STATE OF NEW JERSEY.

(1909)

Thirty-Seventh Annual Report

OF THE

State Board of Agriculture

1909

Printed By Order of the Legislature.

TRENTON, N. J.
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1910

To the Hon. John Franklin Fort, 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 1909.

FRANKLIN DYE,

Secretary.

Dated Trenton, December 21st, 1909.

State Board of Agriculture.

OFFICERS AND EXECUTIVE COMMITTEE FOR 1910.

PRESIDENT.

E. B. VOORHEES, ... New Brunswick.

VICE-PRESIDENT.

JOHN T. COX, ... White House.

TREASURER.

A. J. RIDER, ... Hammonton.

SECRETARY.

FRANKLIN DYE, ... Trenton.

GEORGE E. DeCAMP, ... Roseland.
JOHN M. LIPPINCOTT, ... Moorestown.
WALTER HERITAGE, ... Swedesboro.

STATE CHEMIST.

E. B. VOORHEES, A.M., ... New Brunswick.

STATE ENTOMOLOGIST.

JOHN B. SMITH, Sc.D., ... New Brunswick.

MISS AUGUSTA JOHNSON, STENOGRAPHER OF THE BOARD.

BOARD OF DIRECTORS.

New Jersey State Board of Agriculture.

CLASS A.

P. KENNEDY REEVES, ...Geological Survey.
ALEXANDER P. OWEN, ...
CHARLES C. BASLEY,..... } Board of Visitors, Agricultural College.
EDWARD B. VOORHEES, ...Professor of Agriculture.

CLASS B.

GEORGE W. F. GAUNT, ...Master of State Grange, P. of H.
JOHN T. COX, ...Secretary of State Grange, P. of H.

CLASS C.

DR. J. B. WARD, ... } State Horticultural Society.
JAMES C. HENDRICKSON, ... }
A. LOZIER, ...Bergen County Pomona Grange.
AMOR GAUNTT, ...Burlington County Pomona Grange.
JOHN JAGGARD, ...Camden and Atlantic County Pomona Grange.
WILLIAM H. TAYLOR,.....Cumberland County Pomona Grange.
HENRY B. VAN NESS, ...Central District Pomona Grange.
WILLIAM H. HOFFMAN, ...Gloucester County Pomona Grange.
W. H. OPIE, ...Hunterdon County Pomona Grange.
J. T. ALLINSON, ...Mercer County Pomona Grange.
WM. FITZ RANDOLPH, ...Middlesex and Somerset Co. Pomona Grange.
G. W. BLATCHELER, ...Monmouth County Pomona Grange.
LINWOOD WHARTON, ...Salem County Pomona Grange.
CHARLES M. CRAWN, ...Sussex County Pomona Grange.
J. H. ALBERTSON, ...Warren County Pomona Grange.

BOARD OF DIRECTORS.

NAME.	ADDRESS.	TERM.	COUNTY.
JOHN L. PURZNER, ...	Egg Harbor City, ...	2 years, ...	Atlantic.
JOSEPH BUTTERHOF, ...	Egg Harbor City, ...	1 year,.....	"
JOHN J. VAN WAGONER,..	N. Arlington, ...	2 years, ...	Bergen.
JOHN F. BOMM, ...	Westwood, ...	1 year,.....	"
C. CRAIG TALLMAN, ...	Columbus, ...	2 years, ...	Burlington.

NAME.	ADDRESS.	TERM.	COUNTY.
HENRY R. GILBERT,	Burlington,	1 year,	"
JOSEPH BARTON,	Marlton,	2 years,	Camden.
MARTIN SCHUBERT,	Kirkwood,	1 year,	"
RICHARD LLOYD,	Dias Creek,	2 years,	Cape May.
RALPH SCHELLINGER,	Green Creek,	1 year,	"
N. E. DIAMENT,	Cedarville,	2 years,	Cumberland.
ARTHUR P. SEABROOK,	Deerfield,	1 year,	"
AUGUST W. FUND,	Chatham,	2 years,	Essex.
CYRUS B. CRANE,	Caldwell,	1 year,	"
JESSE MULLEN,	Paulsboro,	2 years,	Gloucester,
A. CLARK GARDINER,	Mullica Hill,	1 year,	"
JAMES LANE,	White House Station,	2 years,	Hunterdon.
F. J. TOMLINSON,	Pittstown,	1 year,	"
R. ELLSWORTH HAINES,	Robbinsville, R. F. D. 2,	2 years,	Mercer.
J. M. DALRYMPLE,	Hopewell,	1 year,	"
JOHN B. PERRINE,	Cranbury,	2 years,	Middlesex.
GEORGE W. MOUNT,	Monmouth Junction,	1 year,	"
GEORGE T. REID,	Freehold, R. F. D. 5,	2 years,	Monmouth.
C. D. B. FORMAN,	Freehold,	1 year,	"
S. E. YOUNG,	New Vernon,	2 years,	Morris.
WILLIAM E. JAMES,	Florham Park,	1 year,	"
C. M. RORER,	Cassville,	2 years,	Ocean.
R. C. GRAHAM,	Holmeson,	1 year,	"
PETER MACDONALD,	Paterson, R. F. D.,	2 years,	Passaic.
IRA MITCHELL,	Paterson,	1 year,	"
E. B. WADDINGTON,	Woodstown,	2 years,	Salem.
JOHN G. BORTON,	Salem,	1 year,	"
A. V. D. POLHEMUS,	Franklin Park,	2 years,	Somerset.
BERNARD MEYER,	Finderne,	1 year,	"
THEODORE M. ROE,	Branchville,	2 years,	Sussex.
LINUS CLARK,	Branchville,	1 year,	"
E. R. COLLINS,	Westfield,	2 years,	Union.
G. E. LUDLOW,	Cranford,	1 year,	"
FRANK HOUSEL,	Broadway,	2 years,	Warren.
JACOB E. ALBERTSON,	Delaware,	1 year,	"

OTHER ASSOCIATIONS.

A. E. HAINES, ... Mount Laurel Farmers' Club.
A. J. RIDER, ... American Cranberry Growers' Association.
WM. W. CASE, ... New Jersey Bee Keepers' Association.
G. F. HARKER, ...
WM. HERBERT LOWE, ... } Veterinary Medical Association of New Jersey.
J. HARRY WOLSIEFFER, ... New Jersey League of Poultry Raisers.
WALTER W. SHUTE, ... E. B. Voorhees Agricultural Club.

PROCEEDINGS

OF THE

THIRTY-SEVENTH ANNUAL MEETING

OF THE

NEW JERSEY STATE BOARD OF AGRICULTURE

HELD AT THE

STATE HOUSE, TRENTON, NEW JERSEY

Wednesday, Thursday and Friday, January 19, 20, and 21, 1910.

STATE BOARD OF AGRICULTURE.

Thirty-Seventh Annual Meeting

FIRST DAY—MORNING SESSION.

WEDNESDAY, January 19th, 1910.

The meeting of the Board was called to order by the President, Dr. E. B. Voorhees, and was opened by prayer by the Rev. Mr. Tomlinson.

President Voorhees—The first order of business is the calling of the roll of delegates. The delegates will answer to their names as they are called by the Secretary.

Secretary Dye then called the roll and delegates responded from most of the organizations entitled to representation.

President Voorhees—There has been an organization perfected in New Brunswick among the short course students called the E. B. Voorhees Agricultural Club, and, according to our rules, they are entitled to a delegate. I think that is rather an important thing that the men who are receiving an education at New Brunswick should form a permanent Associaion, with general meetings held in New Brunswick during Farmers' week. They elected a delegate, Mr. John W. Shute, who will be here this afternoon.

On motion, the Association was admitted to membership in this Board, and the delegate received.

The following order of business was presented by Secretary Franklin Dye:

ORDER OF BUSINESS.

WEDNESDAY.

First Session.

10:30 A. M.–12:30 P. M.

Prayer.

Calling Roll of Delegates. All delegates are requested to be present at the opening session.

Presenting Order of Business.

Minutes of Last Meeting.

Announcing of Committees Appointed:

On Credentials.

On Resolutions.

On Treasurer's Accounts and any other Committees.

11:30 A. M.

Reading of Executive Committee's Report.

Report of State Grange, Hon. George W. F. Gaunt, W. M.

Report of Treasurer, Hon. Walter Heritage.

Report of Secretary of State Board.

Discussion of Report.

Report of Committee on Transportation and Freight Rates, E. R. Collins, Chairman.

Report of Committee on Fish and Game Laws, Chas. Collins, Chairman.

Introduction of Other Business.

Second Session.

2:00 P. M.–5:00 P. M.

Address by the Governor, Hon. John Franklin Fort.

Calling Roll of Absentees and Report of Committee on Credentials.

Appointment of a Committee, consisting of one member from each county duly represented, to nominate officers for the ensuing year (the members present from each county naming their members of this committee). Committee will report when ready.

2:30 P. M.

Report of The Live Stock Commission. F. C. Minkler, Professor of Animal Husbandry, State Agricultural College, New Brunswick, N. J., Secretary.

3:00 P. M.

Annual Address of President of the Board, Dr. Edward B. Voorhees.

4:00 P. M.

Report of Commission on Tuberculosis in Animals, by the Secretary.

4:15 P. M.

Plant Food and Its Application. W. D. Zinn, Phillipi, W. Va.

4:30 P. M.

Introduction of New Business.

Third Session.

7:30 P. M.

Suggestions from English and European Agriculture for the Farmers of the United States. W. I. Chamberlain, LL.D., Ohio Agricultural Experiment Station, Wooster, Ohio.

8:30 P. M.

Discussion of the Game Laws. Opened by Hon. B. C. Kuser, President Fish and Game Commissioners, Trenton, N. J.

THURSDAY.

Fourth Session.

9:30 A. M.–12:30 P. M.

Prayer.

Unfinished and New Business.

10:00 A. M.

Western Methods in Eastern Orcharding. F. C. Sears, Prof. Pomology, Massachusetts Agricultural College.

11:00 A. M.

Co-operation among Farmers; the Business Side. E. M. Tousley, Secretary-Treasurer Right Relationship League, Minneapolis, Minn.

Fifth Session.

2:00 P. M.–5:00 P. M.

The Dairy Situation. H. E. Cook, Dean Animal Husbandry and Dairying, St. Lawrence University, Canton, New York.

3:15 P. M.

The Poultry Industry: Some of Its Requirements. James E. Rice, Prof. Poultry Husbandry, Cornell University, Ithaca, N. Y. (This lecture will be freely illustrated with stereopticon views.)

4:30 P. M.

Methods of Agricultural Education. Carey W. Montgomery, Newark, Ohio.

Sixth Session.

7:45 P. M.

In Auditorium of State Normal School.

Music by the Orchestra and the Philomena Club of the State Schools.

Some Insect Invasions and the Fight Against Them. Richly illustrated stereopticon lecture by Dr. John B. Smith, State Entomologist, State Agricultural College, New Brunswick, N. J.

FRIDAY.

Seventh Session.

9:15 A. M.–12:30 P. M.

Prayer.

Unfinished Business.

10:15 A M.

Co-operation Among Farmers; the Principles Involved. Mr. Tousley.

11:30 A. M.

On motion the reading of the minutes of the last meeting was dispensed with.

President Voorhees then appointed the following Committees:

Credentials—John G. Borton, Woodstown, Salem county; William Fitzrandolph, New Brunswick, Middlesex county; Charles C. Basley, Maywood, Bergen county.

Resolutions—C. D. B. Forman, Freehold, Monmouth county; Joseph Barton, Marlton, Camden county; J. T. Allinson, Yardville, Mercer county.

Treasurer's Accounts—R. Ellsworth Haines, Robbinsville, Mercer county; W. H. Hoffman, Mickleton, Gloucester county.

President Voorhees—We will now hear the Executive Committee's Report.

The following report of the Executive Committee was read by Vice-President John T. Cox:

Report of Executive Committee.

"The Committee has held four meetings. At the April meeting Dr. Voorhees was appointed delegate to the meeting of the American Association of Farmers' Institute Workers, with power to appoint an alternate. Secretary reported as to the March Institutes and the Educational train of the Pennsylvania Railroad, stating that the train work was very successful.

"The June meeting was held in the absence of President Voorhees in Europe. The appropriations to the County Boards and to the State Horticultural Society were made as provided for by law. There were present at this meeting Dr. J. B. Ward and Secretary H. G. Taylor, of the State Horticultural Society, delegates to take action with our Committee, if thought best, to have the two Annual Meetings of the two organizations, State Horticultural and State Board, occur at a wider interval than has prevailed of late. After due consideration, it was mutually decided to hold the Horticultural Society Annual Meeting on December 21st, 22d, and this State Board on January 19th, 20th, 21st, 1910.

"Treasurer Heritage was appointed to act with the Secretary to arrange for the Summer Meeting at New Brunswick. For Farmers' Week, December 28th to January 1st, 1910, it was decided that it would add to the interest on that occasion if exhibits of suitable farm products could be collected for that purpose. The matter was referred to the Secretary.

"The desirability of securing a reliable speaker on Poultry and Egg Production for the next (this) Annual Meeting, with a view to issuing the address in bulletin form for general distribution, was approved.

"At the October meeting the Secretary submitted a list of Farmers' Institutes, places and dates, which was approved, and the matter of Railroad Institutes, or Educational train, to be considered later.

"At the January 18th, 1910, meeting, the usual Committees were appointed.

"Owing to the threatened invasion of our State by the Gypsy and Brown-tailed moth from especially Massachusetts, Rhode Island and Connecticut, we have asked the Legislature through the appropriation committee to allow Dr. John B. Smith, State Entomologist, $1,000 additional for this year's work, and $5,000 as the regular appropriation for the fiscal year beginning November 1st, 1910, in order that extra help may be employed to prevent, if possible, these pests from becoming established here. Your Committee urge not only our farmers and horticulturists, but all institutions possessing shade, ornamental or fruit trees, and all owners of private property adorned with shade trees, to use their influence with their members of the Legislature to secure the funds asked for. The insects named have cost Massachusetts millions of dollars already, and the end is not in sight. It will be wise statesmanship to act promptly in this matter, in order to prevent a greater expense later.

"Your Committee submits the program for this thirty-seventh annual meeting, believing the subjects chosen are timely, and will be found profitable to the agricultural interests of the State, trusting this meeting may not fall behind any of its predecessors in interest and usefulness."

Hon. George W. F. Gaunt, W. M., speaking upon the subject of the State Grange, said: "I do not desire to take the time of this meeting by extended remarks, and will only say that the State Grange of New Jersey was never in as prosperous a condition as an organization as it is at the present time, not only in the increase of membership and new organizations, but in influence the Grange is being felt more to-day than it ever was in the history of the Order."

Treasurer's Report.

REPORT OF WALTER HERITAGE, TREASURER, FOR THE FISCAL YEAR ENDING OCTOBER 31ST, 1909.

Dr.

To amount received from Comptroller during the year,		$5,923 64

Cr.

1909.			
Jan. 17.	By Delegates' expenses at Annual Meeting,		$431 56
	Speakers' expenses at Annual Meeting,		427 28
	Stenographer at Annual Meeting,		102 40
	Janitor and chairs,		24 50
	Lantern service during the year,		120 00
	Appropriations to County Boards,		520 00
	Appropriation to Horticultural Society,		300 00
	Express companies' bills,		184 74
	Packing Annual Reports,		10.00
	Postage stamps and postal cards,		375 78
	Executive Committee's expenses,		370 94
	Filing cabinet,		69 95
	Expenses of Farmers' Institutes,		2,976 49
	Expenses of stenographer, Farmers' Week,		10 00
	Total,		$5,923 64

The report was received and referred to the Auditing Committee.

REPORT OF AUDITING COMMITTEE.

The Auditing Committee have examined the accounts of the Treasurer, and find the same correct.

R. E. HAINES,
WM. H. HOFFMAN.

Secretary Dye's Annual Report to the New Jersey State Board of Agriculture, January 19th, 1910.

GENTLEMEN—The adverse possibilities connected with the practice of agriculture are many. Some of these, as certain insect enemies, blights and fungus troubles, are known, and farmers prepare to hold them in check or subdue them, if that be possible, each year. There are others, as late spring and early autumn frosts, excess of moisture at certain periods of the season's work, or long continued drought when crops are maturing, that may materialize during the farming season at any time, for which the farmer is not prepared, and which it is not possible for him to guard against so as to prevent loss. Sometimes all these unfavorable conditions of weather and the hordes of insect pests combine, and when they do, the situation becomes serious. This was the case to a large extent during the crop-producing season of 1909 throughout the State of New Jersey, and as a result the yield of a number of the most valuable crops was reduced far below the average of a good year.

The farmers began the year's work full of hope, as they usually do, their plans were made for a crop in excess of any previous year, and if the yields for 1909 had been as good as they were in 1908, at the prices prevailing this year, the total gross returns would have been $63,864,937, or $4,506,982 in excess of last year. Even with the reduced yield of this year, with a slightly increased acreage of corn, wheat, rye and white potatoes, as allowed by the United States Department of Agriculture, the yield for this year exceeds that of 1908 by $1,614,802. In view of the reduced yield for 1909 this is a gratifying result.

Our agriculture has gone forward in the past few years with remarkable progress, as note the following table:

TABLE I.

Year.	*Field Crops and Milk.*
1900,	$24,249,179 00
1901,	38,545,095 00
1902,	44,619,344 00
*1903,	39,453,050 00

* Hay, wheat and corn reduced by severe early drought and fall flood.

Year.	*Field Crops and Milk.*
1904,	48,222,505 00
1905,	49,964,286 00
1906,	52,460,262 00
1907,	56,403,734 00
1908,	57,743,153 00
1909,	59,357,955 00

We need to emphasize in the public mind the importance of a prosperous agriculture as the one great essential to the maintenance of individual, family, State and national life. All other industries have their place and are of greater or less importance as related to each other and to agriculture, but they could not exist in a barren land. The first essential is food, and the farmer's business is to *produce* this. While, therefore, Congresses and Legislatures are enacting laws for the protection and development of municipal, transportation, manufacturing and commercial interests, they should also, and more especially, give all reasonable encouragement and protection to this basic industry. They should assist the farmer and the agricultural scientist to *develop the land,* to make it more productive. Only in this way can the evil day of a lack of bread be averted. A thoroughly improved and productive soil, with an intelligent and prosperous agriculture are the greatest essentials to national stability.

All honor to the tillers of the soil! Men who by their intelligence and skill in handling the soil and breeding and care of domestic animals are adding to the nation's wealth each succeeding year untold millions of dollars. And this is true of the farmers of New Jersey. In the practice of their profession they are *improving* the soils of the State; let that fact, for it is a fact, be emphasized. Thousands of acres that are now producing twenty bushels of wheat per acre, sixteen bushels of rye, one and one-half tons of hay, one hundred to three hundred bushels of potatoes, and other crops in proportion, a half century ago would not have paid for cultivation. This increase in production is due to a more intelligent handling of the soil. What the soil is, and what it requires to produce the various crops, is better understood by the farmers now than at any previous period. This knowledge is the result largely of scientific investigation and intelligent farm practice.

The old-time farmer believed he must break up and cultivate the soil in some fashion for best results. The scientist has told him what cultivation does to the soil and the plant. The farmer looked upon the soil as a dead, inert substance, of use only to hold the plant, the water and the manure applied to make it grow. The scientist has demonstrated that the best soils are filled with little organisms, called soil bacteria, which contribute much to its producing power. The farmer believed from observation that coarse manure would do some good in the soil, and also when applied as a mulch. The scientist has shown that humus in plentiful supply, in and through the soil, contributes to the retention of moisture, improves the mechanical condition, makes it possible for rain and air to penetrate, and the roots to permeate more freely, and makes it possible also for soil bacteria to live therein and multiply, thus increasing the crops of the farmer many fold. Further, the scientist has told him there are certain crops of great use to him in increasing the humus and nitrogenous content of the soil. Leguminous crops have been discovered and introduced, which if rightly used will enrich his land and increase his profits at the minimum of cost. The farmer found little excrescences on the roots of his clover plants, which he thought possibly were caused by disease. The scientist investigated and found them to be nitrogen-gathering bacteria, and that there are several species of them. A gift of nature to the farmer of incalculable value, but previously unknown.

The farmer found his clover dying year after year, and knew not why. The scientist has shown him his clover needs the proper bacteria and lime. The farmer selected his seed according to what *seemed* to him to be best. The scientist has studied nature's processes of reproduction and discovered some of her hitherto hidden secrets, so that now it has become possible, by selection and breeding, to increase the crop, both as to its yield and its food value.

The farmer knew his crops needed something in the way of plant food, and he therefore compounded and applied various composts as a starter; the same formula usually to all crops. The scientist has shown him what the various crops are composed

of, and what is best to apply, and in what quantity, to each crop for best results. The farmer knew that corn would fatten farm animals, and it became the general feed for all his stock, and his hogs became so fat they could not stand, and when they were slaughtered they had but little blood. His corn-fed milch cows laid on fat at the expense of the milk yield, and the chickens, fed largely on corn, became too fat to lay eggs. The scientist by analysis has shown what these animals and their products are composed of; this enabled the farmer to feed his stock intelligently and to greater profit. The same is true with the crops of the field.

The farmer has found in recent years a numerous host of injurious insects, of blights and fungus diseases assailing his crops, and even his stock, and he became perplexed as to what to do to remedy the evil. The scientist is at work on these very difficult matters, and is finding the cause and the remedy as fast as it is possible to do.

These and many other questions are outside the farmer's sphere of work; he does not possess the training nor the facilities, even if he had the time, to solve such delicate and intricate matters. We should therefore give every encouragement in our power to our scientific investigators. They are working for us; they are working for the public good. *The agricultural scientist and the farmer are working in co-operation.* If the work of either is crippled, the farmer's labors will be in vain, and *our* supply of food will be correspondingly reduced, and the insects and the blights will consume the products of the earth.

But for this increasing light, the condition of agriculture would be deplorable; with it, the outlook is cheering. Our farmers are hopeful and with every set-back they take a firmer grip on encouraging possibilities with renewed effort. But there is very much yet to be known, and hence our plea for legislative assistance in elevating the standard and widening the scope of agricultural education, so that our unproductive and semi-productive lands may be reclaimed and developed. When this is done the revenues of the State from this source will be far above present conception. And here be it remembered we have more than 1,000,000 acres waiting development in the southern part of the

State. It is not claimed that every acre of this land can be made to produce agricultural crops at a profit, but the greater part of it will do so with proper treatment.

The soils of New Jersey are exceptionally varied in their texture, composition, water-holding power, and productiveness This fact in connection with our favorable climatic conditions makes it possible to produce a great variety of products. The character of the soil, and the altitude, are determining factors in the selection of the crops to be grown for market, on them. While all of the fruit and vegetables produced in the State can be grown in any part of it, there are some varieties that if grown commercially, are better adapted to the lighter or sandy soils. This is the case with strawberries and sweet potatoes. Market gardening and truck farming, too, may be carried on in any county, but there are certain soils better adapted by nature, for such crops. Including white potatoes among such crops, southern Cape May, Cumberland, Salem, Gloucester, Camden, western half of Burlington, Monmouth, and parts of Mercer and Middlesex counties are well adapted. Peaches are becoming a profitable crop in parts of the section outlined, and they are adapted to all the northern counties, as well. They should receive more attention, the State over, as a money crop, and they will, when the enemies to their production are overcome.

Sweet potatoes are grown for market over the entire southern half of the State. They are an important crop in some sections, their total annual value exceeds $2,000,000.

GRAPES.

Grapes for market purposes are a leading crop in Atlantic county, and are grown with profit in Monmouth and Cape May counties. The estimated acreage devoted to grape production in New Jersey is 3,000 acres. The coming of the Italians to our southern counties means a steady increase in the production of grapes and small fruits, and the experimental vineyard established at Vineland, by the United States Department of Agriculture will, no doubt, give an added stimulus to this industry.

Persons not connected with the production of grapes and their uses know little of their value. Mr. George E. Dewey, of the firm of H. F. Dewey & Sons Company, Egg Harbor, N. J., purchases large quantities of grapes every fall in Monmouth, Atlantic, and Cape May counties; he has a personal knowledge of the values and quantities of grapes, as well as the values of wine cellars, machinery and appliances; also the value of the wines and grape juice in the cellars, and his estimation of their total value is $2,000,000. He approximates the value of one acre of vineyard six years old in full bearing in Monmouth county, at $500, and this is true, he says, of all Southern Jersey. The average yield is about two tons to the acre, and their value $40 to $80 a ton. Allowing $20 per acre for expenses of cultivation, etc., would give an income of $120 per acre, or 18 per cent. on the investment. $120 per acre on 3,000 acres gives an annual yield of $360,000.

The Deweys are pioneers in the grape industry in southern New Jersey, having been engaged in the business for the past fifty years. And if the estimate of Mr. George Dewey is correct, grape growing should receive more encouragement than it has heretofore received. Considered in connection with the light soils of the State, grape production will assist in their development, and will increase their value. Already, according to Mr. Dewey, "about 2,000 people are employed in the industry, and the annual output of wines is about 250,000 gallons, together with large quantities of unfermented grape juice."

CRANBERRY PRODUCTION.

Another peculiarly special crop to New Jersey, in addition to the grape, is the cranberry. There is a possible acreage suited to this crop of over ten thousand acres, of which there are over eight thousand acres now producing this fruit, and numbering nearly four hundred plantations.

It is estimated (December 1st, 1909) the crop for 1909 will exceed five hundred thousand bushels, at a value of $1,000,000. Surely a crop that adds this sum to the annual crop values of the

State, merits and should receive some special assistance from the State. The present status of this industry is due to a few pioneers who have experimented with praiseworthy persistency, and often at large financial loss to overcome the obstacles to success and make the business of cranberry production in New Jersey a success. Furthermore, the lands they are reclaiming are comparatively worthless for any other purpose; what they have done, therefore, and are now doing, is a double benefit to the State.

APPLES.

The apple as a commercial crop is declining rapidly in this State. This is due mainly to the invasion of the San José scale. The work of this pest is radical, for if allowed to multiply unmolested, it destroys the tree. Thus the majority of the home orchards on the farms throughout the State have been partially, if not wholly destroyed. It is a sad sight! And yet, there is hope for the future orchardist, providing he will use the known means to checkmate this pest.

This State is both in soil and climate well adapted to the production of this fruit. Even now we have men who are examples of success in apple growing, and whose fruit is not excelled in color and flavor by the much-advertised fruit of the Pacific Coast States. If our young farmers would devote their attention to apple growing in an intelligent, up-to-date method, they will find their income and profits in a few years far in excess of the gain obtainable away from the farm as a salaried employe in a city business.

Owing to the depredations of the scale, our annual yield of this fruit has been steadily decreasing. The estimated yield made by the *American Agriculturist* for 1909, is 300,000 barrels. The same paper estimated the crop of 1905 to be 750,000 barrels, a reduction of more than half in five years.

