agree with me that there is no more important subject which we can consider for a little time that we remain together than the fertility of the soil. It is the basis of agriculture, just as agriculture is the basis of all industry. Without productive land we have nothing, and I purpose to call your attention to some rather broad facts that bear upon this problem, facts that you may not have taken the time to work out yourselves from the existing records.

I refer, first of all, to the records of the United Bureau of Census. You go back to 1870 with me and you will find that the population of the United States was 38,500,000 people; in 1910 it was more than 76,600,000. In other words, our population doubled, practically, in thirty years, the last thirty years of the old century. During the same time the area of farm lands in the United States increased from 408,000,000 acres to 839,000,000 acres.

I think we did not hear much of the high cost of living in the nineties when farm lands were increasing more rapidly than population. That is the time when corn in the corn belt sold for twenty cents a bushel.

If we take the last ten years of that old century, from 1890 to 1900, we find that our population increased by twenty-one per cent. during the decade, and the farm lands increased by thirty-four per cent. during the same ten years.

Now, almost coincident with the end of the old century, we come to the end, practically, of the free government land in the United States, and, during the first ten years of this century, from 1900 to 1910, our population increased by twenty-one per cent., the same as during the previous decade, only a larger increase in the absolute, the percentage remaining the same, but the basis on which that percentage was figured was larger, which gave us an increase of about sixteen million people from 1900 to 1910. And if we increase during the next decade from this date by twenty-one per cent., the increase will be twenty-one million people.

You may remember I stated that during the last ten years of the old century the population increase was twenty-one per cent., while the increase in farm lands was thirty-four per cent.; but, during the first ten years of this century, the increase in population was twenty-one per cent., and the increase in farm lands was 4.8 per cent. less than five per cent. And in his address before the National Conservation Congress, at Kansas City, in 1911, I heard the President of the United States say that according to the information the government had there was only nine per cent. of farm lands to be added in future years, and that at large expense for irrigation and drainage. That would measure the total possible increase in farm-land area of the United States.

I have been interested to note the records of production in this country. Going back to 1899, the year for which the census data are taken with respect to production, I find that there was 4,439,000,000 bushels of cereal crops produced. Ten years later there was 4,513,000,000 bushels. That is an increase of 1.7 per cent. Thus 1.7 per cent. was the increase in the production of food grains during the last census decade, for twenty-one per cent. increase in population. More than ten times increase in population on a percentage basis, over the rate in increase of food grains produced.

If we did not produce much increase in food grains we might hope that we had made up for the deficiency by increased animal products—that we had increased our supply of meat producing animals, cattle, hogs, sheep. And again we turn to the census, but we find that from June 1st, 1900, to April 15th, 1910, the number of cattle in the United States decreased from 68,000,000 to 62,000,000 head. The number of swine decreased from 63,000,000 to 58,000,000 head; the number of sheep decreased from 62,000,000 to 53,000,000 head. In other words, there was no increase in food producing animals, but an actual decrease of ten per cent.

Twenty-one per cent. increase in population, ten per cent. decrease food producing animals, 1.7 per cent. increase in food grains. Now, those are great broad facts, and I don't know of anybody who is more entitled to consider such facts than such a body as we have here assembled.

How do we feed sixteen million new people? There has not been widespread famine in this country. Certainly not. And that would seem at first perhaps to strongly suggest that the data which I have presented to you from the Bureau of Census must be wrong. If we can increase our population by sixteen million and make no increase in food producing animals and almost

no increase in food grains, and still feed the increased population, how have we done it? We have done it by decreasing our exports.

I turn again to the records. I find by taking a five-year average of the exports from the United States, centered on 1900, and another five-year average centered on 1910, that our exportation of wheat decreased from 215,000,000 to 103,000,000 bushels. The annual exportation of wheat from the United States decreased during that ten years from 215,000,000 bushels a year to 103,000,000 bushels a year.

Now, it has been commonly stated that 6½ bushels of wheat is the per capita annual consumption for the people of the United States; that each individual as an average needs 6½ bushels of wheat for his bread. Well, you have 112,000,000 bushels of wheat saved by decreasing our exports; divide it by 16,000,000, the number of people added; what do you get? Seven bushels of wheat. We saved seven bushels of wheat per capita to feed our increased population

Our annual exportation of corn from the United States during the ten years decreased from 162,000,000 to 48,000,000 bushels. The number of cattle shipped abroad, as an average per annum, decreased from 416,000 to 190,000 head. The amount of beef, as beef, that went abroad, during the ten years decreased from 635,000,000 pounds to 357,000,000 pounds. Those are two five-year averages.

The amount of pork and pork products that we exported decreased from 1,535,000,000 pounds to 990,000,000 pounds. We saved by decreasing our exports of cattle, beef and pork, a billion pounds of meat a year to feed sixteen million new people.

It was not enough. Only about 64 pounds apiece, and the American has been accustomed to eating about 152 pounds of meat in the year. It was not enough, so we complain about the high cost of living, particularly the high cost of meats.

There are some other pretty broad facts that seem to bear directly upon this problem, which goes back, as I said in the beginning, to the maintenance of fertility in the soil.

I find, according to the United States Bureau of Census, that the total area of improved farm land, that means farmed lands—not only land that is in farms, not only that, but land that is farmed—the total area of improved farm land decreased during this last census decade in the little State of Delaware by 40,472 acres. In the State of Maryland it decreased 161,000 acres during the same ten years; in Virginia it decreased 224,000 acres; and in New Jersey it decreased 173,000 acres.

This is a compilation simply of the sworn statements of the men who owned or farmed the land in the United States.

In Pennsylvania the acreage of land that was farmed during the decade decreased by 535,000 acres; in New York it decreased by 755,000 acres; in New England it decreased 879,000 acres. That, too, is the decrease in the acreage of land that was farmed.

If we go back for thirty years friends take also the census records; they show that from 1880 to 1914 in New England, New York, New Jersey and

Pennsylvania, there was a decrease in the acreage of land that is farmed of 9,809,000 acres. That is twice the total area of the State of New Jersey.

Now, if New Jersey were suddenly to stop farming, everybody would hear of it, wouldn't they? It would be announced around the world that one of the States of the Union has quit agriculture. But here we can have during one generation an area twice the size of New Jersey agriculturally abandoned. Few people know of it; it has passed almost unnoticed.

These are just broad facts. But it is just such people as are here assembled who must meet these facts.

I rejoiced as I sat here this morning to note the resolutions that this Board had passed in favor of the Agricultural Experiment Station in the State for securing the necessary facilities for agricultural instruction and investigation in New Jersey.

Why have these lands been abandoned? Agriculturally abandoned? There are two reasons; two main reasons. One of them is because of the lack of knowledge on the part of the farmer; and the other is, because of the lack of profit in agriculture as compared with industry and commerce.

There are three materials needed for the permanent improvement and maintaining the fertility of normal soils in general agriculture. One of them is limestone. Lots of it. A natural product. A home product. You have got measureless deposits of it. They are within reach of New Jersey; within reach of everybody at a freight rate that would make it possible to haul it. I don't know what you have been able to secure in regard to freight rates on ground limestone for the restoration of abandoned lands and for doubling or trebling the crop yields or ordinary staple farm crops upon lands that are still being farmed. If you have not yet a reasonable freight rate, get it. If you cannot get it from one authority, try to get it from another. If the railroads won't grant it, perhaps the Legislature will. If the Legislature does not, perhaps the Interstate Commerce Commission will. It is in the interests of the railroads as well as all producers and all consumers to have land built up and made highly productive. A load of limestone should not be considered an object of great profit to the railroads; a man with poor land, who must correct the acid in his soil before he can grow clover successfully, may not have much money to buy limestone. That is the usual situation. And, friends, if that man is not able to build up his land, nobody will ever make money from that man. But if it is made possible for him to improve his land so as to produce larger crops, you may depend upon it the railroad people get their share of the profit in the hauling of the produce and in the hauling back of the lumber to build a new house and a good many other things that a farmer can often afford to buy if he can once be made prosperous. Limestone is one of the materials that is needed.

Vegetable matter is another one. The limestone you have within easy reach, no doubt. The vegetable matter has to be grown upon the farm. It has to consist in part at least, and sometimes in large part, perhaps, of legumes, leguminous crops. Those plants that, when properly inoculated and grown on soil that is properly treated with limestone and sometimes other materials, will have the power to just take hold of an inexhaustible supply of nitrogen in the air and bring it into the ground.

As I said before, you can buy nitrogen to grow market garden crops with, the market gardener can afford to get it that way perhaps better than any other when the supply of animal manures is too small. There are many market gardeners who cannot afford to stop and give up the use of a piece of land for a year to grow clover to turn back into the soil. He can better buy his nitrogen. But if you are going to raise corn, and oats, and wheat, and grasses, forage crops, staple farm crops, you cannot afford to buy nitrogen, as a rule, or, if you can, even then it ought not to be advised, because it is not the most profitable way of getting nitrogen in general farming. A crop of clover is worth raising for its own sake to the man who can utilize it. A clover crop is worth raising. It is worth all it costs to produce it, and so are alfalfa and other legumes. Then it costs the farmer nothing to get atmospheric nitrogen if the crop he gets it in is worth raising it for its own sake.

The third material that is needed on normal soils is phosphorus. What do I mean by normal soils? I mean one that bears some relation to the crust of the earth from which soils are made. Soils are rock powder, pulverized rock. You know if you were to take the average of the earth's rocks that are in the crust, a weighted average, take it in proportion to the quantity of the various rocks that exist in the crust of the earth, and get two million pounds of that mixture, a quantity of rock which would correspond in weight to the average plowed soil of an acre of land; that is really what the farmer works with mainly, the plowed soil of the acre, the roots might go deeper, but that is the soil that he incorporates his manure with, that is where he puts his fertilizer, in this plowed soil—I say that would weigh two million pounds, and it would contain about two thousand pounds of the element phosphorus and fifty thousand pounds of the element potassium, or about sixty thousand pounds of potash would be contained in an acre of land seven inches deep, if it were the average of the crust of the earth.

Normal soils are rich in potash because they relate to the crust of the earth from which they are formed. Normal soils carry about a thousand pounds of phosphorus, and from twenty to forty thousand pounds of the element potassium, or from twenty-five to fifty thousand pounds of potash in the plowed soil of an acre. In other words, potash is one of the abundant constituents of the earth. Phosphorus is one of the rare or limited materials.

We need limestone; we need the leguminous crops, and we should turn them under either directly or feed them and put the manure back in order to increase vegetable matter and nitrogen in the soil, and we need to put phosphorus on normal soils.

Now, there are abnormal soils that are poor in potash and those we find in the peaty soils and muck soils, formed not from the crust of the earth but from partially decayed vegetation that grew on the earth.

Potash is not fixed in a plant. It is easily taken from it by leaching, and if you have a mass of vegetation that partially decays, as it does in stagnant water, the water takes the potash practically all out of that residue and organic matter, and it is used, or may be, to grow another crop of grass or sedge, or moss, or whatever it is that again falls into decay; so that when the land is finally drained, even with centuries or thousands of years of accumulation of muck or peat, it is found to contain very little potash; what

it had was pretty nearly enough but it was used over and over again for the successive annual crop growth. You put that land under cultivation and raise good crops only when you add more potash.

You have some sand lands, particularly residual sand soils; that is, soils formed in place from the disintegration of rocks, and then, by subsequent action of water, the sand from that disintegration has been assorted and carried off by itself and made into a soil. As a rule that kind of sand consists of quartz, very largely silicon dioxide. It has no plant food in it. You have some such abnormal soils, but the glacial sands, such as you no doubt have to a considerable extent in New Jersey, as a rule are rich in potash, because they generally consist not of quartz particles left from the disintegration of rock, but they consist of the rock particles that have been ground up by glacial action. They represent almost the average earth's crust if they have not been subject to a good deal of subsequent leaching or decomposition. Our glacial sands in Illinois contain more than thirty thousand pounds of potash in the acre. Glacial sands contain a great deal of feldspar, and feldspar runs sometimes ten or twelve per cent. potash.

You see, there is a difference whether the sand consists of small particles of crushed rock rich in minerals, or whether it consists of quartz grains left when almost the entire rock is carried away after disintegration and decomposition. But you may have some residual sand lands in New Jersey with little or no potash, and if so, it should be used, and if there are any other soils deficient in potash, it would be used for their improvement. But in the main, normal soils need only these three materials—limestone, organic matter and phosphorus.

There has been more or less talk recently and some articles in the agricultural press about the possible value of sulphur as a fertilizer. It has been stated in some cases on rather high authority, that it is just as imperative to apply sulphur as a fertilizer as phosphorus or nitrogen.

Now, those statements were based upon laboratory investigations, not upon field trials. But the final test that we must always make before we draw final conclusions with reference to farm lands, must be in the field, out in the normal soils under natural normal conditions. When we grow plants in the greenhouse we shut off the rainfall. We may water them with distilled water and be exceedingly careful that we know just what is going in. Under those conditions certain types of plants may respond when you add sulphur, even when grown on normal soil. But, when you shut off the rainfall, you shut off about seventeen or eighteen pounds of sulphur per acre per annum that the rainwater contains.

How much more we shut off we don't know, but that much comes in the rainfall, according to careful analyses of rainwaters that have been made in this country. Seventeen or eighteen pounds of sulphur is probably a little more than a hundred-bushel crop of corn would need and we have there a source of it. Sulphur is thrown into the air with every form of combustion, and if you have ever held your head over the top of a chimney where they were burning coal, you could know there is some sulphur going up there as a rule.

Furthermore, we do not know yet just how much of the sulphur retained

in the plants is required and how much is simply tolerated. The chemist who analyzes a plant finds it contains so much sulphur and draws the conclusion that we should add that much sulphur to the soil to grow that plant. His conclusion may not be at all justified. You know, plants contain very considerable amounts of sodium, but they do not need a bit of it. You can mature a plant perfectly without it. Sodium is not an element of plant food and is not at all essential for plant growth. But it is tolerated. And because it exists in soils, more or less of it is taken up.

Silicon is another element contained in plants in quantity. However, it is not at all essential. It is just tolerated. And so it may be that more or less sulphur is tolerated. But let us turn to field results and see what sulphur does. There are a good many facts available, and I prefer, of course, to give you facts rather than express opinions.

I have here the records of fifteen years' field investigation at Wooster and Strongsville, Ohio. Charles E. Thorne has been Experiment Station Director there for a quarter of a century and he has given us the most valuable information from field investigations that we have in the United States. These data represent fifteen years at Wooster and fifteen years at Strongsville, from five-year rotation crops, corn, oats, wheat, clover and timothy. They put five different fields on each of these Experiment Station farms so that every crop might be represented every year. Now, if you will multiply five (fields or crops) by fifteen (years), multiply that by two (localities), you will have a hundred and fifty. That is a hundred and fifty trials, covering fifteen years' work in two different localities, on normal soils, with five different crops. That ought to mean something to us. It ought to mean more to you or to me than some observation that you made last year on your own farm.

I sometimes think that the greatest need of the American agriculturist and the American farmer is to have confidence in the established facts, and the Experiment Station establishes the facts. It is the institution provided to secure information, and the College and the Board of Agriculture and the Institutes and other agencies assist in disseminating that information.

In those experiments in Ohio they applied bone meal as a source of phosphorus. They figured that it cost them $2.60 per acre for a five-year rotation of crops, that is the money that they spent for phosphorus in the form of bone meal. They got back $19.61 in the increase produced by phosphorus.

You know, farming is not a very profitable business; but, friends, the intelligent improvement of the soil in permanent systems of agriculture is the most profitable business I know of that is open to an honest man. I know of nothing else that brings such large returns as the intelligent improvement of the soil, although general farming as commonly practiced is not highly profitable. If it were we would not have nine million acres of land abandoned right here at the door of the greatest markets in the United States during the last generation.

Two dollars and sixty cents invested in bone meal brought back $19.61, as the average of all these trials. They put $2.60 into slag, phosphate, basic slag, phosphate, and it brought back $19.99. Phosphorus pays on normal soils under good systems of farming.

Now, neither of those materials contains sulphur. They are not sulphur fertilizers—bone meal or slag phosphate. But on another series of plots, right along beside these, they applied an acid phosphate (dissolved bone black), which carried just the same amount of phosphorus as was carried in the bone meal and slag; but it also carries about as much sulphur as it does phosphorus, the sulphur coming from the sulphuric acid used in the manufacture; sulphur in readily available form. And if that sulphur produced as much benefit as the phosphorus, then the increase from both phosphorus and sulphur should be about $38, shouldn't it? Because we know that $19.61 or $19.99 is due to the phosphorus from these other two forms, I say, if the sulphur were equally beneficial, then from this third plot we should get about nineteen dollars from the phosphorus and nineteen dollars more from the sulphur. What is the result? Where the phosphorus and sulphur were used they got $19.02.

$19.61 from bone meal without sulphur.

$19.99 from slag without sulphur.

$19.02 from dissolved bone black with both phosphate and sulphur.

In other words, the sulphur produced no effect. In fact, that plot happens to be slightly below the others. I don't think we should use that to argue that acid phosphate is not as good as bone meal, for they all agree within the possible experimental error.

Those are field results with general field crops; they furnish no basis from which we can draw the conclusion that we must have sulphur in our fertilizers.

I called your attention to the great supply of potash in normal soils. Now, I realize, of course, the common objection that is made to the potash content in the normal soils. Everybody must admit its presence. Commonly it runs around two per cent. And we sometimes find farmers applying fertilizers with 2-8-2 composition. That is the most common fertilizer used in the United States. Well, that is a fertilizer carrying two per cent. potash; two per cent. ammonia, and eight per cent. of available phosphoric acid. And we find them applying two hundred pounds of 2-8-2 fertilizer that carries two per cent. of potash to soil that carries two per cent. of potash; but the potash in the soil is not available. That is the common statement made, and that I grant, of course; not only admit it, but assert it. If it were available, it would be lost very rapidly in our humid climate. It is fortunate for us that it is not available. You ask me how much of it is available, and I am tempted to say, none of it. Very little of it. You probably never have enough in available form when you plant your crop to bring the crop to maturity.

But I don't know of any more important business for the American farmer than that of making plant food available. You can just as well say the nitrogen in the air is not available to the corn crop. Not an ounce of it is available to the corn crop, although there are seventy million pounds of it over every acre of land. And yet it is the business of the American farmer to make that nitrogen available. He knows how, by growing leguminous crops, and turning them into his soil for the benefit of the influence of the

legumes. And so it is his business, if he is a careful student, to see if he cannot make the potash available at very much less expense than buying it from the miners and manufacturers in Germany and shipping it three thousand miles across the sea.

Some years ago we took some so-called insoluble residue secured by the rather common method of soil analysis. This method of soil analysis that is used a great deal is to digest a certain quantity of soil with a certain acid of a certain strength for a certain length of time at a certain temperature. There are five arbitrarily fixed conditions. If you change any one of them you get different results. But this is a rather common method of analyzing soil. Now, as a rule, as a general average, about fifteen per cent. of the soil will dissolve or go into solution by that method. And the analysis is then made of the solution and the eighty-five per cent. of the soil is discarded as an insoluble residue, as of no value.

We took that insoluble residue, accumulated enough of it so that we could use it for pot culture experiments. And then we put into that insoluble residue some phosphate and some limestone and other essential things. All of the essential materials were provided there excepting potash and nitrogen. We did not add either of those materials, because we knew that five-sixths of the potash was still there in that so-called insoluble residue, and we wanted to know whether we could make it available.

And we did not put any nitrogen in because we inoculated some clover seed and put that in, and we know that clover when properly inoculated could get nitrogen from the air and we did not have to add that.

Do you know that that clover made some growth the first year? Decidedly more growth than was possible from the trace of potash in the seed. We wanted to get at the effect of decaying vegetation in its power to liberate potash from the soil. You might say at first, why didn't you apply some manure and plow it down there? We did not dare do that because we would have added some potash. We might have brought some clover in from the field and put that on and turned it under, but we would have added potash from that clover, and turned it in. We were just limited to the growth we could get from that land.