THE DAIRY BUSINESS.

Dairying, in common with most other branches of agriculture, is undergoing some economic changes, and these changes cover

not only the means used and the methods pursued in the production of milk and its resultant products, cream, butter, etc., but also the market to which these products go. These changes are not altogether arbitrary. Although conditions compel the dairyman with poor-yielding cows to improve his stock, or produce the milk that he does produce at a loss, and although the market and the health departments demand that milk shall be produced under such conditions as to safeguard its purity and cleanliness, he may do neither and go out of the business of milk production for market. On the other hand, if one is to continue in the dairy business,, self-interest demands that cows well above the present average producing capacity shall be kept, and that the conditions in which the milk is produced and handled, shall be above adverse criticism. Neither going out of the milk business, nor withholding the supply for a period, will affect the market price of the article very long, as there are other producers farther away, to whom dealers will apply, and thus generally the supply is kept up with the demand. A wise, wide and thorough organization of milk producers is needed, but the price should be regulated between producer, dealer and consumer, according to the cost of production. And this should be done by conference. Where several parties are interested in the production, sale and use of any commodity, they should not antagonize each other, but co-operate in all fairness for the good of all concerned.

Although New Jersey is called, and rightly so, the "Garden State," yet the milk industry is an important one. The number of milch cows is probably 200,000, at least, at this time (it was 223,261 in 1900, with other cattle numbering 39,896), assuming this number to be about right and placing the yield per cow at 4,496 pounds per annum (which is 96 pounds higher than my estimate for 1905, and 49 pounds higher than Dr. Voorhees' estimate of the same year), and allowing 2.20 pounds to the quart, gives 2,044 quarts to the cow. This, at 3¾ cents per quart, gives $76.65 per cow, and a total for the State of $15,330,000. What the net return to each milk producer is, he himself must determine according to his expenditure for keeping each cow. In making such calculation, however, it should be borne in mind that summer pasture, soiling crops, stover and

corn fodder are not figured in our crop returns for the State. And the value of the resultant product of dairying, the manure, is not credited in our crop returns. Placing the pasture, soiling crops, etc., at $1.50 per cow, per month, for six months each year, $300,000. And assuming the value of the manure to be $12.00 per cow, per year, gives a return of $2,400,000, a total for roughage and manure of $2,700,000 for the State, or $13.50 per head credit towards maintaining each cow annually. Then there is the milk, cream and butter used by the farmer and his family, of which usually no account is made.

THE SHEEP INDUSTRY.

An opportunity for money making is waiting for enterprising young farmers throughout our northern counties in the production of winter lambs. The number of sheep kept on the farms of New Jersey is declining year by year. The *National Wool Review* gives us 44,000 sheep of shearing age for 1909, and the value of the wool clip $70,543. Our wool per fleece stands well up in weight and quality with the leading sheep-producing states. At the present price of meats the value of the lambs from the above number of sheep should be $200,000. Neither this sum, nor the value of the wool, are recorded in our crop values. The census of 1880, 30 years ago, gives us 117,020 sheep. Attention to the production of winter lambs is less exacting than is dairying, and the profits at the present price of milk will be larger. Provide the clovers, root crops, alfalfa, etc., for winter feeding. In this way meadows and pastures need not be impoverished during the summer months, as many of the sheep would also be sold early in the spring, and new stock obtained in the fall. I have faith in the sheep industry. By it one can market his farm crops in compact form, and rapidly enrich his land.

POULTRY AND EGG PRODUCTION.

A true census of the poultry industry is difficult to obtain. The United States census of 1900 credits New Jersey with

chickens, including guinea fowls, 1,993,594; turkeys, 32,378; geese, 10,518; ducks, 40,024; with a total value of all poultry of $1,300,853. And the value of the poultry raised in 1889 of $2,265,816, and 11,942,550 dozens of eggs produced in that year. The above number of chickens would give 57 chickens to each farm in the State. Whether this number has been increased in the last ten years, the census soon to be taken should show. I believe it has.

In addition to the above farm poultry there are the numerous large strictly poultry and egg plants throughout the State; of these there has been a large increase.

If the value of the poultry raised in 1889 was $1,300,853, and the State produced about 12,000,000 dozens of eggs, the poultry and egg estimate in our table should be much higher than that given, viz.: $2,750,000.

(The New Jersey League of Poultry Raisers estimates the value of the poultry interests of the State to be $10,000,000.)

With all that is hopeful in the poultry industry, our Thanksgiving bird par excellence, the turkey, is losing its once prominent place as a market crop. This should not be so. For studying the diseases that assail our poultry industry, with a view to overcoming them, and methods of breeding and feeding so as to increase the egg production, our State Experiment Station and Agricultural College should be provided with sufficient funds to undertake this work.

As an evidence of increasing interest in this industry, the demand for literature on the subject of poultry and egg production is constant.

LAND VALUES, ETC.

Reports received from the directors of the State Board of Agriculture give the average price of average farm land as $70.50 per acre. In our estimate of all farm lands we have placed the value at $66.87, which is $2.21 higher than the census and the United States Department of Agriculture estimate.

The number of farms in the State is (census of 1899–1900),	34,650
Average acreage in each farm,	82
Total acreage,	2,841,300
Total value at $66.87 per acre (round numbers),	$190,000,000
Total buildings, census value,	69,230,080
Total implements and machinery,	9,330,030
Total live stock, not poultry,	26,993,864
Total value,	$295,553,974

The estimated crop values for the year are $59,357,955, or approximately 20 per cent. on the above total. From the $59,357,955 gross returns must be deducted the cost of production, taxes, fertilizers, hire, wear, etc., which varies according to the branch of farming followed, and each farmer must determine for himself his actual profit. As an average, it may be safely estimated at from eight to ten per cent. on well-managed average farms.

Crops, acreage and value for 1909 are:

TABLE II.

Crops.	*Acreage.*	*Yield Per Acre.*	*Total Yield.*	*Price Per Bushel.*	*Total Value.*
Corn,	290,000	34	9,860,000	$0.75	$7,395,000
Wheat,	110,000	20	2,200,000	1.09	2,398,000
Rye,	79,000	17	1,343,000	.80	1,074,400
Oats,	60,000	25.5	1,530,000	.50	765,000
Buckwheat,	12,000	22	264,000	.77	203,280
Hay,	437,000	1.5	655,500	16.50	10,815,750
Potatoes, White,	80,000	85	6,800,000	.82	5,576,000
Potatoes, Sweet,	21,000	131	2,751,000	.72	1,980,720
Miscellaneous vegetables and fruits,					11,069,805
Milk,					15,330,000
Poultry and eggs,					2,750,000
Total value,					$59,357,955

Increase in acreage over last year as follows: Corn, 12,000 acres; wheat, 2,000; rye, 637; buckwheat, 1,000; white potatoes, 10,000.

* Live stock, number and value, are:

TABLE III.

	Number.	*Average Price Per Head.*	*Total Value.*
Horses,	103,000	$134 00	$13,802,000
Mules,	5,000	155 00	775,000
Milch cows,	190,000	47 50	9,025,000
Other cattle,	82,000	21 40	1,755,000
Sheep,	44,000	5 20	229,000
Swine,	152,000	12 00	1,824,000
Total value,			$27,410,000

The following tables furnished by Mr. Wm. Coffin, division freight agent, W. J. & S. S. R., show the shipments of farm produce from the southern sections of the State traversed by the railroad named, and the per cent. of increase over the year 1908, seems to justify the Farmers' Institute and Railroad Instruction Train work done in that section:

PRODUCE AND PERISHABLE COMMODITIES FORWARDED FROM WEST JERSEY AND SEASHORE RAILROAD DURING THE YEAR 1909.

Commodity.	*Cars.*
Apples,	43
Asparagus,	61
Berries,	660
Cabbage,	4
Cranberries,	158
Eggs,	41
Egg plants,	16
Fish,	573
Grapes,	6
Ice,	25
Meats,	13
Melons,	188
Milk,	23
Mixed carloads,	3,163
Oysters and clams,	3,401
Peaches and pears,	75
Peppers,	418
Pumpkins,	12
Poultry,	496
Potatoes,	8,002
Rhubarb and onions,	35
Tomatoes,	1,478
	18,891

* From "Crop Reporter" of U. S. Department of Agriculture, February,

STATEMENT SHOWING DISTRIBUTION OF CARLOAD PERISHABLE SHIPMENTS FROM POINTS ON WEST JERSEY AND SEASHORE RAILROAD, 1909.

To.	*Cars.*
Camden and Philadelphia,	7,209
Jersey City and New York,	4,985
Newark, N. J.,	1,186
Other New Jersey points,	399
Buffalo, N. Y.,	331
Rochester, N. Y.,	145
Other New York points,	190
Pittsburg, Pa.,	792
Other Pennsylvania points,	873
Boston, Mass.,	829
Other Massachusetts points,	419
New Hampshire points,	83
Connecticut points,	204
Rhode Island points,	127
Maryland and Delaware points,	212
Ohio points,	264
Chicago, Ill.,	342
Other Illinois points,	6
Wisconsin points,	15
Minnesota points,	42
Montana points,	9
Michigan points,	76
Nebraska points,	4
North Dakota points,	3
South Dakota points,	1
Indiana points,	10
Iowa points,	6
Richmond, Va.,	1
Louisville, Ky.,	1
Other Kentucky points,	3
Kansas points,	1
Washington State points,	1
Vermont points,	14
Maine points,	50
Indianapolis, Ind.,	1
Detroit, Mich.,	17
Toronto, Canada,	19
Montreal, Canada,	15
Other Canadian points,	1
Norfolk, Va.,	1
Washington, D. C.,	1
Colorado points,	1
Oklahoma points,	2
Total 1909,	18,891
Total 1908,	14,042

ABANDONED FARMS.

The fact that the State of New York and some of the New England States have some abandoned farms, and the further fact that they have published a list of such farms and other farms for sale, has led to the belief that New Jersey also publishes such a list, and the inquiries for such farms for sale have been so many as to require considerable time to answer.

New Jersey has no abandoned farms, and we desire to have this fact widely published. Our land is too valuable to be idle, too valuable to be abandoned.

The average value per acre for farm crops for the whole United States for the year 1908, was $11.84, while the average yield for New Jersey for same year was $20.00 per acre. It is $20.90 for 1909. We would not boast, however, of this return; we should do very much better.

CO-OPERATIVE FARMING.

In my report of 1904 I made some suggestions as to the advantages that might be possible under co-operative farming, either by having several hundred acres under one general company ownership management with a scientific director, or by a number of farmers forming a union and employing a scientific helper, one well up in practical agriculture, who could attend to the more intricate questions of soil requirements, plant-food necessary, dairy and other stock feeds, spraying mixtures, etc.

Some of the reasons advanced in support of the proposition were:

"Scientific management would economize expenditures."

"A better and more uniform product would be grown and graded according to the requirements of the markets, and thereby the shipping facilities would be equal to the requirements, as the railroads are seeking large and uniform shipments of farm produce."

"A permanent market would be built up and maintained."

"The milk product could all be manufactured, if not shipped whole, by the association."

"Cold storage could be provided for all fruit produce."

"Such an enterprise, rightly organized and managed, would pay the investors a good profit."

"Furthermore, under such management I would expect a greatly increased yield of all crops. Our present averages are ruinously low, and much of that is miserably inferior."

"This increase in yield, resulting in ultimate profits, would appear in three particulars: (*a*) Larger direct yield per acre; (*b*) production of such crops for feeding purposes as would largely obviate the purchase of feeds, especially for the dairy, from outside sources, and (*c*) economy in feeding and by feeding such foods in combination as would best serve the object in view in feeding at all."

"Incidentally such a plantation would become an object lesson."

"I am quite sure the time will come when, if we don't form a syndicate, we will work together to properly market our stuff. We will unite for that purpose, and for the further purpose of getting scientific men to help us, taking in a county or township, examining our land, giving us information, and so bringing the work up to a higher grade of productiveness, profit and respectability. I think that is what we want to reach. Much of our land does not produce sufficient crops, our dairy animals produce too little for profit; we do not understand it, and consequently we get small profits from the farm."

Mr. Emor Roberts, in the discussion of this general proposition, said in part:

"That is very practicable, according to my judgment. I think business can be conducted that way and our products disposed of, which, after all, is the biggest part of the business, and the product can be managed to better advantage. That which he (the Secretary) has outlined is possible, and I think we will have to come to something of that character, just as sure as night follows day."

I have not lost faith in the possible advantages that might follow some such an arrangement. The Monmouth County Farmers' Exchange is a move in that direction, in so far as buying the farmers' supplies and selling his produce is concerned, and the Granges have been doing a great deal along the same line for

years. But my proposition, while including those, is to go to the field, the stable, the orchard, and aid the farmers by a mind trained along scientific as well as practical lines in producing larger yields per acre at the minimum of expenditure. Also to help him overcome the insect enemies and blights that assail his crops.

Vineland has made a good beginning under the Superintendent plan. "The South Jersey Society for Farming Demonstration" in their first annual statement reports 116 demonstrations with 65 farmers co-operating. Any piece of work showing or designed to show a desirable or undesirable method of farming is listed as a demonstration, and they are grouped under twelve heads, as follows: Alfalfa, Crimson Clover, Liming, Nitrate of Soda, Sweet Potatoes, Irrigation, Soy Beans, Home Mixing of Fertilizers, Spraying, Flea Beetle, Cultivation, Blight. This work is under the superintendency of Prof. Geo. A. Mitchell. The long continued co-operative work of the Granges, the organization of Farmers' Exchanges and the movement for mutual assistance in Vineland all show there is a growing tendency toward co-operation among farmers. They are realizing the necessity for wide and general organization and co-operation, as only by so doing can they receive the largest returns from their business. If in some way we can arrange for one demonstration farm in each county, carried on on exact lines, somewhat as is done at the State Agricultural College Farm, this, too, would be of incalculable advantage in this State, which has so many varieties of soil and such a diversity of products.

FARMERS' INSTITUTES.

In view of the fine progress we are making as a Department, with the limited means at our command, it is to be regretted that the appropriation committee cut down our already too small appropriation from $8,000 which the law allows, to $6,000. This reduction has crippled our educative work through the Farmers' Institutes and in other ways. It is earnestly desired that this fund be increased for the ensuing year. During the past fiscal year nineteen counties were visited with this means of instruction, one

hundred and forty-one sessions were held, and the attendance, counting all who were present at every session was 10,425.

I am convinced from my experience and observation, and from the experience of those in other States who have tried the method of holding movable schools of agriculture, that we need to make our Institute meetings cover the four or more days in a place, as circumstances may demand. The one-day meeting is too short to accomplish the end sought. The three and four-day meeting would give time to treat each subject more comprehensively, giving time for full discussion, time for speaker and hearer to become acquainted, and thus harrow in, as it were, the principles taught. In this way, too, the same sum of money expended would do much more good than it does by the one-day meeting. The one-day Institute will do as a pioneer where none have been held before, but when the farmers are alive to the value of this means of instruction it should be soon followed by the three or four-day day movable school of agriculture.

In addition to the regular Institutes, a Special Educational Train was arranged for by the Pennsylvania Railroad Company providing two cars for lectures at the places visited. Stops of about an hour were made at each place designated, and four addresses of twenty minutes each were given at each stop, two addresses being given at the same time, one in each car. This means of instruction seemed to be highly appreciated, as the attendance was large, and the interest in the subjects treated very marked.

It is the desire of the Executive Committee to extend this method of instruction in co-operation with the Railroad Companies of this State.

COUNTY BOARDS OF AGRICULTURE.

Of these, there are twenty organized, some of which are doing excellent work for the advancement of agriculture within their locality. That all are not so active is to be regretted. The county boards and other farmers' organizations should co-operate for the common good.

SUMMER MEETING.

The Summer Meeting of this Board and the farmers of the State was well attended, and the addresses made at the forenoon session were instructive. The chief object of this gathering, however, is to inspect the experimental work being done at the Agricultural College Farm, under the supervision of the Director, Dr. Edward B. Voorhees. These object lessons, aside from their value to the several professions, are of much interest to practical farmers throughout the State, and a visit to the Farm during the crop growing season is therefore commendable, and should be made an annual occurrence. The full fruitage of the work done there should be realized on the farms of the State.

Farmers' Week.

Another evidence of progress and increasing interest is the six-day Institute in the Short Course Building and Stock Judging Pavilion at the College Farm. The comprehensive course of lectures given with the farmers themselves as students, asking questions, and in all possible ways seeking to know the fundamental principles connected with the great industry they represent is very encouraging. It shows a wide and growing interest and indicates better and better work on the farms of the State each succeeding year.

FEED INSPECTION.

Chapter 29, Laws of 1900—"An Act concerning the regulation of the sale of concentrated commercial feeding stuffs"—has proved its value in protecting purchasers of such feeds. Prior to the enactment of this law very much adultered and misbranded material was put upon the market and sold without any guarantee to the buyer.

Dr. Edward B. Voorhees, State Chemist, who is charged with the examination of commercial feeds under this law, reports:

"During the past year, 1909, 666 samples were obtained from the stock of 138 dealers conducting business in 79 cities and

towns; 18 samples were submitted by farmers, making a total of 684 samples received—518 of these samples belonged to the class that required a guarantee of protein and fat, and the remainder, 166 samples, belonged to the exempt class. A total of 526 samples were analyzed, 370 of which belonged to the guaranteed class.

"The guarantees given were satisfied in 267 samples, or 72.2 per cent. This is not quite as good a report as last year, when 74 per cent. of the samples were found to be correctly guaranteed. The difference can be attributed very largely to the number of deficient samples to be found in the poultry meats, and to the high guarantees of some of the other feeds examined.

"The annual inspection shows a great improvement from year to year, which may be attributed to the close inspection and prompt publication of the results.

"The feed question is growing in importance each year, and farmers who closely follow the recommendations of the bulletins in the purchase of supplies save both in the cost and in the efficiency of the nutrients."

REPLIES FROM DIRECTORS AND SECRETARIES OF COUNTY BOARDS TO QUESTIONS SUBMITTED.

Answers received to our questions state that farm laborers are about as last year.

Wages per month, without board, average $31.30; per day, average $1.58. Wages per month with board, average $19.80; per day, $1.37.

What crops are receiving more attention, and what crops less, is answered as follows:

Atlantic—More grain; less truck.
Burlington—More strawberries.
Cape May—More lima beans; less strawberries.
Cumberland—More potatoes; less corn, wheat.
Essex—More corn; less winter grains.
Middlesex—More potatoes; less oats.
Monmouth—More potatoes; less grains, fruits.
Morris—More corn, hay; less grains, potatoes.

Ocean—More potatoes; less corn.

Salem—More potatoes; less tomatoes.

Somerset—More alfalfa, clover, rye.

The number of creameries, as stated by Hon. George W. McGuire, is 140, with more in prospect.

The number of canning factories, as given by the Bureau of Statistics, is 45.

The spraying of fruit trees is reported to be on the increase in Atlantic, Burlington, Cumberland, Essex, Gloucester, Middlesex, Monmouth, Salem and Somerset counties.

Cape May, Morris, Ocean and Union counties report spraying not on the increase.

The average wholesale price of milk is reported by eleven counties as 3¾ cents per quart.

Twelve counties report the retail average price for milk 7¾ cents per quart.

Seven counties report the average price paid per quart at creamery as 3.7 cents.

To the question, "What is the price per acre for average farm land?" the replies vary from $150 per acre in Bergen and Monmouth counties, to $125 in Somerset; $35 in Hunterdon and $25 in Ocean. The average for the State is $70.50 per acre for *average* farm land.

The average value per head of horses, as reported by County Secretaries, is $182.

The average value per head of mules is $185.

The average value per head of milch cows is $52.00.

President Voorhees—You have heard this very comprehensive report of the Secretary. I can recommend it very strongly to you as a very weighty paper, containing a good deal of suggestive matter. I don't think we realize as we ought to how much of a business farming is—it is the business side of it which I wish to emphasize most strongly—how much of a business farming is, and how little, really, we have to depend upon the soil. According to the report last year we had about three thousand million bushels of corn, about eighty-four million tons. That means a whole lot of work for somebody else besides the farmer, and all

the farmer had to do was to bother with about five per cent. of that weight; out of that eighty-four million tons of corn, ninety-five per cent. of it was gathered from the atmosphere. We do not see it, do not feel it, except when the temperature is very low or pretty high, and yet the farmer has, with the proper manipulation of five per cent., been able to make that enormous mass of material. Now that is a very low production, on the average. It won't require another acre of land, it won't require very much more in the way of tools or machinery to make that, instead of eighty-four million tons, one hundred and sixty-eight million tons. You can double your crop, and it will take mighty little more from the soil. Just stop and think a minute how much you are aided by natural resources, if you only know how to handle them. It seems to me that, with the area being constantly reduced and the demands of the people constantly increasing, your great problem now is to utilize to better advantage every acre of land, and while we are doing that, remember that you are making it better instead of making it poorer, if you do it right. You are dealing with natural forces, and if you can only work those right we can multiply our production without a very great deal of an increase on the other side, and at the same time we are contributing the more to the benefit of the other fellow—the fellow who buys—than any other industry that is now being conducted in this country; because, just as we increase our production, just in that proportion do we benefit ourselves and benefit the public, and I think that the Secretary's recommendations and his suggestions all the way through are eminently practical, and should be studied. What is the use of our coming here annually and making reports, stating the principles involved, getting up here and reciting the conditions, and then not paying any attention to them? In other words, we farmers have got to learn a good deal more about putting confidence in the man who does the work, and if we believe he is right, then we have got to go to work and have the courage of our convictions. There are lots of us doing it, but it is a relatively small proportion. Just as we increase that proportion we will increase our own business, and the more benefits the people about us will get from a better utilization of the natural resources.

Let us take up this report now and discuss it in an intelligent way. Has anyone anything to say?

Mr. Rider—The secretary asked me some time ago for my judgment as to the crop of cranberries, and the prices, and I gave him, I think, a half million bushels of cranberries, which would be worth, according to the experience in years past, a million dollars. If I had to fix those figures to-day I would not say that they would average two dollars a bushel.

So that you see, while we are increasing our crops, we should look for an outlet and a market for them. That is what we have got to do in the cranberry business, and in other lines. That is what the sweet potato people will come to. They have had a good crop of sweet potatoes, but the market for them is limited. There is no question but what there are a lot of people in this country who would be glad to have those sweet potatoes at a fair price if they could get the potatoes to them. Now, it seems to me that while our work is to increase our product, it is also to increase the outlet of our agricultural products. That should go hand-in-hand with the other; providing for the distribution of the product so as to be able to get the maximum of price.

The Secretary—That is just what I have recommended in my report in the matter of organization and co-operation, and the Executive Committee, in arranging subjects for this meeting, have placed organization and co-operation on the program as important subjects for discussion.

President Voorhees—If there is no further discussion of this report, we will hear the report of the Committee on Transportation and Freight Rates, Mr. E. R. Collins, Chairman.

Transporation and Freight Rates.

Mr. President and Gentlemen—During the year just passed the transportation of products from the farm, and supplies to the farm, by means other than those controlled by the farmers themselves, has increased eight and three-quarters per cent. over the year previous as shown by various railroad reports covering the intra-state movements of freight. This shows that the farmers

of our State have had more to sell the past year and have bought more than they did the year before, which is an evidence of increasing prosperity.

The transportation problems affecting our people of the farms has changed but little; there is, however, on the part of the transportation companies, a growing tendency to treat the farmer with more fairness and consideration than he has received heretofore, and the chairman of your Committee is happy to report that in the few instances where he has gone to the railroads to adjust matters for our people, this year, he has found it easier to get a hearing and fair treatment than before. The policy of some years back, that anything went with the farmers, is gradually being revised to "Nothing is too good for the farmers." The latter, of course, being more acceptable to us.

Nine cases of overcharge on shipments of farm products have been investigated by your Committee, since its last report. In all of them a satisfactory adjustment has been made between the shipper and the railroads, with but little difficulty, and the overcharge refunded.

In three instances your Committee has had joint rates published where there were none in force, and effected a saving for the shipper

Your Committee would recommend that in all cases where a shipment of any consequence is to be sent or received, an inquiry be made at the nearest freight office for the rate between the points to be covered by the shipment if it is out of the State. A copy of the Classifications and Rules of the Interstate Commerce Commission is on file at every freight office, and if the agent cannot quote you a rate off-hand he can write to his superior and get a provisional rate if there is no published rate, and then there will be no misunderstanding as to the cost of the transportation. It is easier to get a satisfactory rate before the shipment has gone forward than it is to adjust an exorbitant rate after the shipment has been carried and delivered to the consignee.

In relation to the Hamilton Grange coal shipment of March, 1907, mention of which was made in the report of this Committee last year: This Committee being unable to effect an adjustment of the matter, a formal complaint was filed against

the Pennsylvania and Lehigh Valley Railroads, with the Interstate Commerce Commission, on May 13th, 1909. The complaint was received by the commission and the defendants served with a copy of the complaint. Within the required time both railroads made answer to the complaint, admitting the facts concerning the shipment of coal and the charges for the transportation between Bernice, Pa., and Newtown, N. J., and stating that the co-defendants were willing to make reparation to the Grange for the amount in excess of $2.00 per ton for the transportation. The complaint and answer were before the commission at a meeting held in November.

Since the body of this report was prepared, your Committee received on January 10th, a copy of the finding and order of the Interstate Commerce Commission, in which "It is ordered that the above named defandants be, and they are hereby authorized and directed, on or before the first day of February, 1910, to pay to Hamilton Grange the sum of $51.16, with interest thereon at the rate of six per cent. per annum from January 25th, 1909, as reparation for unreasonable rates charged for the transportation of 25 tons and 112 pounds of coal from Bernice, Pa., to Newtown, N. J., which rates so charged have been found to be unreasonable by this commission, as more fully and at large appears in and by said report of the commission, which said report is hereby referred to and made a part of this order.

"It is further ordered, that said defendants shall maintain in force for a period of not less than two years from the date hereof, a rate for the transportation of coal in carload lots from Bernice, Pa., to Newtown, N. J., which shall not exceed $2 per gross ton."

In November of 1908, the Delaware, Lackawanna & Western Railroad practically closed the station at Broadway, in Warren county. The agent was taken away and shippers of milk, or other products, were compelled to go to either New Village or to ship by express. The people interested made application to the Court of Chancery to prevent the closing of the station, and in their reply to this application the railroad company stated that they did not intend to abandon the station, but would maintain the same freight and passenger accommodations as formerly. How-

ever, in the face of this answer, on the fourth of the January following, the station agent was removed and orders given that no express matter be received for shipment at the station or tickets sold. Following this action by the railroad company, the Grange at Broadway took the matter up and engaged Oscar Jeffery, Esq., as counsel to take the matter before the State Board of Railroad Commisisoners.