The clover made some growth the first year, and we turned it down and the next year we grew clover again and it grew decidedly better than the first year, fairly good growth the second year; and we turned that down as green manure, and the third year the clover on that insoluble residue produced a larger yield than on a pot filled with normal soil from a field that had not been fertilized.

Now, you might ask, how is it possible that the clover grew better than on normal soil? Because the normal soil needs a little more phosphorus than it has and this insoluble residue we supplied with plenty of phosphorus; and the normal soil would do better if it had limestone, but we did not put it in the normal soil, while to the insoluble residue we applied plenty of limestone. So that the only limiting factors there were the potash and nitrogen; we provided the nitrogen by inoculating the clover, and we only got what that brought us from the air. During two years what we grew was turned under;

and the only source of potash was from what was left in that soil which the chemist had not been able to take out by the methods described. We liberated potash from the soil by decaying organic matter, and when the American farmer comes to appreciate the value of decaying vegetation in his soil to liberate plant food from any inexhaustible supply, then he will be on the road toward permanent systems of agriculture, toward permanent systems of soil improvement.

That is a practical method for the improvement of soils. The decomposition products have power to dissolve these minerals of the soils.

Apple juice may be sweet. It finally makes vinegar. Nothing is better known than that fermenting organic materials sour; they produce acid, and that is the agent we want to use in the liberation of mineral plant food. Did you ever leave a pitchfork in a manure pile about six months? And then you discovered it. It had bright steel tines when you lost it, and when you found it what was the condition of the tines? Dissolved. Eaten, we say. You could break them with your fingers, if they had not already fallen off.

That illustrates the power of decaying vegetation to dissolve steel or metal; and it has power to dissolve the minerals of the soil, to dissolve potash, and dissolve the insoluble phosphates that we may apply, if not naturally present in the soil in sufficient amount.

Why should we cart potash here from Germany and use it on normal soils for common farm crops? I wonder if you know why do we put 2 per cent. potash fertilizer on soil that has got 2 per cent. potash in it? I will tell you. We do it because the German Kali Works has a good deal to sell, and, if you do not buy it, who will?

There is just about as good a basis for buying potash to put on normal soils for growing ordinary farm crops as there is for planting crops according to the signs of the moon.

I quote here from a recent article in *The Country Gentleman,* of October 24th, 1914, and it reads as follows:

> "The (Potash) Syndicate is spending a million dollars a year in its worldwide campaign * * * and any farmer who cares to study the statistics showing the enormously increased use of potash in American fertilizers during the past decade must be convinced that advertising pays."

That is the main reason why we use potash on normal soils for ordinary farm crops.

I do not refer to the market garden crops. Just keep in mind all these crops that bring large returns are not under discussion. Whenever you sell fifty, a hundred, two hundred, dollars' worth of stuff from an acre you can buy potash, you can afford to do it, it pays the return; but not when the farm is in staple farm crops.

I wish to state also that there are conditions where the soil may become so poor in decaying vegetation that you do not liberate as much potash as you ought to. Under such conditions the addition of soluble salts, especially in considerable amount, will usually produce some increase in crop yields,

and it may even pay more than its cost if the salt is cheap enough and the crops bring a high price.

I have some records here from twenty-four years' work in Pennsylvania. I think we are entitled to these. If it is worth while for the State of Pennsylvania to carry on investigations for a quarter of a century or more, surely it is worth while for us to know what the results are.

They applied nitrogen under four different conditions in Pennsylvania, singly and in different combinations.

They applied phosphorus under the same four different conditions.

They also applied potash under these four different conditions of combinations.

They had a four-year rotation of crops, corn, oats, wheat, with mixed clover and timothy as hay crop; and these crops were grown on four different fields, so that every crop might be represented every year; and as an average of the twenty-four years under all of those conditions every dollar which they spent for nitrogen paid back forty-three cents, at which I should regard as a fair price for the produce standing in the field, because that is where the fertilizer put its, is it not? Some people are inclined to value the increase produced by the fertilizer at the market price, but when you apply commercial fertilizer to increase your yield of wheat by three bushels, the fertilizer does not put the wheat in the market. Does it? It just delivers it in the field, and you have to handle the extra crop of three bushels the same as the rest. So I say I figure this at what I regard a fair price for the value of the crops in the field. But if you wish you may double the prices all the way through.

At the prices used for each dollar spent for nitrogen, Pennsylvania got back forty-three cents.

For a dollar spent for potash, Pennsylvania got back forty-five cents. Not net. This is not profit. This is gross return.

For every dollar spent for phosphorus, Pennsylvania got back $2.94.

These are the average results from these three elements applied on normal soils, under a fairly rational system of farming, with a good rotation of crops. There was one important thing that it lacked, and that was the return to the soil of the vegetable matter that could have been reurned in farm manure or crop residues. They did not do that. That you would do upon your farm. You would return most likely a considerable amount of vegetable manures either in the form of manure or crop residue.

If you double the prices I have used, then your return would be 86 cents on the dollar for the commercial nitrogen; 90 cents on the dollar for commercial potash, and $5.88 on the dollar for phosphorus.

These field results harmonize pretty well with the analysis of the soil. There are some variations in the different combinations, but the one conclusion justified by these investigations is that phosphorus is profitable on such soils.

I have similar results from Ohio, fifteen years' work at Wooster, with five crops in rotation, four different combinations for each of these different elements of commercial plant food; also twelve years' records from Strongsville with the same rotation system. You multiply these together and you

can see how many figures are represented in each one of these that I shall give you.

At conservative prices, for every dollar spent for commercial nitrogen they got back forty-seven cents.

For every dollar spent for potassium they got back thirty-nine cents.

For every dollar spent for phosphorus they got back $6.83.

As I said before, I don't know of anything else that pays so well as the intelligent improvement of the soil, doing the thing that is needed; but we can easily waste money by buying what we should not.

I think my time is gone, Mr. Chairman. I sometimes talk to a hundred and fifty students on the subject of soil fertility for eighteen weeks, and of course, I cannot hope to exhaust this subject in the short time that we have, and you have another very important and very interesting speaker to come before you.

Mr. Fithian—Are you willing to answer questions?

Dr. Hopkins—Yes; if I can answer them within a few minutes I should be glad to.

Mr. Fithian—You spoke about the wheat production and all that. Did you ever think that we are producing this wheat all through the West so cheap that we are obliged to sell it at a loss if we grow it here; that wheat cannot be produced in New Jersey in this section at less than ninety cents, and if you don't get a profit then it don't pay. That is one important thing. The farmer won't stay on the farm if he can't get a profit.

Dr. Hopkins—The lack of profit, that was one of the reasons I gave, wasn't it?

Mr. Fithian—Yes; I know a great many people put that up to us, "Why don't you do so and so?" and try to give us a new formula to work on. They try to induce us to raise these crops without profit.

Dr. Hopkins—You would be interested to know that the last ten-year average shown by the Department of Agriculture shows a lower price for wheat in the United States than thirty years ago.

Mr. DeCou—I would like to ask if it is practical for us to go in our orchard with lime and plant clover to supply enough potash for our apples and peaches?

Dr. Hopkins—Of course, I would want to know the character of your soil, but if you have normal soil with an inexhaustible supply of potash there—

Mr. DeCou—Good, light clay soil.

Dr. Hopkins—Then I would think that altogether a rational means of fertilizing the orchard. I am not a specialist in orcharding, but so far as I have been able to learn from the fertility

standpoint, which is my subject, the best way to fertilize an orchard is through the cover crop, through the growing of leguminous crops, or to use farm manure. Use limestone and grow leguminous crops, then you can turn them back. Treat the soil to make large growth of your leguminous crop and get that back into the soil, and in doing that you add nitrogen and liberate potash if you have plenty in the soil.

Mr. DeCou—How much lime should we apply and how often?

Mr. Hopkins—That depends somewhat on the acidity of the soil, but I would say, as a permanent system, two tons of limestone per acre about every four years; the initial application might well be double that, four tons for a starter, and then you apply two tons every four years.

A Member—Would the legumes leave any considerable amount of free potash in the soil?

Dr. Hopkins—Well, I have not any very complete data on that. Certainly we know that the large roots of alfalfa would carry a fair amount of potash.

A Member—Are not the largest amounts of inavailable potash at a depth of about three feet; at least below one foot?

Dr. Hopkins—The potash content of normal soils usually increases slightly as you go down. Of course, the subsoil has an inexhaustible supply of it, but there is also abundance in the surface of normal soils.

A Member—In regard to the cover crops, they will extract the insoluble potash from the soil, won't they?

Dr. Hopkins—Yes; to some extent.

A Member—In turning those under will they form in any way suitable potash for the following crop?

Dr. Hopkins—They would bring some potash from the subsoil unquestionably, and then as that organic matter decays in contact with the soil it will liberate a lot more potash; without doubt that would increase the available supply of potash.

Mr. Wynne—In other words, in decaying organic matter in the soil you liberate potash?

Dr. Hopkins—Yes, sir. If you have it in the soil.

A vote of thanks was unanimously voted to Dr. Hopkins for his interesting and instructive address.

Vice-President Cox—The next matter on the program is "Building Communities." This subject will be treated by an old friend of the New Jersey farmers, we used to call him Bob Seeds. I now have the pleasure of introducing to you Mr. Seeds again. (Applause.)

Mr. Seeds' Address.

Ladies and gentlemen: I want to assure you that I am pleased and delighted to get back to New Jersey again. Well do I remember the pleasant days that I have spent in your State, in company with my friend, Secretary Dye. I could not forget him if I wanted to. And then it does my heart good to come down to New Jersey and meet my friend, Dr. Agee. Dr. Agee was doing institute work in Pennsylvania when I went out on one of the abandoned farms that had not had a man on it for seven years, and I was not there five years until the State of Pennsylvania heard of me and hired me and sent me out to do institute work. Now, my dear friends, the building of communities—I would like to add to that the life worth living; I would like to double that subject and say the building of communities or the life worth living.

Mr. Seeds in his semi-humorous address emphasized the value of the good citizens in a farming neighborhood. That to have a community worth while and in which progressive people would prefer to live, persistent efforts should be made to secure such citizens. Not only this, but we should endeavor to improve present population, raising the standard of intelligence, creating wholesome amusements and recreation, and by any and all such means build our communities on a basis of sound morals, prosperity, intelligence and contentment. In such a community one should be able to find the life worth living.

Secretary Dye—Mr. Chairman, we appreciate, I am sure, our friend Seeds visiting us once more. We have all enjoyed this good laugh for more than half an hour, after our three days' work, and I move you, sir, that we extend to him a vote of thanks by a rising vote.

This motion was seconded and adopted.

Vice-President Cox—If there is no other business to come before the Board, I will declare this annual meeting of the State Board of Agriculture adjourned.

The meeting thereupon adjourned.

Report of the State Entomologist.

By Thomas J. Headlee, Ph.D.

The attention of the State Entomologist and his assistants has this year been devoted to the inspection and certification of nurseries, to the inspection of nursery stock coming into New Jersey from foreign countries and from the brown tail and gypsy moth areas of New England, and to the control of insect outbreaks and of bee diseases.

The personnel of the regular force has remained unchanged. Mr. H. B. Weiss has continued as assistant to the State Entomologist in nursery stock inspection and insect outbreak control, Mr. E. G. Carr, as deputy of the State Entomologist in bee disease control, and Miss Augusta Meske as clerk and stenographer.

The work of examining nursery stock naturally involves the examination of that which is grown within the State and that which comes into it from other States and foreign lands. These two phases are from the standpoint of time in the year when the work must be done and from the standpoint of methods employed, very different. The home-grown stock must be examined between the middle of July and November first. The incoming stock must be looked after at all seasons of the year, but the great bulk of it is to be inspected during October, November and December, and during March, April and May. The inspection of most of the home-grown stock is made as it stands growing in the nursery row, while the incoming stock is examined in a dormant and exposed condition.

INSPECTIONS OF STOCK GROWN WITHIN THE STATE.

Discussion of the purpose underlying this work and the methods employed in carrying it out have been rather fully given in entomological circular No. 2, and the actual work will be described without preface of any sort. All told, 145 nurseries have been examined, 136 have been found clean or promptly cleaned up, and 136 certificates have been issued.

An effort has been made to bring all dealers in nursery stock into a direct relation to the entomologist for the purpose of exercising some sort of supervision of the stock they handle. The sources from which the dealer gets his stock are investigated. If found to be satisfactory he is asked to sign an agreement that he will confine his purchases to the specified sources. When he has thus obligated himself he receives a dealer's certificate, which he can use for shipping purposes. In this way a very common channel for the disposal of inferior stock is rather effectually closed. In the course of this work the sources of stock from which dealers secure their supplies have been investigated, the proper agreements executed and 31 dealers' certificates issued.

The nursery inspections of the present year have yielded nothing new of a really important nature. The insect injuries are much the same and the

nature and acreage of stock remain unchanged. Fully three-quarters of the entire nursery output consists of ornamentals.

LIST OF NURSERIES CERTIFICATED IN 1914.

(In numerical order to 168.)

1. Henry A. Dreer, Inc., Riverton (general), 15 acres.
2. American Nursery Co. (formerly F. & F.), Springfield (general), 300 acres.
3. W. A. Manda, Inc., South Orange (general), 26 acres.
4. North Jersey Nurseries, Millburn (general), 10 acres.
5. Elizabeth Nursery Co., Elizabeth (general), 500 acres.
6. T. E. Steele, Palmyra (general), 100 acres.
7. Bobbink & Atkins, Rutherford (general), 300 acres.
8. George W. Bassett, Hammonton (general), 5 acres.
9. Charles Black, Hightstown (general), 50 acres.
10. Willard H. Rogers, Mount Holly (general), 4 acres.
11. J. Murray Bassett, Hammonton (general), 11 acres.
12. J. D. Lindsley, Mendham (general), 5 acres.
13. George A. Schultz, Jamesburg (peach), 4 acres.
14. F. A. Tompkinson, Blue Anchor (bush berries), 1 acre.
15. Benjamin Barrett, Blue Anchor (bush berries), 1 acre.
16. Frank Wieland, Egg Harbor City (berry), 2 acres.
17. Michael N. Borgo, Vineland (general), 5 acres.
18. Joseph di Fabrizio, Hammonton (bush berries), 10 acres.
19. George H. Liepe, Cologne (bush berries), 8 acres.
20. Chas. W. Staton, Hammonton (berry), 1 acre.
21. John F. Leed, Waterford Works (berry), 5 acres.
22. Not sent.
23. Julius Seeley, Hammonton (berry), 1 acre.
24. James V. Clark, Cape May (berry), 1 acre.
25. M. Dimeo, Hammonton (bush berries), 5 acres.
26. Henry Schmidt, Weehawken (greenhouse stock).
27. C. A. Conover & Son, Lebanon (peach), 5 acres.
28. Emerson Pullen, Cranbury (peach), .75 of an acre.
29. Lager & Hurrell, Summit (orchid stock in greenhouses).
30. W. H. Polhemus, Robbinsville (strawberry), .5 of an acre.
31. Mrs. N. P. Creely, Burlington (strawberry), 8 acres.
32. Guarantee Nurseries, Trenton (general), 70 acres.
33. Henry Pfeiffer, Cologne (general), 5 acres.
34. James M. Ralston, Allenhurst (general), 5 acres.
35. Albert Nirk, Nutley (general), .5 of an acre.
36. John Moore, Little Silver (general), 1 acre.
37. Albert Nelson, Allentown (general), 1.5 acres.
38. Charles A. Bennett, Robbinsville (general), 150 acres.
39. A. G. Freer, Manasquan (general), .5 of an acre.
40. James Ambacher, West End (general), 4 acres.
41. Wm. O'Hagan, Asbury Park (general), 10 acres.
42. F. E. Beugelaar, Rutherford (general), 2 acres.
43. Mrs. W. S. Herzog, Morris Plains (general), 3 acres.
44. James Clinton, Morris Plains (general), 1 acre.
45. John Ryan, Basking Ridge (general), .5 of an acre.
46. J. F. Noll & Co., Newark (general), .5 of an acre.
47. Leonard J. Smith, Merchantville (general), .5 of an acre.
48. Alvah H. Reynolds, Madison (general), 5 acres.
49. M. C. Gay, Vineland (privet), 3 acres.
50. John Casazza, Vineland (general), 5 acres.
51. Shady Lawn Nursery, Hammonton (general), 35 acres.

52. George H. Peterson, Fair Lawn (general), 8 acres.
53. Peter Henderson & Co., Jersey City Heights (general), 8 acres.
54. Hartung Bros., Jersey City (general), .25 of an acre.
55. Smith & Haff, Plainfield (general), .5 of an acre.
56. Julius Roehrs Co., Rutherford (general), 20 acres.
57. J. B. Duke Farm, Somerville (general), 5 acres.
58. Henry E. Burr, East Orange (general), 20 acres.
59. **Amon Heights Nurseries, Inc.**, Camden (general), 6 acres.
60. Charles L. Stanley, Plainfield (general), 1 acre.
61. Benjamin Connell, Merchantville (general), 1 acre.
62. Mrs. C. Schlobohm, Englewood (general), $^1/_{36}$ of an acre.
63. W. S. Perry, Delaware (general), 1 acre.
64. Elliott Nursery Co., Princeton Junction (general), 5 acres.
65. T. C. Kevitt, Athenia (general), 1 acre.
66. Union County Nurseries, Elizabeth (general), 100 acres.
67. Chas. Momm & Sons, Irvington (general), 8 acres.
68. Frank Lenz, Irvington (general), 3 acres.
69. Frank Koehler, Camden (general), .5 of an acre.
70. J. T. Lovett, Little Silver (general), 200 acres.
71. George A. Steele, Eatontown (general), 105 acres.
72. Frank Marra, Little Silver (general).
73. Wm. S. Rose, Red Bank (general), 5 acres.
74. Thomas Jones, Short Hills (dealer's).
75. K. Herman Stoye, Eatontown (dealer's).
76. F. W. Woolworth Co., New Jersey stores (dealer's).
77. Samuel Brant, Madison (peach), 1 acre.
78. Jos. H. Black, Son & Co., Hightstown (general), 30 acres.
79. H. C. Steinhoff, West Norwood (general), 20 acres.
80. A. A. Watts, Westfield (general), 5 acres.
81. Chas. H. Totty, Madison (greenhouse stock).
82. Arthur J. Collins, Moorestown (general), 8 acres.
83. Samuel C. DeCou, Moorestown (general), 25 acres.
84. Wm. Henry Maule, Inc., Hightstown (dealer's).
85. Theodore Bremkes, Irvington (dealer's).
86. S. S. Kresge Co., for New Jersey stores (dealer's).
87. John W. Wooton, Arlington (dealer's).
88. W. G. Eisele, West End (general), 18 acres.
89. G. F. Neipp, Chatham (greenhouse stock).
90. W. G. Badgley, Chatham (greenhouse stock).
91. Willard B. Kille, Swedesboro (general), 1 acre.
92. Walter R. Shoemaker, Swedesboro (strawberry), 1 acre.
93. Andrew B. Vanderbeek, Paterson (dealer's).
94. Hammonton Nursery Co., Hammonton (general), .5 of an acre.
95. Wm. Tricker, Arlington (general), 5 acres.
96. J. C. Williams Est., Montclair (general), 6 acres.
97. James H. Vliet, Gladstone (peach), .5 of an acre.
98. J. Kaiser Davis, Chester (peach), .5 of an acre.
99. W. T. Grant Co., Newark (dealer's).
100. Muzzy Bros., Paterson (dealer's).
101. Thomas Creamer, Hammonton (dealer's).
102. Warren Shinn, Woodbury (dealer's).
103. Max Rumprecht, Fort Lee (general), .5 of an acre.
104. Garfield Williamson, Ridgefield (general), 11 acres.
105. Manalapan Nurseries, Englishtown (general), 3 acres.
106. S. T. Hillman, Cape May (dealer's).
107. James L. Hall, Farmingdale (dealer's).
108. Paul L. Heggan, Waterford (dealer's).
109. Mrs. E. P. McColgan, Red Bank (general), 45 acres.
110. Edwin Allen, Jr., New Brunswick (general), .5 of an acre.
111. Bound Brook Nursery Co., Bound Brook (general), 60 acres.