The State Railroad Commission, in March last, made an order that the railroad company should restore the agent at the depot. From that order the railroad company took an appeal to the Supreme Court, and the case was submitted on briefs at the June term of that court and the Supreme Court dismissed the appeal from the decision of the commission. Then the counsel for the railroad company applied to the Supreme Court for a re-hearing of the case, and up to the present, your Committee is not informed whether the court will grant a re-argument.

The people of Broadway do not know what, if any, conclusion has been reached, but there is one thing discomfortingly apparent, and that is that there has been no agent at the station or express service for over a year, and whether they will ever get them again they do not know. The outcome of this matter is being awaited with considerable interest, as it is of vital importance for our people to know whether a railroad can abandon stations that have been established for years, at will. If they can do this they have the power to ruin any place that gains their disfavor, or the receipts from which does not meet the expectations of the management.

In relation to the transportation of freight and express matter by the trolley or street railways of the State, following a resolution passed at the last session of this Board, Senator Gaunt introduced a bill removing the disability of street railways from carrying such traffic. Senator Gaunt's bill was confronted with some opposition, and in the closing hours of the session he accepted a substitute for the original bill, which was passed and became a law, Chapter 104, Laws, session 1909. This law removed the restrictions and allowed trolleys to carry freight, subject to regulations in cities of over 12,000 inhabitants where freight or express

matter is carried between the hours of six o'clock in the morning and eleven o'clock at night.

In November letters were sent out by this Committee to most of the larger companies operating trolley lines in the State, asking what progress had been made by the various lines in installing freight or express service. Very few of the companies made answer. Several lines have installed the service, and it is working satisfactorily to both the transportation companies and the people along the lines, who find it a great convenience. The Public Service Corporation, that controls the largest trolley systems in the State, have not as yet put the service in operation on its lines. Colonel E. W. Hine, secretary of the corporation, informs your Committee that his corporation have the matter under advisement, and giving it close consideration. In several sections of New York State there is an extensive system of trolley transportation of freight and expressage, notably that centering at Utica. Specially constructed cars make regular trips over the lines and gather up the shipments at road corners or lane entrances and deliver the goods at a central station in the various towns, where the consignee goes for them. In the towns goods for the rural districts are taken to the central station and distributed to the consignees along the lines. A system of this kind would be of great value to the farmers of our State. It is doubtful if the carrying of freight in carload lots by trains would be feasible through the streets of our towns at any time.

As lime plays an important part on our farms, this Committee took up the question of a reduction of the transportation rates on lime for agricultural uses, with the railroads, during the past season. No definite result was reached, but the matter is still under way, and it is hoped to get from the Interstate Commerce Commission a distinctive classification for agricultural lime and a more systematic classification for all prepared fertilizers.

The powers of the State Board of Railroad Commissioners were increased by the last Legislature, Chapter 189, Laws, session 1909, but the authority to regulate rates of transportation within the bounds of the State was not given. It would seem that authority to pass upon intra-State rates should be given this commission, especially as the authority of the Interstate Com-

merce Commission is not operative where the journey of the shipment is entirely within the boundaries of one State.

Respectfully submitted,

E. R. COLLINS,
A. J. RIDER,
THEODORE BROWN,
Committee on Transportation and Freight Rates.

The report of the Committee on Transportation and Freight Rates was ordered spread on the minutes and a rising vote of thanks was given the Committee as evidence of appreciation of their labors by the members of the Association.

In answer to a call for the report of the Committee on Fish and Game Laws, Mr. Collins said:

"Mr. President, if my recollection serves me right, this Committee, appointed two years ago, consulted with the Game and Fish Commission and tried to get some legislation passed in reference to the game laws, satisfactory to the agriculturists; the Committee did some work on that line year before last and made a report here a year ago, and by inference that Committee was discharged. Following that this Board passed a resolution making the Executive Committee the Legislative Committee. Now, under those circumstances, your Committee have dropped the subject and have no report to offer."

President Voorhees—Is there any other business to come before the Board at this time?

Mr. A. Clark Gardiner—Mr. President, I offer the following resolution, which was sent to our Congressman, Hon. H. C. Loudenschlager:

WHEREAS, The oleomargerine interests of this country are preparing an attack upon the present law imposing a high tax on colored oleo; therefore be it

Resolved, That this Gloucester County Pomona Grange, Number Eight, knowing that a reduction in the tax on oleo, colored in imitation of butter, means millions of pounds of oleo thrown on the market in competition with butter, and sold as butter, thereby lowering the price of the same, and as we represent the agricultural interests of this county and State, we do earnestly petition you to do all in your power to protect the dairy interests of this country and vote against any repeal of the present law or amendments thereto hurtful to the dairy interests of this country.

The above resolution was unanimously adopted by the Gloucester County Pomona Grange, Number Eight, in session assembled on January 11th, 1910.

ELMER E. CLEMENT, *Master.*

I offer that resolution, and ask the Board to consider it and adopt it, with the substitution of the names of each Senator and Congressman of our State instead of our own Congressman as there.

President Voorhees—The resolution will be referred to the Committee on Resolutions.

The meeting then adjourned to 2:00 o'clock. P. M.

FIRST DAY—AFTERNOON SESSION.

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

The following committee, consisting of one member from each county, was appointed to nominate officers for the ensuing year:

Atlantic County—A. J. Rider.
Bergen County—John F. Bomm.
Burlington County—C. Craig Tallman.
Camden County—Joseph Borton.
Cape May County—Richard Lloyd.
Cumberland County—William H. Taylor.
Essex County—Cyrus B. Crane.
Gloucester County—A. Clark Gardiner.
Hunterdon County—W. H. Opie.
Mercer County—R. Ellsworth Haines.
Middlesex County—John B. Perrine.
Monmouth County—George T. Reid.
Morris County—William E. James.
Ocean County—R. C. Graham.
Passaic County—Ira Mitchell.
Salem County—John G. Borton.
Sussex County—Thomas M. Roe.
Somerset County—A. V. D. Polhemus.
Union County—G. E. Ludlow.
Warren County—J. E. Allstetter.

Report of the State Entomologist.

BY JOHN B. SMITH, SC.D.

The usual routine work of the position was carried on during the season of 1909 and the nursery inspection work again demanded most of the time of the assistant, Mr. Edgar L. Dickerson, who was continued in his employment during the year.

The following certificates were issued subsequent to the report made at the last meeting, for the season of 1908:

No. 92. C. A. Conover & Son, Lebanon (peach).
No. 93. Mrs. E. B. Conover, Fairmount (peach).
No. 94. James Apgar, Fairmount (peach).
No. 95. Fleming Bros., Califon (peach).
No. 96. James W. Farley, Fairmount (peach).
No. 97. Chas. W. Schneider, Little Silver (privet).
No. 98. Thomas R. Hunt, Lambertville (small fruits).
No. 99. W. Willeson, Arlington (shade and ornamentals).
No. 100. Garrett T. Stryker, White House Station (peach).

During the summer of 1909 most of the nurseries were subjected to a preliminary inspection by Mr. Dickerson, and in all cases the attention of the owner was called to any conditions that might interfere with the issuance of a certificate in early fall. In consequence, the nurseries when again formally inspected in early September, were found to be cleaner and in better condition than ever before, and only a very few had to be held over until the owner cleaned up.

We have now rather more than 100 nurserymen and dealers in nursery stock, with an area under cultivation amounting to 2,000 acres, and an investment of several hundred thousand dollars. The business is an important one, and deserves the attention of the State and measures for the protection of the interests.

Up to date of this report the following certificates have been issued for 1909:

No. 1. T. C. Kevitt, Athenia (strawberry).
" 2. Ellsworth Pedrick, Bridgeton (strawberry).
" 3. J. T. Garrison & Sons, Bridgeton (strawberry).

No. 4. Bobbink & Atkins, Rutherford (general).
" 5. Henry A. Dreer, Inc., Riverton (general).
" 6. George A. Steele, Eatontown (general).
" 7. T. E. Steele, Palmyra (general).
" 8. J. T. Lovett, Little Silver (general).
" 9. Peter Henderson & Co., Jersey City (general).
" 10. Herman K. Stoye, Eatontown (general).
" 11. Wm. Rose, Red Bank (general).
" 12. Ralston Bros., Allenhurst (general).
" 13. Chas. A. Schneider, Little Silver (general).
" 14. J. H. O'Hagan, Little Silver (general).
" 15. John Moore, Little Silver (general).
" 16. The Julius Roehrs Co., Rutherford (general).
" 17. F. E. Beugelaar, Rutherford (general).
" 18. Stumpp & Walter, Dumont (general).
" 19. Theo. A. Ball, Mountainside (general).
" 20. Henry E. Burr, East Orange (general).
" 21. Red Towers Nurseries, Hackensack (general).
" 22. Hiram T. Jones, Elizabeth (general).
" 23. Wm. F. Bassett, Hammonton (general).
" 24. J. Murray Bassett, Hammonton (general).
" 25. Carlman Ribsam, Trenton (general).
" 26. W. A. Wadley, Bound Brook (general).
" 27. George H. Peterson, Fair Lawn (general).
" 28. J. D. Lindsley, Mendham (peach).
" 29. Arthur J. Collins, Mooreston (general).
" 30. S. C. De Cou, Moorestown (general).
" 31. Charles Black, Hightstown (general).
" 32. Jos. H. Black, Son & Co., Hightstown (general).
" 33. Wm. Henry Maule, Hightstown (dealer).
" 34. S. T. Hillman, West Cape May (dealer).
" 35. Herman Conrow, Moorestown (strawberry).
" 36. K. E. de Waal Malefyt, Ridgewood (general).
" 37. Samuel Brant, Madison (peach).
" 38. J. C. Williams, Montclair (general).
" 39. Charles A. Baird, Freehold (general).
" 40. Charles A. Bennett, Robbinsville (general).
" 41. Chas. B. Horner & Son, Mount Holly (general).

No. 42. I. C. Townsend, Merchantville (general).
" 43. Mrs. N. P. Creely, Burlington (strawberry).
" 44. J. M. Gerard, Dover (dealer).
" 45. Charles Bird, Arlington (general).
" 46. American Nursery Co., formerly F. & F. Nurseries, Springfield (general).
" 47. Elizabeth Nursery Co., Elizabeth (general).
" 48. Charles Momm, Irvington (general).
" 49. Frank Lenz, Irvington (general).
" 50. North Jersey Nurseries, Newark (dealer).
" 51. J. F. Randolph, East Rutherford (dealer).
" 52. A. S. Wallace, Montclair (dealer).
" 53. Hartung Bros., Jersey City (dealer).
" 54. John B. Lauhoff, East Rutherford (dealer).
" 55. I. D. Cole, Rutherford (dealer).
" 56. Wm. W. Lukens, Princeton (dealer).
" 57. George A. Shultz, Jamesburg (peach).
" 58. James McColgan, Red Bank (general).
" 59. Garfield Williamson, Ridgefield (general).
" 60. John Bennett, Atlantic Highlands (general).
" 61. Charles L. Stanley, Plainfield (dealer).
" 62. James L. Hall, Farmingdale (dealer).
" 63. Peter V. Drake, Hopewell (peach).
" 64. W. A. Manda, Inc., South Orange (general).
" 65. Edwin Allen & Son, New Brunswick (general).
" 66. W. E. Eisele, West End (general).
" 67. Mansfield Eick, Bissell (peach).
" 68. J. H. Lindsley, White House (peach).
" 69. James H. Vliet, Gladstone (peach).
" 70. Luther A. Apgar, High Bridge (peach).
" 71. Fleming Bros., Califon (peach).
" 72. James Apgar, Fairmount (peach).
" 73. Willard Apgar, Fairmount (peach).
" 74. James W. Farley, Fairmount (peach).
" 75. Alvah L. Reynolds, Madison (general).
" 76. J. F. Noll & Co., Newark (dealer).
" 77. Wm. B. Ellis, Vineland (general).
" 78. John Casazza, Vineland (general).

No. 79. Michael N. Borgo, Vineland (general).
" 80. R. D. Cole, Bridgeton (general).
" 81. John McCleary, Sewell (general).
" 82. Stanton B. Cole, Bridgeton (general).
" 83. Max Rumprecht, Fort Lee (general).
" 84. David V. Higgins, Ringoes (peach).
" 85. W. H. Forristel, Plainfield (general).
" 86. Cumberland Nurseries, Bridgeton (dealer).
" 87. J. M. van Gelderen, Long Branch (dealer).
" 88. H. C. Steinhoff, West Norwood (general).
" 89. Peter Henderson & Co., Jersey City (special).
" 90. J. E. Kuhns, Cliffwood (strawberry).
" 91. Alfred G. Kull, Far Hills (general).
" 92. John Ryan, Basking Ridge (general).
" 93. Joseph J. Ayars, Williamstown (dealer).
" 94. Mrs. E. B. Conover, Fairmount (peach).
" 95. Willard H. Rogers, Mount Holly (general).
" 96. Bobbink & Atkins, Rutherford (special).
" 97. Frank A. Breck, Vineland (privet).
" 98. Benjamin Connell, Merchantville (dealer).
" 99. William C. Evans, Sewell (dealer).
" 100. Isaac Hildabrant, New Germantown (peach).
" 101. Samuel E. Blair, Nutley (general).
" 102. Samuel H. Wilson, Lebanon (peach).
" 103. C. A. Conover & Son, Lebanon (peach).
" 104. Chas. H. Totty, Madison (greenhouse stock).
" 105. Mrs. N. P. Creely, Bnrlington (peach).

Orchard inspection work has been continued as demanded; but no systematic examinations have been made. It is a work that needs doing; but there has been neither time nor money to accomplish it.

The appropriation of $3,000 for the work of the office has become wholly inadequate, and prevents the carrying out of measures that would result in great benefit to our horticulturists.

Two trips were made into New England during the summer of 1909 to determine the progress of the Gypsy and brown-tail moth work, and to ascertain what increase or decrease of danger to New Jersey could be discovered. One of these trips in late July

was extended into Maine, and Captain E. E. Philbrook, who is in charge of the State work, supplied me with information and aided me in my investigations generally. The second trip in early September was into New Hampshire, in company with Dr. L. O. Howard and Mr. D. M. Rogers, in charge of the U. S. Government work in the New England States.

The outcome of these trips is the conviction that the danger from these pests is greater than ever before, and this, not from natural spread, but artificial introduction The brown-tail moth has covered most of Maine, New Hampshire and Massachusetts, and winter nests may be sent into other States on almost any kind of woodland produce or plants. In fact the insect was so introduced into Westchester county, New York, in 1909, and only the prompt and radical measures adopted by the New York Department of Agriculture stamped it out. A similar introduction into New Jersey is liable to occur almost any time.

In Maine the Gypsy moth has reached the lumbering districts and egg-masses may be found on almost any car-load of lumber sent out of the infested territory. In fact New Jersey barely escaped infection in that way in the winter of 1908-09. A force of 75 men is supported by the State of Maine and an additional force of scouts by the U. S. Department of Agriculture, for the examination of all lumber before it is shipped away from these infested regions. It seems imperative, however, that New Jersey should not rely altogether upon the work done by these authorities, careful as it is; but should be in position to guard itself against any accidental introduction from unsuspected sources or accidental slips. This is the more essential since New Hampshire has not done much, thus far, to prevent the escape of these pests from her territory. In Connecticut, where the Gypsy moth was also introduced by accident, the situation is well in hand, and there is no reason to believe that there is any danger to New Jersey. It would be a serious mistake to omit precautionary measures or such as would enable us to act promptly on the discovery of the pest should it escape the vigilance of those engaged in the effort to confine it to its present limits.

A totally unforeseen task was the investigation and inspection of nursery stock introduced into the State from foreign countries

and likely to be infested by brown-tail or Gypsy moths. Attention was called to this danger early in January, by the New York Department of Agriculture, and through the co-operation of this Department, and later the U. S. Department of Agriculture, it became possible to follow probably most, if not quite all, the plants sent into New Jersey from European countries and part of those coming from Asia.

In all, plant stocks were received by 52 separate consignees in a total of 9,696 parcels, some of them containing many thousand individual plants. Not all of these were inspected, by any means, for much was of a character not dangerous, some of it came under a satisfactory certificate and some came from localities where no brown-tail moth was known to occur. It was French stock chiefly that proved infested and a considerable number—in one case nearly 50 nests—were found in some of the shipments. As a rule the nurserymen co-operated with the entomologist, and it is believed that no nests or egg-masses escaped discovery and destruction.

The happening disclosed the weakness of our inspection organization, because the sums available are so small that without the aid given by the national and New York State organizations it would have been impossible to discover and follow the shipments that came into the State.

At the time of writing, shipments for the season 1909-10 have already come into the State in considerable number, and thus far the stock has been clean or of a character not likely to carry infection.

During the early summer nurserymen were warned to order all foreign stock subject to inspection if sent without a certificate, and all foreign nurserymen who were known as dealing in New Jersey were informed of our inspection requirements and supplied with printed copies of our law.

The various custom house brokers and New York agents of foreign firms were also advised of our requirements and these warnings and notices have borne fruit. The really responsible firms have paid more attention than ever before to the quality of stock sent into the State, more of it than ever before comes in under a proper certificate, and some of the New York agents

have arranged to notify the entomologist of all shipments made through them for New Jersey points. All these matters have demanded more time and labor from the entomologist than ever before, and if the requirements increase, as seems probable, additional help and more comprehensive organization will be required.

Following his report, Mr. Smith said: I want to say in regard to this, that we do not need any new law in the State, so far as the inspection work is concerned, or so far as keeping out the insect pests is concerned. Our law is sufficiently comprehensive to enable me to take proper measures. But, in order to keep in contact with the shipping circles in the city of New York and in Philadelphia, the ports of entry, it is necessary that I should have authority to provide blanks upon which reports can be made, and it is necessary, also, that I should have somebody whom I can send at almost any time when I receive word of a shipment that has come into the State, and follow it up and see that it is inspected when it comes in. I have never had but a single assistant during the time that this law has been in force, and, of course, there is a limit to the possibilities. You cannot go all over the State at one time, and a man cannot do more than a certain amount of work in any one day, and, besides, traveling about is rather expensive. For some years the railroads were kind enough to supply me with a pass. In view of the recent legislation on the subject my pass has been cut off, and that makes a difference of over a hundred dollars to the State of New Jersey each year. Now, traveling is also expensive, and the result is that up to the present time I have spent the full proportion and a little more than the full proportion of the appropriation made for the current year in keeping up with the work that had to be done in order to make certain that the State of New Jersey should be saved from the introduction of the brown-tail and the Gypsy moth. Now, I think we can keep that pest out of the State if we can follow it up promptly; but, if this matter is allowed to go, and I am not given a sufficient amount of funds to employ help enough to do whatever work needs to be done, I cannot guarantee that we won't have the Gypsy or brown-tail moth in the State of New Jersey within another year. (Applause.)

Vice-President Cox—This is the proper time to take this matter up for discussion. Is there any member present who desires to ask the Professor any question upon the matter; now is the opportunity to do it.

Mr. Rider—Mr. Chairman, I would like to ask whether there has ever been found any enemy of this Gypsy or brown-tail moth?

Mr. Smith—Yes, there has; and that is a question which I expect to take up to-morrow night in the course of my remarks before the State Board, when I will tell at length what has been done by the United States Department of Agriculture in connection with the New England States in the way of introducing the parasite. There is a well-defined organization at the present time for the distribution of parasites, and natural enemies of these insects.

Mr. Roberts—Mr. Chairman, may I offer the following resolution, directly in line with Prof. Smith's remarks?

Vice-President Cox—If there is no objection the resolution will be received at this time.

WHEREAS, The orchards, forests and shade-trees of the State are threatened by the Brown-Tail and Gypsy Moths, insects that only the most radical and persistent work could control if they once got a foothold; therefore be it

Resolved, That our Legislative Committee be directed to secure, if possible, an appropriation from the Legislature available for our State Entomologist, to guard against these destructive and disagreeable pests and stamp out, promptly, any outbreaks should they occur.

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

Vice-President Cox—Is there any further discussion of this report? If not, we will take up the report of the Live Stock Commission, F. C. Minkler, Professor of Animal Husbandry, State Agricultural College, New Brunswick.

The report made by the Live Stock Commission, which is published for the first time this year, thoroughly covers the subjects treated by Professor Minkler in the paper read before the State Board of Agriculture, and for this reason Professor Minkler's paper is omitted from this report. The published re-

port of the Live Stock Commission may be had on application to F. C. Minkler, Secretary, New Brunswick, N. J.

Mr. Rider—I move you, sir, that the paper be received with the thanks of the Board, and ordered printed. I think it contains some valuable inforomation to the farmers of the State.

Seconded and carried.

Vice-President Cox—The time has now arrived for the presentation of the annual address of our honored President, Prof. E. B. Voorhees. (Applause).

Prof. Voorhees then read his annual address, as follows:

President Voorhees' Address.

This meeting marks the ninth year of my service as your President, and it may be of interest to you, as a preliminary to this address, to call your attention to the kind of agricultural pabulum that in the last eight years has been dished out for you.

In addition to a brief review of the various branches of the work with which the Board is specifically charged, particular attention has been called to the many natural advantages, from an agricultural standpoint, possessed by the State, and the following subjects discussed in detail:

Location in reference to markets; its adaptability for growing special money crops; transportation facilities; railroads; trolleys (freight and passenger); destructive and constructive systems of farming compared—a warning and a promise—utilization of the capital stock of the country; the removal of fertility by crops; the advantages of exporting finished products; the economic fault in the exportation of raw products and in the importation of finished carbohydrate products; intensive and extensive systems of farm practice compared. A comparison of the yield per acre of the grain crops in Belgium, farmed for many centuries, and in the United States, a new country; the social, educational and business advantages derived from farmers' organizations; the development of telephone lines and their usefulness to the farmer; autos, and their relation to State roads; commercial fertilizers and their relation to intensive culture; the natural improvement

of soils. The use of lime, green manures; cover crops; alfalfa and other legumes; the relation of profitable dairying to soil improvement; forage crops, improved pastures; organization of dairymen and the establishing of milk exchanges; the improvement of live stock; the changes which have affected the cost of milk and methods of meeting the situation; demonstration work on farms; relation of tenant farming to soil improvement; summer meetings and their advantages. These and many other phases of the question of farming surely give strong evidence that agriculture is a broad subject, and one because of its importance as a basic industry is worthy of our best attention.

There are, however, two questions which it seems to me stand out as pre-eminently important at the present time. The first is that farming is a big business, while not yet placed on a real business basis, is gradually approaching that desired end; the business of farming is more nearly on an equal footing with other kinds of business than ever before, although according to high authority the farmer receives, on the average, but 30 cents of the dollar the consumer pays for his products.

I think it will be found by the investigations now set on foot under National and State authority, that the recent great increase in the cost of living is due rather to the increased cost of distribution and sale of food products than to exorbitant charges by the farmer or to combinations for controlling prices. The farmer, in too many cases, yet takes what he can get, but he is learning that farming is a business, and can be conducted on business principles, and he knows, or ought to, that it rests with him as to whether he shall receive his due proportion.

ADVANTAGES OF A MORE INTENSIVE PRACTICE.

A situation which bears a very close relation to this of business farming is the near approach of the time when increased farm yields rather than the development and exploitation of new areas distant from points of consumption, must provide for the increased demand for farm produce and thus making the business side more prominent than at present. The farmers in New Jer-

sey who are located next door to markets, must find their first and greatest opportunity in increasing the yields of crops on the farms already under cultivation, and in the second, the development of the lands now unproductive, but which are capable of improvement and peculiarly adapted to specialized crops.

Our annual yields per acre of cereal crops, potatoes, hay and sweet potatoes, for example, while relatively high as compared with other States, are yet much lower—but little more than one-half as high as might be obtained with better management. Our soils are not exhausted, but have lost much of that quality called "condition." They need such amendments and such management as will make conditions favorable for increasing active fertility.

Our experiments, as well as the experience of scores of farmers, have shown that if methods were adopted which would utilize to a greater degree the natural agencies in soil improvement, and if soil amendments and fertilizers were judiciously used, it would be possible to increase the average yields of corn, wheat, rye and buckwheat in a very short time by 5 bushels per acre; oats by 10 bushels; sweet and white potatoes by 50 bushels, and hay by one ton.

The acreage of these crops now reported by our Secretary is 1,064,363, and with these increased yields would be worth, at prevailing prices, $12,300,819. If to these values were added the increased values of pastures, which if properly cared for, would be doubled, a gain of at least $1,000,000, the possible increase in yield and value of fruits, because of improved quality, which the horticulturist familiar with the possibilities under good culture claims could be increased by at least $20 per acre, or on the 100,000 acres, $2,000,000, and the gain from all other products, $2,000,000 a year, it would make a total of $17,300,319, or an addition annually of nearly one-fourth to our present total gross income. This largely increased income is perfectly feasible and possible, and can be gained without increasing the area one acre, and without increasing the need for extra labor or tools or machinery, but even assuming a cost of $10,000,000 for labor, tools, commercial fertilizers, lime and other necessary amendments, it would still leave a net gain of about $5 per acre, the interest on an increased valuation of $100 per acre.

IMPROVEMENT OF WASTE LANDS.

When the limit of production is reached on lands at present cultivated, there are at least 300,000 acres of land in the State which our experiments have shown are capable of rapid and relatively cheap improvement, and well adapted for market garden crops, for small and large fruits, and for alfalfa and forage crops. In most cases, the timber would pay the clearing, and an application of lime, minerals, phosphoric acid and potash would, at an average cost not to exceed $7 per acre, enable the immediate growth of leguminous forage plants, and of a number of other money crops, which may be grown while land is in preparation for the fruits. This area, if cut up into farms, would make six thousand 50-acre farms, or preferably twelve thousand 25-acre ones, which in five years could be made to produce, by intensive practice, an average gross income of at least $50 per acre; an addition to our present income of $15,000,000, besides the addition of many thousands to our rural population, thus strengthening the mainstay of our Republic.

It must be remembered, too, that farming is the only business that adds real wealth to a State; it deals directly with natural laws; the products are derived from the combining of single elements in the soil and air into useful commodities. From intangible and invisible elements, it builds up materials of value. The farmers make the products; the manufacturers manipulate them, while all others are engaged in transporting, distributing and selling them.

That is, in any other industries than farming, dependence must be placed on materials already organized; the farmer furnishes these materials. A farm, well managed, therefore, is a more important asset to a State than is represented by the dollars' worth of products it produces. Hence, in the two directions outlined, increasing the yields per acre, as well as the improvement of the unproductive areas, a State's wealth is increased to a greater degree than it would were the same dollars invested in a business which manipulates and handles the products. The trend of the agricultural population has been westward, and now that the

areas available there are largely occupied, it is turning toward the east, and we, in this State, with our superior advantages of location, climate and soil, should be prepared to take advantage of the present tendency.

A few suggestions as to present conditions and the relation of the individual farmer thereto, must now be considered. The farmers are, as a whole, prosperous; they are better equipped to carry on their business than in the past. They have been careful students of the agricultural problems, and have benefited directly by the work and investigations of the Experiment Station and by the presentation of these results at Farmers' Insitutions and Agricultural and Horticultural Meetings, and by a more general co-operation with the various organizations established for their benefit.

THE DAIRY BUSINESS.

There is, however, one notable exception—the dairy business is not as prosperous as it should be, notwithstanding farmers are keeping better cows, are feeding them better and are, as a whole, obtaining a higher average yield and a better quality of milk than in the past. It is a fact that with the exception of those dairymen who both produce and sell their milk, and thus obtain the dealer's profits, dairying is not a paying business proposition. Milk sold at the farm, in cans, for less than 4 cents per quart, is not paying the cost of production. This condition of affairs has existed for several years, and is due to a number of very well defined causes. A continuation of the present conditions will surely result in the loss of a large part of this very important industry of our State, and the ultimate very greatly increased cost of dairy products to the consumer.

It is to be hoped that with full information on the part of farmers, dealers, health boards and consumers, the conditions may be improved, the industry retained and the producers benefited. Among the reasons which are assigned as the cause of the present situation are the following:

First, an increase in the cost of dairy cows. Ten years ago, a first-class dairy cow, capable of producing 7,000 to 8,000 pounds

of milk a year could be bought, delivered at the farm, for $50 to $60. Today, the cost of dairy cows of that type range in the eastern markets from $75 to $100 apiece. Of course, it is not to be assumed that all cows owned ten years ago were of this type, but there are more animals of the healthy, vigorous, large-producing type at the present time than there were ten years ago, and the great improvements made in the breeding, handling and care of cows has contributed directly to an improved product.

Second, the cost of feed has increased practically in proportion to the increase in cost of cows, whether the feeds are purchased or raised. This is clearly shown by a comparison of the average prices of feeds in 1898 and 1908, taken from the annual records obtained by the Agricultural Experiment Station:

	1898. *Per Ton.*	*1908.* *Per Ton.*
Wheat bran,	$14 10	$29 20
Wheat middlings,	15 85	31 46
Dried brewers' grains,	15 13	28 91
Malt sprouts,	12 08	25 92
Corn meal,	15 02	29 52
Hominy meal,	13 94	30 76
Gluten feed,	15 22	31 22
Linseed meal,	24 32	35 69
Cottonseed meal,	23 00	33 28

From 1898 to the present time, there has been a gradual increase in the cost of good feeds until now the prices are in most cases nearly double what they were ten years ago. During this time, there have been a few instances where there has been a considerable increase in the selling price of milk, but on the whole the increased price at the present time is not in proportion to the increased cost of feeds. In fact, with these few exceptions, the retail price of market milk in large towns and cities was in 1898 eight cents per quart, and is, with few exceptions, 8 cents per quart at the present time; the consumer is not paying any more for his milk to-day than he did ten years ago, notwithstanding the increased cost—the producer is the chief sufferer.

Third, the cost of labor and handling has increased almost in proportion to the cost of feeds and cows: First, because of the

general increase in cost of labor; second, because of the requirements now demanded, a higher grade of labor must be used. In 1898, a good stableman and milker could be hired for from $18 to $20 per month and his keep. At the present time, men capable of properly handling a herd are scarce at from $35 to $40 a month and keep, and the keep is increased in like proportion.

Fourth, restrictions now placed upon the production and sale of milk. In the interests of public health, and the ultimate benefit of the dairy business, clean milk should be the object and regulations to that end are proper and should be enforced. The dairymen are, as a whole, in sympathy with any movement which will increase the quality and food value of their product, and are willing and desire to comply with the requirements, although the extra cost of such compliance should be met in the price received.

Many difficulties have arisen and antagonisms engendered, because of the changes in methods demanded, and which entail an uncalled for expense, and do not contribute to the improvement of the product. The trouble usually arises because the inspectors appointed to enforce ordinances which provide for the sanitary production of milk are not trained in sanitary science, and besides know nothing of the physiology of the cow, the chemistry of milk, of bacteriology, of the character of breeds, and are absolutely ignorant of the most important phases of milk production.

The sanitary standards adopted by health boards are usually helpful, and would be of greater service if the simple scoring of dairies was accompanied by intelligent information to the consumer, but as a rule no attempt is made to encourage the consumers to use the milk of the higher grade.

The situation is a difficult one to solve, still it is evident that the onus rests largely upon the dairyman himself He is not obliged to sell his milk for less than cost, whatever may be the conditions which surround its production and sale He can go out of business as many are doing; this means a sacrifice in many directions: First, of a business established; second, of money invested and loss due to selling; third, the difficulty of adjusting himself to new conditions; and fourth, loss of the advantages derived from a combination of general farming with this phase of live stock husbandry.

The great difficulty is that the dairymen do not, as a whole, co-operate and work together as do manufacturers and other business interests, and make the product only when it pays to do so. It is entirely within their power to do this, although it may be necessary in the beginning to suffer an immediate and small sacrifice, in order to accomplish a permanent improvement and the placing of their industry on a proper business basis. This co-operation has been attempted in many cases in the past, and has in some instances succeeded, but in most instances failed, because on the whole the dairymen have not a sufficient knowledge of all of the facts of the business to agree upon essentials, or when agreed to stick to them.

Furthermore, the producers, dealers and health boards should co-operate; there should be on all boards of health, having to do with dairy matters, members representing the producers, the dealers and the consumers, so that all phases of the question may be properly brought before the board and understood. Inspectors should be trained, and should have a knowledge, not only of sanitary laws, but of the production and composition of crops; of the character and value of purchased feeds and their utilization in the production of milk; they should be required to pass an examination on these points before being permitted to act in that capacity.

THE FEED QUESTION.

The conditions as to cost of production, as here outlined, are based upon progressive methods of practice; they are still worse for the man who is careless in his management and in his purchase of feeds. We are growing too little and buying too much, both of feed and fertility. Farmers are buying, annually, thousands of tons of mixed and other kinds of feeds, not to supplement but to piece out their home-grown supply. To supplement home-grown feeds is entirely proper, provided the right kind is bought, chiefly those products rich in digestible protein, as cottonseed meal, linseed meal, dried distillers' and brewers' grains, gluten feed, etc., these are real supplements as they supply the compounds that are usually deficient on dairy farms. The great

economic fault, however, is that in too many instances the farmer is buying what he already has in excess—at least, in such great abundance as to make the additions superfluous, so far as actual needed nutrients are concerned—he is really economically but little better off than he was before. Money and time expended are not paid for by this practice.

The conditions as they exist show that it is not ton price, which would be bad enough, but bulk rather than kind and quality of nutrient that guides in the purchase. A much larger tonnage of mixed or proprietary feeds, ready rations, guaranteed to meet all conditions of feeding, are bought rather than those unmixed by-products which, because they are the by-products in the manufacture of oil, sugar, or starch, from seeds and grains, make them much richer in nitrogenous substances than the original grains, and these serve, as a rule, to directly supplement the home-grown feeds. Furthermore, a study of the feed situation shows that, on the average, the buyer pays the same price per ton for products that carry from 8 to 15 per cent. of protein, and as much or more of crude fiber as he does for feeds containing 20 to 41 per cent. of protein, and containing a low percentage of crude fiber.

Those feeds which contain a low content of protein, and a high content of fiber are not necessarily unwholesome, nor are they always unsatisfactory feeds, where the entire supplies must be bought; they are to be sure made up in large measure from bulky by-products, which could not be sold undisguised, but when mixed with more or less of the concentrated, highly nitrogenous feeds, make mixtures that are both palatable and digestible.

The point is, however, that in the buying of these feeds, even when free from deleterious substances, consumers are obtaining large quantities of substances which they do not need, and paying for them exactly in the same ratio as for those which they do need and which help to utilize to full advantage their home supplies.

It is quite likely that chemists of Experiment Stations have been responsible in some degree for this state of affairs; they have advised farmers to utilize as fully as possible, by suitable preparation, the coarser products of the farm, as corn stalks and straw, by selling their high-priced carbohydrate feeds, or exchanging

them for the relatively low-priced by-product protein feeds, thus saving both in the selling and the buying.

Manufacturers of oat meal, rice meal and cottonseed products, have argued, and rightly, that if the straw and stalks ordinarily wasted by the farmer are recommended by the teacher of the farmer as worthy of use, their waste heaps of hulls, chaff, dust and fiber in the same class, must also possess value. They have, therefore, in the interests of national economy, the conservation of natural resources, in a spirit of pure philanthrophy, used these materials as a basis for mixtures of feeds of various sorts, and the farmer who has not made a careful study of the situation has been misled into buying at high prices substances which he is already wasting. The exalted position thus taken by the manufacturer does not carry with it any license to add substances that are harmful, as rice hulls, peanut shells, coffee hulls, ground corn cobs and weed seeds, which unfortunately are found in some of them, and for which the same high prices are paid.

It has been shown by the experiments conducted with forage crops at the Experiment Station that the cost of total nutrients in the purchased feeds has been two and one-half to three times as much as for the nutrients contained in the home-grown products, and on a fair basis of comparison, they have been equal in value, pound for pound, to those nutrients contained in the so-called balance feeds.

I have taken from our records the average yields per acre for five years of the two crops grown each year for two groups of crops, one cereal the other legume; for the cereal crop, oats and peas and corn, and for the legume group, oats and peas and cow peas. Analyses were made of these crops each year; it was found that the average yield per year of the first group was 14.9 tons, costing $29.80, and which contained:

Protein,	721	lbs.
Fat,	185	"
Carbohydrates,	4,108	"
Total nutrients,	5,014	" or 2.5 tons.

In order to make this product comparable with the purpose in the purchase of supplementary feeds, I have used only the

group of nutrients protein, and I find that on this basis the yield of food would be equivalent to 2¼ tons of wheat bran, with an average of 16 per cent. of protein and equivalent to 4 tons of mixed feeds, with an average of 9 per cent. protein costing $67.50 and $120, respectively.

It is not to be assumed, of course, that the digestibility of the dry matter of forage crops is as high as for the more highly concentrated nitrogenous feeds, but it is quite as high as for the wheat bran, but probably higher than in the mixed feeds, which contain low percentages of protein and of which large quantities are now being used.

In the two crops of oats and peas and cow peas, the average yield per acre per year was 13.7 tons, which contained:

Protein,	850	lbs.
Fat,	199	"
Carbohydrates,	3,509	"
Total nutrients,	4,558	" or 2.28 tons.

Equivalent in protein to 2.65 tons of wheat bran and 4.7 tons of the mixed feeds.

The cost of raising the crops was $34.25, and the average cost of an equivalent in wheat bran and mixed feeds $79.50 and $141.00, respectively, a difference of $45.25 and $106.75 in favor of the home-grown crops.

While it is not asserted that the total nutrients in the two kinds of feeds are equivalent in value, nevertheless it is abundantly shown that the differences between the cost of nutrients are so great as to make the home-grown products very much cheaper and they are surely quite as palatable as the concentrated feeds. Thousands of dollars would be annually saved if more feeds were grown and less bought; besides, the practice would be accompanied by soil improvement.

THE PURCHASE AND USE OF FERTILIZERS.

Another question of great importance is the purchase and use of fertilizers, and I desire to call your attention specifically

to some phases of it recently investigated, and which will appear in bulletin form, that is of immediate importance and should, if observed by you, result in considerable gains.

From the studies that have been made, and the results that have been obtained, it is evident that the conditions in reference to the availability of the minerals and the distinctions that are now made between those on a commercial basis are fairly satisfactory. Farmers need not pay high prices for their unfavorable phosphoric acid and potash in mixed fertilizers. That is, most mixed fertilizers do now contain, so far as phosphoric acid and potash are concerned, relatively small amounts of the insoluble forms and the cost of the insoluble is very much less than for the available. Clear distinctions are drawn, and the farmer owes it to himself to maks such selections as will reduce the cost to him of plant-food not intended for immediate use, but as amendments.

The use of commercial fertilizers has been one of the most important factors in the development of the farming interests of this State. The present annual consumption is about 90,000 tons, which, at an average cost of $29 per ton, makes a total expenditure of $2,610,000.

This great quantity of fertilizer is being used for increasing the crops of grain, hay, potatoes, fruits and market garden crops. The money was expended for nitrogen, phosphoric acid and potash, and notwithstanding the claims made for superior brands and special formulas, the returns have been due to the actual amounts of nitrogen, phosphoric acid and potash that these crops have been able to obtain from the total in the fertilizers used.

The value of the increased crops made from the use of any one or more of these constituents is, however, measured both by the amount that the crop obtained, and the character of the crop obtaining it. A pound of nitrogen, phosphoric acid or potash, when used in making a crop of celery, or of asparagus, or of fruit, would be worth more than if used in making a crop of wheat, rye or hay; furthermore, the value to the user of the nitrogen or other constituents bought in a fertilizer, is measured both by the amount that the immediate crop is able to obtain,

and the proportionate amount of the total that would eventually be gathered.

Of the sum annually paid for these three constituents, about 40 per cent., or over $1,000,000, is paid for nitrogen, which is the only one of the three essenital elements that is liable to suffer any considerable loss in use, as the experiments conducted along this line show that, on the average, not more than 70 per cent. of the quantities applied even in the best forms, is recovered in the crops.

The case is different with phosphoric acid and potash; these are not subject to serious losses, under good methods of soil management. For all practical purposes, these remain in the soil until they are taken out by plants.

From the standpoint of crop, it is evident that the utilization of nitrogen is a much more important matter than the use of phosphoric acid and potash, although the further fact that a pound of nitrogen, capable of being used in a commercial fertilizer, and without regard to form, costs from four to five times as much as a pound of "available" phosphoric acid or of potash, is an additional argument in favor of greater care in its purchase and use.

Nitrogen as nitrate is the only commercial form soluble in water, ready for immediate use by most plants; nitrogen as ammonia is also a form soluble in water, but it is less available than the nitrate. A pound of nitrate and a pound of ammonia, being definite chemical compounds, are quite as good from one source as another.

Organic forms of nitrogen have to decay first, changing to ammonia and then to nitrate, and are therefore less quickly available; a pound of organic nitrogen varies in availability according to its source whether derived from dried blood or peat, or from intermediate products.

Since nitrogenous materials are variable in their rate of availability—that is, the rate at which the nitrogen in them may be absorbed by the plant—the farmer desires to know the dependence that can be placed on the different materials; he wants "available" nitrogen. Hence, the chemical and physical characteristics

of the various forms of nitrogen have been made the subject of very considerable study and investigation, in order that at least approximate values in respect to availability may be attached to each form. Sufficient work has been done thus far to establish a pretty safe relationship between the nitrate, ammonia and organic nitrogen, in the form of dried blood. It has not been possible, yet, to investigate fully all of the various forms of organic nitrogen, so as to assign an exact value for the different materials.

The very extensive investigations conducted by Dr. Paul Wagner, at Darmstadt, Germany, show that for the crops tested by himself and others, namely, barley, oats, rye, wheat, mangels, sugar beets and potatoes, there was returned in the harvest sixy-two parts of nitrate-nitrogen for every hundred parts applied, and forty parts of organic-nitrogen for every hundred parts applied as dried blood. In no case is the recovery equal to two-thirds of the nitrogen applied; besides, there are wide variations in the amount recovered in the different forms.

In 1898, plant nutrition experiments were begun at this Station, one object of which was to study the "relative availability" of these three forms of nitrogen, using a rotation of corn, oats, wheat and timothy; crops which, because of their long periods of growth, would be likely to absorb relatively large proportions of organic nitrogen. The results of these experiments for two rotations (ten years) are reported in detail in Bulletin No. 221, and show that the recovery for nitrogen as nitrate was 62.09 parts per hundred; for the nitrogen as ammonia, 43.26 parts per hundred; and for organic (dried blood nitrogen), 40 parts per hundred. These results agree almost exactly with those obtained by Dr. Wagner and his associates. With the returns from nitrate, the highest recovery regarded as 100, the relative availability of the nitrogen as ammonia would be 69.7 and of nitrogen as dried blood 64.4.

Nitrate, ...	.48	per	cent.,	or	19	per	cent.	of	the	total.
Ammonia, ...	.77	"	"	"	30	"	"	"	"	"
Organic, ...	1.32	"	"	"	51	"	"	"	"	"

Assuming that the forms of organic nitrogen used in these

of the organic nitrogen to furnish as much "available" nitrogen as is contained in one pound of the nitrate nitrogen, and 1.43 lbs. of the ammonia nitrogen to furnish as much "available" nitrogen as is contained in one pound of the nitrate nitrogen. Yet because of commercial conditions the farmer paid a higher price per pound for his organic nitrogen than he paid for his nitrate and his ammonia nitrogen; using the same relations that exist in the commercial cost of nitrogen, the actual prices paid were: for organic nitrogen, 26.52 cents per pound; ammonia nitrogen, 23.73 cents, and nitrate nitrogen, 23 cents. At these prices the nitrogen purchased in that year cost $1,157,400. If, however, the returns from the different forms of nitrogen were in the same proportion, as indicated in the experiments, which must be admitted to be relatively correct for nitrate and ammonia, and assuming that the organic was as good as that in dried blood, the cost of the "available" nitrogen in the three forms actually was:

For	organic,	41.1c.	per lb.
"	ammonia,	33.9c.	" "
"	nitrate,	23.0c.	" "

While the farmer should have paid, on the basis of availability:

For	organic,	14.8c.	per lb.
"	ammonia,	16.1c.	" "
"	nitrate,	23.0c.	" "

—and a saving of $383,940 would have been effected. If, therefore, instead of buying organic and ammonia nitrogen, nitrates only had been purchased, the same gain in crop from the use of the nitrogen could have been purchased for $773,460, instead of $1,157,400.

The point of importance, therefore, is the price that is paid for the organic forms. In the above discussion it has been assumed that the organic nitrogen contained in the fertilizers has been derived from dried blood, or from other materials quite as good. As a matter of fact, however, dried blood does not contribute even a large proportion of the organic nitrogenous materials used, the bulk of the nitrogen being derived from products

of a lower grade. Various kinds of meat and bone tankage, dried fish, fish scrap, cottonseed meal, garbage tankage, leather meal and even peat being used to supplement products of the higher grade. These, while genuine nitrogen carriers, have been shown to have a wide range in availability, the leather and peat rating in availability as low as four, in comparison with nitrate as 100.

It may be urged, first, that these products possess a value as sources of nitrogen; second, that they are valuable as absorbents and in improving the texture of mixtures containing nitrates, acid phosphate and potash salts, as mixtures of chemicals only cannot be applied by machinery, and third, that proper conservation of natural resources demands that waste nitrogenous materials should be utilized. The points are *conceded*. The Experiment Station does not discourage, but strongly encourages, the utilization of waste products containing nitrogen. It would be false to its duty to the farmers, however, if it did not clearly point out to them what is known of the relative agricultural value of such products. It is not solely a question of use—it is a question of cost. The cost to the farmer of a pound of nitrogen in these materials, of a value lower and more variable than the nitrate and ammonia, should be lower than higher than for nitrate or ammonia.

It is not economy to save refuse nitrogenous materials if the cost of the nitrogen to the farmer is greater and his returns less than may be obtained by the use of nitrogen from materials of known value. Farmers have been and are now spending thousands of dollars for nitrogen for which they do not receive a proportionate return.

These figures possess a very great practical significance, as they have a direct bearing upon the economical purchase and use of the nitrogen contained in the fertilizers now offered upon the market.

Commercial conditions fix the price of the various nitrogenous materials, and the cost to the farmer of any one form is not measured by its usefulness to him, but by the cost in the market. That is, there is no strict relationship between commercial and agricultural values.

It happens that at the present time a pound of nitrogen in the form of nitrate or of ammonia costs the farmer less than a pound of organic nitrogen; that is, the nitrogen possessing the highest rate of availability as nitrate is less expensive to him than dried blood nitrogen, or even that derived from low grade nitrogenous materials, which do not possess any definite rate, and which must, on the average, show a much lower rate of availability than dried blood, because the mixtures contain nitrogen derived from many sources, not uniform in their content of nitrogen or in their physical character or constitution.

The Experiment Station has, since its establishment, consistently urged the farmers, in their purchase of fertilizers, to be guided not only by the quantities of the constituents present in the mixtures offered, but also by the kind that is used in them, pointing out the importance of selecting brands which contain high percentages of available plant-food, more especially of nitrogen, because of its relatively greater importance or its higher cost. The results obtained in the investigations reported in Bulletin No. 221 emphasize very strongly the wisdom of such advice in reference to the expensive and elusive element "nitrogen."

A concrete example will make clearer the economic phases of the question. The analysis of the various brands sold in the State in 1909, and reported herewith, shows 2.57 per cent. of total nitrogen, divided as follows:

To the farmer it is purely a business proposition. He buys nitrogen in order that he may get a return in crop. If in one case 100 pounds of nitrogen contribute sixty pounds to the crops upon which it is applied, and in another 100 pounds contribute but forty pounds to the crops, the purchaser should not pay the same for the second as for the first, for if he did so he would pay 50 per cent. more per pound for his "available" nitrogen. That is, if the cost of the first hundred pounds was $15, the second hundred should cost but $10, when the basis of value is the amount available in each.

Whether the conditions in reference to dairying, buying feeds or fertilizers shall be improved, rests largely with the farmer himself. As already pointed out, farming is a great business enterprise, which must be carefully studied in all its phases if

the best results are to be obtained. Farming, to be successful, as in any other enterprise, means work—hard, continuous, intelligent work—but the rewards are quite as great in proportion as in any other industry.

Vice-President Cox—We have listened with interest to the valuable address of our President. I have no doubt but what there are a number of persons present who would like to ask the Doctor some questions touching the address, and opportunity is now afforded to do so.

Mr. Forman—Mr. Chairman, I understand from the Doctor's address he said there were about three hundred thousand acres in the State of New Jersey which were capable of improvement, which could be made to pay a profitable investment, and that the wood upon the land, or the timber, would pay for the clearing. Now, if the land should be cleared, deforested, what would be the result? Would there be any notable depreciation in our rainfall? Our foresters tell us we must not destroy the forests, we must keep them, or we will be parched and dried up.

Prof. Voorhees—I am not a meteorologist, but, fortunately, I happened to see a note in the paper this morning, a report by Professor Moore, who is at the head of the Bureau of Meteorology at Washington, saying that it does not; that is, the claims made by the foresters that to remove the forests results in a change in the rainfall is not so. I think we might clear up even six hundred thousand acres in South Jersey and skedaddle some mosquitoes out of it, and not do any harm to anyone.

A Delegate—I think I understood the Professor to say that in the course of five years, with proper fertilization and cultivation of the crops, our farm products could be increased twelve million dollars. Now, what per cent. of that must be expended in extra labor and fertilizer for the production of the twelve million dollars? I think I infer that there would not be a net gain to the farmer of twelve million dollars.

Prof. Voorhees—I don't know the amount, but I assumed ten million dollars, if I remember rightly. Those figures are all based upon actual experiments. We carried out the experiment for five

years, and the average cost of fertilizer for those five years was seven dollars an acre, and we were able to get a value of over seventy-five dollars, leaving almost a net of fifty dollars in five years, using nothing but phosphoric acid and potash, and using a soil that was slightly sandy, and some parts of it probably worse than the average of the soil that is represented by the three hundred thousand acres.

The Delegate—I would like to ask further, is not the cultivation of a crop just as important as the expense of putting in the extra fertilizer?

Prof. Voorhees—Oh, yes; only, on this soil, you don't have to cultivate much. There is not much there to cultivate. All you have to do is to get the crop going and take it off. What I mean by that is, the actual cost of manipulation. There is no extra cost of preparing the soil, because it is already in condition that you can handle it very easily, so that the cost of preparation would be relatively less, after the timber is off, than on some of the other land. Now, it seems to me that there are those here who can give us an idea and some data or good advice in reference to the utilization of this kind of land. Mr. Repp here might tell us how he puts out apple trees upon lands just as the timber is cut off, does not cultivate at all; he just puts in the trees and then goes ahead with the harrow, and in a few years the timber is all cleared out, and there is no great expense to it. Mr. Repp, don't you do that?

Mr. Repp—Yes, sir.

Prof. Voorhees—And it don't cost you very much to cultivate it?

Mr. Repp—It costs less than it does to cultivate the crops.

Prof. Voorhees—So, you see, there is not a big lot of labor involved there. After he cuts the forest trees off, close to the ground, he puts his fruit trees right out into those forests, and then his cultivation later is such as to gradually remove all the stumps and roots.

A Delegate—I would like to ask the Doctor what his preference is in regard to nitrogen, in the use of nitrate of soda or sulphate of ammonia, and ask him what his opinion is of fish?

Prof. Voorhees—Organic substances all show a much lower rate of availability than the chemical substances nitrate of soda and sulphate of ammonia. Whether a man should use all nitrate or not depends upon how he is going to apply it and upon what particular crops. I think ordinarily it would be much better to use a small proportion of organic nitrogen. There are certain kinds of crops where I would use it, but I would not want to use a great deal of it.

A Delegate—What of blood?

Prof. Voorhees—Blood would be a high grade nitrogenous material; it stands on top.

A Delegate—How about fish?

Prof. Voorhees—Fish stands lower than blood; fish and cottonseed meal are equally good, and then the various materials they run down to possibly ten on a scale of a hundred.

A Delegate—Would fish give up its nitrogen in time for a potato crop?

Prof. Voorhees—I think so, if you plant it early enough, and dig late enough. I would not depend upon organic nitrogen altogether for a potato crop. You see, you cannot make any potatoes until you get your top; now your nitrogen in organic form cannot feed your top until it rots, and the nitrogen in organic form won't rot until it gets warm enough, and you ought to have your early potatoes grown by that time.

A Delegate—The nitrogen from the nitrate would be gone in a little while, so wouldn't it be well to follow that up with organic nitrogen?

Prof. Voorhees—Put on some more nitrate. Why not? To put in more organic nitrogen is a very good plan for the manufacturer to follow, but not for the farmer. It is all right to put in organic nitrogen, provided you don't have to pay two prices for a substance you don't get right away. I am not advising that you shall use only organic nitrogen; I am only advising that the conditions as they exist at the present time shall be changed so that when a man buys organic nitrogen he shall pay a price

for it more in proportion to its usefulness to him. And you can rest assured that from every hundred pounds you put in of the nitrate you will get a very much larger return, taken on the average, than you will from any of the other forms. There are many conditions where I would not use nitrate, and many where I would not use much organic. If you will only keep in mind the relative price that ought to be paid, and not pay the same price or a higher one for a pound of nitrogen which in one form is only half as good as it is in another pound.

Secretary Dye—I move, Mr. Chairman, that the address of Dr. Voorhees be received and made a part of the annual report, and that we tender to him a rising vote of thanks. (Carried.)