112. J. H. O'Hagan, Little Silver (general).
113. Paul Stier, Bayonne (dealer's).
114. Samuel Sward, Newark (dealer's).
115. John F. Randolph, East Rutherford (general), .5 of an acre.
116. K. E. deWall Malefyt, Ridgewood (general), 13 acres.
117. N. J. Forestry & Landscaping Co., Hackensack (dealer's).
118. John McCleary, Sewell (general).
119. Harry J. Stein, Newark (dealer's).
120. Samuel E. Blair, Nutley (general), 11 acres.
121. Carlman Ribsam, Trenton (general), 21 acres.
122. Chas. C. Owens Co., Inc., Orange (dealer's).
123. Martin C. Ribsam, Trenton (dealer's).
124. Caldwell Nurseries, West Caldwell (dealer's).
125. Richard Evans, Jr., Wenonah (dealer's).
126. A. S. Wallace, Montclair (dealer's).
127. Dirk de Haas, Plainfield (dealer's).
128. J. T. Garrison & Sons, Bridgeton (strawberry), 1 acre.
129. Ellsworth Pedrick, Bridgeton (strawberry), 1 acre.
130. Henry J. Forristel, Plainfield (general), 4 acres.
131. Wetzel Bros., Springfield (dealer's).
132. W. M. Howey, Sewell (dealer's).
133. Luther A. Apgar, High Bridge (peach), .5 of an acre.
134. J. H. Lindsley, White House (peach), .5 of an acre.
135. John Bennett, Atlantic Highlands (general), 6 acres.
136. A. E. Wetherbee, Hammonton (dealer's).
137. W. Grant Schoenly, Dayton (general), .5 of an acre.
138. Charles Bird, Arlington (general), 5 acres.
139. Peter Henderson & Co., Jersey City Heights (greenhouse stock).
140. Apgar & Cregar, Fairmount (peach), 1 acre.
141. Mansfield Eick, Bissell (peach), .75 of an acre.
142. Howard Philhower, Mountainville (peach), .25 of an acre.
143. Mr. O'Hagan & Son, Asbury Park (general), 2 acres.
144. Isaac Hildabrant, New Germantown (peach), 1 acre.
145. John Fleming, Califon (peach), .5 of an acre.
146. Mathias Fleming, Califon (peach), .5 of an acre.
147. R. D. Cole, Bridgeton (general), 8 acres.
148. Peter Flaime, Minotola (strawberry), .5 of an acre.
149. W. F. Lacroix, Buena (lilac), 40 acres.
150. F. J. Tomlinson, Blue Anchor (strawberry), .25 of an acre.
151. Samuel H. Wilson, Lebanon (peach), .5 of an acre.
152. David V. Higgins, Ringoes (peach), 1.75 acres.
153. Cicero Higgins, Ringoes (general), 3 acres.
154. Peter V. Drake, Hopewell (peach), .75 of an acre.
155. Charles A. Baird, Freehold (general), .5 of an acre.
156. G. Walter Swain, Sea Girt (general), .5 of an acre.
157. Harold Hornor, Mount Holly (general), 12 acres.
158. George W. Young, Deal Beach (general), 6 acres.
159. Wm. E. Evans, Glassboro (dealer's).
160. H. W. Collingswood, Woodcliff Lake (strawberry), 1 acre.
161. J. H. Kuhns, Cliffwood (strawberry), .25 of an acre.
162. Thomas W. Head, Bergenfield (general), .25 of an acre.
163. K. M. van Gelderen, Long Branch (general), 3 acres.
164. Wm. Herbstreith, West Nutley (general), 5 acres.
165. Delanco Supply Co., Delanco (dealer's).
166. Gulliksen Bros., Hackensack (general), 20 acres.
167. Charles W. Schneider, Little Silver (general), 4 acres.
168. M. Boks, East Rutherford (dealer's).

San José scale (*Aspidiotus perniciosus* Comst.) has been found on left-over cherry, plum, apple, peach, mountain ash, hawthorne, currant, gooseberry,

Prunus pissardi, eornus sanguinia, lilacs, Aronia arbutifolia, Chinese privet, standard privet, quince, flowering crab, Spirea sorbifolia and snowberry. Although present on other stock it was undoubtedly most abundant on left-over fruit stock. Three-quarters of the nurseryman's San José scale trouble is directly traceable to this left-over fruit stock. Keeping left-over stock of this sort is not only a dangerous, but in many cases a useless, practice—dangerous because it acts as a source of infestation for adjoining stock and useless because it is frequently condemned after the summer's care. Although fruit stock is primarily to blame, left-over mountain ash, flowering crab, hawthorne and other plants, especially subject to San José attack, are dangerous.

The oyster shell scale (*Lepidosaphes ulmi* Linn.) was exceptionally abundant on lilacs. Its presence was also noted on poplars and willows. It seems to be on the increase, and has done, in some cases during the past year, more damage than the San José scale. The elm scale (*Gossyparia spuria* Mod.) has been found in sufficient numbers to merit attention. The euonymous scale (*Chionaspis euonymi* Comst.) was this year much in evidence. The cherry scale (*Aspidiotus forbesi* L.), while not seriously abundant, was frequently found.

The white pine weevil (*Pissodes strobi* Peck.) did a considerable amount of harm. All infested shoots should be cut and burned while the grubs are in them. Other methods of control will not pay the nurseryman. The fruit bark beetle (*Scolytus rugulosus* Ratz.) has attacked much left-over stock. The poplar and willow borer (*Cryptorhynchus lapathi* Linn.) has done about the usual amount of damage. The rose twig girdler (*Agrilus viridus* Linn. var. *fagi* Ratz.), first noticed in 1913, was this year rarely taken. The lilac borer (*Podosesia syringæ* Harr.) was present in about the usual numbers. The iris borer (*Macronoctua onusta* Grt.) was exceptionally abundant and did much harm to its food plant. The wood leopard moth (*Zeuzera pyrina* Linn.) was encountered in normal numbers.

The cotton-wood leaf beetle (*Melasoma scripta* Fab.) was less abundant than usual. The fall web worm (*Hyphantria cunea* Bois.) was much in evidence in late summer. The catalpa sphinx (*Ceratomia catalpæ* Bdv.) was unusually noticeable. The bag worm (*Thyridopteryx ephemeræformis* Steph.) appeared on spruce, arbor vitæ, tamarack, lilacs, maple and deciduous cypress. The mourning cloak butterfly (*Euvanessa antiopa* L.) affected the lombardy poplars and elms, but no really serious damage was done. The yellow-necked caterpillar (*Datana ministra* Dru.) was seen on both fruit and shade tree stock. The imported currant worm (*Pteronus ribesi* Scop.) was found on currants and gooseberries, and was allowed to do entirely too much damage. The European hornet (*Vespa crabro* Linn.) was found to have girdled considerable numbers of lilac bushes. Pear leaf blister mite (*Eriophyes pyri* Pgst.) was in evidence in some places. The spotted condition of the leaves of rhododendrons and mountain laurel, characteristic of the rhododendron lace bug (*Leptobyrsa explanata* Heid.) was seen in several places. The bramble flea louse (*Trioza tripunctata* Fitch) was found damaging blackberry plants in parts of South Jersey. The strawberry root louse (*Aphis forbesi* Weed) has been rare this season. Apple plant lice,

mainly (*Aphis mali* Linn.), have done an unusual amount of damage. In some nurseries the apple stock was so affected that it grew very little. The spruce gall aphis (*Chermes abietis* Linn.) has been found in some of the northern New Jersey nurseries.

The following species were taken very infrequently: sinuate pear borer (*Agrilus sinuatis* Oliv.); hemlock scale (*Aspidiotus tsugæ* Marlatt); elm leaf beetle (*Galeracella luteola* Mull.); locust borer (*Cyllene robiniæ* Forst.); poplar stem gall louse (*Pemphigus populicaulis* Fitch); silver-maple mite-gall (*Eriophyes quadripes* Shimer); gall on rose (*Rodites rosæ* Linn.); various unidentified mites on rose, maple, oak and evergreens.

In nine cases out of ten it does not pay to try to grow good, healthy plants from poor stock, particularly if insect infested. It is better to destroy it and start with good plants. Left-over stock in the hands of the dealer should be destroyed, for he has no means of handling it properly. In the end he has to destroy most of it.

INSPECTIONS OF STOCK COMING INTO THE STATE.

In accordance with the plan adopted last year, the examination of incoming stock has been divided between the State Plant Pathologist and the State Entomologist, the former becoming responsible for shipments from other States and the latter for consigments from foreign countries, and from gypsy and brown-tail moth infested aceas of New England. It has also been the practice for the plant pathologist to examine such foreign stock as could be reached in the course of examining domestic importations and of the entomologist to inspect such domestic importations as he could reach in the course of his foreign stock inspections. In this way, of course, a considerable amount of traveling expense have been saved and a larger volume of domestic stock inspected.

Under the present plant quarantine act the Federal Horticultural Board has advanced notice of all shipments from foreign countries. Notice from the board of stock coming into the State is received by the entomologist invariably before the stock itself comes in. On receipt of notice of shipment a card is at once sent to the consignee telling him that the entomologist has been informed of the impending arrival of foreign stock, asking him to notify the entomologist promptly of its arrival and to hold it in its original package, unopened, until the inspector can examine it. As nearly as may be within 48 hours of its arrival the stock is examined and treated as its condition seems to warrant.

Directly from the organization engaged in enforcing the gypsy and brown-tail moth quarantine in New England, notice of shipment from those points into New Jersey is sent to the entomologist. Inasmuch as all this stock has been given a most careful inspection, it has not been thought necessary to reinspect all of it on its arrival in New Jersey. Recent developments have, however, led to a change in plan, and it is now proposed to inspect every shipment.

The number of cases of stock received are set forth in the following table:

Fall—Belgium, 3,634; Holland, 1,807; England, 142; Germany, 244; France, 45; Ireland, 41; Scotland, 2; Spain, 10; Denmark, 3. Total, 5,928. New England (Moth Quarantined Area), 135. Grand Total, 6,603.

Spring—Belgium, 3,184; Holland, 3,047; England, 226; Germany, 62; France, 166; Colombia, 128; Venezuela, 110; Japan, 96; Ireland, 52; Brazil, 36; Scotland, 10; Philippine Islands, 7; Italy, 4; Cuba, 3; Bermuda, 1; Switzerland, 1; Hungary, 1. Total, 7,134. New England (Moth Quarantined Area), 370. Grand Total, 7,504.

Most of the stock from Belgium consists of bay trees, azaleas and palms; from Holland, boxwood, shade trees, evergreens, rhododendrons and roses; from England, Ireland and Scotland, roses and fruit stock; from France, trained and other fruit stock, shrubs and evergreens; from Germany, greenhouse stock, fruit stock, evergreens and roots; from Colombia, Brazil, Venezuela and the Philippine Islands, orchids; from Japan, dwarf evergreens, fruit stock and bulbs; from Spain, Italy and Hungary, grape cuttings; from Denmark, roses; from Bermuda and Cuba, dracena canes; from Switzerland, lilacs; from New England, evergreens and other ornamentals of both woody and herbaceous characters.

For the purpose of showing the species of insects found and their distribution, the following table is submitted:

SPRING OF 1914.

Times Found.	*Name and Host.*	*Country of Origin.*
1	*Chermes abietis* (spruce gall aphid)—spruce,	England
1	*Coccus hesperidum* (scale insect)—aralia,	Belgium
20	" " " " —bay trees,	Belgium
5	*Tingitid* egg (lace wing)—rhododendrons,	Holland
17	*Chrysomphalus aonidum* (scale insect)—palms,	Belgium
1	" " " " —calophyllum sp.,	Belgium
3	*Lepidosaphes ulmi* (Oyster-shell scale)—boxwood,	Holland
1	*Diaspis boisduvalii* (scale insect)—orchids,	England
3	*Pseudaonidia pæoniæ* (scale insect)—azaleas,	Japan
1	*Psychid* case, empty (bag worm)—evergreen,	Japan
1	" " " " " —azaleas,	Japan
3	*Aleyrodid puparia* (white fly)—palms,	Belgium
1	*Aleyrodes* sp. " " —rhododendrons,	Holland
2	*Notolophus antiqua* (eggs European tussock moth),	Holland
1	*Mantis* egg mass—azaleas,	Japan
1	" " " —conifer,	Japan
3	*Pseudococcus* sp. (mealy bug)—palms,	Belgium
1	" " " " —ficus,	Belgium
1	" " " " —palms,	England
3	*Targionia biformis* (scale insect)—orchids,	Venezuela
1	" " " " "	Colombia
1	*Saissetia hemisphærica* (scale insect)—rusellia sp.,	England
5	*Chrysomphalus dictyospermi* (scale insect)—palms,	Belgium
1	*Lecanium corni* (scale insect)—boxwood,	Holland
1	*Bryobia* sp. eggs (mites)—fruit trees,	England
1	Saw fly cocoon—packing,	England
1	*Lasius niger*, var. *alienus* (ants)—packing,	Holland
1	" " " " " —packing,	France
1	*Amara ovata* (ground beetle)—packing,	England
2	*Cattleya* fly indications—orchids,	Brazil
2	" " " —orchids,	Colombia

Times Found.	*Name and Host.*	*Country of Origin.*
1	*Kentia* (mealy bug)—palms,	Belgium
1	*Chrysomphalus rossi* (scale insect)—orchids,	Philippine Islands
2	*Hemichionaspis aspidistræ* (scale insect)—*aspidistra,*	Belgium
1	*Philonthus politus* (rove beetle)—packing,	England
1	*Apion ulicis* (weevil)—seed pods of *Ulex Europea,*	England
1	*Aspidiotus britannicus* (scale insect)—bay trees,	Belgium
1	*Pterostichus vulgaris* (ground beetle)—packing,	Holland
1	*Tortricid* larva—holly,	France
1	*Fiorinia fioriniæ* japonica (scale insect)—conifer,	Japan
1	*Aspidiotus* sp. (scale insect)—conifer,	Japan
1	*Damaster blaptoides* (ground beetle)—packing,	Japan
1	Wire worm—packing,	France
1	*Hemiptera* new genus and new species near *Pachypeltis* of Signoret—orchids,	Philippine Islands

When examinations of the spring shipments began the inspectors were notified to collect all traces of insect and fungous species. The fairly specific statement above is the result. Of the entire number of species brought in only five are in any sense beneficial—*Damaster blaptoides* Koller, a large carabid from Japan; *Pterostichus vulgaris* Linn., a common carabid of Europe; *Amara ovata* Fabr., a ground beetle common in Europe, and *Philonthus politus* Fabr., a rove beetle known as an enemy to maggots. The remaining species are either harmful or indifferent. All infestation, with the exception of greenhouse species already established in the State, was destroyed. Bad infestations of forms already established were cleaned up or destroyed.

The traces of plant disease organisms collected by the entomological inspectors were turned over to the department of plant pathology. Twelve species were found, most of which were determined by Mr. C. A. Schwarze of that department.

When the fact that each of the 13,567 cases contained an average of about 500 plants and required an average of 20 minutes to examine its contents is coupled with the fact that this work involved about 1,480 separate shipments we get some idea of what a task this inspection is. In the fall of 1913 the full time of four men was required, and in the spring of 1914 the full time of four men was required. To meet this demand temporary inspectors were engaged. The practice of employing temporary help has been followed for two years and seems rather satisfactory. Certainly, with the limited funds that are available, it seems the only practicable way to examine the stock.

INSECTS RECENTLY INTRODUCED.

In the year 1913 the work and specimens of a very serious European enemy of the Scotch Fir (the pine beetle *Myelophilus piniperda* Linn.), were found on the young Scotch Fir at Rutherford. Although the entomologist feared that the species had become established and kept the most careful lookout possible, he could secure no traces of it or its work during the past season.

In 1913 a peculiar injury to Rosa rugosa was frequently found, in one case occasioning a loss of $200 worth of standard rose stock. The grub found in

the injured stems was plainly a buprestid but did not belong to any of the common species. The species seemed to prefer standard roses and Rosa rugosa, but was taken by Mr. Weiss on Rosa carolina, Rosa blenda, Rosa multiflora Japonica, Rosa nitida, Rosa rubrafolia, Rosa setigera and on wild roses. A single specimen was bred out during the current year and the species proved to be *Agrilus politus* Say, hitherto known only to breed on willow. Mr. Charles Kerremans of Belgium has examined the single specimen bred from our material and believes it to be a variety of the European species *Agrilus viridis* Linn. Cutting and burning the infested stems is the measure of control most likely to prove satisfactory.

In 1913 a peculiar maggot was taken from roots of Iris at Orange. The collection not possessing a duplicate, some specimens were sent to Washington and were identified by Mr. Nathan Banks as the narcissus fly (*Merodon equestris* L.). It has been taken again this year at the same place.

INSECT OUTBREAK CONTROL.

Plant lice on apple (principally *Aphis mali* Fabr.) have been so abundant as to form a serious outbreak. Letters, newspaper articles and lectures were utilized to inform persons whose property was threatened. In so far as such methods could be made to serve the purpose all persons who were sufficiently interested to take the trouble were put in a position to protect their plantings.

The tent caterpillar (*Malacosoma americana* Fabr.) appeared early in the season in northeast New Jersey and in sufficient numbers to constitute an outbreak. The greatest amount of complaint came from the commuting districts of Bergen County. Letters, lectures, newspaper articles and personal visits were employed to meet the emergency. Unfortunately the neglected land grown up with wild cherry was so large in proportion to the cultivated land that many persons, who carefully protected their trees and gardens from the caterpillars bred on their own places, saw their plantings overrun and damaged by hordes of hungry worms from waste land adjoining.

Early in July reports of army worm damage came from Monmouth County where the worms were passing from exhausted grasslands into adjacent fields of corn, potatoes and wheat. A personal visit was made and the use of trenches advised. Mr. W. B. Duryee, Jr., the farm demonstration agent of that county, carried on the work of control in a very efficient manner. By the 20th of July the worms had become a pest in nearly all parts of the State and were especially bad along the eastern coast. Most of the complaint then came from their work in lawns. The use of arsenicals (dry and wet) and of the poisoned bran mash proved rather unsatisfactory. Although thousands of the worms were destroyed by the substances they were not stopped short in their work of destruction as they were by trenching. Mr. Duryee found that the following method afforded prompt relief. Shallow trenches were dug along the edges of paved walks, walls and foundations, and finely pulverized lime was dusted over the grass being careful to prevent any from getting into the trenches. The following morning the worms were found collected in the trenches and were killed by pouring gasoline upon them. One treatment seemed to stop the trouble. No doubt in the use of this

method cases would be found in which the worm trouble would be renewed by migrants from adjacent untreated premises. Such invasion might be met by trenching, poisoned bran barriers or repetition of the shallow trench, lime and gasoline procedure.

Persons with injured lawns were advised to apply a quick acting fertilizer for the purpose of enabling the grass to recover. The formula recommended by Dr. Jacob G. Lipman, Director of the New Jersey Experiment Station, is as follows: For one acre of medium-light to heavy soils a fertilizer composed of 150 pounds of bone meal and 150 pounds of nitrate of soda should be satisfactory, while for the same sized plot of very light soil a fertilizer composed of 100 pounds of bone meal, 150 pounds of nitrate of soda and 50 pounds of muriate of potash should be used. The fertilizer should be applied just before a good rain, or be followed promptly by heavy watering. It must be evenly distributed.

A second incipient outbreak of this species appeared in Cumberland and Monmouth counties, but the damage done was negligible.

BEE DISEASE CONTROL.

Generally speaking, the season just passed has been a lean one for the beekeeper. The natural result of such a season is to make the beekeepers become careless and to neglect the bees, allowing diseases and moths to work their will.

The diseased apiaries found last year in Cape May, Cumberland and Salem counties during last year's inspection were re-examined this season and found pretty generally free. In some cases, however, the disease had not been eliminated. Every case of failure seemed to be traceable to improper carrying out of the advised procedure.