On motion, Mr. Voorhees' address was made a part of the record.

Report of Commission on Tuberculosis in Animals.

The question of a pure milk supply occupies the front place on the platform of public discussion, and in the thought of intelligent consumers and the officials connected with our boards of health. Prominence is given to this subject not only because milk is an essential article of food, but also because it is possible for it to become the medium whereby disease germs may be conveyed to the human system. Hence, the crusade against impure milk and all that contributes thereto, and the demand for healthy animals, properly fed, and conditions of stable life that may assist in promoting the health of both the animals and their product. Within common-sense limitations, such demands are reasonable, and as soon as possible, dairymen should conform thereto. Not all the sanitary theories, however, can be worked out in profitable practice, nor all the demands conformed to at the present average price paid for milk. Exactions that count more for show and added expense than they do for actual benefit, should not be made. But such as clean stables, abundance of fresh air, all the sunlight possible, and healthy cows are reasonable demands.

It should be said to the credit of the majority of our milk producers that they are introducing as fast as they can such improvements as will conform to all reasonable requirements for a pure milk supply.

But dealers and consumers, also, have a part in this work.

The handling of the milk between the producer and the consumer is subject to numerous possibilities of infection, and these should be scrupulously guarded. Professor C. B. Lane, formerly of the U. S. Department of Agriculture, Dairy Division, said in part, in a recent address:

"If I were to pass judgment on the producer and consumer, I am inclined to think I should give the producer the credit for having advanced farthest in doing his part in the fight for pure milk. The consumer needs to be educated to take proper care of milk when it reaches his door. Unfortunately, the law stops at the consumer's door, but it follows the producer all the way from the cow to the kitchen. If we should examine conditions to-day, we should find many a filthy ice box that is far worse than the worst examples of dairymen's milk houses. The consumer should examine the source of his supply and pay the dairyman a living price when the product is delivered to him in good condition rather than be looking for the cheapest milk he can buy. The average consumer is surprisingly ignorant concerning his milk supply. He not only does not realize the importance of having pure milk, but he is ignorant concerning its greater cost. Three-fourths of the milk consumers of this country have never looked up the source of their milk supplies or seen any account of them.

"It is interesting to note the strides that the milk producers are making in this world-wide effort to improve the quality of milk. Dairymen in all sections are becoming interested to raise the standard of their business, National, State, county, and local meetings are being held everywhere to discuss these matters."

The control of bovine tuberculosis will not be an impossibility when the owners of dairy animals realize the importance of establishing and maintaining such conditions of stable life and such surroundings as will tend to maintain the health of the animals, and when, further, they realize the folly of keeping suspicious animals in their herds and the unwisdom of introducing into their herd after it has been tested and freed of disease, animals having no guarantee as to their health. The one safe course is to test the entire herd, remove all condemned members, improve the stables in the matter of light, ventilation and dryness up to the

best known standard, introduce no new members except under careful test. Watch the herd so as to detect any later development of disease and test once a year.

The work and experience of this commission justifies the above recommendations. We have had under regular annual test some herds for three years, a number of others for two years. At the first test the number of reactions in some cases where the conditions were not what they should be reached as high as eighteen per cent.; in others, less than one per cent. A test of those same herds, twenty-two in all, embracing six hundred and ninety-seven cows, made last October, gave but four and nine-tenths per cent. (4.9%) of reactions, and the probability is that a test next October will show a still smaller number.

Of the experiment herds referred to, we mention a few to substantiate the effectiveness of the tuberculin test.

A herd of ninety-eight cows were tested in October, 1908, eighteen were found tubercular, and destroyed; the remaining eighty were retested this year and only two were condemned.

Another herd of forty-four tested in 1905, when eleven were condemned and slaughtered, balance of thirty-one retested in 1908, with two condemned and tested again this year with only one condemned

A herd of thirty-five cows tested with six condemned, retested this year, none condemned.

The last we mention, where thirty-eight were tested last year with five condemned, the owner bought others to replace, which were not tested. In the retest this year, seven were condemned, but six of these were of the recent purchase. Showing the importance of replacing with tested cows only. This course is urged upon all farmers and dairymen wherever the diseased animals are found and removed, and the commission is pleased to state that this is being heeded to a much greater extent than ever before.

Ex-Governor Hoard, in replying to a critic of the tuberculin test, said: "It is true that the best authorities claim that the tuberculin test is not infallible. On the other hand, they hold that it is the best method we have for determining whether an animal has tuberculosis or not. When the test is applied by men of understanding, it is accurate ninety-nine times out of a hundred,

which of course, makes it a very reliable test. There are conditions in which the test will fail to work. This is where the judgment of the Veterinarian or person who uses the test must be brought into action, for unless a cow is in perfectly normal condition and handled in a proper manner, there is danger of the test indicating that an animal is tuberculous, when she is well. But the fact that men misuse the test and are not competent to apply it properly does not necessarily detract from its value as a means of revealing tuberculosis. We believe the protection of the health of the herd, if for no other reason, warrants a man to apply the tuberculin test to his cows."

Mrs. E. W. Strawbridge, whom many of this Board know, in an address before the Western Guernsey Breeders' Association last summer, gave her experience and views, and her experience may be avoided by others if they will follow the recommendations made in the forepart of this report. She said in part:

"Our herd was of good size, and composed mostly of fine animals, and we took a trip abroad, leaving things, as we supposed, in good shape. Sickness developing among the calves, due, I think now, to improper care and housing, my brother, a Philadelphia veterinarian, took a hand and had the herd tuberculin tested. When we returned we found about twenty of our fine animals either condemned or already killed. In our ignorance, we rather resented this testing, and though we got rid of the reacting animals, we had not learned our lesson.

"We built a good cow-stable with ventilation, cement floors, etc., and bought more cows. As time went on I began to grow uneasy. One or two cows became ill, and I gradually awakened to the fact that perhaps tuberculin testing was a necessity. I well remember how Hoard's dairyman used to preach the tuberculin test and how I disliked it, and would not read the articles. At last I resolved to face the situation. I consulted Dr. Leonard Pearson, of national fame, and asked him if he tested the cattle how soon we could hope for a clean herd. He said, 'Surely in three tests; possibly in two.'

"How well I remember that sad day, when the first test was made, and twenty-one of my beloved Guernseys reacted. It was a severe blow, but they were disposed of—among them some fine

young cows that could milk from thirty-five to forty pounds apiece, and that had become part of the family. The next spring took four more, and now so careful am I that I have them tested on an average of once a year. Even yet, so well do I remember the former sad experiences, I never breathe quite freely until the test is completed. I feel so strongly on this subject that I think no one has a moral right to sell an animal to another unless he can feel sure from these tests that it is free from this scourge. I would as soon sell a man poison, or take money from his pocket, as to sell him a tubercular animal. There is no way of estimating the injury one such animal can do."

Governor Hoard himself had a similar experience with his herd years ago and he now follows and advocates the course of cleaning up and annual testing.

Many persons who have bought cows at public sales which they believed to be free of disease, have later found out that they were tubercular at the time they were purchased. All such persons are heartily in favor of a law to prevent the indiscriminate sale of untested cattle, believing this demand is just.

The damage done by the sale of diseased cows and their indiscriminate introduction into other dairies has been incalculable, and the State in a majority of such cases has been called in later to examine and clean up herds infected in this way. If the State had been called to inspect such herds *before* they were scattered, just so many sources of infection would have been stopped and other herds would not have been contaminated, and the total expense would have been less. Farmers may think their herds are free of disease, and unintentionally sell them as healthy. The safe way and the honest way is to sell them after a reliable test has been made.

Governor Griggs, when Governor of this State, approved the work of this commission for one reason, among others, that it is "educative." This is true, and a comparison of the dairy premises throughout the State, and of the animals kept now and a few years ago, shows a very great improvement. Such improvement in numerous instances, indeed, as to leave no room for criticism.

The work of the commission is not confined to any one county or section of the State. Requests for examination are taken up in the order of their application, and attended to as soon as possible in every case. During the year eighteen counties have been visited. Some of them several times. 4,629 animals have been examined and tested, of which 530 were condemned and slaughtered. This is about eleven per cent. But it must be borne in mind, these were suspicious herds. For these the owners received three-fourths of the appraised value amounting to a total of $12,548.00 an average of $23.67 per head.

IMPORTATION LAW.

The law enacted to prevent the importation of tubercular dairy animals into this State has been of great benefit in this respect—competent veterinarians who have had extended opportunity for observation in connection with their actual practice state it is their belief that the cows now imported are better by fifty per cent. than those imported prior to the enactment of this law. Reasons for this are, dairymen are demanding a better class of cows and dealers do not find it profitable to purchase and bring in suspicious animals with the possibility of having them condemned without compensation. Surrounding States, too, are giving more strict attention to the subject of healthy cows and clean dairies, and the testing of animals by competent veterinarians. This is of advantage to our dairymen who depend upon the breeders of those States to supply them with the needed additions to their herds. We believe, however, as we have said in previous reports, that it would be more profitable in every way in the long run if our milk producers would become dairymen in every sense, and breed up their own herds, from stock having an established reputation for good constitutional vigor and maximum milk production. We are paying out annually large sums to breeders of other States for stock of questionable pedigree and doubtful profit. The records of the commission show there were 6,255 cows brought into New Jersey during the year closing October 31st, 1909. These at an average price of $55.00 cost

our dairymen $344,000. Owing to the outbreak of foot and mouth disease during the year, when transportation of domestic animals was prohibited, the number imported is about 1,000 less than it was for the year previous. The enforcement of this law has become the means of improving the stock imported, as previously stated, and to that extent it reduces the per cent. of tubercular cows within the State.

The table herewith shows the counties visited, with other details, also the report of the treasurer, Mr. Charles Howell Cook:

County.	*Total No. Examined.*	*Total No. Condemned.*	*Total. Sum Paid.*
Atlantic,	1	1	$30 00
Bergen,	48	5	120 00
Burlington,	1,069	160	3,744 75
Camden,	43	19	340 00
Cumberland,	110	19	312 00
Essex,	237	26	638 50
Gloucester,	118	40	1,069 00
Hunterdon,	323	52	1,057 50
Mercer,	151	24	435 25
Middlesex,	60	45	673 25
Monmouth,	406	44	790 25
Morris,	365	30	591 25
Ocean,	9	..	.....
Salem,	224	16	288 00
Somerset,	149	7	129 00
Sussex,	960	59	1,371 00
Union,	45	9	232 50
Warren	311	36	777 75
	4,629	530	$12,548 00

Total appropriation, ... $20,000 00

Total sum paid for cows, ... $12,548 00
Expenses of inspection, veterinarians, ... 1,777 90
Salaries—Secretary, assistant and stenographer, ... 3,129 08

Expenses of Commission,

Traveling expenses of—
- Secretary, Franklin Dye, ... $68 83
- Assistant, Samuel B. Ketcham, ... 111 01
- Tuberculosis Commissioners, ... 57 65

Tuberculin for Imported cows, ... 275 00

Mailing cases for shipping tuberculin,	$5 00	
Ear tags for imported cows,	200 00	
Rings,	11 50	
Postage,	206 24	
Stationery and blanks,	257 51	
Typewriter,	89 25	
Express,	6 23	
		1,288 22
		$18,743 20

A Delegate—Mr. Chairman, I would like to ask the Secretary, of the number of cows tested last fall, what breed reacted most?

Secretary Dye—I could not tell you that; we kept no record on that point. I doubt if there is very much difference. I believe you will find it depends very much upon the condition of the stable life and the manner in which the cows are bred.

The Delegate—Last fall there was a test made in a herd of cows in Burlington county, and the Guernseys went down bad. I had a one-third interest in the Guernseys. Of the fifty-three cows there are five living to-day; that is, of course, very bad. When it came to the Jerseys in our section, they were tested the same as the others, and they went through with flying colors. They were far above the Guernseys or any other breed.

Secretary Dye—In your opinion, then, some breeds are more free from tuberculosis than others?

Prof. Voorhees—I don't think there is anything in that theory. I think tuberculosis is no respecter of breeds. It all depends upon the physical character of the animal itself and the environment. I think if you will take the statistics gathered by the different States you will find that it is not a question of breed; it is a question largely whether the germ gets into the herd, and how well that herd is taken care of.

A Delegate—It speaks well for the Jerseys of that section.

Prof. Voorhees—Yes, but it does not say anything for the breed.

A Delegate—I have kept records for twenty years. The Guernseys and the Jerseys are the ones that have it, and the Ayershires do not have it, and you cannot give it to them, and

the Holsteins very seldom have it. I have not any Ayershires, but I want to get them.

Mr. DeCou—I am willing to say that the Tuberculosis Commission has done a great deal of good work, but the futility of a thorough stamping out of tuberculosis in cattle, in my mind, is very evident. The veterinaries that examine the cows do not know their business. If we have got a cow and she looks a little bad, we get rid of her. Of course, we try to keep our stable in the best manner possible, but we get rid of diseased cows as fast as we can; and a great many are getting rid of them by being perfectly sanitary with their stables and by getting away with suspicious cows.

Secretary Dye (replying to Mr. DeCou)—Would you stop all efforts to hold in check smallpox, typhoid, diphtheria and scarlet fever, and all these various diseases assailing your family? Would you put a stop to all the efforts to suppress or hold in check tuberculosis? The statement that there is no less number of tubercular cows in New Jersey than when the commission was started will not hold water. Where is all this disease that has been cleaned out? In our experience we have found cows kept in dirty stables not fit to produce milk in—stables with little light and ventilation. One stable was so dark we could not see the cows at all in midday. There is need for inspection, there is need for investigation, and need to remove the diseased animals from the herds. They are a menace to the healthy animals and a loss to the owner. Mistakes are made sometimes—that is true of all except perfect folks. You charge our veterinaries with being inefficient or not careful. Our veterinaries are coming up, and have studied those things very closely. We have veterinaries who can be trusted implicitly, and they are very careful in their examinations. There are a great many things which need investigation and need care, and we are working along as carefully as we can, and you ought to be thankful that there is some little compensation from the State to help the farmers out. For what would they do without it, unless they got rid of them, as you say you do?

A Delegate—He says they get rid of the cows; I would like to know how they get rid of them—how did they dispose of them?

Mr. DeCou—I don't want to condemn the commission, but what I want to say is, they don't get onto it sufficiently to eradicate it or even to reduce it much; they don't go anywhere unless they are invited or unless something radical comes up—perhaps some board of health of some city. There are lots of herds where they have got tuberculosis, we know that; but the commission has not been invited to visit them and they go right on having it. I did not mean to convey the impression that the Tuberculosis Commission had not done any good. I believe they have saved the State thousands of dollars.

Secretary Dye—The law does not permit the commission to go into any herd except it is invited by the owner, or requested to do so by the State Board of Health.

Mr. Brown—Mr. Chairman, I think the State Tuberculosis Commission in its present form is doing the farmers a great deal of good, and if there is anything at fault, it is probably with the tuberculin test. I am not familiar with it myself, but there is just one question I would like to ask: If a herd of cattle is tested by some unscrupulous veterinary or some unscrupulous dealer, and some of them respond to the test—say this thing is done secretly or without the knowledge of the commission—if the tuberculin test was again applied by any person in say a few days, or a month, to those cows, would they respond or not?

Secretary Dye—It is generally held they would not respond, not with the ordinary dose. So if the fact was known that they had been filled up with tuberculin, the dose would be doubled, or increased so as to get a reaction in those cases to determine whether they were diseased or not.

Mr. Brown—Is not that a point which the commission want to look into a great deal more strictly?

Secretary Dye—We are looking into all these points that we can.

Mr. Harrison—I feel that there is a great deal more tuberculosis among cows in my community to-day than there was fifteen years ago. In fact, fifteen years ago we all had open stalls and we had very few cows that had tuberculosis, inasmuch as they had plenty of fresh air, and there was no need of the cows having tuberculosis. Now, the agricultural papers come out and tell us we must keep our cows warm; and we started in to keep them warm and we found we could get more milk by keeping them warm, and we closed up the stables and kept them warm and gave them tuberculosis because we did not give them fresh air. Now, there is not one stable out of fifty in our community that has got good ventilation. The consequence is that we have got a tuberculosis condition among the herds. If the money that has been spent in killing tuberculosis cows had been spent in an attempt to give the cow a whole lot of air and good ventilation, it would be a whole lot better off, in my opinion.

Secretary Dye—That is just what we are doing. Wherever these defects exist we recommend and urge the needed improvement and if you understand your business you can keep your cows warm and yet have good ventilation.

A Delegate—I would like to ask one question: Isn't there a law prohibiting bringing stock into the State without it being examined or tested for tuberculosis, and is it being enforced?

Secretary Dye—They can bring them in without being examined, but must bring them in under a permit to be examined as soon as they arrive by one of our local veterinaries. The law is being enforced.

A Delegate—Mr. President, some of the gentlemen have been talking about breeds, and some seemed to think that the Jerseys and Guernseys were more susceptible to tuberculosis. Our veterinarian, a good man, tells me from his own knowledge that they can be made to seem free from it. We know down our way that if you test a cow twice inside of a month, the second time she is not expected to react. That will explain that part of the matter. I had my herd tested at my own expense. I have kept those cows in the barn all winter. Some of them I have had seven years. Except in very fine weather, once in a while a few hours,

I did not turn these cows out at all till spring. I wanted to see how those cows would stand that. I had a veterinary come and test them, thirty-four head. Those that I had bought this year with tags in their ears, and three or four that I intended to sell anyway, that did not come up to the fixed standard, I did not have tested. Of the rest, three cows reacted, but all of them were cows that were bought last winter. One was a Jersey, one a Grade Jersey, and the other was a big Holstein cow from Madison county, New York, and she has still the ring in her ear where the tag was put in a few years ago when I bought her. The cows I have had five or six winters. I know the way I used them and studied the best way all right, and not one of them had tuberculosis.

On motion, the report was accepted and spread on the minutes.

Secretary Dye—Mr. Chairman, in view of the fact that we have lost one of our fellow-members who was associated with the Board for many years, and who was a member of the Executive Committee, I move that we request our President to appoint a committee on the matter of a memorial to the deceased members. (Carried.)

Vice-President Cox—Next we have on our programme, "Plant Food and Its Application," by W. D. Zinn, Phillippi, West Virginia. I have the pleasure of introducing Mr. Zinn.

Plant Food and Its Application

Ladies and Gentlemen of New Jersey: It may seem like a joke to you that one should be invited from the State of West Virginia to speak to you on any subject pertaining to agriculture. When you hear the name of my State mentioned, you intuitively think of mountains, coal mines and "moonshiners." We have them all, my friends, but we have other things.

There are vast plains of level land in our State that contain nearly five acres unbroken even by a hill. We have more farming land than most other States because we can farm both sides.

Here in New Jersey you are handicapped because you cannot farm but one side. I want to tell you, also, that we are second

to but one State in the production of coal, and we produce more oil and gas than any other State in the Union; of the latter named article we have two kinds. As for fruit, even the Garden of Eden could not compare with the little mountain State for variety, quality and quantity. Thousands of acres of commercial orchards are being planted each year.

One farmer had a net income of $45,000 this year from 100 acres of apple orchard.

Within ten years, when you speak of the Land of the Big Red Apple, you will think of West Virginia, and not of a State farther west; but my subject was not West Virginia, but "Plant Food and Its Application."

When we speak of plant food we really mean about ten elements that are essential to plant growth. Six of these elements are in abundance in all soils. It is as if you turned your horse into good June bluegrass and provided plenty of water for him—you would flatter yourself that he has all he needs to thrive well, and yet, if he could not get air he would soon die—the air you know he can get without your bothering about it. Just so with these six elements in the soil.

It is well understood, however, that the soil may lack one or more of four elements, viz., nitrogen, potash, phosphorus and lime. If the soil is deficient in any one of these elements then the crop will be correspondingly small. That is, if the soil contains phosphorus enough to produce ten bushels of wheat only, then there will be but that amount raised.

The same is true of either of the other two elements. Hence, we can readily see the necessity of having a balanced plant-food in the soils if maximum crops are to be produced. The source from which this plant-food is derived is a matter of no little importance to the farmer. In our State we spend more than a million of dollars for commercial fertilizers annually, and as a chance I would take the money that is lost by the unintelligent purchase and injudicious use of commercial plant-food than to have all the profits gained thereby.

In buying nitrogen one should always know the source whence it comes. This element is sold in the form of nitrate of soda, tankage, cotton-seed meal, animal bone, etc., etc. In soda it is

very readily available and should be applied to growing crops, or on soils where plants will soon be growing. Tankage may or may not be a good form of nitrogen. If the tankage is composed of dried blood and meat scraps, then the nitrogen will soon become available, and it is perfectly safe to apply it when the seed is sown; but if the tankage consists of a large percentage of hair, horns and hoofs, then your children may reap the benefit of your sowing, but you will hardly do so.

Our principal supply of phosphorus comes from phosphate rock, animal bone and basic slag.

The phosphate rock, when treated with sulphuric acid, is a very readily available source of phosphorus, and but for the fact that it is considered by some as a means of creating harmful acids in the soil, would be the cheapest and best source of phosphorus.

Animal bone contains a large per cent. of phosphorus, and when applied to the soil in the form of raw bone-meal, will in time furnish phosphorus to the plants, but it is slow in acting, and does not give large immediate returns. If the bones are steamed, as is the custom of some manufacturers, then much quicker returns are obtained.

Basic slag, another source of phosphorus, is a safe carrier in which to purchase this element of plant food. It contains about 40 per cent. of lime, also.

We get most of our commercial potash from the deposits in Germany, and it comes to us in the form of coarse salt.

There are two kinds, viz., muriate and sulphate of potash.

For the ordinary crops, such as corn, wheat and oats, the muriate is preferable because it is cheaper; but for some special crops, such as tobacco and potatoes, the sulphate is said to be more desirable.

HOME-MIXED FERTILIZERS.

Where one finds that his soil needs more than one element of plant-food, quite a little money may be saved by home-mixing. If phosphorus and potash are wanted, then phosphate rock or steamed bone and muriate or sulphate of potash should be pur-

chased and the two mixed together, with a shovel. In Ohio there is a manufacturer who mixes it just in this way.

Director Thorne, of the Ohio Experiment Station, claims that one-fourth of the cost can be saved by home-mixing. A comparison of prices showed that in a low-grade fertilizer, analyzing 1-8-1, the average cost was 26.3 cents per pound for nitrogen, 8 cents for phosphorus and 6.8 cents for potash; while by purchasing the nitrogen in nitrate of soda, phosphorus in steamed bone and potash in muriate, the cost would be 15 cents, 5 cents, and 5 cents, respectively.

At the former prices a ton of such goods would cost $19.42, but by home-mixing it could be purchased for $12 per ton.

THE USE OF LIME.

Lime is the fourth element of plant-food that may be needed in our soils. Most soils contain lime enough to grow ordinary crops, but continual cropping has so reduced the lime content of many soils that it no longer neutralizes the harmful acids in the soil.

From the Atlantic ocean to the Mississippi river comes the complaint that clover does not thrive as in former years, and an analysis of these various soils discloses the fact that they are deficient in lime. In some States, such as Pennsylvania, Maryland, and other States, large quantities of caustic lime have been used so frequently until complaint comes from these sections that lime has ruined the soils—has burnt up the humus. The truth is, the soils have been over-dosed.

We have now learned that a very small quantity of lime will correct the acidity of many soils, so that clover and other legumes will thrive. I have known an application of 500 pounds per acre to give good results.

Carbonate of lime or raw limestone is a safer form in which to use it, but it requires double the amount. If this form is used the stone should be crushed and ground into a fine powder, if possible, in order to obtain immediate results.

Experience on my own farm has proved that some land needs only one of the first three elements named, and to supply the other two is a waste of money.

For years I have been growing cow peas, soy beans, hairy vetch, crimson clover and other clovers. Besides, all the crops grown have been fed on the farm and the manure carefully saved. One can thus see why my soil does not need nitrogen.

Again, my soil is a heavy clay and, being well supplied with vegetable matter, enough potash is made available so that an application of this element does not increase the yield.

How long I may be able to practice this method remains to be seen, but since both the liquid and solid manure are saved, I take it that but little potash is being lost each year.

The phosphorous, however, is quite another proposition. Chemical analysis has shown that our soils are deficient in this element. Even with live stock farming the total phosphorous content of the soil becomes less, because there is but little phosphorous returned with the manure. Quite a little of this element is carried off in the bodies of the live stock, especially in their bones. To replace the amount taken away I have been using the phosphate rock known as floats. This is used in the manure as an absorbent.

Tests at the Illinois, Ohio and Maryland Experiment Stations have shown that the phosphorous in floats will be made available by the actions of the acids in the manure. On my own farm I have proven to my satisfaction that the humic acid in the soil will also render the floats available.

A few years ago I applied floats to a portion of a wheat field where the soil was well supplied with humus. After the wheat had come up I thought I had made a great mistake, for on that portion of the field the wheat did not start so soon as where the treated goods had been used. If a hard winter had followed, I think the wheat on the floats section would have frozen out. By the first of June of the next year, however, those who passed by the field often asked me what treatment I had given that piece to make it so much better than the rest of the field. There was also a marked difference between the growth of the wheat at harvest time; but the wheat was not harvested separately, so

In mixing floats with manure I aim to put forty pounds to a ton of manure. We sometimes get on less, and sometimes more. The Ohio Experiment Station has obtained better results from the application of the treated goods, but the difference has been slight. Ordinarily I would not advise the direct use of floats upon land except where the soil contains plenty of vegetable matter.

A SPECIAL CROP FERTILIZER.

I am not unconscious of the fact that I run counter to the teachings of good authority when I state that I do not believe much in a special crop fertilizer. We find on the market a Potato Fertilizer, a Wheat Special, a Corn Grower, etc., etc. And some farmers come to the conclusion that it takes one kind of plant-food to produce potatoes, and an entirely different kind to grow wheat, losing sight of the fact that all soils contain more or less of all the elements of plant-food, and that the function of artificial fertilizer is not to supply the soil with the entire amount of all the elements necessary to grow any given crop, but to make up for the deficiency of the soil in any one or more elements. Let me explain. Here is a soil on which clover has been grown for years; tons of stable manure have been applied to it. As a result of this treatment it has a superabundance of available nitrogen. Now I take it that one would be throwing his money away if he should use a special wheat fertilizer containing nitrogen on that land in order to grow wheat. I have another instance. Here is a clay soil (and most all clay soils are well supplied with potash) that has been filled with vegetable matter by turning under rye, crimson clover, etc., and in addition it has been treated with manure saved on a cement floor, where no liquid was lost, and consequently is rich in potash. I want to plant this ground to potatoes. Must I buy a so-called Potato Fertilizer because it is known that potatoes require a good deal of potash? This soil, as are most soils in my State, is deficient in phosphorus. Then would it not be the rational thing to do to supply it with that element in which I have found it is deficient?