All queen rearing apiaries were inspected and no traces of disease were found. They were certificated as follows:

No. 1.—Robert B. Spicer, Wharton, Morris County, May 18th to July 31st, 1914.

No. 2—Albert G. Hann, Clinton, Hunterdon County, June 23d to August 15th, 1914.

No. 3—W. T. Falconer Mfg. Co., Wharton, Morris County, July 13th to July 31st, 1914.

No. 4—Robert B. Spicer, Wharton, Morris County, August 1st to October 31st, 1914.

No. 5—W. T. Falconer Mfg. Co., Wharton, Morris County, August 1st to October 31st, 1914.

No. 6—Albert G. Hann, Clinton, Hunterdon County, August 5th to October 31st, 1914.

In addition to examining the queen-raising apiaries themselves all adjacent bee yards were examined for the purpose of preventing the queen-raising apiary from becoming infected from that source. The entomologist believes that the best interests of the beekeeping public are served by protecting the queen breeder from infection in so far as that may be practicable.

The bulk of the inspection work was placed in Camden, Burlington, Gloucester, Ocean and Monmouth counties. The territory of the first four was

rather carefully covered and part of the last was examined. All told, 4,001 colonies have been inspected during the past season; 61 were found to be infected with American and 147 with European foul brood. For the purpose of bringing out the relation of the inspection work of previous years to that of this year, the following tabular statement is submitted:

Year.	*No. of Yards.*	*No. of Colonies.*	*No. in Frame Hives.*	*No. in Box Hives.*	*No. Having American Foul Brood.*	*No. Having European Foul Brood.*	*No. of Yards Diseased.*
1912	378	3277	2922	355	157	381	173
1913	337	2932	2326	606	81	238	97
1914	405	4001	3199	802	61	147	79

The figures show a decrease in the amount of foul brood found. It is possible that the vigorous campaign of education is beginning to bear fruit.

There is a comparatively small amount of American foul brood in the State, and such as there is, is not widely scattered. European foul brood has, however, been found in every county, except Atlantic and Gloucester. The county distribution of the brood diseases is indicated in the following table:

County.	*Apiaries with European foul brood.*	*Apiaries with American foul brood.*
*Atlantic,	None.	None.
†Bergen,	44	14
*Burlington,	23	7
*Camden,	3	None.
*Cape May,	15	None.
*Cumberland,	22	2
†Essex,	6	6
*Gloucester,	None.	None.
*Hudson,	None.	2
‡Hunterdon,	7	1
‡Mercer,	2	None.
*Middlesex,	13	16
†Monmouth,	17	None.
‡Morris,	17	8
*Ocean,	6	None.
‡Passaic,	12	5
*Salem,	6	4
‡Somerset,	4	7
‡Sussex,	15	17
*Union,	12	5
‡Warren,	1	2
	225	96

Conclusions.—In 1913 began an attempt to clean up all disease in Atlantic, Cape May, Cumberland and Salem counties and to keep them free as a test of what could be done under favorable conditions. The result of the first two years' effort will appear in next year's inspections. The number of yards and the number of colonies this year are the largest ever covered during a single inspection season in this State. Notwithstanding the increased ground covered, not only has the percentage of diseased colonies decreased, but the actual number found was smaller.

*Counties thoroughly inspected. †Counties very largely inspected.
‡Counties in which very little work has been done.

Report of State Pathologist.

MEL. T. COOK.

The organization of the department for the fiscal year ending November 1st, 1914, was practically the same as during the preceding year. Mr. C. A. Schwarze, Assistant State Plant Pathologist, is a well-trained botanist and mycologist, and has proved himself an excellent inspector. His general knowledge of plants makes him an excellent advisor to many people who receive small shipments of stock, but who have very little knowledge and no practical experience in the planting and caring of trees and shrubbery. Mr. Amos Kirby was Assistant Inspector for South Jersey from November 1st to December 15th, 1913, and Mr. George L. Walter for the same territory during March and April of 1914. Mr. George W. Martin, Assistant Plant Pathologist in the Agricultural Experiment Station, and Mr. H. Clay Lint, Union Sulphur Company Fellow in Plant Pathology in Rutgers College, have assisted by conducting experiments in the study and treatment of diseases of orchard fruits and potatoes, and in rush season have occasionally helped in the inspection work. We have also had the co-operation of Mr. Guy West Wilson, Special Agent for the U. S. Bureau of Plant Industry, who was located in New Brunswick from July 1st, 1913, to July 1st, 1914, for the purpose of studying the organisms causing the blight of the chestnut trees.

The results of this co-operative experimental work are published in the report of the New Jersey Agricultural Experiment Station for 1914.

NURSERY INSPECTION.

The nurseries of the State have been inspected in accordance with Chapter 54, Laws of 1911, and in most cases were found to be in exceptionally good condition. There is much greater spirit of co-operation between the nurserymen and the State Board of Agriculture than in the past. We have received more inquiries concerning plant diseases than at any time in the past, and many nurserymen have called our attention to diseases that would otherwise have escaped notice and have asked for assistance in controlling them.

The list of certificates issued, in numerical order, to 168, in 1914, is printed in report of State Entomologist, pages 170 to 180 of this report.

Following the method introduced last year for the reduction of peach yellows in the State, we again co-operated with the Department of Horticulture in offering bud wood to the nurserymen. Twelve nurserymen availed themselves of this offer and buds were distributed, including the varieties of Elberta, Carman, Belle of Georgia, Stump, Greensboro, Waddell, Frances, Edgemont, Arp, Reeves, Lola, Hiley, Governor Hogg, Early Crawford, Steven's Rareripe, Mt. Rose, May Flower, Champion and Early Wheeler to the following:

	Elberta.	Carman.	Belle of Georgia.	Stump.	Greensboro.	Waddell.	Frances.	Edgemont.	Arp.	Reeves.	Lola.	Hiley.	Gov. Hogg.	Early Crawford.	Steven's Rareripe.	Mt. Rose.	May Flower.	Champion.	Early Wheeler.
Willard Apgar, Fairmount, ...	X			X		X				X		X							
Bound Brook Nurseries, Bd. Brook,	X	X	X	X	X		X			X	X	X		X					
Samuel Brant, Madison, ...					X	X				X	X	X	X				X		
R. D. Cole, Bridgeton, ...	X	X	X	X	X	X	X	X		X	X	X		X	X				
J. K. Davis, Chester, ...					X	X						X							
Mansfield Eick, Bissell, ...	X						X												
Elizabeth Nurseries, Elizabeth, ...	X	X	X	X	X	X	X	X		X	X		X	X					
F. & F., Springfield, ...	X	X	X	X	X						X	X		X	X				
John F. Leeds, Waterford Works,..					X		X		X										
K. de Waal Malefyte, Ridgewood,..	X													X					
Manalapan Nurseries, Englishtown,	X	X	X	X	X				X	X	X	X			X		X	X	X
Samuel H. Wilson, Lebanon, ...										X	X					X			

It will be seen that several of these nurseries also received buds a year ago, but the number of requests was not as large as we expected. However, we were not able to supply the number of buds called for. Next year it will be necessary to limit the number of buds distributed to each nurseryman. This is a rare opportunity for the nurserymen to secure buds true to name and as free from yellows and little peach as it is possible to determine with our present knowledge of these diseases.

INSPECTION OF INTER-STATE AND FOREIGN SHIPMENTS.

The shipments of stock into this State were so large that it was impossible to inspect any considerable amount of it. However, the work was carried forward in co-operation with the Department of Entomology as thoroughly as circumstances would permit.

The dealers in seed potatoes were not as friendly to inspection of potatoes as the nurserymen are to the inspection of nursery stock. And we regret to say that the Exchanges and Granges did not take as much interest in the seed problem as we expected. The quantity of seed potatoes coming into the State was so large and the amount of our funds so small that it was impossible to inspect more than a very small percentage. POWDERY SCAB (*Spongospora subterranea*) was found on two shipments of potatoes from Maine, but thus far we have not found the disease in the growing crops. The SCURF (*Rhizoctonia*) was found in *great abundance* on many shipments, but unfortunately its presence did not disturb many of our dealers or growers. *Such disregard to presence of this and other diseases by the dealer and grower is costing our farmers many thousands of dollars annually.*

CROWN GALL (*Pseudomonas tumefaciens* S. & T.) and some other diseases were found on a number of shipments of nursery stock. All such diseased stock was condemned and either destroyed or returned to the consignors. There is an increasing sentiment against crown gall among our nurserymen and orchardists. The following parasitic fungi were found on foreign nursery stock:

Volutella buxi on boxwood from Holland.
Exobasidium azaleæ on Azalea from Belgium.
Mycosphaerella fragareæ on strawberry from England.
Botrytis cinerea on roses from Holland.
Colletotrichum kenteæ on Kentia palm from Belgium.
Colletotrichum omnivorum on Aspidestea from Belgium.
Phyllosticta maculicola on Dracaena terminalis from Europe.
Diplodia sp. on orchid from South America.
Penicillium sp. on Gladiolus bulbs from Holland.
Colletotrichum sp. on Dacaena canes from West Indies.
Colletotrichum sp. on Orchids from South America.
Leaf spot on Rhododendrons from England.
Twig fungus on English walnut from England.
Immature fungus on grape canes from England.
Immature fungus on apple from Holland.

Epidemics.—The only serious epidemic was the "yellows" of the asters. This disease was prevalent in a number of places in the State, and was the cause of very heavy losses. It is deserving of special attention.

Although, with the exception of the asters "yellows," there were no serious epidemics as compared with those of 1913, yet there were many more inquiries concerning diseases of plants, and our correspondence was much heavier than ever before, and we were required to make many more personal visits to points throughout the State than in 1913.

Publications.—The following publications have been issued during the year:

(1) Press Bulletin No. 8, by the State Board of Agriculture on "Powdery Scab of the Potato," by Mel. T. Cook.
(2) Circular 33, N. J. Agri. Exp. Station, on "Potato Diseases in New Jersey," by Mel. T. Cook and G. W. Martin.
(3) Circular 34, N. J. Agri. Exp. Station, on "Crown Gall and Hairy Root," by Mel. T. Cook.
(4) Circular 35, N. J. Agri. Exp. Station, on "Some Diseases of Nursery Stock," by Mel. T. Cook.
(5) Circular 36, N. J. Agri. Exp. Station, on "Grain Smuts: Their Causes and Treatments," by Mel. T. Cook.
(6) A short paper on "The Jonathan Spot Rot," by Mel. T. Cook and G. W. Martin in Phytopathology 4:102-105 (1914).
(7) A short paper on "Cladosporium Disease of Ampelopsis Tricuspidatum," by Mel. T. Cook and Guy West Wilson, in Phytopathology 4:189, 190 (1914).
(8) A short paper on "Notes on Economic Fungi," by Mel. T. Cook, in Phytopathology 4:201-203.
(9) A short paper on "The Southern Bacterial Wilt in New Jersey," by Mel. T. Cook, in Phytopathology 4:277, 278.

Needs of the Department.—The appropriation has never been sufficient to permit the full and complete execution of law. We have never been able

to inspect more than a small percentage of the incoming nursery stock, but by a careful distribution of our work we have been able to examine some stock from practically all the nurseries sending consignments into the State. When diseased stock was found in one consignment, we have endeavored to inspect all stock from that nursery until we had reason to believe that their stock was in a satisfactory condition. The results of our efforts show that the nursery stock coming into the State at this time is of a much higher grade than it was three years ago.

However, there are many diseases prevalent in the State which are demanding attention. Of course, a great deal of this has been or will be cared for by the Agricultural Experiment Station. This is especially true of the diseases of the orchard fruits and potato crops. Among some of the other important problems are the following:

(1) The diseases of the tomato. The tomato is one of the most important crops of the State, especially in the southern part. Heavy losses of this crop are due to the LEAF BLIGHT (*Septoria lycopersici*), to MOSAIC, and to other diseases.

(2) The diseases of the sweet potato. The sweet potato is also an important crop in the southern part of the State. Heavy losses are due to BLACK ROT (*Sphaeropsis fimbriatum*) and to the STEM or YELLOW ROT.

(3) The diseases of the legume crops. The number of complaints concerning the ROOT ROT (*Sclerotinia*) of the crimson clover, and of other diseases of other legume crops, emphasizes the importance of timely work of this subject.

(4) The "Yellow" of the aster. This disease is causing heavy losses in many localities. It is not well understood, and there is no satisfactory treatment.

(5) The diseases of the truck crops. The number of complaints concerning the diseases of truck crops are increasing rapidly, and this work is sufficient to take the time of one or more workers.

(6) The diseases of the ornamentals. The growing of ornamental plants is a much greater industry than most of us realize. The number of inquiries from growers of these crops is increasing rapidly and the work demands the attention of competent investigators.

Diseases of the Year.—A list of the 143 most important diseases of economic plants which have come to our attention during the past year will be published in the report of the New Jersey Agricultural Experiment Station for 1914. In addition to these, there are many other diseases which have been recorded from time to time. Some of these diseases are very destructive, and would be the cause of heavy losses if it were not for the persistent efforts of our most progressive farmers to control them.

Officers of the State Grange of New Jersey, P. of H., 1915.

Master—G. W. F. GAUNT, ...Mullica Hill, Gloucester county
Overseer—WALTER H. HAVENS, ...Cranbury, Middlesex county
Lecturer—CAROLINE ALLINSON, ...Yardville, Mercer county
Steward—C. C. BASLEY, ...Farmingdale, Monmouth county
Assistant Steward—D. HOWARD JONES, ...Freehold, Monmouth county
Chaplain—SAMUEL L. HOMAN, ...Swedesboro, Gloucester county
Treasurer—CHARLES COLLINS, ...Moorestown, Burlington county
Secretary—JOHN T. COX, ...Three Bridges, Hunterdon county
Gate Keeper—AMOR J. GAUNTT, ...Jobstown, Burlington County
Ceres—MARY V. RISLEY, ...Stone Harbor, Cape May county
Pomona—LILLIE HAINES, ...Robbinsville, Mercer County
Flora—LOUISA MABIE, ...Westwood, Bergen county
L. A. S.—BESSIE ACKLEY, ...Deerfield, Cumberland county

Executive Committee—GEORGE W. F. GAUNT, Mullica Hill, Gloucester county; ALBERT HERITAGE, Mickleton, Gloucester county; H. M. LOVELAND, *Bridgeton*, R. D. 8, Salem county; A. W. FUND, Chatham, Morris county; THMOAS W. DEKAY, New Milford, N. J.; JOHN T. COX, Three Bridges, Hunterdon county.

State Grange meets first Tuesday in December, 1915.

COUNTY DEPUTIES.

Atlantic—Henry Pfeiffer, Cologne, Atlantic county.
Bergen—E. M. Lyman, Park Ridge, Bergen county.
Burlington—Joseph Engle, Mount Holly, Burlington county.
David L. Ballinger, Moorestown, Burlington county.
Camden—Howard Garwood, Haddonfield, Camden county.
Cape May—A. T. D. Howell, Dias Creek, Cape May county.
Cumberland—Walton E. Davis, Shiloh, Cumberland county.
Essex—E. O. Wettyen, Cedar Grove, Essex county.
Gloucester—Alvin L. Gaventa, Swedesboro, Gloucester county.
I. B. Pancoast, Clayton, Gloucester county.
Hunterdon—Joseph Bodine, Flemington, Hunterdon county.
Frank V. D. Fisher, Stockton, R. D. No. 2, Hunterdon county.
Mercer—C. Newton Hutchinson, Robbinsville, Mercer county.
Middlesex—Everett Marshall, New Brunswick No. 2, Middlesex county.
Monmouth—D. Howard Jones, Freehold, Monmouth county.
Morris—A. W. Fund, Chatham, R. D., Morris county.
Ocean—D. Howard Jones, Freehold, Monmouth county.

Passaic—D. Henniger, Paterson, R. D. No. 2, Passaic county.
Salem—Maxwell W. Buzby, Woodstown, Salem county.
Somerset—H. W. Kline, New Brunswick, R. D. No. 6, Somerset county.
Sussex—E. W. Clark, Sussex, Sussex county.
Sanford J. Crawn, Newton, R. D., Sussex county.
Union—A. W. Fund, Chatham, R. D., Morris county.
Warren, District No. 1—N. Warne, Broadway, Warren county.
Warren, District No. 2—James I. Cook, Delaware, R. D. No. 2, Warren county.
Women's Work Committee—Eudora N. Rue, Windsor; Mary Ella Vanaman, Dias Creek; Mabel S. Lippincott, Marlton.

Finance Committee—William H. Borden, Mickleton; J. T. Allinson, Yardville; Walter H. Havens, Cranbury.

1915 Pomona Granges.

MASTERS, SECRETARIES AND LECTURERS, WITH POST-OFFICE ADDRESSES.

Burlington County, No. 1. Master, Henry S. Lippincott, Marlton, N. J.
Secretary, A. J. Gauntt, Jobstown, N. J.
Lecturer, Caroline S. E. Wills, Marlton, N. J.
Meets fourth Tuesday in January, April, July and October.

Sussex County, No. 2. Master, Robert L. Everett, Lafayette, N. J.
Secretary, George C. Smith, Hamburg, N. J.
Lecturer, Frank Stoll, Layton, N. J.

Hunterdon County, No. 3. Master, William E. Rittenhouse, Stockton, R. D., N. J.
Secretary, Edward P. Nief, Flemington, N. J.
Lecturer, J. Spencer Dilts, Three Bridges, N. J.
Meets second Friday in January, April, August and October.

Cumberland County, No. 4. Master, William H. Taylor, Millville, N. J.
Secretary, L. F. Glaspey, Shiloh, N. J.
Meets second Tuesday in January, April, July and October.

Mercer County, No. 5. Master, N. F. Woodward, Pennington, N. J.
Secretary, T. A. Bolmer, Rocky Hill, N. J.
Lecturer, Miss Caroline Allinson, Yardville, N. J.
Meets March 3d, New Egypt; June 2d, Windsor; September 1st, Allentown; November 17th, Cranbury.

Salem County, No. 6. Master, Clifford Crispin, Salem, N. J.
Secretary, Minnie C. Wilkinson, Woodstown, N. J.
Lecturer, Elsie Edwards, Woodstown, N. J.

Camden and Atlantic Counties, No. 7. Master, Abram J. Severns, Blackwood, N. J.
Secretary, Harry E. Horner, Merchantville, N. J.
Lecturer, Amelia Bates, Haddonfield, N. J.
Meets Haddonfield, January 9th; Berlin, April 24th; Blue Anchor, July 31st; Blackwood, October 30th.

Gloucester County, No. 8. Master, Albertus Orr, Swedesboro, N. J.
Secretary, Lidie Hoffman, Clarkeboro, N. J.

Central District, No. 9. Master, Ehler O. Wettyen, Cedar Grove, N. J.
Secretary, E. Oscar DeCamp, Roseland, N. J.
Meets fourth Wednesday in January, April and October.

Warren County, No. 10. Master, Nicodemus Warne, Broadway, N. J.
Secretary, Henry Race, Oxford, N. J.
Lecturer, Mrs. William Cook, Hope, N. J.
Meets January, May, September and November.

Bergen County, No. 11—Master, John F. Bomm, Westwood, N. J.
Secretary, Mrs. Julia Maynard, Paterson, R. D. No. 3, N. J.
Lecturer, Mrs. Louisa Mabie, Westwood, N. J.
Meets February, April, September and November on day fixed by entertaining Grange.

Monmouth County, No. 12. Master, J. L. Pittenger, Freehold, N. J.
Secretary, S. B. Wells, Marlboro, N. J.
Lecturer, Edgar Bearmor, Belmar, R. D. No. 2, N. J.
Meets second Saturday in March, June, September and December.

Middlesex and Somerset, No. 13. Master, J. D. Quick, South Branch, N. J.
Secretary, H. W. Kline, New Brunswick, R. D. No. 6, N. J.
Lecturer, A. L. Clark, New Brunswick, N. J.
Meets third Thursday in January, April, August and October.

Cape May County, No. 14. Master, Francis E. Bate, Fishing Creek, N. J.
Secretary, Eli Townsend, Stone Harbor, N. J.
Lecturer, A. T. D. Howell, Dias Creek, N. J.

Subordinate Granges.

Pioneer No. 1—Master, Spencer Perrine, Cranbury, R. D., Middlesex County.
Secretary, J. Edward Chamberlin, Cranbury Station.
Lecturer, Mrs. W. J. Campbell, Cranbury, R. D.
Meets second and fourth Tuesday evenings at Cranbury.

Marl Ridge, No. 2—Master, William H. Davis, Cream Ridge, Monmouth County.
Secretary, Edith P. Harrison, Wrightstown.
Lecturer, Mrs. Emily L. Buck, New Egypt.
Meets first and third Friday afternoons in I. O. O. F. Hall, New Egypt.

Hammonton, No. 3—Master Mrs. Lizzie C. Bassett, Hammonton, Atlantic County.
Secretary, Mrs. Charles Myers, Hammonton.
Lecturer, Mrs. Adelaide Brewster, Hammonton.
Meets first and third Fridays in Grange Hall.

Swedesboro, No. 5—Master, Harrison M. Stiles, Swedesboro, Gloucester County.
Secretary, Minnie Young, Swedesboro.
Lecturer, Mrs. Ella H. Brown, Swedesboro.
Meets every Wednesday evening in Black's Hall.

Somerset, No. 7—Master, H. W. Kline, New Brunswick, R. D. No. 6, Somerset.
Secretary, Maude M. Goodrich, Middlebush.
Lecturer, Mrs. Jane Wilson, Middlebush.
Meets second and fourth Wednesday evenings in Wyckoff's Hall.

Moorestown, No. 8—Master, Harvey M. Roberts, Moorestown, Burlington County.
Secretary, Mrs. Sadie E. Collins, Moorestown.
Lecturer, Sarah E. C. Thomas, Moorestown.
Meets Thursdays, 2 P. M., December to April; first and third Thursday evenings balance of year.

Woodstown, No. 9—Master, Edward Broomell, Woodstown, Salem County.
Secretary, M. W. Buzby, Woodstown.
Lecturer, Tacie C. Broomell, Woodstown.
Meets Wednesday evenings in Peterson's Hall.

Vineland, No. 11—Master, John L. Kee, Vineland, Cumberland County.
Secretary, Mrs. Marie E. Hendrickes, South Vineland.
Lecturer, Mrs. J. A. Vanaman, Vineland.
Meets Saturday afternoons, Grange Hall, Landis Avenue.

Ringoes, No. 12—Master, Frank L. Trout, Ringoes, R. D. No. 1, Hunterdon County.
Secretary, Mrs. Laura Sutphin, Ringoes, R. D. No. 1.
Lecturer, Miss Jessie Fullerton, Ringoes, R. D. No. 1.
Meets first and third Saturday evenings, second and fourth Saturday afternoons in Grange Hall.

Hopewell, No. 16—Master, George J. Schaible, Bridgeton, R. D. No. 1, Cumberland County.
Secretary, Walton E. Davis, Shiloh.
Lecturer, I. M. Sheppard, Shiloh.
Meets every Wednesday night, Grange Hall, Shiloh.

Cumberland, No. 18—Master, H. B. Hancock, Greenwich, Cumberland County.
Secretary, Sarah S. Hancock, Greenwich.
Lecturer, Mrs. Loren Clunn, Greenwich.
Meets first Monday evening each month.

Fenwick, No. 20—Master, Edwin Grosscup, Hancock's Bridge, Salem County.
Secretary, Anna E. Harris, Harmersville.
Lecturer, Myrtle Grosscup, Hancock's Bridge.
Meets every Thursday evening in Grange Hall, Harmersville.

Mannington, No. 25—Master, Linwood Patrick, Salem, Salem County.
Secretary, Lida N. Hamilton, Salem, Salem County.
Lecturer, Acsa Austin, Woodstown, Salem County.
Meets Tuesday evenings at Mannington Grange Hall.

Harrisonville, No. 26—Master, James B. Kirby, Mullica Hill, Gloucester County.
Secretary, Belle Kirby, Harrisonville.
Lecturer, Annabel Conover, Harrisonville.
Meets Tuesday evenings in Grange Hall.

Elmer, No. 29—Master, B. Walter Brooks, Elmer, Salem County.
Secretary, Mary W. Gaunt, Monroeville.
Lecturer, Laura A. Evans, Elmer.
Meets Wednesday evenings in Garrison's Hall.

Bridgeport, No. 32—Master, James Sweeney, Bridgeport, Cumberland County.
Secretary, C. B. Vicery, Bridgeport.
Lecturer, Elizabeth Hago, Swedesboro, R. D.
Meets every Tuesday evening at Bridgeport.

Cedarville, No. 34—Master, S. D. Starkey, Fairton, R. D. No. 1, Cumberland County.
Secretary, Miss Margaret Starkey, Fairton, R. D. No. 1.
Lecturer, Miss Lida W. Dunsafe, Cedarville.
Meets first and third Thursday evenings, Jerrell Hall, Cedarville.

Medford, No. 36—Master, Herbert Cochley, Medford, Burlington County.
Secretary, Julia S. Haines, Medford.
Lecturer, Almeda Wilkins, Medford.
Meets Thursday afternoons from December 1 to April 1; first and third Thursday afternoons of April, May, September, October and November; first and third Tuesday nights of June, July and August.

Haddon, No. 38—Master, Joseph Sharp, Haddonfield, R. D., Camden County.
Secretary, W. R. Stafford, Marlton, R. D.
Lecturer, Viola Garwood, Ashland.
Meets Wednesday afternoons, November to April; Saturday evenings, balance of the year.

Mantua, No. 39—Master, Alexander D. Burt, Wenonah, Gloucester County.
Secretary, Geneva M. Burt, Wenonah.
Lecturer, Deborah Kirkbride, Sewell, R. D.
Meets Monday evenings, Y. M. C. A. Hall, Wenonah.

Windsor, No. 40—Master, Leon Mount, Trenton, R. D. No. 2, Mercer County.
Secretary, R. D. Perrine, Windsor.
Lecturer, J. Addison Ely, Robbinsville, R. D. No. 1.
Meets second and fourth Tuesdays.

Hope, No. 43—Master, Leslie A. Platts, Bridgeton, R. D. No. 3, Cumberland County.
Secretary, Elizabeth Miller, Bridgeton, R. D. No. 4.
Lecturer, Mrs. Mary D. Miller, Bridgeton, R. D. No. 2.
Meets first and third Tuesday evenings in Grange Hall, Lower Hopewell.

Marlton, No. 45—Master, Clifford Atkinson, Marlton, Burlington County.
Secretary, Caroline S. E. Wills, Marlton.
Lecturer, Florence Winner, Marlton.
Meets in Endicott's Hall, Tuesday afternoons, December to March; first and third Tuesday evenings, balance of the year.

Pemberton, No. 50—Master, G. Harold Porter, Pemberton, Burlington County.
Secretary, F. M. Hargrove, Vincentown.
Lecturer, Georgia Rosbach, Pemberton.
Meets first and third Friday evenings in Grange Hall.

Mullica Hill, No. 51—Master, Asa Moore, Mullica Hill, Gloucester County.
Secretary, Anna G. Tonkin, Mullica Hill.
Lecturer, Elizabeth Gardiner, Mullica Hill.
Meets Tuesday evenings in Grange Hall.

Deerfield, No. 52—Master, Howard B. Padgett, Deerfield, Cumberland County.
Secretary, Frank L. Ott, Bridgeton, R. D. 5.
Lecturer, Mrs. F. O. Ware, Deerfield.
Meets Wednesday evenings in Brotherhood Hall, Deerfield.

Centre Grove, No. 57—Master, Charles F. Earle, Millville, R. D. No. 1, Cumberland County.
Secretary, Evelyn Earle, Millville, R. D. No. 1.
Lecturer, William Taylor, Millville, R. D. No. 1.
Meets second and fourth Wednesday evenings, Centre Grove School House.

Columbus, No. 58—Master, William E. Shinn, Columbus, Burlington County.
Secretary, Reba J. Sharp, Columbus.
Lecturer—Mrs. Ella Lippincott, Bordentown.
Meets every other Friday evening from January 1, in Grange Hall, Columbus.

Thorofare, No. 59—Master, Harry Windish, Thorofare, Gloucester County.
Secretary, Charles H. Budd, Thorofare.
Lecturer, Margaretta Low, Thorofare.
Meets Monday evenings at Thorofare.

Courses Landing, No. 60—Master, Lambert C. Richman, Woodstown, Salem County.
Secretary, Gertrude W. Freas, Sharptown.
Lecturer—Eva DuBois, Woodstown, R. D.
Meets Tuesday evenings in K. of P. Hall, Sharptown.

Crosswicks, No. 61—Master, Howard M. Rogers, Crosswicks, Burlington County.
Secretary, Emma Margerum, Crosswicks.
Lecturer, Carrie Bowers, Yardville.
Meets second and fourth Saturday evenings, Orthodox School House.

Pennington, No. 64—Master, A. T. Blackwell, Harbourton, Mercer County.
Secretary, William Drake, Pennington, R. D. No. 1.
Lecturer, Mrs. S. S. Hixson, Harbourton.
Meets second and fourth Saturday afternoons.

Vincentown, No. 67—Master, John Copperthwaite, Vincentown, Burlington County.
Secretary, Mrs. F. Githens, Vincentown.
Lecturer, Mrs. Kezzie Atkinson, Vincentown.
Meets every Saturday evening in Grange Hall, Vincentown.

Ewing, No. 73—Master, Hadoram M. Fine, Trenton, R. D. No. 1, Mercer County.
Secretary, William H. Cadwallader, Trenton, R. D. No. 1, Mercer County.
Lecturer, Mrs. S. J. Vernon, Trenton R. D. No. 1, Mercer County.
Meets first and third Tuesday evening, Church House, Ewing.

Mercer, No. 77—Master, John Stout, Hopewell, R. D., Mercer County.
Secretary, J. M. Dalrymple, Hopewell, Box 116.
Lecturer, Mrs. Annie M. Conover, Hopewell, R. D.
Meets second and fourth Saturday afternoons in Grange Hall, Hopewell.

Wantage, No. 78—Master, Eugene A. Slaughter, Sussex, Sussex County.
Secretary, Mrs. Evi Vandruff, Sussex.
Lecturer, Mrs. Ida Roy, Sussex.
Meets first and third Wednesday evenings in Grange Hall at Sussex.

Hamilton, No. 79—Master, Winfield S. Lee, Hamilton Square, Mercer County.
Secretary, R. E. Haines, Robbinsville.
Lecturer, Bessie Condict, Robbinsville.
Meets first Tuesday afternoon, third Tuesday evening, from October to March; evenings, balance of year.

Friesburg, No. 81—Master, Thomas E. Roork, Elmer, R. D. No. 3, Salem County.
Secretary, Attie D. Loveland, Bridgeton, R. D. No. 8, Salem County.
Lecturer, Mrs. Kate Sigars, Bridgeton, R. D. No. 8, Salem County.
Meets Tuesday evenings at Friesburg Grange Hall.

Williamstown, No. 85—Master, James Taggart, Franklinville, Gloucester County.
Secretary, Grace Ritchie, Williamstown.
Lecturer, Meta Taggart, Franklinville, R. D.
Meets second and fourth Tuesday evenings from November to May; every Tuesday balance of year, in Grange Hall.

Locktown, No. 88—Master, Lester B. Sherman, Flemington, R. D. No. 2, Hunterdon County.
Secretary, Harry B. Bodine, Flemington, R. D. No. 2.
Lecturer, Ellen V. Goodell, Flemington, R. D. No. 2.
Meets every Tuesday evening, Grange Hall, Locktown.

Blackwood, No. 90—Master, E. J. Cunard, Blackwood, Camden County.
Secretary, Martin Schubert, Laurel Springs.
Lecturer, Josephine Severns, Blackwood, R. D.
Meets every Saturday evening in Grange Hall.

Monmouth, No. 92—Master, G. L. DuBois, Freehold, Monmouth County.
Secretary, G. W. Blatchley, Jr., Freehold.
Lecturer, H. E. Taylor, Freehold.
Meets first and third Wednesdays.

Hightstown, No. 96—Master, George Davison, Cranbury, Middlesex County.
Secretary, Frank C. Danser, Cranbury.
Lecturer, Hattie E. Cunningham, Hightstown.
Meets every Saturday afternoon, December to March; second and fourth Saturday evenings balance of year.

Liberty, No. 99—Master, D. H. Taylor, Bradevelt, Monmouth County.
Secretary, S. B. Wells, Marlboro, Monmouth County.
Lecturer, Rev. William W. Hoagland, Marlboro, Monmouth County.
Meets second and fourth Wednesdays in Grange Hall at Bradevelt.

Sergeantsville, No. 101—Master, Percy W. Bush, Stockton, R. D. No. 1, Hunterdon County.
Secretary, W. E. Rittenhouse, Stockton, R. D. No. 1.
Lecturer, Miss May F. Merrill, Sergeantsville.
Meets Saturday evenings in Grange Hall, Sergeantsville.

Livingston, No. 104—Master, A. W. Fund, Chatham, R. D., Essex County.
Secretary, J. H. M. Cook, Essex Fells.
Lecturer, Mrs. Mary Edwards, Chatham, R. D.
Meets first and third Thursday evenings, Mechanics' Hall at Livingston.

Morris, No. 105—Master, A. M. Webb, Hanover, Morris County.
Secretary, A. L. Reinmann, Jr., Hanover, Morris County.
Lecturer, Mrs. Louise Young, Whippany, R. D., Morris County.
Meets second and fourth Tuesdays.

Caldwell, No. 107—Master, Austin E. Hedden, Verona, Essex County.
Secretary, Mrs. A. E. Hedden, Verona.
Lecturer, Richard C. Campbell, Verona.
Meets second and fourth Thursday evenings.

Roseland, No. 108—Master, Marcus W. DeCamp, Roseland, Essex County.
Secretary, E. Oscar DeCamp, Roseland, Essex County.
Lecturer, Mrs. J. K. Ellison, Roseland, Essex County.
Meets second and fourth Tuesday evenings in Grange Hall at Roseland.

Warren, No. 110—Master, Frank Housel, Broadway, R. D., Warren County.
Secretary, Mrs. May Oberly Groff, Broadway.
Lecturer, Joseph Banghart, Broadway, R. D.
Meets first and third Tuesday evenings in Grange Hall, Broadway.

Mickleton, No. 111—Master, Walter Owen, Paulsboro, Gloucester County.
Secretary, Benjamin C. Heritage, Mickleton.
Lecturer, Elena M. Gerner, Clarksboro.
Meets Thursday evenings in Grange Hall, at Mickleton.

Hurffville, No. 115—Master, Benjamin F. James, Pitman, Gloucester County.
Secretary, Walton H. Chew, Pitman, Gloucester County.
Lecturer, C. J. Davenport, Sewell, R. D. No. 1, Gloucester County.
Meets Saturday evenings in Davenport's Hall, Hurffville.

Rocksburg, No. 116—Master, Van Young, Phillipsburg, R. D., Warren County.
Secretary, Warren Herman, Phillipsburg, R. D.
Lecturer, Flossie Bachman, Stewartsville, R. D.
Meets every two weeks.

Washington, No. 117—Master, S. T. Bowman, Washington, Warren County.
Secretary, Mrs. Jos. Bodine, Washington.
Lecturer, Mrs. Henry Race, Oxford.
Meets first and third Thursday.

Oak Grove, No. 119—Master, Charles E. Bird, Pittstown, Hunterdon County.
Secretary, Miss Lillie Grassing, Pittstown.
Lecturer, Howard Robinson, Pittstown.
Meets Tuesday evenings in Grange Hall.

Aura, No. 122—Master, John L. Miller, Glassboro, R. D., Gloucester County.
Secretary, Joseph Guest, Aura.
Lecturer, Phebe Guest, Aura.
Meets Wednesday evenings in Grange Hall, Aura.

Cross Keys, No. 123—Master, Albert Lewis, Williamstown, Gloucester County.
Secretary, Jacob Harper, Williamstown.
Lecturer, Stella M. Hurff, Williamstown.
Meets Saturday evenings in Hurff's Hall.

Grand View, No. 124—Master, James J. Higgins, Flemington, Hunterdon County.
Secretary, William Y. Holt, Flemington, Hunterdon County.
Lecturer, Edward P. Nief, Flemington, Hunterdon County.
Meets Saturday nights, April to October; balance of year Wednesday nights.

Riverside, No. 125—Master, William S. Davis, Three Bridges, Hunterdon County.
Secretary, W. W. Foster, Three Bridges.
Lecturer, Mrs. Josie Lane, Three Bridges, R. D.
Meets every Saturday evening in Grange Hall, at Three Bridges.

Delaware, No. 126—Master, I. S. Appleman, Columbia, Warren County.
Secretary, J. H. Albertson, Delaware.
Lecturer, Elizabeth Hartung, Delaware.
Meets first and third Fridays.

Iona, No. 127—Master Edgar Revere, Franklinville, Gloucester County.
Secretary, Paul Browning, Monroeville.
Lecturer, Grace Sterling, Franklinville.
Meets Saturday evening, Nute's Hall, Franklinville.

Bergen, No. 129—Master, Joseph P. Winters, Ridgewood, Bergen County.
Secretary, Arthur Lozier, Ridgewood.
Lecturer, Mrs. L. F. Merrill, Hackensack.
Meets first and third Wednesdays in Grange Hall, Spring Valley Road.

Franklin, No. 130—Master, Leonard Pikaart, Midland Park, R. D., Bergen County.
Secretary, Mrs. J. Vanderhoff, Wyckoff.
Lecturer, Mrs. Leonard Pikaart, Midland Park, R. D.
Meets every Tuesday evening in Grange Hall, Wycoff, except June, July and August, every two weeks.

Rancocas, No. 131—Master, Charles E. Shinn, Jr., Burlington, R. D. No. 1, Burlington County.
Secretary, Mrs. Nancy M. Leeds, Rancocas.
Lecturer, Mrs. Laura T. Lundy, Rancocas.
Meets first Wednesday afternoon, third Wednesday evening, from April to November; balance of year every Wednesday afternoon.

Cold Spring, No. 132—Master, David MacPherson, Cape May City, Cape May County.
Secretary, Alexander Lyle, Erma.
Lecturer, Mrs. Frank E. Bate, Fishing Creek.
Meets Monday evenings.

Hickory, No. 133—Master, A. B. McCrea, Pattenburg, Hunterdon County.
Secretary, Charles D. Tharp, Pattenburg.
Lecturer, Goldie Zick, Pattenburg.
Meets Wednesday evenings near Pattenburg.

Ramsey, No. 135—Master, Jacob C. Straut, Allendale, R. D., Bergen County.
Secretary, Alice Young, Mahwah.
Lecturer, Edward Smith, Allendale, R. D.
Meets Tuesday nights.

Lincoln, No. 136—Master, William H. Bomm, Westwood, R. D. No. 2, Bergen County.
Secretary, Lila E. Bomm, Westwood, R. D. No. 2.
Lecturer, Mary J. Ludwig, Westwood, R. D. No. 2.
Meets second and fourth Wednesdays, in Westwood.

Berlin, No. 138—Master, H. H. Gillon, Berlin, Camden County.
Secretary, X. F. Ottiger, Berlin, Camden County.
Lecturer, Anna M. Gillon, Berlin, Camden County.
Meets Tuesday evenings in Grange Hall, Broad Street, Berlin.

Tuckahoe, No. 139—Master, J. Alfred Reeves, Tuckahoe, Cape May County.
Secretary, Z. A. Townsend, Tuckahoe.
Lecturer, Alice E. Stewart, Tuckahoe.
Meets first and third Friday evenings in Mechanics' Hall.

Montague, No. 140—Master, John Scheets, Port Jervis, R. D. No. 1, New York.
Secretary, Harry E. Cortright, Port Jervis.
Lecturer, John Middleton, Port Jervis.
Meets second and fourth Saturday evenings.

Pascack, No. 141—Master, John J. Brickell, Park Ridge, Bergen County.
Secretary, E. M. Lyman, Park Ridge.
Lecturer, Mrs. F. M. Curtis, Harrington Park.
Meets second and fourth Saturday evenings in Borough Hall, Woodcliff Lake.