Experiments on my own farm have demonstrated the fact that my soils need nothing but phosphorus, even in producing potatoes. Of this element I often use large quantities, and get satisfactory results. On one field I applied 900 lbs. acid phosphate per acre, with a very satisfactory yield of potatoes, but when a heavy application of sulphate of potash was used no difference in the yield could be noticed. I have used potash nitrate of soda and phosphate rock in check-rows in corn, and the only results I obtained were where the phosphorous was used.

WHERE TO APPLY PLANT-FOOD.

Believing that more soils and consequently more crops suffer from the want of humus in the soil than from any other one thing, I have been led to wonder whether or not we have not fertilized the wrong crops. I have found that for corn, commercial fertilizers give little or no return on land well supplied with vegetable matter Especially was this true where a heavy sod which had been fertilized in the spring before the crop of grass was taken off, had been plowed down. I like to get as many returns from one investment as possible, and where the meadow has been fertilized quite a per cent. of that fertility goes into the roots and stubble, and where this is turned down and thoroughly decayed that portion is ready again to give a profit in the grain crop to which the ground may be sown. I harly see how it is possible to get so much profit from fertilizing a crop which does not have an extensive root system and which does not produce a turf or sod on the surface.

APPLYING MANURE.

I believe that about the same principles hold in the application of manures to the land, except that manures tend to increase the bacterial life of the soil. Every farmer has observed that manure is more lasting than commercial fertilizers. This is true, not because it contains more plant-food—it may contain more and it may contain less—but the difference lies largely in the fact that

most commercial fertilizers are inorganic matter and consequently do not increase the humus content or bacterial action of the soil.

One will obtain a larger yield per acre by a heavy application of manure, but on the other hand he will get a larger profit per ton of manure by a light application. Therefore, since I do not have enough manure to go all around, I apply it lightly and cover as many acres as possible. After experimenting with it on all crops, I have adopted the practice of applying the manure on meadow and pasture land. I believe that as a mulch it will do as much good as if it were incorporated in the soil.

By this method I increase the growth of grass, which, if made into hay, will give a corresponding increase in the manure crop next year. It will also greatly increase the humus in the soil and will thereby obviate the danger of losing a portion were I to spread it upon the bare ground. The Ohio Station obtained much better results from manure when it was used on the wheat or sod as a top dressing than they got from putting it on bare ground.

Vice-President Cox—What action will the Board take in reference to this paper?

A Delegate—I move that it be accepted, with the thanks of the Board, and that it be incorporated in the annual report. (Carried.)

Vice-President Cox—Just at this point we will vary a little from the printed programme, and listen to a report, an unusual report, before this State Board, from the E. B. Voorhees Agricultural Club, to be presented by Mr. Shute.

Report of the E. B. Voorhees Agricultural Society.

The Short Courses in Agriculture were established four years ago. These courses were inaugurated in order that the farmers and their sons, together with other parties interested in agriculture, might devote twelve weeks of their time during the winter months, when they can best leave their various homes and obtain a more thorough knowledge of the principles of practical and scientific agriculture. The record of attendance is rapidly in-

creasing each year until there are now seventy-seven students enrolled and pursuing the week outlined at the present session.

It was found, however, that during this comparatively short period it was impossible for the students to get more than the rudimentary facts and principles and the idea was conceived to form an agricultural society by uniting the graduates of the Short Courses into an agricultural organization, the object of which was to keep them in close contact with the work of the Experiment Station and the Short Courses and enable them to participate in the experiments of various lines with the idea of furthering the various interests of agriculture in the State. This club was appropriately named the E. B. Voorhees Agricultural Society, and now has a membership of one hundred and fifty, made up largely of students that have attended the Short Courses and others are interested in its future welfare.

Three meetings are held during the year at the College Farm, one at the close of the Short Courses in March when plans are made for the work of the club for the ensuing year, the next meeting being held in conjunction with the annual festival and harvest home, at which time the members make reports of the success or failure of the various crops grown in their section, while the third meeting is held during Farmers' Week in December when the students assemble and bring exhibits of farm products for competition in the various classes for which awards are offered by the Society.

A prize of $10.00 is offered for the best ten ears of corn grown by a member of the Society, the same amount is offered for the best display of apples, while medals varying in value from $5.00 up are given by the club for the best exhibit of other agricultural products. Furthermore, the student devising and executing the best plan for experiment work is further recognized by the awarding of a medal, and already a great deal has been accomplished to further the interests of the New Jersey farmers through the work of the E. B. Voorhees Agricultural Society. It is the object of this association to work in conjunction with the State Board of Agriculture, and the various Granges and other organizations the object of which is to place the business of farming on a more profitable and business-like

Membership is not confined to the students attending the Short Courses, however, but any resident of New Jersey is eligible for membership who is interested in agriculture and wishes to lend his influence toward promoting this line of work. Such organizations prompt good-fellowship among the students and members; enables them to exchange ideas pertaining to their special line of work and is a step toward organization and co-operation, necessary factors for future agricultural progress.

The Chairman announced the following committee on deceased members: Mr. John T. Cox, Charles Collins, Theodore Brown.

Vice-President Cox—The time for adjournment has now arrived, and we will take recess until 7:30 this evening.

The meeting then adjourned till 7:30 o'clock, P. M.

FIRST DAY—THIRD SESSION.

Vice-President Cox presided.

The Vice-President—You will all be interested in listening to some "Suggestions from English and European Agriculture for the Farmers of the United States," by Dr. W. I. Chamberlain.

Mr. Chamberlain read a lengthy and instructive paper, which was enthusiastically received.

Vice-President Cox—We have listened with a great deal of pleasure to this very interesting paper by Dr. Chamberlain. Does any member of the Board wish to ask the Doctor any questions?

Mr. Fithian—Mr. Chairman, the gentleman has been making some comparisons, and I want to ask how is it, with all these favorable conditions, that nine young men out of every ten in my county leave the farm, with some of the best lands in that section selling at a very cheap rate? We have been told that thirty-six hundred men own in England what the thirty-six million ought to own. According to reports of the papers, thirty-six people in this country own pretty near all of it.

Mr. Chamberlain—Mr. Chairman, I would rather answer first why they do not leave the farm over there. Because they cannot get so good wages in the towns when they go to gain their living there. With us, in the best parts of Ohio, that is not true. Young men are not leaving the farms. Of course, what takes our young men from the farm is our superior opportunities for education and for getting into all kinds of work where the brain tells more and the hand tells less, and the very high wages which are gained in our manufacturing and mining centres and in our cities all through, in fact, that is the thing that draws them away, and, then, the strong desire for city life, of course. But it is probably worse in New Jersey than it is in Ohio. In Ohio a large part of the farmers' boys are staying on the farms and becoming well-to-do farmers, and especially the hired men.

A Delegate—I move you, Mr. Chairman, that the able paper of Mr. Chamberlain be accepted and made a part of the annual report, and that Mr. Chamberlain be tendered a vote of thanks. (Carried.)

We will now take up the discussion of the Game Laws, and this discussion is to be opened by the Hon. B. C. Kuser, the chairman of that commision. (Applause.)

Mr. Kuser—Mr. Chairman and gentlemen, I was appointed two years ago on the Fish and Game Commission, and the first thing I took up was, Why should ninety-eight per cent. of the people pay for the pleasure of the two per cent. who like to hunt game? Last year I had a bill introduced in the House by Mr. Radcliffe allowing the issuance of licenses for $1 to everyone who wanted to shoot. This will take care of the Game Commission and all the expenses. We have taken in this year $52,806. This is a great benefit to the farmer. I know that, for I always lived on a farm until a few years ago. Anyone can ask for a license, his name is put on it, and it shows his address, which I think is a good thing. We charge an unnaturalized foreigner a ten-dollar license fee. Before this dollar license he could say, "I am a resident of New Jersey, I can shoot." But since the dollar license he has got to have something to show why he can shoot, and that stopped between fifteen and twenty

thousand foreigners. At the same time it stopped all the boys from running around with rifles, which I guess all of you have had experience with, going along the road, and the first thing you had a bullet going over the top of your head, and you wondered where it came from, and it was some boy shooting at some songbird. They have got to pay a dollar license, and if we catch them shooting out of season it is a twenty-dollar fine. That is only the resident license. Our non-resident licenses are ten dollars.

When this present commission took office they were taking in a thousand dollars a year. This last year we took in a little over six thousand dollars.

The non-resident licenses are ten dollars. I think it would be a great deal better if it were five dollars to all people living in States that will do the same for us; that is, that will only charge the people of New Jersey five dollars for shooting in their States, and making the foreigners pay ten dollars; that is, unnaturalized citizens. There were only sixty taken out in the State of New Jersey in the last year.

We are spending this year about twenty thousand dollars for birds, which we are going to send out on farms or wherever there is good territory to send birds to. We bought two thousand Hungarian partridges and four thousand English pheasants, and if any of you gentlemen have got a good place to turn out the birds and will write to your Secretary or to the commission we will be very glad to send some to you.

We tried last winter to get what they call a Game Farm. On a Game Farm it would cost to raise English pheasants about a dollar to a dollar and a half apiece; and we have just imported some and they cost us three dollars and a quarter apiece. It would be a great saving to have our own farm, and we could raise eight or ten thousand birds or more a year, at a big saving to the State from the present cost.

We are stocking the State this year with about one hundred and twenty thousand brook trout. We are stocking South Jersey streams with them, which I think is a very good idea. During the last year in Ocean county we tried the experiment down there with very good success. So we are going to try South Jersey streams and see if they can have good protection.

I think one of the main things to protect in this State is our song birds. You take the game birds, they are harder to shoot than the song birds. I think the song birds, everybody likes to hear them and I would rather see them protected than anything, because they are easier killed.

We have found this year violations of the law so that we collected three thousand dollars, mostly of foreigners shooting robins and all kinds of birds—catbirds and everything they could get to shoot.

There is another question often asked: Why is the State divided into two sections? In 1907 we put a law on our books for snow—they cannot gun during tracking snow, which I think is one of the best things we could have. In Sussex county in 1907, the shooting came in the first of November and up to the first of January they had eleven days' shooting.

On woodcock, my first year in the commission, the woodcock season came in for July and the first of October; now on quail the season comes in the tenth of November; and when anybody went shooting for woodcock they killed everything. I am a shooter, I know just what I am talking about; because you take a bird that gets out in the shrubbery the first of October, you cannot tell what it is, and you are going to shoot it, and if you kill it, if it is a quail, you are breaking the law. That is one reason why we divided the State. Take the woodcock; they come in in the northern part of the State about the first of October, and they come in down in South Jersey about the first of November. By having two sections it would make it about the fifteen of October, the same as Pennsylvania; and as for quail, in the northern part of the State we have hardly any quail. I would make that for quail from the fifteenth of October to the first of December in the northern part of the State, and the southern part of the State between the fifteen of November and the first of January; that would give shooting in both parts of the State. Our State is a little less than two hundred miles long.

We want the farmers to try to help us in protecting all game, and if the farmers will let buckwheat stand, we would be very glad to give them the seed, which I think is a good thing in corn—the last time they cultivate corn to sow buckwheat—if you do

that you will get food for the birds. You take northern Jersey, and all over Jersey, a few years ago we had lots of quail. This year, or the last few years, we had very few of them, for two reasons: one is, that there are so many shooters, and another is that there is no food for them. If any of the farmers will write to us our Secretary will be very glad to furnish him with the buckwheat for whatever they let stand for food for the birds.

Now take the ducks. I happened two days ago to hear from south Jersey or from Ocean county. We wonder where the duck is gone to. In Ocean county they are shooting now out of what they call air-holes. I think it is murder, to say the least. Men go out and wear white clothes, and when the ducks get in the water-holes they murder them. I think our duck law ought to be closed the first of January all over the State, and I believe if we do that we will have some ducks left.

If there is any question anybody would like to ask I would be very glad to answer it.

Vice-President Cox—The members of the State Board, I know, a number of them, have some ideas of their own touching upon this game question, and I know that Mr. Kuser, as President of the State Fish and Game Commission, would like to know something of the sentiment prevailing among the farmers who come close to the game of the State, and I hope our members here will feel at liberty to express views upon the game laws now in operation, and to suggest such changes to the Fish and Game Commission as may be desirable to our people, and might be valuable for the commission.

Mr. Bomm—I would like to ask who owns the game?

Mr. Kuser—Well, the State of New Jersey owns the game.

Mr. Brown—Mr. Chairman, what we want in our section of the State is that no one shall be allowed to come on our farms without the written consent of the owner, under a heavy penalty. (Applause.) The gentleman has said that the law stopped about fifteen thousand from gunning this year. We want all the rest stopped, except those we see fit to grant a written consent to. This game business has got to be a burden on the farmers.

Mr. Kuser—I believe you have got a law to that effect now. They have got to have, not the written consent, but the consent of the farmer.

Mr. Fithian—I live in a gunning section, although I do not do any gunning. I once did gunning, and shot my thumb off, so that I quit gunning.

But I find that the game law in our section, for some reason, is the most unpopular thing you can think of. I own property, and I like to know who is gunning there, and if they have a license it shows it. But I know that the sentiment of my community is against it. I cannot see why, when a man comes over my place, I have not the right to know who he is. I cannot see why this should be so unpopular with fair-minded men. In my judgment, nine out of ten men are opposed to it in my community.

Mr. Rider—Mr. Chairman, there has been a sentiment, I think, among farmers generally, that was adverse to most any laws that assume to control the game, but from my experience and observation, our present law is the best one that has ever been in existence in New Jersey. I say that because I see them take down train-loads of passengers, foreigners, and they don't permit them to have arms or ammunition, but they will smuggle them in, and they have all kinds of fire-arms. Knowing they live in New Jersey, they shoot all kinds of birds—not only quail, but song birds, or any animal they can get sight of, and sometimes they don't stop at shooting chickens, if they can get them right where somebody don't see them. And I am sure during the last year we have had less trouble than ever from that experience. In fact, we have had no trouble. They don't take a gun, because they don't think they can use it; they know they are liable to twenty-five dollars fine. And we know that most all who were gunning before were foreigners, but this year there has been an absence of it.

Mr. E. R. Collins—For the inhabitants of the State of New Jersey, as they increase, the question of regulating hunting over the lands of farmers is bound to be more difficult to arrange, and there is a growing inclination on the part of the farmers, at least in Union county, to keep hunters off of their farms. Now

how would this do? To have the law so that all lands are closed to hunting unless the owner posts notices that it is open to hunting. Wouldn't that settle a whole lot of it? (Applause.) All lands closed unless notices are posted, "Hunting permitted." Then your hunter, if he gets on posted land, cannot say, "I did not see the sign." Because he knows if he did not see the sign, "Hunting permitted," he has no business on that land. Now that is what the owners of land in Union county think would be a good idea. They would like such a law. The answer to that is, "Well, if that is the law, then there will be no hunting." Very well, then let there be no hunting. (Applause.)

Mr. Kuser—I will answer the gentleman in this way: I would like to see the game protected, and that is what we are for; the Game Commission is to protect the game. If all the farmers would do that, that would be a good thing.

Mr. Ludlow—Has a man got a right to gun when there is snow on the ground?

Mr. Kuser—No.

Mr. Ludlow—Why not?

Mr. Kuser—Well, you can track the deer or any game bird or rabbit.

Mr. Ludlow—Does the game law say anything about squirrels?

Mr. Kuser—No.

Mr. Ludlow—I had a man all fixed, but they told me the law did not say anything about squirrels; he said he was gunning for squirrels; that we could not hold him. We could not find a rabbit on him, so what was I going to do with him?

Mr. Kuser—I tried last year. I had a bill introduced in the House to the effect that they could not shoot squirrels, but we have been occupied with other matters in our commission.

Mr. Ludlow—Now they go around and say, "Well, I am after squirrels," and that is the end of it; and you cannot do anything with them unless you find a rabbit on them, and if the man is bigger than you are, you cannot get the rabbit.

Mr. Forman—I would like to ask if doves are protected?

Mr. Kuser—Yes.

Mr. Forman—In Monmouth county we have quite a flight of doves and some of the men there are very much displeased because they cannot shoot them. They say that the farmers of Monmouth county shoot those doves and when their migratory season comes they go off down to Maryland and Virginia and those people shoot them off. We raise them, and we think that is an injustice. I don't see, if we furnish food for them, whether it be weed seed or wheat, or what not, why we should not have the right to have a few of them before they go down to Maryland or Virginia or wherever they go.

Then there is another thing which is recent in our section, which is, that we have quite a number of foreigners who fish sometimes, for want perhaps of better employment. They don't catch very many fish. I know one instance where a Polock was caught by a game warden and fined, and some of his chums chipped in and paid his fine and they swore vengeance on this warden and the man went around quite afraid of his life for a little while.

And another thing, we have a good deal of trouble chasing out those fellows when we see them coming on our property. By the time we get to the boundary line of our property the fellow is over on the next neighbor's, and you get up there and by that time another fellow is coming on the other side, and finally you catch some school boy—papa got him a gun to go hunting with. I think there ought to be an age limit. I don't think a boy under fifteen years of age, or even older, ought to be allowed to carry a gun or to shoot game. Nearly all the accidents that happen in Monmouth have been by the careless use of firearms in the hands of boys from twelve to fifteen years old.

Mr. Kuser—We suggested that same thing last year to the Game Committee of the House. One of the members said, "I have got a boy twelve years old," and he said, "I won't stand anything of that kind." He could not see what we had against it. We would like to have such a law. I tried hard for some of these laws. We have put through two or three laws, and one of them

is the dollar license, another one is the non-resident gun license and the foreigner's license; and it is a hard thing to try to get a bill through both the House and the Senate. But you speak of the doves and robins—the robins come in the same class that you spoke of. We will have a meeting in New Orleans, on the fifth of February, of the National Game Association, which I think will do some good. I am going there that day. We are going to start a new association and probably get all of the States to join, to see what we can do in protecting the doves. If one shoots them, all ought to shoot them. And the robin the same way.

A Delegate—Mr. Chairman, I have a neighbor who told me last spring that he had twenty-five or thirty apple trees, and that either the rabbits or the hares, he was not positive which, had about cleaned out those fruit trees. Now, Mr. Kuser is speaking about the beautiful robin. No doubt the robin is a very pretty bird, but in our section of the country they have a few cherry trees, and my wife said to me last spring, "You had better pick those cherries when they are half grown, because the robins will clean them out." Since I have been in Trenton and I have seen the smiling face of Mr. Kuser, I recognize him as having passed by our place, and I will take care I don't harm them when he is around; but I should just like to ask Mr. Kuser's advice as to what we should do with the rabbit or hare, in the case of my neighbor's fruit trees, and also the robin, if he is going to eat our cherries up before we can get them, so that we only get a few?

A Delegate—Plant more cherry trees.

Mr. Kuser—If the gentleman will apply to the Game Commission, we will give him permission to catch the rabbits in the fall or the spring; that is the object of the law that we have on the statute books.

Mr. Rorer—How about the robins—can they have the cherries?

Mr. Kuser—That is up to the Assemblymen and the Senators. whether they will pass such a bill.

A Delegate—Mr. Chairman, in our section we do not get very much fruit; we have just enough cherries for family use. Sometimes we have more than the robins can eat, but as a general thing the robin cleans out all the cherries, and it seems to me that the robin does us a lot of damage. I am speaking for a part of Burlington county.

Mr. Rider—I want to say that if the gentleman has a few cherry trees, he forgets to look at the other side of the ledger. I think he will find, if he counts up all the good that the robins do, that that will ten times overbalance the robins eating cherries.

Dr. Ward—Mr. Chairman, I think that this dollar license is one of the best laws ever put on our statute books. I live in Essex county, as you know, contiguous to the city of Newark, and we are overrun by the foreign element of that city. The Italians come in swarms and overrun our places, not only during the week days, but also, against the law, on Sunday. Now this year, since this dollar license has been in force, we have had very few of those men trespassing on our place. My place has been posted for years. I have, may be, a dozen large printed boards prohibiting trespassing, prohibiting gunning, and they did very little good. They would trample over the place, but this year the trespassers have been very few, and I believe it is the dollar license that has kept them off. I would be very, very sorry to see that taken off the statute books. I have had a good many talks this fall with sportsmen, and I have not heard one up in my section of the State but what has approved of this law and has thought it was a good thing.

Mr. Harrison—There is one thing I could never understand with our game laws. The Game Commission have bought English pheasants and some other kind of pheasants. What is the good of putting them out here if you are going to allow people to gun for them the same year you put them out. What is the sense of it? If you are going to try to stock the State with this kind of bird, why don't you have a closed season on them for five or ten years and give them a chance?

Mr. Kuser—In reference to the closing of the season for the English pheasants, we take it from this standpoint: we turn out

the birds about the middle of March or the first of April. Those birds will breed that year, and people are going to pay a dollar license, or five or ten dollars, whichever it may be, for a non-resident; now, they want to get something for the money. I know one time we bought ten or twelve thousand dollars worth of quail and turned them out in January, and they all died; there would not be one hundred alive, because they starved to death. Our idea and the reason we have to pay so much for the birds is to try and get them as late as we can. If we had a game farm, as I spoke of, we could get our own birds and they would not cost us near as much; and we could turn out more of them, and if we turned out ten thousand birds, the commission figures that there would be fifty thousand birds before the winter season. The pheasant in eight weeks' time is full grown, and the people who take out the licenses want something to shoot at, and that is the reason I would be against a closed season on the English pheasants and the Hungarian partridge.

A Delegate—I want to say that you don't have to post your land here, except in the outlying lands; no man has a right to gun there without your permission.

Secretary Dye—Mr. President, I have not said a word, but I want to say now, I think this discussion has been mutually helpful. We understand each other better. The farmers have expressed their opinions and given their experience. Now, it seems to me, sir, that the next step is to appoint a judicious Fish and Game Committee from this Board of three or five members, and let them be on call as it were, and be in conference with the President of the Fish and Game Commission and in touch with the Legislature, and perhaps they will evolve something that will help the situation where it needs improvement. I move you, sir, that a committee of five be selected by the President, to be appointed at his convenience.

This motion was carried.

The board then adjourned till Thursday, January 20th, 9:30 o'clock A. M.

SECOND DAY—FOURTH SESSION.

THURSDAY, January 20, 1910, 9:30 A. M.

Vice-President Cox, Chairman—Dr. Voorhees is detained. Our session this morning will opened with prayer by the Rev. Dr. Walter A. Brooks.

Secretary Dye—Mr. Chairman, I raised a question yesterday in my report, which did not seem to arouse the attention of any of the members and it was not pressed then; that was with reference to Farmers' Institutes; with reference to having a longer period devoted to the institute work in any locality than that which has been given hitherto. I believe that it would be highly advantageous and far more beneficial if we could have a longer period devoted to the institute work in any given locality where the interest is sufficient to warrant it. For instance, Matawan, Keyport and Red Bank; there are three localities in close proximity and with good railroad facilities. Now, it would seem as though it would be much better if we could hold a three-day meeting at one of those places next fall or winter, and the next year, if desirable exchange and go to one of the other places and hold a three-day meeting. We referred yesterday to the New Egypt institute; the railroad company there took it up this year and brought the farmers to New Egypt, and we had a two-day meeting there, very successful indeed. So, there are other localities in the State similarly situated. Moorestown might just as well have three days as two; Woodstown could have three, and at Salem they ought to have a three-day meeting, and so in different places throughout the State. But what I want to have is the co-operation of the counties, the officials of the Granges and the county boards. You must not expect to have the institute work planned and carried out from the office in the future as much as it has been in the past. It is impossible. The work of the office is increasing and it is a great hardship on the secretary to do that work and go about the State conducting the institutes, so we want a local committee that will co-operate with us in this work. I don't

know just what the executive committee will decide on. Possibly they may call all the county secretaries and the secretaries of the Granges down to Trenton for a conference on the place, time and subjects, or possibly arrangements may be made to go to the counties and confer with them there. Something of that kind will need to be done, I am quite sure, to make this work more efficient and reach a wider circle of people. It does not do to expend the money where there is not enthusiasm and interest enough to get out a good large attendance. I bespeak your co-operation and help in the future even more than I have had it in the past.

Vice-President Cox—If there are no resolutions to be introduced at this time we will take up the programme.

Prof. F. C. Sears, of the Massachusetts Agricultural College, will talk to you upon "Western Methods in Eastern Orcharding."

Better Methods in Eastern Orcharding.

BY F. C. SEARS.

I wonder how many of my hearers ever saw a sign displayed in the window of a high-class fruit store, bearing some such legend as this: "Choice New England apples for sale," or "New York apples," or even "New Jersey apples." On the other hand, I wonder if there is anybody in this audience who has *not* seen "Choice Oregon apples for sale," or "Hood River Spitzenburgs," or "Colorado Jonathans." And if you have *not* seen one, and *have* seen the other, I wonder how many have speculated on why it is that matters have come to such a pass that the name of any eastern State has come to be regarded as having no advertising value when attached to an apple, when the name of almost any State from Colorado to the Pacific coast carries with it the guarantee that its apples are going to be excellent in every respect. I do not believe that I have overstated the situation in general, and it is certainly worth the consideration of any one who is interested in the fruit industry of the east, or even of the general student of agricultural conditions.

Of course there are some exceptions to the general rule implied in the above. There are individual men here and there in the east who perhaps get as much for their fruit as anybody in the famed western sections. But these eastern growers of reputation are not sufficiently numerous to give their State or section any such standing as Hood River has, or the Wanatchee Valley. In fact, we may say that they have personally overcome the prejudice which exists in the minds of most consumers *against* our eastern fruit. All this is certainly discouraging to one who is interested in eastern fruit growing and who would like to see the industry placed where it belongs, as one of the leading branches of agriculture in this section; and it would be far more discouraging if it were not for the few exceptions noted above, where our eastern growers have, so to speak, lived down the reputations of their sections and have shown their customers that they could produce fruit second to none in quality.

Now, how did this condition of affairs come to exist? What advantages has the western grower over us here in the East, and have we any advantages over him? And lastly, how can we go about the matter of recovering our lost markets and of putting the fruit industry on a business basis?

I have been studying and talking little else than this fruit situation for the past three years, and should like to suggest to you a few conclusions which I have reached. To begin with, let us briefly review the situation in the western orchard sections, and see what factors have contributed to their success.

In the first place, and I believe most important of all, the orchard business is a great industry with them. Whole districts do little else than grow apples, and with this immense investment at stake, and with every man, woman and child in the section talking and thinking of nothing but apples, the industry is bound to reach a high level. What one man does not discover another man will. Jones gets a new idea in pruning; Smith discovers a better way of fertilizing; while Brown comes out with an improved scheme for packing; and each one adopts these suggestions, so that all three have advanced to a point far ahead of what any one, by himself, could possibly have attained. This is a well recognized principle in any industry, yet one which we

have systematically neglected here in the East. If Denmark had had only a handful of men scattered over the country engaged in dairying, it would never have become the leading dairying country of the world, and if we are ever going to put the orchard industry of the East on a satisfactory footing, one of the first steps which must be taken is to get more people engaged in it as a business. There is no use in dabbling in orcharding while we depend on the dairy for a living and raise most of the hay among our apple trees. I believe that nothing would put orcharding on a sound basis so quickly as to get one hundred men in each of our best orchard States in the East to plant from twenty to one hundred acres of orchard.