Olive Branch, No. 142—Master, L. H. Stemler, Matawan, R. D. No. 1, Monmouth County.
Secretary, J. H. Douglass, Matawan, R. D. No. 1.
Lecturer, R. V. Crine, Morganville.
Meets Thursday evening, October to April; every two weeks balance of year.

Delaware Valley, No. 143—Master, Ira Stoll Layton, Sussex County.
Secretary, George E. Hursh, Layton.
Lecturer, Frank Stoll, Layton.
Meets first and third Saturday evenings in Grange Hall, at Layton.

Saddle River, No. 144—Master, J. O. Ackerman, Saddle River, Bergen County.
Secretary, Agnes C. Leamon, Saddle River.
Lecturer, E. F. Conklin, Saddle River.
Meets first and third Wednesday in Association Hall.

Wayne Township, No. 145—Master, Aaron Laauwe, Paterson, R. D. No. 1, Passaic County.
Secretary, C. Fred Day, Paterson, R. D. No. 1.
Lecturer, John Lobb, Paterson, R. D. No. 3.
Meets first and third Thursday in Grange Hall, at Preakness.

Egg Harbor, No. 146—Master, Henry Tapken, Egg Harbor, R. D., Atlantic County.
Secretary, Harry Baum, Egg Harbor, R. D.
Lecturer, L. A. Young, Egg Harbor.
Meets first and third Saturday evenings, in Golden Eagle Hall.

Wrightstown, No. 147—Master, Clifford Borden, Wrightstown, Burlington County.
Secretary, Rosha Thompson, Wrightstown, Burlington County.
Lecturer, Edward West, Wrightstown, Burlington County.
Meets second and fourth Wednesday evenings in Mechanics' Hall.

Stanton, No. 148—Master, John V. Painter, Lebanon, R. D., Hunterdon County.
Secretary, James W. Lare, Flemington, R. D. No. 1.
Lecturer, Emma A. Anderson, Lebanon, R. D. No. 1.
Meets Thursday evenings in Grange Hall, at Stanton Station.

North Arlington, No. 149—Master, P. J. O'Malley, North Arlington, Bergen County.
Secretary, Edward Favier, Lyndhurst.
Lecturer, Celia Brandenburg, North Arlington.
Meets second and fourth Saturdays.

Burlington, No. 150—Master, William H. Bodine, Florence, Burlington County.
Secretary, Hannah E. Shedaker, Burlington.
Lecturer, Fannie McIntyre, Burlington.
Meets Saturday afternoons, December to March; evenings balance of year.

Milltown, No. 151—Master, George Redshaw, Jr., New Brunswick, R. D. No. 3, Middlesex County.
Secretary, Joseph J. Smith, South River, Box 294.
Lecturer, Mrs. Frank Smith, New Brunswick, R. D. No. 3.
Meets second and fourth Wednesday evenings in Mechanics' Hall, Milltown.

New Market, No. 152—Master, Everett Marshall, New Brunswick, R. D. No. 2, Middlesex County.
Secretary, B. De Witt Giles, New Market, Middlesex County.
Lecturer, Mrs. Jessie Randolph, New Brunswick, R. D. No. 1, Middlesex County.
Meets second and fourth Thursday evenings.

Raritan Valley, No. 153—Master, S. D. Opie, Neshanic Station, Somerset County.
Secretary, Mrs. C. S. Phillips, South Branch.
Lecturer, D. K. Scott, South Branch.
Meets second and fourth Monday evenings in Grange Hall, South Branch.

Fair Lawn, No 155—Master, Aaron Courter, Fair Lawn, Bergen County.
Secretary, Albert I. Ackerman, Ridgewood, R. D. No. 2.
Lecturer, Mrs. Amy Bogert, Fair Lawn.
Meets first and third Monday evenings in Grange Hall, Fair Lawn.

Raritan, No. 156—Master, J. P. Brower, Keyport, Monmouth County.
Secretary, Harry M. Aumack, Keyport.
Lecturer, William S. Brower, Keyport.
Meets second and fourth Wednesday evenings the year round; first and third Wednesday afternoons, December to March.

Farmingdale, No. 157—Master, Max Lamont, Farmingdale, Monmouth County.
Secretary, Mrs. C. C. Basley, Farmingdale, R. D. No. 2.
Lecturer, Miss Susie Ketcham, Farmingdale, R. D. No. 1.
Meets first and third Friday evenings.

Whitehouse, No. 159—Master, P. Davis Reed, Whitehouse, Hunterdon County.
Secretary, Miss Ethel M. Burdette, Whitehouse.
Lecturer, W. A. Drinkwater, Whitehouse.
Meets Saturday afternoons, October to April; evenings balance of year.

Frankford, No. 160—Master, Linus Clark, Branchville, Sussex County.
Secretary, Mrs. R. V. Armstrong, Augusta.
Lecturer, Mrs. William R. Bale, Augusta.
Meets second Saturday, at 1:30 P. M., in Cook's Hall, Branchville.

Shrewsbury, No. 161—Master, Henry McLeon, Red Bank, Monmouth County.
Secretary, Frank A. Bloodgood, Red Bank.
Lecturer, Henry Coe, Jr., Red Bank.
Meets first and third Tuesday evenings at Red Bank.

South Seaville, No. 162—Master, Frank Swain, Swainton, Cape May County.
Secretary, Clara D. Townsend, South Seaville.
Lecturer, Hattie N. Fidler, South Dennis.
Meets second and fourth Tuesday evenings at South Seaville.

Titusville, No. 163—Master, William H. Blackwell, Titusville, Mercer County.
Secretary, J. Hart Smith, Titusville.
Lecturer, Charles H. Olmstead, Titusville.
Meets first and third Saturday afternoons, December to April; balance of year first Tuesday evening, third Saturday afternoon.

Hardyston, No. 164—Master, John S. Katzinstien, Franklin, Sussex County.
Secretary, George C. Smith, Hamburg.
Lecturer, Mrs. E. K. Martin, Hamburg.
Meets first and third Monday evenings in Mechanics' Hall, Hamburg.

Farmers' Enterprise, No. 165—Master, Clinton R. Hardin, Newton, R. D. No. 1, Sussex County.
Secretary, Charlie M. Crawn, Newton, R. D. No. 2.
Lecturer, William Iliff, Newton, R. D. No. 3.
Meets second and fourth Saturday in I. O. O. F. Hall, Newton.

Blue Anchor, No. 166—Master, Stephen Gardiner, Winslow, Atlantic County.
Secretary, Benj. Barrett, Blue Anchor.
Lecturer, Mrs. Stephen Gardiner, Winslow.
Meets first and third Saturday evenings at Blue Anchor.

Glendola, No. 168—Master, Edgar Bearmor, Belmar, R. D. No. 2, Monmouth County.
Secretary, Chester Thompson, Belmar, R. D. No. 2.
Lecturer, Mrs. Charles White, Belmar, R. D. No. 2.
Meets second and fourth Friday evenings in Mechanics' Hall, Glendola.

Millstone Valley, No. 169—Master, C. A. Wyckoff, Millstone, Somerset County.
Secretary, H. S. Van Nuys, Jr., Millstone.
Lecturer, Mrs. C. A. Wyckoff, Millstone.
Meets Friday afternoon in Winter; evenings in Summer.

Lawrenceville, No. 170—Master, J. Fred Brown, Princeton, R. D. No. 3, Mercer County.
Secretary, Mrs. Frank Applegate, 43 West State Street, Trenton.
Lecturer, Mrs. Mary J. Calkin, Princeton, R. D. No. 2.
Meets first and third Tuesday evenings, 7:45 P. M., in Grange Hall.

Washington Valley, No. 171—Master, A. L. Zimmerman, Martinsville, Somerset County.
Secretary, I. R. Penny, Martinsville.

Salem, No. 172—Master, W. Winfield Patrick, Salem, Salem County.
Secretary, Anna L. Reeves, Salem.
Lecturer, Anne Dickinson, Salem.
Meets Thursday evenings in Dennis Hall, Salem.

Stillwater, No. 177—Master, William C. Maines, Stillwater, Sussex County.
Secretary, Obadiah Van Horn, Stillwater.
Lecturer, Carrie M. Huff, Stillwater.
Meets first and third Saturday evenings.

Clayton, No. 179—Master, Edwin Wyckoff, Clayton, Gloucester County.
Secretary, Lewis S. Misskelley, Clayton.
Lecturer, Mary A. Nixon, Clayton.
Meets Saturday evenings in Down's Hall, Clayton.

Pedricktown, No. 180—Master, John D. Cook, Pedricktown, Salem County.
Secretary, C. B. Green, Pedricktown.
Lecturer, George Gaventa, Pedricktown.
Meets Wednesday evenings in Red Men's Hall, Pedricktown.

Westville, No. 182—Master, Carroll C. Headley, Westville, Gloucester County.
Secretary, Samuel H. Hewitt, Sr., Westville, Gloucester County.
Lecturer, Lavinia Headley, Westville, Gloucester County.
Meets Saturday evenings.

Acquackanonk, No. 183—Master, L. C. Conradi, Paterson, R. D. No. 2, Passaic.
Secretary, H. G. W. Henniger, Paterson, R. D. No. 2.
Lecturer, Mrs. S. E. Shuit, Paterson, R. D. No. 2.
Meets second and fourth Tuesday in Grange Hall at Richfield.

Plainsboro, No. 184—Master, Abel H. Updyke, Plainsboro, Middlesex County.
Secretary, H. A. Stults, Plainsboro.
Lecturer, Mrs. H. A. Stults, Plainsboro.
Meets first and third Monday evenings in Grange Hall, Plainsboro.

Rio Grande, No. 186—Master, W. D. Hand, Rio Grande, Cape May County.
Secretary, Edna Endicott, Rio Grande.
Lecturer, Emma Fisher, Rio Grande.
Meets first and third Tuesday evenings in Grange Hall, Rio Grande.

Moravian, No. 187—Master, Osmun Hildebrant, Delaware, R. D., Warren County.
Secretary, Noel M. Harris, Townsbury.
Lecturer, Mrs. George Pierson, Blairstown, R. D. No. 1.
Meets first and third Saturday evenings at Hope.

Passaic Township, No. 188—Master, Elber Bebout, Millington, R. D. No. 1, Morris County.
Secretary, Mrs. A. H. Faulkner, Millington, R. D. No. 1.
Lecturer, Mrs. G. B. Spencer, Chatham, R. D. No. 2.
Meets second and fourth Monday in Myersville Hall.

Manalapan, No. 190—Master, Cyrenius V. Aumack, Englishtown, Monmouth County.
Secretary, Francis G. Stockbridge, Englishtown.
Lecturer, Henry W. Herbert, Englishtown.
Meets every other Monday evening from January 11th, 1915, in Columbia Hall, Englishtown.

Cologne, No. 191—Master, William Hohneison, Egg Harbor, R. D., Atlantic County.
Secretary, J. L. Purzner, Egg Harbor, R. D.
Lecturer, Mrs. M. Mauroff, Egg Harbor, R. D.
Meets third Saturday and first Thursday.

Allenwood, No. 193—Master, L. J. Allen, Allenwood, Monmouth County.
Secretary, Peter Tilton, Allenwood.
Lecturer, Miss Frances Reynolds, Manasquan.
Meets first and third Thursday evenings in Mechanics' Hall, Allenwood.

Towaco, No. 194—Master, Ward Witty, Towaco, Morris County.
Secretary, Grant Yerbury, Towaco.
Lecturer, Ludwig Vogel, Towaco.
Meets first and third Tuesday evenings at Lyceum Hall.

North Haledon, No. 195—Master, Alexander Hay, Paterson, R. D. No. 3, Passaic.
Secretary, Julia D. Yahn, Paterson, R. D. No. 3.
Lecturer, C. Walter Ellis, Paterson, R. D. No. 3.
Meets every Wednesday evening in North Haledon Borough Hall.

Adelphia, No. 196—Master, Leon A. Barkalow, Adelphia, Monmouth County.
Secretary, Mrs. John Stricklen, Freehold, R. D. No. 3.
Lecturer, Mrs. M. F. Vossler, Farmingdale, R. D. No. 1.
Meets first and third Monday evenings in K. of P. Hall.

Newport, No. 197—Master, Harry Lore, Newport, Cumberland County.
Secretary, Morton Bradford, Newport.
Lecturer, Mrs. Mary Newcomb, Newport.
Meets Wednesday evenings.

Chester, No. 198—Master, Romeo Robinson, Chester, Morris County.
Secretary, Mrs. L. B. Tredway, Chester.
Lecturer, William H. Woodruff, Chester.
Meets second and fourth Friday evenings in Grange Hall.

Stone Harbor, No. 199—Master, Eli Townsend, Stone Harbor, Cape May.
Secretary, Mrs. O. S. Herbert, Stone Harbor, Box 205.
Lecturer, Miss Marie L. Van Thuyne, Stone Harbor.
Meets Saturday evenings in Harbor Inn.

Toms River, No. 200—Master, Charles W. Herflicker, Toms River, Ocean County.
Secretary, John Fischer, Silverton.
Lecturer, Mrs. C. L. King, Toms River.
Meets first Thursday evening in Mechanics' Hall.

Mt. Bethel, No. 201—Master, F. T. Horton, Plainfield, R. D. No. 3, Somerset County.
Secretary, Leslie Schumacher, Plainfield, R. D. No. 3.
Lecturer, Sol. Aarons, Plainfield, R. D. No. 3.
Meets second and fourth Friday evenings in Mountain House Hall, Mt. Bethel.

Millstone Central, No. 202—Master, James McKnight, Freehold, R. D. No. 4, Monmouth County.
Secretary, John V. Ely, Cream Ridge, R. D. No. 2.
Lecturer, Rose Pullen, Cream Ridge, R. D. No. 2.
Meets second and fourth Friday evenings in Red Men's Hall, Clarksburg.

Bargaintown, No. 203—Master, William Garwood, Linwood, Atlantic County.
Secretary, Roland Haggerty, Box 276, Pleasantville.
Lecturer, Miss Ethel Peters, Linwood, R. D.
Meets every other Tuesday from December 15th, 1914, in Bargaintown Hall.

Reports of County Boards of Agriculture.

ATLANTIC COUNTY.

OFFICERS FOR 1915.

President, JOHN HUENKE, ...Egg Harbor City, R. D.
Vice-President, PROF. A. J. RIDER, ...Hammonton
Secretary, WM. F. HOHNEISEN, ...Egg Harbor City, R. D.
Treasurer, WM. LIEPPE, ...Cologne.

The Atlantic County Board of Agriculture held four enthusiastic meetings during the year 1914. The first in Hammonton, on April 6th, was attended by 115 persons. Subject was, "Vocational Training." Well known speakers, like Mr. Crassman, Prof. A. J. Rider and Dr. Kendall gave a very exhaustive talk on the subject. The second, or largest meeting ever held by the Board, was at Germania, with an attendance of 250 enthusiastic people interested in agriculture. Speakers were: Prof. A. J. Rider, Jos. P. Abbott, Mayor Mueller, of Egg Harbor City. The third meeting was held at Bargaintown, with an attendance of 75. Vocational training and peach growing were discussed. The fourth annual meeting was held in Egg Harbor City on December 19th, afternoon and evening, with an attendance of 65. It was not so well attended owing to the stormy weather. Speakers were: A. J. Rider, L. Douglas, Mr. Smith, and Prof. Aubry, of New Jersey Experiment Station. All four of these meetings were held in connection with the Granges of the different places.

The year has proved what can be done if the County Boards and Granges work hand in hand. Our county has a farm demonstrator, appointed on November 1st, 1914, and also has started four vocational or agricultural schools in different sections, through the efforts of County Board and Granges.

The Atlantic county corn-growing and home-making contest, under the auspices of our public schools, proved a success. Prizes aggregating $150 were awarded at Court House at Mays Landing. The attendance that witnessed the distributing of the prizes shows that more of the people are taking interest in these affairs than used to do, as there were over 400 people from different parts of the county present.

We also had two institute meetings, one at Hammonton, with attendance of 101, and another at Cologne, with about 80 present. The County Board can look back with pride at what they have accomplished this last year.

Fraternally yours,

WM. F. HOHNEISEN,
Secretary.

BERGEN COUNTY.

OFFICERS.

President, FREDERICK M. CURTIS, ...Harrington Park
Vice-President, ISAAC A. HOPPER, ...Fair Lawn
Secretary, JOHN M. MYERS, ...Westwood, R. D. 2
Treasurer, FRED. V. STROHSAHL, ...Park Ridge

Board of Directors—P. A. Beardsley, F. Heine, J. H. Ackerman, John F. Bomm, Herman Tice, A. I. Ackerman, A. Lozier, J. J. Van Wagoner.
Delegate to State Board—Frederick M. Curtis.

Bergen county has been classed by some as a place of residence for city business men. Events of the past year gives proof that Bergen is more than that. This county is made up of every kind of soil, and one choosing to follow any special or general line of farming can find just the spot he or she might need. The north and western parts of the county are hilly and well adapted to horticulture. All kinds of fruit grow to perfection. In the central and southern parts are found choice locations for truck crops, with the best markets in the world within driving distance.

The Bergen County Board took a leading part in establishing a market in Jersey City late in the autumn. We have every reason to believe that this market will be one of the best and largest in the State.

Spraying outfits are coming more into use each year, which is bringing our fruit up to the highest standard of quality and beauty.

All kinds of berries and small fruits have always been special favorites of our farmers, and our nearness to market gives us a chance to have the fruit fully mature before picking. The peach orchards of good varieties are very profitable, and where located on elevations where late spring frosts do not destroy the blossoms an annual crop is quite sure to be harvested. Intensive farming has brought new problems, which we are now in shape to combat intelligently.

Early in the year we got the appointment of a farm demonstrator, L. F. Merrill, a graduate of the State College at New Brunswick, and for a time an instructor is at our service at all times. At the first indication of trouble with our trees, fruit or other crops, we call in Mr. Merrill as quickly as we would summon a doctor for a member of the family or the veterinarian for an ailing animal. His services are even more valuable in anticipating trouble.

Each year there is less fodder brought into the county, as our farmers are studying the crops that his stock must have. Silos are now on nearly every dairy farm. Alfalfa is grown successfully wherever it has been tried intelligently, except where conditions were entirely unsuited to the plant.

Two canning factories have been established and are turning out products that are eagerly sought by those who are good judges of quality.

The large peach crop this year was harvested with very little loss and marketed at fair prices. The apple crop was below the average and marketed at a low to medium price.

We held five Institutes during the year, which were attended by large and appreciative audiences. We held four quarterly or business meetings in our new rooms in the Court House. These rooms of the Bergen County Board are the headquarters or office of our Farm Demonstrator and all farm and stock papers, National and State bulletins and textbooks are on file. The farmers of the county have a right to feel proud of their calling and their dignified headquarters at the county seat.

JOHN M. MYERS.
Secretary.

BURLINGTON COUNTY.

Officers for 1915.

President, Fred Lippincott, ... Moorestown
Vice-President, C. Craig Tallman, ... Columbus
Secretary and Treasurer, H. H. Albertson, ... Burlington

Directors, Two Years—Robert C. Wills, Marlton; Morris Evans, Birmingham; Emmor Roberts, Moorestown; Charles P. Rue, Wrightstown; William T. Baggs, Burlington.

Directors, One Year—Harold Budd, Pemberton; Edward Rogers, Medford; Wright Longstreth, Jacobstown; Howard Haines, Rancocas; C. Craig Tallman, Columbus.

Delegates—State Board, one year, John B. Evans, Birmingham; State Board, two years, Edward Rogers, Medford.

Burlington county farmers do not feel boastful of their results from the year's work. Few fortunes were made by bumper crops, while some savings were wiped out by poor ones. The extreme drouth in the spring and fall and the generally cool summer and wet harvest were extraordinary. These climatic conditions seriously affected some early truck crops and the hay crop, and made grain harvest difficult and hazardous.

Depressing influences at work have lowered the prices of farm products, in common with most commodity prices. The average received for many crops has been below the average for the past few years, and in some cases has been below the cost of production. The increased demand for grain for export, on account of the European War, has to some extent counterbalanced other low prices, but as grain is not extensively grown by many farmers, especially the truckers, the increase in value of this kind of crop will not alone bring us general prosperity.

Potato growers have had a fairly good crop, which sold at moderately profitable prices early in the season. Fruit growers had an immense crop of apples and peaches, both of which sold at low figures. Several farmers shipped fruit by rail to points outside the State and to seashore towns by auto trucks, thus helping to relieve the glut in the Philadelphia market.

Corn was a good crop this year, and less mouldy than in recent years. Alfalfa proved its value again this year in supplementing a short hay crop in a dry season. Tomatoes, for canning, are a crop growing in favor, and there will probably be more acres planted to them next year.

Notwithstanding the high prices of dressed meat, and the demand for corn at a good figure, the prices of live animals at the farm are lower than they should be. Milch cows are selling well, and good horses and mules are quoted high. More of the work animals used on our farms might profitably be raised at home.

On July 29th the County Board held a successful summer meeting at the home farm of Horace Roberts, near Moorestown. About 800 people attended. One hundred and thirty automobiles were counted at the meeting. After addresses by Prof. Erret Wallace and Prof. M. A. Blake, and a lunch under the trees on the spacious lawn, the visitors went in trucks, wagons and automobiles to see the farms of Mr. Roberts and of Barton Brothers, adjoining.

There being sufficient sentiment in the county favorable to our having a farm demonstrator to convince the Superintendent of Demonstration Work, Prof. Alva Agee, that a demonstrator would find support here, steps were taken to secure an appropriation from the Board of Freeholders. Early in the year the farmers had a hearing before the Board, which appropriated $600 for the purpose. During the fall several men have been under consideration for the position, and one has been selected by Prof. Agee, after visiting the county and meeting several leading farmers. He will be likely to start work here before the first of the year.

The boys' and girls' contests have shown a growth in number of participants and in excellence of work. Those whose contributions and efforts have made the contests possible should feel that the outlay has been well worth while. We note visible results at the exhibition of products grown by the boys and made by the girls, but the best investment is a long time one, of character building and rural training, which will last through life.

So much for what is being done for the young folks living in the rural sections of our county. On the other hand, the question has been asked, "What can the boys and girls do for us?" To answer this question, William R. George, founder of the George Junior Republic, at Freeville, New York, a

self-governing community of boys and girls, has suggested that some of the pupils in the public schools could, with little effort, take a farm census that would be both useful to the State and National governments and instructive to the young people. The United States Department of Agriculture and our State Board are frequently sending blanks for crop reports and other agricultural information, to the County Board Secretary and to other farmers, and the answers when made are almost always based on more or less guess work. It is thought that the scholars could help in getting the accurate data wanted.

The plan is to have the teacher in each rural school choose four or five of her brightest boys and girls, and divide between them the portion of country represented by that school, so far as possible, by giving to each child selected, the road on which he or she comes to school. The junior census taker is then to visit each farm on the given road and get the information asked for. Taken together these school census reports would give as complete information on the questions asked as the farmers questioned were able to supply. If this were extended to include all of the schools, it should be as accurate a census as it is possible to obtain.

The best results, however, would be in giving to the boys and girls some responsibility, by doing a pleasant piece of work for the Government. It would connect the schools with the business side of rural life. It would acquaint the scholars with the common affairs of their own communities in an interesting way, which is not now always noticeable.

The Directors of the County Board of Agriculture, having the consent and approval of the plan from Prof. H. A. Stees, County Superintendent of Schools, decided to try it out in the schools of this county. Census blanks have been sent to teachers in the rural schools, with a letter explaining the plan. The success of the school census will, of course, depend primarily on the teachers, and also to a considerable amount on the farmers who are asked for data.

HENRY H. ALBERTSON,
Secretary.

CAMDEN COUNTY.

The Camden County Board of Agriculture held one meeting in November in connection with the Camden county corn contest meeting. The attendance was large, there being nearly one thousand people present. In the morning, Dean R. L. Watts, of State College, Pa., gave us a very interesting and inspiring address. Dr. Hadley, of New Brunswick, also gave a good address. In the afternoon, in connection with the corn contest, Mrs. Rose Morgan, of New York City, held her audience spellbound for over an hour. Dean Watts also made another inspiring address. Enthusiasm ran high, and I feel the Camden County Board of Agriculture is doing very effective work.

JOSEPH BARTON,
Secretary.

CAPE MAY COUNTY.

OFFICERS FOR 1915.

President, JOSEPH CAMP, ... Pierces
Vice-President, HOWARD HOFFMAN, ... Cold Spring
Secretary, RALPH SCHELLINGER, ... Green Creek
Treasurer, RALPH TAYLOR, ... Cold Spring

Delegates to State Board of Agriculture—Ralph Schellinger, one year; L. D. Compton, two years.

The Cape May County Board of Agriculture held two very good meetings during the year, one at Tuckahoe, February 26th, and one at Cape May Court House, November 6th, in connection with the boys' corn and potato-growing contest. These meetings were well attended and seemed to be of much interest.

Prof. Alva Agee addressed the Tuckahoe meeting, and Prof. Lipman, Director of the Experiment Station, was the principal speaker at the November meeting.

RALPH SCHELLINGER,
Secretary.

CUMBERLAND COUNTY.

Officers for 1915.

President, William E. Shoemaker, ... Bridgeton
Vice-President, Walton E. Davis, ... Shiloh
Secretary, A. M. Seabrook, ... Bridgeton
Treasurer, Leslie A. Platts, ... Bridgeton

The Cumberland County Board of Agriculture held two meetings in 1914. The annual meeting was held on August 19th. Little interest had been manifested in the Board for some time, and the last meeting, prior to the annual meeting, was held March 13th, 1913. The annual meeting was held at Tumbling Dam Park, in connection with the County Farmers' picnic. Only a few were present at the morning session, and after the election of officers and the transaction of the other business, some time was devoted to the consideration of plans and suggestions to revive the interest which had been on the wane for several years. It was decided to hold the next meeting early in December, and a committee was appointed to arrange a program.

There was a much larger number in attendance at the afternoon session. Mr. David Shropshire gave a very profitable address on "Legumes," William E. Shoemaker spoke on "Growing Alfalfa," A. M. Seabrook made a brief address on "Grading and Packing of Produce," and Mr. L. Willard Minch gave some valuable points on "Marketing."

The second meeting was held at Shiloh, on December 10th. The large Academy Hall was secured for this meeting. The program committee worked in co-operation with the Shiloh Grange to make the gathering interesting and successful. It proved to be one of the most largely attended meetings ever held by the Board. The afternoon session was devoted to the discussion of the following subjects: "What attractions or inducements do you deem necessary to keep our boys and girls on the farm?" "The relation of household equipment to rural life and its problems."

A number of instructive papers were read upon these subjects, one of them by a school girl, giving her views of some of the home attractions she thought necessary to attach the girls more closely to the farm. Several merchants had exhibits of household equipments for the inspection of the audience. J. J. Unger, County School Superintendent, made an address on "Co-operation," in which he asked for the co-operation of the County Board along educational lines. The Board unanimously voted to appoint a committee of three to co-operate with the general County Committee in their work.

The ladies of Shiloh Grange served luncheon to those who remained over for the evening session, and members of the Grange opened the evening meeting with a short literary and musical entertainment. This was followed with an illustrated lecture on "The economic value of our native birds," by Mr. Bennett K. Matlock, of Bridgeton. Views of many birds were shown upon the canvas, and their value to the farmers explained. This lecture

was peculiarly attractive and instructive. Nearly 200 people were present in the afternoon, and about 350 were in attendance in the evening.

Crops, with the exception of wheat, corn, apples, peaches, pears and grapes, have, as a rule, been light in this county, owing to the extremely dry weather. A few good rains in July and August proved a boon to the corn crop, and the yield was the heaviest in many years. Both early and late potatoes, hay, vegetable crops generally, strawberries and other small fruits were below the normal yield. There has been considerable increase in the acreage of alfalfa sown, as compared with last year.

A. M. SEABROOK,
Secretary.

ESSEX COUNTY.

OFFICERS FOR 1915.

President, A. W. FUND, ...Chatham
Vice-President, A. E. HEDDEN, ...Verona
Treasurer, GEO. E. DECAMP, ...Roseland
Secretary—GEO. P. F. MILLAR, ...Chatham

Delegates to the State Board For Two Years—A. E. Hedden, Verona, and E. O. Wettyen, alternate.

Directors—E. O. Wettyen, H. F. Harrison, A. E. Hedden, Joe H. M. Cook, Marcus DeCamp, William Deicks.

The agricultural review of the year 1914 is very favorable compared with the average. The year just passed was late in getting warm in the spring and later in the summer there was a severe drought which lasted late into the fall.

Trucking in Essex county is carried on in nearly all parts as the markets are so near. Some truckers grow for the wholesale markets, while others sell direct to the consumer and secure the retail price. Trucking this past year was not as profitable to the grower, for produce did not bring so large a price. Crops were larger, but the prices were so much lower that they did not bring as much as an average crop.

The dairy industry of the county is not to be overlooked, for dairying forms the source of income for a large portion of the inhabitants. The dairy herds are becoming larger and the small herds disappearing, giving better stables, better cows and purer milk. Alfalfa is keeping step with the dairy cow, more is being sown from year to year.

Fruit was a large crop—apples overbore, breaking the trees, peaches of all varieties bore well, older trees doing better than the younger ones; pears were well loaded but most varieties did not overload; cherries did well; strawberries, raspberries and blackcaps loaded up fine, but the blackberry was the exception, there being scarcely any on the wild ones, and only a very moderate crop on the cultivated ones.

The inhabitants of Essex feel proud of their poultry. Outside of the cities poultry is found in nearly every farm and yard, and we feel justly proud of our Essex County Poultry Association, which hold a very successful poultry show every year.

The Institute held under the auspices of the State Board of Agriculture was not so well attended as the officers hoped. Nevertheless lessons were learned, problems solved, and questions answered which were taken home and will be put in practice. Thus improved ideas will be seen in better dairies, better crops and better farms generally.

In conclusion, would say the year just passed was a year of plenty, the late spring holding the fruit buds back and keeping them from freezing and

giving a great set of fruit, the abundance of summer rain insuring full maturity, and with a dry fall to secure what the soil produced, making it a year of prosperity.

GEO. P. F. MILLAR,
Secretary.

GLOUCESTER COUNTY.

OFFICERS FOR 1915.

President, HENRY EDWARDS, ... Mullica Hill
Vice-President, EARL URION, ... Harrisonville
Secretary, MINNIE YOUNG, ... Swedesboro
Treasurer, WM. H. BORDEN, ... Mickleton

Gloucester County Board of Agriculture has held four regular meetings during the year, with an average attendance of 66; also, in co-operation with the State Board, held an Institute at Mullica Hill on the 19th of November, and another is scheduled for Williamstown on January 19th.

The season just passed has not been a very prosperous one for the average farmer of this locality. The cold, wet weather continued late in the spring, thus holding the farmers back with their spring work. Then about the time of setting out sweet potato plants came a long continued drought, so that it was hard to get the plants to live, in consequence of which the acreage put out in sweet potatoes was much below the average. Although the crop was short, the price was good, which made up in part for the shortage in yield.

The tomato season started off well and farmers were much encouraged with their prospects and for the week ending July 2d the shipments eclipsed all former years, over 42,000 crates being shipped from Swedesboro Station alone, but before the end of the month the heavy rains came, which had a great effect on the quality of the tomato, making it so watery they would not carry and the farmers were given a jolt from which it was hard to recover. The price dropped to 25 cents per crate and for the week ending July 25th the receipts to the farmers were approximately $80,000 less than the corresponding week of 1913.

There were shipped from Swedesboro Station during the year 1914: 9,964 crates asparagus, 478,644 crates tomatoes, 6,049 baskets tomatoes, 70,654 barrels sweet potatoes, 262,498 hampers sweet potatoes, besides a good many thousand baskets of tomatoes which were shipped by boat to the canning factories and other markets.

The hay crop was very short owing to the drought in the early part of the season. The apple and peach crops were unusually large, but comparatively few of the farmers of this section grow fruit very extensively.

MINNIE YOUNG,
Secretary.

HUNTERDON COUNTY.

OFFICERS FOR 1915.

President, E. T. BUSH, ... Stockton
Vice-President, WM. BELLIS, ... Copper Hill
Secretary, ROSCOE DEMOTT, ... Stanton
Treasurer, F. J. TOMLINSON, ... Pittstown

A meeting of the board was called during the noon recess of the State Institute held in the Court House, Flemington, November 20th, 1914, and the above-mentioned officers were elected and delegates appointed to represent

the board at the annual meeting of the State Board of Agriculture, the Horticultural Society and the State Beekeepers' Association.

In reporting crop conditions and yields for the past year we find it difficult to describe them in a manner that will do justice to the whole county. The corn crop was not up to that of the year before, due entirely to the dry weather during earing season, and the early frost that killed much of the later planting. However, early planted and well cultivated corn gave a good yield of well-ripened grain. Wheat was almost a total failure. Many fields barely returned the seed, while others gave from eight to twelve bushels per acre. Occasionally we would see a late sown field that had not suffered an attack of the Hessian fly that looked like giving a good crop. Oats and hay were both better than for two years previous to last year and were gathered in good condition. Potatoes were only a fair crop, but prices were good. The peach crop, in sections of the county suitable to that industry, was quite heavy, and prices much lower than for the past few years, good fruit averaging thirty and forty cents a basket, wholesale price.

The raising of young stock, both cattle and horses, is being practised to a greater degree than in former years and more and more the farmers are realizing the importance of growing their own dairy herd from good healthy, profitable cows and raising colts of a type that attracts the buyer or are able to easily work the heavy machinery used in modern farming. The dairy industry claims the attention of the majority of the farmers, but scattered here and there are a few swine farms and poultry plants. The prices received for the proceeds from both were quite encouraging last year. Pork brought from nine to thirteen cents per pound during October and November, and poultry, live and dressed, were in demand, bringing from twelve to sixteen cents, and eggs for the past few months, October, November and December, have been bringing forty and fifty cents per dozen in open market.

ROSCOE DE MOTT,
Secretary.

HUDSON COUNTY.

Organized December 28th, 1914.

OFFICERS.

President, THOS. LOUGHRAN, SR., ... West Hoboken
Vice-President, CHARLES BOLLING, ...
Secretary, FRANK FALLON, ...
Treasurer, JOHN GRAHAM, ...

Board of Directors—Daniel Y. Lewis, Samuel Hanler, Charles Forst.
Executive Committee—Ed. Schultz, E. Forshee, R. Searles, Geo. Veltman.

MERCER COUNTY.

The Mercer County Board of Agriculture held three enthusiastic meetings during the year 1914. The Thirtieth Annual Meeting, held in the Court House, Trenton, February 25th, was largely attended. The following subjects were discussed: "Captains and Their Executives," by Mrs. Harriett Fisher Andrews; "Improving the Farm Flock," by Prof. H. R. Lewis; "Securing Heavy Sods," by Mr. Henry Palmer. The Seventh Annual Field Meeting and Basket Picnic, at the beautiful home of Mr. C. Palmer West, near Allentown, on July 30th. Mr. John Nelson and Prof. Alva Algee gave

a discussion on "Alfalfa." There was a potato-sorting demonstration by Mr. John Hendrickson and Mr. Robert Dilatush. The day was fine, and there were fully 500 present.

The County Board and Farmers' Institute, in connection with the Public Schools' Contest and Exhibit, held a meeting in Odd Fellows' Hall, Pennington, on November 24th. Corn was the principal subject of discussion. Mr. F. W. Cruser spoke on "Corn Culture"; "How May I Increase the Yield," was discussed by Mr. D. P. Wilter, of New York State. Hon. Edward Casper Stokes favored with an address and presented the prizes for the Mercer County Board of Agriculture Corn and Potato Contest, and also the school prizes. Prof. M. A. Blake gave an address on "Rose Culture." All of our meetings have been well attended, and the farmers of Mercer county are looking forward to the coming meetings of the Board with interest. Our President, Mr. J. T. Allinson, has worked without ceasing to build the Board of Agriculture up to its present efficiency.

We have had one of the driest falls for many years, making it so that fall plowing for grain was very late, but the grain sowed on potato patches got a fine start. It also caused a scarcity of milk and cream, but with it all cows are selling for about $100 each. The pork crop was small, with good prices early in the season. Percentage about as follows: Wheat 80 per cent.; rye, 90 per cent.; oats, 85 per cent.; corn, 80 per cent.; hay, 70 per cent.; potatoes, 90 per cent.; peaches, 105 per cent.; apples, 75 per cent.

In conclusion, we are very grateful for the results of our labors for the year 1914, and are ready to put our hands to the plow with renewed energy this spring of 1915.

R. E. HAINES,
Secretary.

MIDDLESEX COUNTY.

Officers.

President, D. J. Perrine, ... New Brunswick
Vice-President, Wm. H. Giles, ...New Brunswick
Treasurer, Geo. Redshaw, Jr., ...
Secretary, W. B. Kurtz, ...Bound Brook

Executive Committee—A. L. Clark, Chairman, New Brunswick.

Reviewing the work and conditions in Middlesex county during the year, we learn there is a tendency towards specific lines, rather than general farming, due to market conditions and a more serious consideration of the adaptability of the soil to produce remunerative crops. This change has been stimulated in part by intelligent and comprehensive discussion of farm topics under the auspices of the County Board and local Granges.

The crops as a whole were produced at a profit; wheat, rye and corn were above the average yield. Hay and oats, while short, were a paying crop, owing to advance in price. All kinds of vegetables, except celery and cabbage and turnips, were abundant and prices remunerative. Fruits of all kinds yielded above average crops and prices were satisfactory, except in the case of peaches, which, owing to a super-abundant crop, were sold as low as ten cents per 16-quart basket, the average prices ranging from twenty-five to ninety cents, as to quality and locality. Weather conditions were unfavorable to late varieties and considerable brown rot, especially among the early varieties. Many trees have died from disease.

The weather was dry until July 1st, followed by very wet during cultivating time, consequently the corn fields showed more weeds than usual at cutting time. The fall was so dry that seeding was delayed, and grain and

grass were slow in germinating, and the stand and condition are not as good as desired for wintering. Late fall rains and mild weather permitted fall plowing. Owing to drouth and high winds, the husking of corn was delayed later than usual. There are about 860 acres devoted to alfalfa production.

Dairying is on the decrease, owing to high price of cows and feed and low prices of milk, as well as more stringent rules and drastic measures governing the production and sale of milk.

The average farmer depends upon the nearby horse auction marts for his horses. As a result many inferior horses are used in this county, it being more economical to buy second-class horses in the spring and resell in the fall, than to winter any but the very best and necessary animals. Sheep and swine are not produced in sufficient numbers to supply the local markets, though the price of pork would enable every farmer to raise pork at a good profit.

Poultry and egg production is being boomed by interested and enthusiastic poultrymen, yet many persons previously in the business are either going out of business or are reducing their flocks. Many farmers do not consider it profitable to keep poultry as a side line, the high price of feed and low price of poultry precluding the possibility of a profit.

Price of land is steadily increasing, owing in part to the influx of the "Back to the Lander" and real estate promoters, who pay above the real market value, and in many instances convert producing into non-producing farms, except so far as to exploit some theory of farming or to promote personal ambitions, to the detriment of legitimate farming, and induce many to give options on their farms. To this cause more than any other is due the impoverished condition of many farms in this county.

While there has been nothing phenomenal in the work of this Board, there has been enough accomplished to demonstrate the usefulness of the Board to the average farmer. First of these is the successful agitation of the necessity of a public market in New Brunswick, where the farmer and his patrons can meet under more congenial and profitable conditions. This question was discussed in all its phases by his Honor Mayor Scott and representatives of political, economic and mercantile organizations and the County Board and Pomona Grange. As a result of this meeting a public market is assured. At this meeting was also inaugurated a corn-growing contest, for which prizes will be awarded at the December 28th meeting.