In the second place, these famous western orchards are for the most part young. Many of them are right in their prime, and others just coming into bearing, so that the fruit which they are producing there at present is the very best which many of these orchards will ever produce, and the owners are planning to set more, so as to keep up a supply of young orchards not over twenty-five years set. I do not believe that the importance of this factor is half appreciated by our New England orchardists who are trying to compete with this class of fruit, with fruit from trees long past their prime. Until we get orchards more nearly on a par as to age, we shall not be competing with them on anything like an equal footing, though our fruit trees will certainly retain their vigor longer than theirs.

The third factor in their successful orcharding is spraying. It is a business proposition with them, and they never neglect it. It is nothing uncommon for their orchards to be sprayed five, six, seven or even more times in a season; and experimental spraying at the Oregon Agricultural College has shown that ninety-nine per cent. of their apples can be kept free from worms or fungous diseases, and many of their orchardists are approaching very close to this in actual practice by proper spraying. With us, in the East, the orchard that is sprayed *at all* is the exception, and usually one, or at most two, sprayings are all that any orchards receive. We let the coddling moth and the San José scale take what they want, and we take the rest.

The fourth factor which I believe has contributed to the success of the western fruit is the fertility question. Their lands are

new, virgin soils, full of all the elements of plant food, and the fruit grown on them has all the raw materials at its disposal which it can possibly use at any stage of its development. In the East we are growing fruit, which we expect to compete with the western product, on lands which are worn out with constant cropping, and which are, in addition, too often forced to grow two crops every year—a crop of fruit and a crop of hay. Not only this, but the crop of hay is frequently considered the more important. A recent orchard survey made in one of the New England States brought out the fact that in most cases where an orchard was plowed up and cultivated this was done because the hay had ceased to make a good crop, and the cultivation continued only long enough to get the land again in good condition, so that it could be re-seeded.

A fifth element of their success is certainly cultivation. This is thorough and continuous, so that all the power of the soil goes to making fine foliage and fine fruit, instead of being divided up among weeds, grass and fruit trees, as is too often the case with us. I am willing to admit, for the sake of argument, that sod culture, so called, is a possible method of caring for an orchard, but growing apple trees in a hay-field is never attempted in the Hood River Valley, and it ought not to be in New Jersey.

The sixth factor in the conquest of our markets by western fruit, and the one which more than all others has given them the inside track, is, in my opinion, their methods of handling and grading and packing their fruit after it is grown. Even with our faulty method of growing fruit, we produce a lot of fine apples, but nine-tenths of them are not marketed so as to command the high price which their quality would warrant; while the western grower grades and packs in such a way as to insure the apples reaching the consumer in perfect condition. Not only is every apple put on the market perfect, or nearly so (the blemished ones produced being discarded), but they are graded so that all the apples in each box are exactly alike. For the past few years it has been my practice to ship in from the West Coast —from Oregon and British Columbia principally—several boxes of apples to be used in my classes for demonstration purposes; and though these boxes come clear across the continent alone by

express, receiving much rougher handling than they would if shipped in a carload, as is usual, yet so perfect is the packing, and so careful has been the previous handling of the apples that they arrived with practically every apple in perfect condition. And the apples in the middle of the box and in the bottom are just as good as those on the top. This is certainly the key to western success in getting gilt-edged prices for fruit. "A dozen Oregon Spitzenburgs" or "a box of Colorado Winesaps" has a definite meaning, just as much so as "a dozen California navel oranges," and customers are willing to pay for this certainty of getting something which is good.

A seventh factor, and one closely allied to the sixth one just discussed (in fact, responsible for it to a considerable degree), is their organization, their co-operation. It is not "John Jones of Hood River," but the "Hood River Association." Someone has said that no man ought to pack his own apples, for it is too hard for him to see a worm-hole, and the western orchardists act strictly on this principle. The grower produces the fruit, and there his connection with it ceases until he pockets the proceeds. He turns the fruit over to the association, and it is packed and sold by men who have no personal interest whatever in the fruit, and whose only object is to pack honestly and well and to sell at the highest possible price. This insures that only first-class fruit will go into the package, for these associations have discovered the fundamental truth (entirely overlooked, as a rule, by eastern orchardists) that two good apples are worth more than the same two apples with two poor ones thrown in. More than this, the association handles in large quantities, and can capture and hold markets which smaller lots could not possibly do.

The eighth and last factor in their success which I shall mention—though there are doubtless a few other minor ones which might be included—is their climate. I believe that the dry, sunny weather which most of their apple sections have puts a color and a "finish" on their fruit which it is difficult to get here in the East. Mind, I don't say that it *can't* be done here, but certainly it *isn't* very often, even in the few well cared for orchards which we can boast. This, it seems to me, is only a factor in the situation which might disturb the man who wants to go into orcharding

here in the East, and, as I shall try to show, this is more than offset by advantages which we have.

Let us turn now to the situation here in the Eastern States and see what factors there may be, if any, to encourage the prospective orchardist to select this section as the field of his operations.

I should place at the head of the list the quality of our eastern-grown, and particularly our northeastern-grown, fruit. I believe that there is no other section where the flavor, and aroma, and juiciness, and sweetness, and, in fact, all those factors on which we base quality, more particularly in the apple, but to a greater or less extent all fruits, are more highly developed than they are right here in the northeastern United States. This is not my own judgment alone, though I have had many opportunities of comparing the fruit of this region with that of other sections, and particularly with the far western apples so generally found in full possession of our best fruit stores; and, almost without exception, when our eastern apples were as well grown and had been as carefully handled—which, I am sorry to be obliged to admit, was not always the case—almost without exception I have had no hesitation in saying that the advantage of quality lay with our home apples. Professor John Craig, at Cornell, one of the highest authorities on such matters, and one of the judges at the Washington Apple Show in 1908, a man who has had frequent opportunities to test this point, has repeatedly expressed the opinion, publicly and privately, that for *quality* eastern apples were in the lead. The same opinion has been expressed to me on many occasions by those who have taken pains to test the comparative merits of our New England apples and those from Oregon and other western sections. Now, if this is so, the importance of this one fact more than outweighs all other possible advantages that the West may have over us. "Quality" ought to be our motto, to be kept constantly before our growers from the time they select their varieties until the ripe fruit is placed in the hands of the consumer in absolutely perfect condition as to growth and handling. It ought to be dinned into the ears of the customer, and in every way possible brought to the attention of the other senses, particularly his sense of taste, until to call for

eastern apples would be not the *last* but the *first* thing he would think of doing. Of course, the western grower scouts at the idea that the East can grow fruit of better quality or even of as good quality as he can grow. And this matter is yet to be tested, but whatever the quality when the fruit leaves the trees, I do not believe there is any question that when the western fruit gets into the hands of the eastern consumer it is not in most cases of as good quality as that of equally well-grown eastern fruit.

In the second place, land values very much favor the East. Men have been "going West to grow up with the country" for so long that prices for land in any of the good fruit sections out there are abnormally high, while they are correspondingly low here in the East. One hears constantly of the wonderful prices which are paid out there for raw lands, or for land just set to orchards, while one thousand dollars, two thousand or even five thousand dollars per acre have been refused for bearing orchards. Here in the East, on the contrary, while there are a few instances where good prices have been offered and refused, yet, as a rule, plenty of orchard land may be bought for from ten to fifty dollars an acre, and in some sections as low as five dollars per acre. Still, no country in the world abounds more in ideal sites than this eastern section. There are almost unnumbered sections where high, rolling lands, with splendid orchard soils, may be bought for prices which will give the man starting on them a tremendous advantage over those starting on lands in the West. If one can buy land ready to set out apple trees at twenty-five dollars per acre, and this can be done in many parts of the East, he has just one-quarter of the capital to pay interest on which the man who uses one-hundred-dollar land, and his chances of paying dividends are that much better. The skeptical may ask, "If this is so, why have New England and other eastern lands so long gone begging?" And I frankly admit that I would like to ask that question myself, though I certainly do not want to be classed among the skeptical as to eastern possibilities in orcharding. As nearly as it has been possible for me to figure out a reply to this question, which is certainly a legitimate one and an important one, if we are to convince those intending to go into

orcharding that the East has distinct advantages to offer them, the reasons are about as follows:

1. We are so largely a suburban community here in the East that truck crops and dairying have been very profitable, and, once these branches of farming were started, they naturally kept in the lead, as farmers are proverbially conservative and slow to change into new lines.

2. There has been too long here in the East a feeling that we could not compete with the West in *any* line of agriculture. When the grain crops were the main feature of farm operations, and the grain states of the middle west were first opened up, it *was* a one-sided fight, and our eastern farmers came to feel that in anything which the western farmer could produce, he was bound to win; and they therefore the more assiduously stuck to truck and dairying, where they were safe from this competition. But just as, at the National Corn Show last year, it was a young man from Connecticut who took the prize for the highest yield of corn per acre in the United States, and who is now giving pointers and selling seed corn to his western competitors, so I believe that the eastern orchardist, if he will only try it, can as fully and easily upset the notion that the West has an absolute and iron-clad lead in the production of apples.

A third factor which certainly ought to stand in the favor of the Eastern orchardist is the matter of markets. If he is competing on anything like equal terms with the western orchardist in other respects, it would certainly seem that the fact that he is in the midst of the best markets in the world, while his competitors are three thousand miles away from them, ought to give him the difference in the cost of freight and express rates as a margin of profit, or handicap on his western competitors. The thing to do then is to *make* the terms equal; to adopt up-to-date methods, whether they are western, northern, southern, or eastern, that this market factor *shall* stand to our credit. Unfortunately, this nearness to markets has in the past worked as much, if not more, against as for eastern fruit. For while the grower of good fruit finds it easier to get his product in the hands of the consumer, so does the man with wormy or windfall apples for sale, and as at present, the old, worn-out orchards

of the East are producing an unfortunately large amount of this class of fruit, a customer is led to believe that is about all that we *do* grow here, while our western friends, on the other hand, are so far from market that no one is rash enough to ship windfalls or other refuse on here, so they are spared the reflected odium of this trash in the markets, and their fruit ranks correspondingly high with consumers and with everybody who loves a fine thing.

The foregoing discussion presents the main facts of the orchard situation, both East and West, as I see them. It only remains to sum up the case, and to make some specific suggestions as to putting our orchard industry on its feet, in accordance with the general principles already given. I would suggest to those who may be thinking of planting an orchard, the following points:

1. If possible, put out as much as ten acres of orchard, preferably twenty-five acres. The equipment for running an orchard costs as much for one acre as ten, and the cost of setting is very light indeed. In an orchard in which I am interested, it cost less than six cents per tree to fit the land and set in the trees. The trees themselves for ten acres ought not to cost over fifteen cents each, and could probably be secured for ten cents. Furthermore, with an orchard of this size, one can afford to do many things, and will be stimulated to do many more, which he could not do for a small orchard. By all means, make the orchard large enough, and I am saying this with a full realization of the fact that men frequently put out more orchard than they can take care of. I do not wish to be understood as underestimating the value of intensive culture, but I believe that in nine cases out of ten, the culture is more intensive in a ten-acre orchard than in a half-acre orchard.

2. Use the greatest care in choosing varieties. This is a cruical matter, and one on which a great many men fall down. Get prolific varieties.

There is no profit in growing an orchard which does not bear fruit. You must get the bushels if you are going to get the dollars. If possible, get varieties which have been grown in your particular locality, so you know that they can be made to succeed. By all means, choose high-quality fruit. In my opinion, the Ben

Davis ought never to be grown—in most of New England, at all events. Possibly it may be allowable in parts of Maine, where better sorts will not grow, but an eastern Ben Davis is such a miserable thing as compared with those of the middle West, and the variety is such a poor thing anyhow, that we certainly cannot afford to grow it here in the East. Select popular, well-known varieties, if you can. People do not know the Wisner's Dessert or the Fannie as they do the Baldwin, Rhode Island Greening, or the Northern Spy.

3. Plan to practice clean culture in the orchard from the beginning, if possible. It means better care in so many other ways. It means better acquaintance with every tree in the orchard, and consequently better attention to its needs. In particular, it means less borers; and in localities where they are at all troublesome, this one point is sufficient to warrant the adoption of this method. If it is absolutely impossible to cultivate on account of steepness of the land—and there are undoubtedly thousands of splendid orchard sites on the hillsides of New England and other points in the East, then practice the so-called "sod culture" method; that is, cut the grass and weeds which grow on the land, and leave them as a mulch about the trees.

4. Begin to fertilize the orchard as soon as it is set, and keep it up every year. In my own orchard, each tree is given one ounce of nitrate of soda and one pound of a mixture made of about five pounds of basic slag or acid phosphate, to furnish phosphoric acid, and three pounds of high-grade sulphate of potash. This is scattered about the tree, not close enough to injure the trunk, as early as the land is in good condition in the spring, beginning the year the trees are set, and continuing every year. Probably the nitrogen can soon be omitted. In fact, on the trees two years set we shall this year drop out the nitrogen, as they are making all the growth we want with merely good cultivation. For bearing orchards, we use 500 pounds of basic slag or acid phosphate, and 300 pounds of high-grade sulphate of potash per acre. Mr. J. H. Hale uses 1000 pounds of bone-meal, and 400 pounds of muriate of potash per acre. Either of these formulas is high feeding, but high feeding pays with trees as truly as with steers. It is the man in any locality who fertilizes highly who gets the reputation for

annual crops and for big crops of fruit. Particularly if one is starting an orchard on old pasture land, or lands where the plant food has in any way been expended—and this sort of land often offers ideal orchard sites—it is important to give plant food to the trees in liberal quantities. A chemical analysis of the soil may show an abundance of plant food, but the final test is *fruit*. The orchard which is fertilized highly, year in and year out, crop or no crop, is the one which gives the money.

5. Spray the orchard. It is not always necessary during the first few years, but, on the other hand, it is sometimes absolutely necessary if the trees are to be saved. Rose chafers will sometimes drop down (or crawl up) in a night, and prompt measures and strong poisons are necessary to prevent great damage. Other leaf eaters are almost as much to be feared.. A good spray pump ought to be bought when the orchard is set, and kept in readiness. Keep an eye out for the San José scale, and for anything else which may attack the trees, and keep ahead of them. When the trees come into bearing, spraying becomes still more imperative. The codling moth is always rampant in our orchards, and wormy apples are tolerated in a way which is ruinous to our reputation. Last year, I went to a fruit store in Amherst, and bought a dozen locally grown Baldwins, at two cents apiece. Practically every one had a worm-hole in it. One of the most prominent orchardists in Massachusetts stated to me last year that, in his opinion, the Canadian Fruit Marks Act, which allows ten per cent. of wormy or otherwise defective specimens in No. 1 apples, was far too strict, and that his own No. 1 apples that year would average nearly fifty per cent. wormy. Until we get a different view from this on what is allowable in No. 1 fruit, the West will continue to take our best markets, and it will be strange if it does not drive us out of even the second rate ones.

6. Practical thinning on the trees which set heavily. This is a practice which is never neglected in the West, and which has already gained some foothold here in the East. It gets rid of defective specimens of fruit before the tree has had the drain of bringing them to maturity, and the result is better fruit that year and more likelihood of a crop the following year. Some varieties need thinning far more than others, but any variety of any

fruit which tends to overbear fruit will be benefitted by it. It is by no means as expensive an operation as many people think. From twenty-five to fifty cents ought to thin a good-sized bearing apple tree. It takes grit to do this, and it needs practice and quick work to do it cheaply and properly, but I am sure this is one of the secrets of western success and eastern lack of success.

7. Lastly, handle the fruit with the greatest care. Grade it with the greatest accuracy, and pack it with the greatest skill and honesty. In picking and sorting the fruit, it ought never to be tossed about, or let fall. No apple should be let go of until it is in contact with those already in the basket. Pad baskets and tables to avoid bruising. For packages, use the regular bushel box for all the best grades of apples, either 10x11x20, inside measurement, or 10½x11½x18. The old, flat bushel box used for vegetables ought to be abandoned. The box ends should be of ¾″ stock, the sides of ⅜″, and the top and bottom of ¼″. For the top and bottom and sides, good clean spruce, straight-grained and free from knots, is best. It must be good stock, to combine strength and springiness, with lightness. Where barrels are used—and they will undoubtedly long continue to be our main package—get new ones if possible. The second-hand ones are never entirely satisfactory. And grade and pack with the greatest care. Carry out J. H. Hale's famous motto, found on his labels, "U C top U C all." Use lace circles for the barrels, and do everything possible to make the package and its contents attractive. And to carry out this seventh point, organize and co-operate. We lose force and power and effectiveness when we attempt to work individually.

And lastly, and all the time, believe in eastern orcharding. Tell your customers and your friends that we can and do grow better fruit here than anywhere else, and then turn in and prove to them that you are telling the truth.

President Voorhees—You have heard this very interesting and practical address. It is now open for discussion.

Mr. Rider—Mr. President, I want to say something on this subject that will be interesting to our friend from Massachusetts, and probably new to some of the people of New Jersey, on

the line of what he has been telling us. Cape Cod has a great reputation in Massachusetts for cranberries, and Cape Cod cranberries are known the world over, and it is so now that it is thought the best Cape Cod cranberries are grown in New Jersey. They bring from half a dollar to a dollar more on the barrel by having it stamped on the barrels that they are grown in Cape Cod. The other day I was in the store of Thomas Martindale & Co., on Market street, Philadelphia. I saw some of my latest shipments of cranberries labeled Cape Cod Cranberries. I said: "Isn't that a kind of a libel on the way New Jersey people grow cranberries?" He smiled and said, "The people want Cape Cod cranberries, so we give them to them."

I think it is about the same with the apples; if he had his apples packed in boxes like the Western apples and gone to dealers, and said, "Here, I have got some Western apples, just came in," he would have sold them right away.

President Voorhees—They do things differently up there.

Secretary Dye—At the Pan American Exposition we had a nice exhibit of sweet potatoes, and a gentleman admiring them said, "I am from the State of Illinois; we grow sweet potatoes in Southern Illinois." I said, "I know you do; then you put them on the Chicago market as Jersey sweets, don't you?" He admitted that that was true, stealing our name for sweet potatoes grown in Illinois.

I believe this fruit business is on the verge of improvement in the East, and it should be. I was in California in 1893 and saw some of the large fruit-growers there—they had two or three thousand acres—and I remember a gentleman asking me about the peach crop in New Jersey. I said, "What difference does that make to you?" He said, "It makes a very great difference. If you have a good peach crop in New Jersey it cuts our market very much." Well, I said, "We are going to beat you in California. We can beat you in flavor anyway, whether we can beat you in color or not." He says, "Yes, you can beat us in flavor." That is true.

I happened to be out to the Seattle Exposition. Of course, the exposition was for the booming of those Pacific States and Alaska relatively, and they had a beautiful show of fruit, but they

confessed that the boom is on now for those people, and they are trying to exploit their fruit lands and all their other lands that they have for sale as rapidly as possible. I asked them how much it cost to clear that land which had been cut off years before with those old pine-stumps embedded there many feet under the soil. Well, they said, it cost them from fifty to a hundred and fifty dollars an acre to clear it. What did the people pay for it? Well, they are holding it from a hundred to five hundred dollars an acre, and with trees well set and growing it costs on up to a thousand dollars an acre. Now, it seems to me that condition won't last, and if we will adopt their methods of apple growing here in the East we will succeed.

Furthermore, the population is increasing over there rapidly, and the demand for fruit on the coast will certainly increase.

Mr. A. C. Buck—Mr. President, I would like to ask when and how to thin the fruit?

Prof. Sears—The time of the year would be, perhaps, the last of June. The idea is to get the fruit out of the way, take it off, just as soon as there is enough difference in the size, so that you can judge, the quicker you get it off after that the better, and the operation is certainly good for the tree, take off those defective specimens, and the usual plan is to thin them about six inches apart on the tree. When you get through with them it scares you. It is worse in the case of plums than with apples. If you take them all off until they are six inches apart you will be scared with the result. The ground will be covered and there won't appear to be anything left on the tree, but when the time comes to pick the fruit in the fall you will find that you have left plenty on the tree if you leave them six inches apart, they increase in size, and another thing, next year you will be far more likely to have a good crop for it.

Another thing; talking of plums, we have been very careful about that, and we find the brown rot gets into them far less, particularly in our Burbank; we noticed this year and last year, we left three or four trees as a check to see what the result would be, and on those trees we found it much worse.

A Delegate—You said the operation could be done for fifty

Prof. Sears—I think they pay $2.25 a day; we pay about $2.00 in Amherst, $1.75 to $2.00. A few years ago all our Burbank trees which were full-grown trees cost us on an average an hour a tree. My friend said with him last year in those large Baldwins which I told you a little while ago averaged nine barrels per tree, that his men got over the trees and they cost him an average of fifty cents per tree for thinning. You will find after they are at it that they can go pretty fast. It depends more on the man than anything else. One man will make it cost a dollar and a half, and then another man will get in there and thin it and it will cost less than fifty cents a tree. You have got to have men of some judgment and who will move quickly. It depends, too, on the size of the tree. But sometimes you will find that one man will thin three trees while another man is thinning a single tree.

Mr. Chamberlain (of Wooster, Ohio.)—Mr. President, may I say it seems to me that there should be a concentrated effort, a united effort, to convince the buyers of apples that an apple is made to eat and not to look at. It seems to me unquestionable that from Ohio to New England we can beat the West in quality. A California Bartlett pear is hardly fit to eat. I think the Northwest raises better fruit than California. But I do know that Western apples are not so good as the Ohio apples. Of course the climate there puts a better finish on the apple, but if we can convince the people that the apple is made to eat, and not simply to look at, then we have won a big victory for the East. As for the percentage of wormy apples, I have had Prof. Crawn come into my orchard at our Experiment Station—I am put down there as the Experiment Station, but I have a farm of my own away from that, and I have had him come in when we have picked apples, two or three thousand bushels, stacked up, and he asked the privilege of taking them on our padded sorting table and seeing how many there were to each hundred that must be thrown out, either because they were defective in shape or because they were scabby or because they were wormy, and he went ahead with several boxes, several hundreds, and when he got through I asked him to report and he said there were from four to five, just as they were picked from the tree and ex-

amined, in each hundred that were not fit to go as first-class apples. I sent the fruit to a cold-storage man in Cleveland, and as his men packed them, they were sent in bulk on straw packed in market-baskets and put in cold storage; he says that is a great deal better than any other way for him; and when they picked over the first car he wrote me how many baskets of apples out of twelve hundred baskets of the first car I sent him were unfit to put in cold storage. He says, "Less than one basketfull out of twelve hundred was thrown out as not fit to put into cold storage," and I thought that was a pretty good reputation. I kept his letter a long time. It can be done, done by thorough spraying and careful spraying. We had simply agreed how those apples should be sorted. I got ninety cents a bushel for the apples in bulk, by the carload that year and sent some three carloads.

A Delegate—I would like to ask when is the proper time to pick the fruit. Take it here in New Jersey, we have fine fruit, and the winds come onto us very suddenly, and I would like to know when is the best time to pick that fruit? When it is matured or before?

Prof. Sears—In a general way, I think the apple wants to be fully matured. I think the results of experiments have shown that the apple which is matured will keep better in storage than one that is not. I believe, too, there is no doubt that the longer you leave the fruit on the trees the better color it will get. A few days in October means a lot of improvement in the color of it, but I think some of your local men can give you better advice on that.

A Delegate—What about the frost and the rain that comes on when your apples are on the tree, and the rain falls for two days and your crop is on the ground? My apples this year, what few we had, and we had as nice ones as we ever had, doubled in value as far as looks, and almost, it seems, quarter in quantity in the last ten days that they hung on the tree, and yet if they had hung there a week longer, instead of having two hundred and fifty barrels of nice apples for myself we would probably have had seventy-five barrels.

Mr. Repp—I would like to ask the delegate what part of the State he lives in?

The Delegate—The northern part of the State, near Paterson.

Mr. Repp—What variety of apple was it?

The Delegate—The Baldwin apple.

Mr. Repp—Well, the Baldwin would be likely to give you more trouble than the others like Rome Beauty, which would hang on the tree longer; also the Baldwin in an orchard that was lacking in moisture will ripen up earlier and drop quicker than one which is kept growing, and the dry season would have something to do with the time you would pick. A distinction has been made between a mature apple and a ripe apple, which is very good. A mature apple is an apple that is fully grown and very well colored; a ripe apple is an apple in condition for eating. An apple that is fully ripe will not keep very well in storage. We do not want to pick an apple that is under size and before it is fully matured and fully grown when the apples hold well to the tree. An apple like the Rome Beauty, as long as it is growing and not fully matured, will hold well unless we have high winds and rains. But the Baldwin is an apple which, in this State, varies considerable according to which part of the State it is grown. If it is grown in the southern part of the State, where we have sandy soils and a good deal of heat, it ripens early and will drop soon, and it is hard to get it fully ripe; but in the northern part of the State, with good cultivation and good moisture and it is kept growing, it will hold on longer; as soon as the Baldwins begin to drop some of them begin to ripen, then you want to save them and you will have to pick them.

President Voorhees—If there is no further discussion of this paper, we will take up the next order of business which will be an address on "Co-operation Among Farmers; the Business Side," by Mr. E. M. Tousley, the Secretary and Treasurer of the Right Relationship League of Minneapolis, Minnesota.

Co-operation Among Farmers—The Business Side.

By E. M. Tousley.

ADAPTABILITY.

Co-operation includes the whole of life, financial, social, political and spiritual. With a subject so broad, one is embarassed to know where to begin and when to leave off. I will, however, endeavor to throw some light on the business end of co-operation this morning and to give you the deeper and more ethical principles involved, essential to success, to-morrow morning.

Co-operation is adaptable to every walk and vocation of life; in fact, our city, state, and national organizations are but co-operation applied to government. Co-operation means literally a working together, and when thoroughly understood and the participants imbued with the right spirit to carry it out, its workings are extraordinarily simple and its benefits large.

It would be impossible in the time at my disposal to describe all the various ways and vocations in which it may be practically and successfully employed. You tillers of the soil are primarily interested in that phase of it most adaptable to the raising of farm products and the marketing of same, and yet if you will stop to think a moment you must realize that the larger part of the value, possibly three-fourths, of such products, as well as of all manufacture merchandise, must go to the consumer through the doors of retail and wholesale stores. If this be true, or approximately true, is not the store, then, the key to the situation? We of the Right Relationship League believe it is. These stores also may become, in a large measure, savings banks for the people. My remarks, therefore, will treat more particularly of the store phase of co-operation, buying and selling, rather than the improvement and increasing of farm crops and subjects related thereto. The co-operative phases of these latter should be exhaustively studied into and taught by the states through their agricultural colleges and experiment stations.