Mr. D. H. Jones, of Monmouth county, gave a lucid and comprehensive talk on "How to Grow 300 Bushels of Potatoes to the Acre," incidentally stating that the varieties were not such as the farmer cared to use on his own table. One point was particularly emphasized: that it pays to plow deeply and fertilize heavily.

The midsummer meeting was held as a field day on the farm of the President, whose general farming crops of potatoes, corn, wheat and hay showed the results of years of intelligent and intensive farming.

The autumn meeting was held as a field day at the model fruit farm and cold-storage plant of Mr. George Smith, South River, whose orchard of trees laden with fruit, free from disease or blemish, gave evidence that the care given them would be highly profitable, and was an inspiration for more insistent and persistent measures to grow good fruit. After partaking of refreshments, provided by our genial host, Mr. Hankinson, Farm Demonstrator, of Mercer county, gave an intelligent and practical review of the work a county demonstrator may accomplish, especially if he is a scientifically educated and energetic young man with enough practical experience to avoid making errors of judgment. This Board is not taking active measures to secure a demonstrator for this county. Mr. Martin, of the College Farm, gave a short practical lecture on diseases of fruit trees, and recommended heroic measures in dealing with such diseases as "little peach" and "yellows."

The November meeting was held in the Public Library, New Brunswick. After election of officers for the ensuing year and routine business, the

subject of "Orchard Sprays, How to Prepare and Apply," was ably presented by W. W. Oley, of the College Farm. "Green Manures and the Bumper Corn Crop," was discussed by D. P. Witter, of New York State Institute, from a different tangent from the ordinary, going into the fundamental principles of "the why" before presenting the "how" of this ever-increasing and important subject. It is regretted that this subject was not heard by every progressive farmer of the county, as it would result in one gigantic "corn contest," to the profit of all participating.

The December 28th meeting was held jointly with the Poultry Association and Granges, as an exhibition of everything of interest to the farmer and his family, in Brunswick Hall, New Brunswick.

In resumé, we report that the year past has been satisfactory to the average farmer, notwithstanding climatic conditions, and the eternal combat with diseases and pests. The Board, while numerically small, is accomplishing results in an unobtrusive manner in keeping up the interest, and spurring on to greater effort the farmers of this county, not only to produce two blades of grass where formerly but one grew, but to get a correspondingly profitable return for the production. Much of the success and interest manifest is due to the optimism, untiring zeal and energetic effort of our very efficient chairman of the Executive Committee.

W. B. KURTZ,
Secretray.

MONMOUTH COUNTY.

Officers for 1915.

President, Frank P. Jones, ... Freehold
Vice-President, J. C. Richdale, ... Phalanx
Secretary, D. H. Jones, ... Freehold
Treasurer, W. M. Moreau, ... Freehold

The Monmouth County Board of Agriculture is in as good a condition as usual. Three meetings were held the past year. At the first one, March 21st, 1914, in the Court House, Freehold, the principal speaker was Dr. J. G. Lipman, Director of Experiment Station. His subject was "The Experiment Station and the Farmer; Their Relation." The second meeting was held April 24th, 1914, in the Court House, Freehold. This was a meeting to better the corn crops, and Prof. F. C. Minkler gave a very interesting talk on "Corn Production." The third meeting was held in the Grammar School Auditorium in connection with the boys' agricultural corn contest, under the direction of the Y. M. C. A. The principal speakers were Prof. App. of Rutgers College, on "Better Corn." Mr. Wm. Collingwood, editor of the *Rural New Yorker,* gave a talk to the boys principally, but interested the older people as well.

We had a favorable season for most crops. Potatoes were extra good and a good price prevailed. Many acres gave a yield of over 100 barrels.

Corn, extra good crop and harvested in good shape.

Hay normal, price good.

Grain little below normal and much was spoiled by rain at harvest time.

Peaches, good crop, price fair.

Apples, extra good crop, price very low.

Berry crop normal, price good.

Small vegetables, such as cucumbers, peppers, tomatoes, cabbage, etc., good crop, prices low.

Horses, better grade is being brought in and sold by dealers of western horses. Mules the same, price high, very few raised.

Milch cows scarce and high, more being raised than in former years.

More beef stock is being raised than before on account of high price. Hired help more plentiful than usual.

Farm land still high and in demand. Many from Long Island and North Jersey coming here and buying farms.

D. H. JONES,
Secretary.

MORRIS COUNTY.

Officers for 1915.

President, G. E. Felch, ...Florham Park
Secretary-Treasurer, E. C. Hopping, ...Florham Park

Directors—G. E. Felch, Wm. F. Ely, D. A. Hopping, Wm. E. James, E. C. Hopping, Florham Park; James Cook, Hanover; S. E. Young, Rockaway; W. B. Lindsley, N. D. Goble, New Vernon; Wm. C. Spargo, Dover; S. C. Hicks, Morristown.

Delegates to the State Board—S. E. Young (2 years), Rockaway; Wm. C. Spargo (1 year), Dover.

The annual meeting of the Morris County Board of Agriculture was held in the Borough Hall, Florham Park, G. E. Felch, President of the Board, presiding. The Secretary's annual report and Treasurer's report were approved as read, when the regular order of business was suspended in order to give Prof. Alva Agee, of the Department of Agriculture, opportunity to explain to those present the advantages to be gained by having an Agricultural Demonstration Bureau established in Morris county. Prof. Agee's remarks were listened to very attentively, at the close of which many questions were asked in regard to the operations of the Bureau. Prof. Agee was given a hearty vote of thanks for his instructive address.

A motion by Mr. J. M. Hait, that the Morris County Board of Agriculture go on record as approving of a County Demonstration Bureau, was unanimously carried. The regular order of business being again taken up, the above officers for the ensuing year were elected. Seven names were presented for membership, and were accepted unanimously.

The official business being finished, the meeting was opened for general discussion, in which all seemed anxious to present their views on the different subjects, and it appeared that an agreeable as well as profitable meeting had been held; that farmers were beginning to realize the necessity of getting together; and the Morris County Board of Agriculture was not only growing in membership, but was coming to the front in all matters pertaining to agriculture, so much so that the committee appointed to draft a suitable inscription for the two handsome cups presented to the Union County Board of Agriculture, for competition throughout the State, by President Frelinghuysen, and won by the Morris County Board, was requested to have the matter attended to at an early date.

Two Institutes were held during the year, one at Florham Park and one at Dover. From the encouragement received it was decided to hold two Institutes during the winter.

In reviewing the condition of the farm and the farmers during the past year, we find that the early drought that was such a hindrance to the farmers during several years past did not present its usual appearance this year, in consequence of which very large crops of all kinds have been gathered throughout the county. We would make especial mention of peaches, which for a number of years have been a failure in Morris county. This year they returned to their natural self and produced abundantly, many baskets being left unsold. Altogether, we note the farmers in Morris

county, notwithstanding the effects of the European War, are in a more favorable condition than for several years.

The many poultry associations being established in Morris county give evidence that the poultry industry is fast coming to the front.

E. C. HOPPING,
Secretary.

OCEAN COUNTY.

OFFICERS FOR 1915.

President, JOHN W. JAMISON, ...Cassville
Vice-President, P. DAVITT, ...Toms River
Treasurer, H. R. WILLS, ...Toms River
Secretary, R. C. GRAHAM, ...Holmeson

Delegates—Two years, J. W. Jamison, Cassville; one year, R. C. Graham, Holmeson.

The Ocean County Board of Agriculture has had little success in the way of new members, five only having been added here, but promise of more in the near future. Some meetings have been interesting, while others have been small through the absence of members. The board is reorganized and fully determined to make this the best year it has ever had as far as lay in th members' power.

Crops have had a very peculiar season to a good many, but persistent energy has helped a great deal and has brought the farmer out and a little to spare, so they are encouraged. Late planted corn was hard to get up as the dry weather made it come up uneven, but the early planted has made a good crop and brought a good price. White potatoes averaged well and brought fair prices early, but fell off in price later. Sweet potatoes had only half crop and sold higher than last year. Pickles did not pay to handle.

Apples, peaches and pears not properly sprayed were of inferior quality and did not bring very high prices. Garden truck was in abundance and of good quality. Strawberries not a heavy crop but fair prices. There has been an over-production of cranberries as other fruit was so cheap and plentiful that the cranberry crop don't pay to harvest, while grain was up and down in price all along.

Pork is on the decline, not bringing as much by three cents per pound as earlier in the season. There are more hogs and more poultry raised than in former years and less cattle kept, as dairying is not preferred by most farmers. Winter grain looks promising, considering the dry fall months, as there was no rain to speak of for ninety-three days. There is an increased acreage sown to fall grain. The winter has been mild and a good deal of plowing is being done and if the climatic conditions are favorable there will be a struggle to see who can raise the biggest crops as the European war will have a tendency to increase the prices for our produce. Stock wintering good and no sickness reported.

There are very few public sales and not many farms changing hands as everybody is hoping for the trolley road to come that has been so long talked about. At the meeting held December 28th, 1914, the officers were elected as above.

R. C. GRAHAM,
Secretary.

PASSAIC COUNTY.

Officers for 1915.

President, Ira Mitchell, ...Paterson, R. F. D. No. 1
Vice-President, Fred C. Day, ...Paterson, R. F. D. No. 1
Secretary, Aaron Laauwe, ...Paterson, R. F. D. No. 1
Treasurer, Frank T. Torbet, ...Paterson, R. F. D. No. 1

The Passaic County Board of Agriculture held two meetings during the year 1914, the first on April 2d, at North Haledon, in connection with the North Haledon Grange, which was very largely attended. C. F. Day and George W. Winters, delegates to the State Board, reported what they had heard at the State Board of Agriculture meeting at Trenton. Walter C. Ellis, a graduate of the short course of the New Jersey College of Agriculture, read a very interesting paper on pure bred poultry. The time was then taken up with discussions on different topics of agriculture.

The next meeting was held on December 22d. We had a very small attendance on account of the night being very cold. Mr. L. F. Merrill, Bergen County Farm demonstrator, spoke on the benefit of having a farm demonstrator in Passaic county and on the benefits of cow testing associations. Mr. Curtis, President of the Bergen County Board of Agriculture, also spoke on the benefits of having a county farm demonstrator.

The farming conditions in Passaic county are in a fairly prospective condition. The hay crop was large but badly gathered on account of the continuous rainy weather. The potato crop was the best in many years and we received very good prices. The early cabbage crop was a very large one, but prices ruled low. The late cabbage crop was poor on account of the great drought we had during July and August.

Dairying in Passaic county is about the same as last year. Dairymen all complain of the high price of grain and the low price of milk.

Much talk about growing alfalfa, more lime being bought last year than ever before, showing that farmers are beginning to think and that the teachings of experiment stations are beginning to take effect.

AARON LAAUWE,
Secretary.

SALEM COUNTY.

Officers for the Year 1915.

President, Henry M. Loveland, ...Friesburg
P. O. address, Bridgeton R. D.
Vice-President, Maxwell Buzby, ...Woodstown
Treasurer, J. Gilbert Borton, ...Woodstown
Secretary, G. A. Duell, ...Woodstown

Executive Committee—Richard Ware, Collins B. Allen, Salem; Jesse L. Colson, Elmer; John P. Ridgway, Hancock's Bridge; Asher B. Waddington, Lewis Edwards, John G. Borton, Woodstown.

The board has held three meetings, all of which have been well attended and the subjects discussed have been especially interesting, instructive and varied.

Prof. Alva Agee was with us at the February meeting and gave us a very good talk upon "The High Cost of Living" from the farmer's view. Prof. Shimer, supervisor of public schools, at the April meeting had as his subject,

"The School with a Perfect Score," urging parents to co-operate with the Board of Education to secure proper buildings and surroundings, and with the teachers to reach this score without which no good teacher is satisfied.

Prof. John H. Voorhees attended the November meeting in Harmersville and talked upon "The Growing of a Profitable Crop of Corn." Other subjects discussed by our own members were "Winter Dairying," "The Effect of Removal of the Tariff Upon the Dairy Products of Our County," "Improved Machinery for the Farm," and a debate on *"Resolved,* That milk is more profitable for the farmer than potatoes." These were all ably talked upon and showed that the farmers are progressing.

It was urged at the February meeting that our freeholders should employ a county farm demonstrator, but after due consideration they did not feel that the appropriations for the year would permit it.

Owing to climatic conditions the crops of hay and potatoes were much below the average but wheat and corn were the best for many years. There will be much smaller acreage of potatoes and larger of corn planted this year. Owing to the high prices of cows, many of the farmers are raising their calves. Several have put in milking machines, which have proved quite satisfactory.

Five Farmers' Institutes were held in the county.

G. A. DUELL,
Secretary.

SOMERSET COUNTY.

Officers for 1915.

President, Charles S. Hamilton, ...Somerville, R. D. No. 4
Vice-President, Jacob D. Quick, ...
Secretary, Ellsworth Brokaw, ...Somerville

Directors—A. L. Nevius and Wm. C. Lane, Bedminster; Chas. L. Roberts and Thomas Douglas, Bernards; A. G. Van Nest (now deceased) and Tunis Eyck, Branchburg; Bernard Myers and Luther Martin, Bridgewater; Geo. B. Randolph and Peter Hageman, Franklin; Jacob D. Quick and Henry S. Van Nuys, Jr., Hillsborough; Louis D. Opie and John H. Drake, Montgomery; Chas. F. Debele and Geo. M. Beltham, North Plainfield; E. E. Cooper and Mark Stultz, Warren.

We have held three meetings and will hold another next month, making four for the year. Some were well attended, others were not. We organized a Prize Corn Growing Contest and quite an interest was manifested. Twenty-six entered the contest. Owing to the Farmers' Institute being held this month we haven't been able to round up our contestants with their exhibits.

Our season has been one of extremes, with very little rainfall, and, taking the year as a whole, it has not been a prosperous one for the farmers of our county. Owing to an outbreak of the foot and mouth disease in our county we are under quarantine. Have only heard of one herd being affected and doubtless the disease will be confined to one or two herds.

The regular crop rotation is generally followed and nearly all the products produced are fed upon the farm. Milk, eggs and hay are the money crops of many of our farmers. Alfalfa acreage about 250 acres in the county.

ELLSWORTH BROKAW,
Secretary.

SUSSEX COUNTY.

OFFICERS FOR 1915.

President, R. V. ARMSTRONG, ...
Vice-President, LINUS CLARK, ...
Secretary and Treasurer, THEO. M. ROE, ...

Delegate to State Board—R. V. Armstrong

At the meetings held the attendance was better than the preceding years. Much interest was manifested in the best means to pursue to get a good stand of alfalfa. A few of the members had successful crops, particularly Thomas Inslee, Irving Avery, John Katzenstein, Geo. P. McDonalds and Irving Roe. Crops, generally, come good, particularly hay, corn and the fruits. The apple crop was a heavy one, though the fruit was inferior in size and quality, due to long continued drought in late fall. The water problem has been a serious one to most farmers, the streams not filling up as usual in November.

We were particularly fortunate in not having any cases of the foot and mouth disease in our county, for which we are very thankful. Much active interest is shown in poultry, and larger flocks are on the increase. A successful poultry business seems to require much study and close attention.

THEO. M. ROE,
Secretary.

UNION COUNTY.

OFFICERS FOR 1915.

President, E. R. COLLINS, ...Westfield
Vice-President, G. E. LUDLOW, ...Cranford
Secretary, C. H. BREWER, ...Rahway
Treasurer, OGDEN WOODRUFF, ...Elizabeth

Eleven regular meetings and one special meeting was held by the Board during the year. As has been the custom the past few years, the Board has held meetings on special subjects, each of which was covered by specialists. Thus, "Pruning and Spraying," by Prof. Farley; "Care of Animals," by Prof. Minkler; and "Potatoes and Their Diseases," by Prof. Cook, were all given special prominence, and proved of great interest to all those in attendance at those meetings. While the growing of potatoes in the county has been on the decline for several seasons, the past year there has been a little increase, both in acreage and yield, the latter owing to a cool, rainy month of July, which while of no great benefit to other crops, and a detriment to haying and harvesting, helped the potato crop wonderfully. The crop season proved very unfavorable all the way through. Spring being later than usual, not much planting was done until after the middle of May, owing to wet and cold condition, and again later from July 28th to November 10th no rain was had, which caused a drought more severe than that of either the two seasons past, and some late crops were entire failures, notably turnips, which could scarcely be found anywhere in the county. Early crops of vegetables and fruits produced well, but at that time prices were so low that it did not pay to go to market, spinach and cabbage bringing only twenty-five cents per barrel, and green beans dropping to a very low mark, but only for a short time. Tomato crop was good and prices averaged well throughout the season. Strawberries and

raspberries produced well, and blackberries would have been large crop, but the drought the latter part of the season caused many to dry up on the bushes. Peaches too plentiful; small in size and rather poor in quality, prices averaging low. Apples scarce this spring, the off season in Union county. Pears plentiful, but small in size; the late varieties, owing to the drought, matured too soon and would not keep any length of time when harvested. Grapes would have made a large crop if conditions for ripening had not been especially unfavorable, some varieties being damaged more than others. Drought caused the foliage to drop, and the clusters of fruit shriveled and did not ripen, Brighton, Campbell's Early and Moore's Diamond on my grounds being a complete loss, while Concord, Niagara and Worden were damaged but little. The hay crop was good, but considerable of it damaged by the rainy weather during July, and some large fields could not be harvested until the month of August. Early planted corn, well tended before July, yielded fine crops, and the fall being very favorable for husking, the crop was housed in fine condition. Poultry interests in the county keeping up, and there seems to be an increased interest taken in swine the past year. Dairy interests about normal, and good cows very high in price. There is also more interest being taken in bees, and one of our last April meetings was devoted entirely to this subject, Prof. Carr, of the New Jersey Experiment Station giving a practical talk upon the care and management of bees. There is no doubt that bees are a great benefit to the fruit grower. I believe this from observations I have made in the neighborhood, but I do not like bees myself, as I am afraid of being stung.

The question of establishing a market in Elizabeth has been under discussion for some time, but no conclusion has been reached. This, no doubt, if it could be had, would not only benefit the people of the city, but be of advantage to many small growers of fruits and vegetables.

Several new members have been added to the Board the past year, and an increased interest is being shown both in horticulture and agriculture throughout the county, some of the schools taking the matter up under the guidance of their principals and the county superintendent of schools. There is about 25 acres in alfalfa in the county.

C. H. BREWER,
Secretary.

WARREN COUNTY.

Officers for 1915.

President, James I. Cook, ...Mt. Hermon
Vice-President, N. Warne, ...Broadway
Secretary and Treasurer, Chas. M. Oberly, ...Alpha

The Warren County Board of Agriculture held four meeting the past year, all of which were well attended. Many farmers are showing more interest in the meetings, and find that it is to their benefit to attend same, where they can discuss the different subjects presented.

With warm growing weather the last of April and first of May, the oats, corn and potatoes were planted in good condition, and they had plenty of rain to keep them growing. There was a fair crop of hay, but unfavorable weather to store it in the barns, on account of so much rain in haying time. This was also true of the wheat harvest. It was impossible to get it thoroughly dry to stack or store it. The Hessian Fly destroyed most of the wheat crop in Warren county this year. There was a good stand of young clover and alfalfa that was sown in the spring, making good pasture for the cattle until August, then there came a drought. Wells and springs began to dry up and farmers were compelled to draw water three and four

miles for their stock. We had one severe rain and wind in November, which helped to fill the springs and cisterns.

Corn, oats, apples, peaches, pears, cabbage and onions proved, on the average, a fair crop. Tomatoes looked very fine until the vines had attained full growth, when the rain destroyed most of the first bloom, and by the time the next bloom came it was too late for ripening. In consequence, the crop was light but the prices were higher, which partly compensated for the shortage in crop.

Home-grown dairy cows are highly recommended at the present time by many of the farmers, as dairy cows that are shipped to different parts of the State are the ones that often bring disease and cost the farmers thousands of dollars.

CHAS. M. OBERLY,
Secretary.

CONTENTS.

A.

B.

C.

E.

F.

G.

I.

M.

O.

P.

R.

S.

T.