In attempting to organize co-operatively, especially to have stores of their own, farmers are frequently told by merchants and others who wish to do all they can to discourage co-operation, "You are a farmer. If you do your farming right and raise good crops, etc., you will come out all right. You are not a merchant and had better stick to your farm."

This line of argument would be good if all of it were true. Like most half truths, it is worse than a whole lie. It is true that the farmer should make a special study of his chosen vocation in an attempt to do the best he can, raise the best and most grain, produce, stock, etc.

But let us see if a farmer is only a farmer. Is the plowing of the ground, the planting of the seed, and the harvesting of the crops his only vocation? As soon as the farmer has harvested his crops he has on hand a large amount of grain, produce, live stock, etc. As soon as separated from the land, these commodities immediately become merchandise, and the farmer must enter into the commercial world in order to dispose of them. If he is ignorant of the best market and of prices and of general training, and stands alone in his conduct of negotiations with the business men of the commercial world, experience has proven that he will very frequently lose quite a percentage of the value of his year's toil in an attempt to market his produce advantageously. This is so patent to every farmer as to be self-evident.

But assume for a moment that he has disposed of his crop and has the money in his pocket. What must he do with it? A very small fraction of the total sum will go for taxes, fire and life insurance; perhaps a small portion for hired help. The bulk of it must be spent for manufactured articles known as merchandise, such as groceries, dry goods, shoes, furniture, lumber, fuel, harness, blankets, agricultural implements, fertilizers, etc., etc. What would the farmer's merchant friends think of him should he send a five-year-old boy to town with several hundred dollars to negotiate for the purchase of all these articles? Yet in the merchant's argument above stated, he says to the farmer in effect: "Don't post yourself on the market price of merchandise or its quality, or attempt to place yourself in a position where you are as well informed about these things as I am. Keep yourself as

ignorant as a five-year-old boy and I will do the rest." He will certainly "do" the farmer if he follows such advice.

In fact, the actual tilling of the soil and reaping of the crops is only about half, or perhaps less than half, of what the farmer must do if he is to get on in the world. Let him be educated in all these things. Let him co-operate with his neighbors in assisting to start, as rapidly as conditions in the neighborhood will allow, a co-operative creamery, elevator, store, credit society, produce exchange, and other institutions, which will not only save him dollars (because he places himself in the position of the middleman), but will also educate him and his children in all the affairs of life. Stick to the farm? Surely, but learn how to farm so well, including the other half, that of enlightment in the commercial world, to such an extent as that the boys may be kept on the farm because they can see in it not only an attractive life, but a future full of promise. If the average American farmer will follow this advice, the cry of "How shall we keep the boys and girls on the farm?" and "the dangers of city life to country-bred boys and girls," will no longer be heard in the land.

HISTORICAL.

Twenty-eight poor weavers of Rochdale, England, in the year 1884, conceived the idea of reducing the cost of living, because they had failed to increase their scanty income by a previous strike, by agreeing to contribute two pence a week toward a common fund with which to co-operatively buy the necessaries of life. This was the origin of what has since come to be known as the world-famous "Rochdale Plan" of the people owning their own stores.

From this humble beginning the movement has spread and grown immensely popular, until at the present time there are many thousand retail stores, with an annual turnover of goods amounting to nearly $60,000,000, with a net profit of over $56,000,000, besides two of the largest wholesale mercantile establishments in the world, on this plan of equitably distributing the profits of this vast amount of business among the 2,500,000 members who created it by their trade.

Every article used or consumed by man can now be obtained in England and Scotland on the co-operative principle.

A Continued Rate of Increase.—The sales of the two English and Scotch Co-operative Wholesale Societies for the last three months of 1906, were $51,050,320.00. This is at the rate of $204,201,280.00 a year. This was an increase of 35 per cent., compared with the same period five years ago. This rate of increase has been going on for twenty-five years. There is nothing to prevent a continuance of the rate of increase. As the sum grows larger, the amount of the increase grows larger. In another twenty-five years, at the ratio of the last five years, the sales should be $915,645,365.00, and in fifty years from now it will embrace practically all the merchandising business in these two countries and a very large majority of its manufacturing. Nothing can prevent co-operation from sweeping competition off the boards.

In studying the history of co-operation in this country, it will be observed that the American farmer has always been a pioneer in the movement. Without taking your time to recapitulate the history of such organizations as the Farmers' Alliance, Grange, and kindred societies, I desire to call attention to the innumerable attempts made during the past fifty years to enter co-operative merchandising, and the main reasons for the failure of nearly all to attain success. The most definite causes are:

First, lack of a definite, tried plan.

Second, lack of a proper system of financing the organization work.

Third, absence of a central guiding body.

Fourth, lack of proper business management of local retail stores, occasioned by the absence of such central, guiding body.

Fifth, the lack of adequate sources of supply on account of the non-uniformity of the working plans of local societies, resulting in scattered efforts.

Dr. John Lee Coulter, of the Economic Department of the University of Minnesota, says in a paper published in the "Yale Review," November, 1909, entitled, "Organization Among the Farmers of the United States," page 15:

"By this time (1870) it was clear that sporadic meetings would not secure the desired results. There must be a complete network of related local societies, and these must be connected with a strong central organization. Organizations must be permanent and widespread. The Grange had been slowly but surely gaining such a strong foothold as was necessary, and now stepped in to fill the gap. The National Order of Patrons of Husbandry was formed in 1873. Slow growth from 1867 now quickened apace and the membership soon grew into hundreds of thousands.

"'Too much was expected. It was thought that legislation could be enacted quickly and that all evils would disappear at once. That great strides were made, all now admit; but immediate relief was not possible. Legislation was not the cure-all; or if it was, it could not produce instantaneous results. Business co-operation was to supplement legislation. Hundreds of thousands of farmers joined local, county, or state business societies. Practically all of these were for the purpose of buying goods cheaper, or manufacturing goods for themselves. Few of these succeeded permanently, although local and temporary success is recorded in hundreds of cases. The farmers had gone stand the new business; often they were guilty of very unwise or hasty conclusions; a brief or slight setback often discouraged them and set them back years. But there were many local successes, and some of these have resulted in the formation of permanent farmers' business societies, which have continued to prosper to the present day.

(Page 21.) "It should be noted especially that nearly all these movements were too much political and social. Too little attention was given to the economic and business side. One result was a great number of local stores or agencies, unable to stand upon their own feet, with poorly paid employes, generally poorly financed, and often poorly patronized. But the educational value was very great; the savings were considerable; and out of that movement has come a considerable number of highly successful stores, each now on as satisfactory a basis as the large privately owned enterprises. At the present time the number of these stores is rapidly increasing The movement is now separated

from the .other organizations. System and business are being substituted for the old co-operative movement which was too largely 'the tail of the kite.' "

(In the July number of "The World's Work" Dr. Coulter gave a detailed study of the experiences of nearly 100 of these newer stores—the Right Relationship League movement.)

In a brochure entitled, "Twelfth Biennial Report of the Bureau of Labor and Industrial Statistics, Part One, Co-operative Stores," issued by the labor commissioner of Wisconsin in 1905-6, edited by Ira B. Cross, a detailed history of the co-operative store movement of the United States is entered into and causes of failure given. Included in the paper are the names and supposed statistics of several hundred co-operative stores scattered throughout the United States. (This list, however, and the statistics are unreliable.) From a reading of all such historical data, as well as from our own experience during the past five years in organizing over 100 co-operative stores, none of which has failed, the writer is convinced that under the head of one or more of the above causes can be classified a majority of the failures of co-operative store attempts.

First, lack of a definite, tried plan. As a rule, most attempts to organize have had for a motive other ideas than to reform business and create conditions favorable to all the people in the present and coming generations. The participants have been short-sighted or their judgment has been warped by prejudice or local conditions. Many starts have been made by persons who wished to get even with some enemy. Others, because they thought merchants and other classes of society were getting too rich, and so on. Organization by local talent is almost invariably attempted in meetings of persons absolutely ignorant of the fundamental principles involved or of any systematic plan, resulting in about as many different ideas as there are different persons present.

The remedy for this weakness and the model to follow, is the Rochdale plan, which has been in successful operation in Great Britain and Europe for nearly seventy years, and which now numbers in membership something over 10,000,000 souls. The Rochdale plan, in short, is:

1. Buy and sell for cash.
2. Sell at a fair margin of profit.
3. A fixed rate of interest on share capital.
4. Quarterly or semi-annual settlements.
5. Division of profits among the patrons and employes in proportion to business transacted.
6. Full dividends to shareholders and employes on amount of business transacted.
7. Half dividends to non-member patrons on amount of business transacted.
8. Each member to have but one vote, regardless of the number of shares owned.
9. Provision for permanent Educational Fund and a Reserve Fund.
10. Limiting the ownership of shares in the enterprise to $500.00 or $1000.00.
11. Unlimited membership, so that everyone in the community, without class distinction, may join on equal terms and receive similar benefits.

On a plan of this kind and with any sort of reasonable business management and judgment, no co-operative company can fail.

Second Cause of failure, lack of a proper system of financing the organization work. Prior to five years ago, I have been unable to discover in this country the name of any co-operative movement which had a central organizing bureau so financed as to make possible the successful and long-continued organization of co-operative stores on a systematic plan. Even those phases of co-operation which have reached the highest success and have become largest in number; namely, the co-operative creameries and elevators of the Northwest, have no such central organizing bureau. While in a majority of cases each local creamery and elevator company has been financially successful and saved considerable money for its members, they lack the true co-operative missionary spirit, and a very great proportion of the possible savings and profits have been lost because of a lack of ownership in, or control of, the business machine "higher up" ordinarily termed the middleman. With the proper kind of an organizing

bureau, these successful co-operative concerns could have long since become their own middleman and saved to themselves and consumers that which has now been lost to them forever. One of the worst difficulties in trying to work with a bunch of farmers organized mostly for social purposes, is that they have preconceived notions of what should be done. Not having had actual experience in organizing, operating, and financing co-operative institutions requiring large capital, they usually overshoot the mark, or are so narrow that they refuse to spend money for necessary information, assistance, and advice, both in organizing and subsequently operating such institutions. If co-operative retail establishments are the key to the situation and one, at least, of the foundation stones upon which to build a co-operative commonwealth, you realize that when enough of these are organized and in successful operation, it will then be a comparatively easy step to organize wholesale stores through which the retails may be supplied. The retail companies must, however, be on substantially the same plan, or they will never get together and agree to work together in their own wholesale. When the movement has gained sufficient footing in these respects and the stockholders have learned to work and save together co-operatively, acquired confidence in themselves and in each other, and have actually assumed their share of the financial and other responsibilities, regardless of whether the result shall bring profit or loss—the next step will be the establishment of factories to supply both the wholesale and retail stores with the goods needed; and thus can be logically built up a voluntary co-operative state within a state. This process must necessarily be slow, when it is considered that the people of any given community, including farmers, must raise from $10,000.00 to $50,000.00 with which to capitalize their first retail establishment. Such establishment must eventually include all the necessaries of life, such as groceries, dry goods, shoes, clothing, millinery, drugs, hardware, furniture, farm machinery, lumber, coal, fertilizers, and farm products of all description.

In seeking to raise this amount of money, it cannot, of course, all be paid in cash. Some can only pay a small amount in cash,

others more; the balance being settled by giving notes. Then the education must begin. Sometimes poor management makes the subscribing stockholders discouraged; add to this the fact that the opposing merchants and almost the entire business world will put up big scarecrows before the members daily in order to discourage them, and you readily see that many of the farmers who have given notes in settlement of their shares of stock begin to get "cold feet" and wonder how they can get out of paying the notes. If they allow the notes to become past due, this further hampers the management in its finances and chances for success. Our remedy at all times for all these ills is education and publicity. Educate the members that true co-operation does not consist in looking for the profits of dollars alone; the participants must have the spirit of co-operation, which means patriotism. In other words, this co-operative movement in its true form is nothing but the world-old fight for liberty; dollars, and dollars alone, mean servitude.

LEAGUE WORK AND HISTORY.

The Right Relationship League consists of active and honorary members. The promotion bureau is composed of the active officers, those actively engaged in the work of organizing. The honorary members are those who have paid $1.00 for honorary life membership, which includes one year's subscription to the official organ, there being no subsequent dues. One representative from each local co-operative company organized by the League, and the directors of the League, constitute the Advisory Board and Co-operative Education Bureau, which Board and Bureau has established an Auditing Department for the stores, and an official magazine. It is expected that the stores will fully capitalize and operate the Co-operative Wholesale Company, already incorporated, within the coming year.

The promotion bureau receives no financial support or income, directly or indirectly, from the honorary membership or from any of the co-operative store companies. This department is maintained by the commissions derived from the opposition, as later explained. As there are already too many stores (See

Secretary Wilson's report), duplicating waste for consumers to pay, we rarely start a new one. Our plan is to contract with a first-class merchant doing a prosperous business who is willing to sell his business to an association gotten up on our co-operative plan in the merchant's trade territory. An organizer is put into the field to solicit members, his salary, at the rate of $125.00 per month and expenses, being advanced by the merchant weekly. The organizer secures the signatures of individual farmers and others to a "Proposal to the People" made by the merchant or firm with whom we hold contract, which provides, among other things, that each subscriber must take the official organ of the movement for one year, at least. This proposal specifies definitely the terms and conditions upon which the merchant will turn his property over to the people. There can be no misunderstanding. There are no secret contracts. The League furnishes free all literature, by-laws, articles of incorporation, etc. When the number of shares specified by the merchant in his "Proposal" has been sold, an organization meeting is held (no meeting of any description having previously been held) and the subscribing stockholders are requested to be present to complete the organization.

A corporation is then formed under the co-operative laws of the state, which usually provide for one vote per member, regardless of number of shares held, and the new co-operative company is ready for business. At these organization meetings an officer of the League is always present to answer all questions and guide then aright. Before leaving, he usually arranges with the stockholders or the board of directors to have an expert invoicer present to represent the company when the goods and property are invoiced by appraisment, as specified in the merchants' original proposal and by the company by-laws. As soon as the amount of the invoice has been determined, a meeting of the board of directors is called, at which meeting, also, an officer of the League is always present, and the turnover is made. Should the amount of stock subscribed for by the people and settled for either in cash or by note, be inadequate to pay the merchant in full, the balance is settled by company note on such terms as will not embarrass it to pay. A membership fee of $5.00 is paid by

each stockholder, which goes into the promotion fund of the company. Out of this fund is refunded to the merchant the expenses advanced by him for organizing the company. The merchant pays a small commission to the League on appraised value of the property he has turned over, and thus the new company is started with its stock up to full par value, no water, with a going business, having eliminated at least the competition of one, and sometimes two, of the largest merchants of the town or city, and having retained all the old patrons besides acquiring many new ones.

The League has no legal hold of any kind on these companies after they are organized, but assists them materially in an advisory capacity. The membership in them includes both farmers and townspeople, local bankers in many cases becoming much interested and taking stock in them. We request the members to call them people's stores and not farmers' stores, thus avoiding class distinctions and prejudices.

The Right Relationship League is incorporated without capital stock, its purpose being to study, teach, and promote true co-operation. It opened its offices in Minneapolis, Minn., in January, 1906, since which time the entire time of its officers has been devoted to organizing and subsequently fostering the local companies, with the result that a group of about 100 stores is now operating on these plans in the States of Minnesota, Wisconsin, and North and South Dakota. A start has also been made in Missouri. While there have been no outright failures, which we consider a remarkable record when the panic of 1907 is remembered, in two or three instances stores have been sold back to their original owners. In these cases no one lost money, however, each stockholder getting back what he had paid in.

The liability of the stockholders on their stock varies in accordance with the laws of the various states in which they are organized. New legislation is badly needed, both for the fostering of co-operative enterprises and for the protection of the people against so-called, but counterfeit, co-operative schemes.

Third, Absence of a central, guiding body. This point has been largely covered under the head of the second weakness. In the northwestern movement the Promotion Bureau has so far acted

as the guide, but it is desired that the people shall more largely take upon themselves this responsibility through the Advisory Board and Co-operative Education Bureau of the League and the Co-operative Wholesale Company. In England and Scotland the Co-operative Union has affiliated with it over thirteen hundred retail societies representing nearly two millions of members. Without such central organization to which the stores shall hold themselves accountable, no uniformity can be had and the power of concentrated buying and selling is lost.

Fourth, Lack of proper business management of local retail stores, occasioned by the absence of such central, guiding body. I have already given a number of reasons to prove the truth of this weakness. In most cases where the League starts to organize, a majority of the farmers are intensely suspicious of our motives. It is but natural. They have been roped in many times by "slick talkers" from the city. This natural feeling is purposely intensified by the opposition of some of the business men of the town who willfully and ignorantly misrepresent us and our plans. We pay no attention to this, however, but persistently explain our plans and their fairness, and almost invariably win out. Then the business is turned over to the new co-operative company. The expense of organizing has necessarily been quite large. The officers and directors of the company feel that the future expense in this particular should be largely, if not entirely, cut off. The manager in charge wants to make a good record and show a profit, and he also imagines that all outside help and advice which causes any expense, whatever, should be eliminated.

Where this feeling becomes intense and the League officers do not have opportunity to meet with the board of directors and explain and advise along lines we know by actual experience to be essential to the success of the company, all we can do is to leave it alone. In such cases they almost invariably go wrong to a greater or less extent. It is extremely difficult to eliminate from human nature the old principles of greed and the desire of a man or a clique of men to get the best of the other fellow. Wherever this is attempted, trouble follows. The most disasterous results yet experienced in our movement have been in cases where a company specifically requested the League not to "butt

in." Unless notified that we are not wanted, if the League hears of any trouble, it always offers its services whether requested or not. In all such instances we always receive the thanks of the officers and leaders subsequently. I am glad to be able to report, however, that a large majority of the stores are working harmoniously with us and have come to learn the truth of our motto that "*All* of us *together* know more than any *one* of us."

Under the head of proper business management, we have found the Auditing Department of the movement, presided over by a so-called traveling auditor and his assistants, to be a most valuable factor. Mr. O. J. Arness, the auditor, worked with some of our largest companies and best bookkeepers for over six months, evolving a system of books and report blanks to exactly fit the co-operative store work.

The principal forms in the uniform system of bookkeeping consist of the following:

First—Invoice Record. This is a specially ruled sheet having columns for amount of invoice, date of invoice, terms and date when invoice must be paid in order to get the customary cash discount. It also has a column for goods, short, damaged, or returned. Invoices from and charges against wholesale houses are entered chronologically on this record. At the end of the month the total of invoices and the total of allowances (shortages, damaged goods, and returned goods are posted directly to the Ledger.

Second—Cash Sheet. A specially ruled sheet on which are recorded transactions pertaining to the selling end of the business. This sheet has special columns with printed heads. From a Daily or Detail Record Sheet we carry the day's transactions classified to the regular Cash Sheet. Thus the total cash sales for the day are carried into the Cash Sales Column, Credit Sales, if any, into the Credit Sales Column, produce bought, into the Produce Column, and so on. Of course, the record of credit sales is only auxiliary. It does not affect the Cash Sheet proper. This sheet is balanced at the end of each week and a duplicate copy sent to the traveling auditor's office. The totals of this sheet are not posted until the end of the month, the footings of each week being carried forward.

Third—The Check Register. On this sheet we enter all checks issued. It is also specially ruled, which enables us to classify the remittances so as to reduce the work. Thus, we have a column for Accounts Payable which is divided into two sections. Discount and Remittance, another one for Freight, while the third column is headed General. The totals only of the former two are posted at the end of the month, while the items in the General Column are necessarily posted individually.

In connection with these forms we have a number of other supplementary forms or devices which are labor saving.

When the auditing department was created by the 1908 Conferference, no one probably had any definite idea as to what would be expected from such a department. Up to the present time it has been possible to do but very little auditing. It was soon discovered after the auditor was installed that few of the fifty or sixty co-operative stores then in operation had anywhere near an adequate system of bookkeeping. After a system had been worked out it was found that but few of the managers had a sufficient knowledge of bookkeeping to enable them to follow the system. This necessitated this department extending its services in the capacity of a school, teaching these managers how to make a correct record of their daily business transactions.

Since the bookkeeping methods were inadequate, the stores were naturally conducting their business more or less in the dark. They would take their inventories at the end of the year and perhaps figure up a considerable profit, when, as a matter of fact, they had sustained a loss or come out without any profit. In this way some of them paid out unearned dividends, and before long they reached a condition where they were unable to meet their wholesale accounts with reasonable promptness, which led to crowding on the part of the latter. This made it necessary for the auditing department to act as a sort of financial adviser or assistant manager until these stores could be restored to a better financial basis. In this capacity the department has been able to help several companies during the past year and prevent them from being forced to disband.

These adverse conditions are constantly and rapidly improving, so much so that at the present time a number of the com-

panies are able to make up their own annual statements, and many others require very little assistance.

Fifth—Lack of adequate sources of supply on account of the non-uniformity of the working plans of local societies, resulting in scattered efforts. I believe it unnecessary to treat this subject at length. All men of experience know that a carload of any commodity can be handled and bought cheaper, proportionately, than a single pound, even in the capitalist and competitive world. This being true, it requires no argument to prove that primary organizations, such as co-operative retail stores or co-operative produce selling agencies, are but the first step in the distribution of commodities to consumers. The business world being a system of wheels within wheels, wherein anywhere from three to six middlemen intervene between producer and consumer, it logically follows that the more of these machine wheels that can be acquired, controlled, or eliminated by the actual producers and consumers, the greater the savings will be. If five to fifteen per cent. can be saved on the goods ordinarily purchased in a co-operative department or general merchandise store, it is common knowledge that in both the jobbing and manufacturing ends a like or even greater percentage can be saved. Therefore, even if no effort should be made by existing private sources of supply to antagonize or boycott the co-operators, it stands to reason that the different local co-operative societies must band together for the purpose of acquiring ownership in, and control of, their own jobbing and manufacturing sources of supply, and eventually, and as soon as possible, the primary sources of production also. When this shall have been accomplished, it will then appear as though the only other necessary step to a financial, political and industrial democracy will be the government ownership of natural public monopolies, such as the means of transportation, communication, etc.

Will not this reduce the "high cost of living" we are hearing so much about since the recent bill revising the tariff was passed? If not, I think a large majority of our eighty or ninety millions of American citizens join me in requesting some wiseacre to produce a better remedy.

STATISTICAL.

On account of the limited time at my disposal, it will be impossible to give you complete statistics regarding our movement. We have turned over from private to co-operative ownership about 125 stocks of goods; in a number of cases the real estate also; approximating in value $1,250,000.00. In a number of instances, two or more stores have been consolidated. When any of these companies decline or refuse to co-operate with us and will not send their reports to the auditing department for inspection, we cut them off the list and do not count them as being affiliated with the movement. Three stores have been sold back to original owners. In two cases where the trade was not sufficiently large to warrant running, the stocks were sold at auction. In four cases the people did not seem to have the spirit of co-operation and, becoming misled by some of the influential members, converted their companies into ordinary corporations, eliminating all the co-operative principles. Counting these causes for discrepancy between number of stores turned over and those now harmonizing with the League, there are 93 stores left, with over 7,000 members, each holding $100.00 worth, or more, of stock. Of these 93 stores fully 80% may be termed as fully successful, about 10% moderately successful, and about 10% meeting with rather poor success, the latter requiring extra efforts on the part of their management and the traveling auditor to put on the road to prosperity.

For particular details of plans, methods, and the trials, difficulties, and successes of co-operative stores organized and operated in large cities, with a membership of from 500 to 50,000 each, almost exclusively confined to urban workers, see Holyoake's "History of Co-operation," in two volumes; also "History of the Rochdale Pioneers," same author, the latter now being printed serially in our official organ, *Co-operation*.

Three well-attended Annual Co-operative Conferences of delegates from the companies have been held in Minneapolis, Minn., and a fourth will be held in March, 1910.

The following figures are furnished by our Auditing Department:

SUMMARY.

Number of companies reporting,	56
Number of members of companies, about,	6,500
Paid up capital,	$655,000 00
Property at beginning of past fiscal year or at time of turnover, including merchandise, real estate and fixtures,	800,000 00
Present annual sales, about,	2,100,000 00
Actual sales past year, about,	1,600,000 00
Approximate stock fixtures and real estate, December 31st,	840,000 00
Estimated net profit,	85,000 00

At the conclusion of the reading of Mr. Tousley's paper, the Board adjourned till 2 o'clock P. M.

SECOND DAY—FIFTH SESSION.

President Voorhees in the chair.

President Voorhees—The next matter on the programme is an address on the Dairy Situation by Mr. H. E. Cook, Dean of Animal Husbandry and Dairying, St. Lawrence University, Canton, New York.

Mr. Cook—Mr. President and members of the Board, the pleasure in coming back to New Jersey once more is all mine and not yours. I remember, with a great deal of interest, those former visits and the inspiration and good things that I carried back to our good State of New York. I just took occasion to say to Mr. Dye that it was an inspiration to come down here and see him, with his age and his vigor, and his determination, but, best of all, his vigor.

Now, to speak with you this afternoon for a little time, informally. I do want to read some thoughts, interspersed with some comments, but I would rather it appear in the form of a face to face talk than in the form of a lecture. Each day seems to make me more careful in what I say, and each day seems to lead me into more trouble. I think, as a rule, much of the trouble comes from a misunderstanding. It is a pretty difficult thing to express one's thoughts with all of the relationship, in a

few words, and so, definite and correct statements are often misinterpreted and the speaker is accused of heterodoxy or foolishness, or wildness or what not, just because of a misunderstanding, and so I want to read for a few minutes, and when we get through, if there is any time, and you think that my position is not right, let us talk it over together and not wait until I am gone. That gives only one man a chance.

We hold, to-day, in the East, a very unique position. Never before in the history of this country has there been such interest in agriculture as there is to-day. Our interest in the past has been one of exploitation and development of the resources that God has given us. A great field was opened up in the West and ever since the birth of Christ men have been going westward, until now, if you go West, you go East, and we are up against a proposition such as we have never faced before in this country—a proposition which concerns you and me most vitally, but concerns the consumer maybe even more. And so, our professional men, our business men of every type, are interesting themselves in this question of growing plants, not because they are particularly interested in the growth of the plant, but because great transportation companies are interested in transporting the goods, and great manufacturing concerns are interested in maintaining the integrity of their business, and the payment of a wage that will permit their employes to live, and as the price of food products goes higher, they feel the very foundation stone of their business in danger.

I have just come from the most notable agricultural meeting ever held, I think I can safely say, in the State of New York, the revitalizing of our old State Agricultural Society. Railroad men, legislators, manufacturers, presidents of chambers of commerce, all classes and types of people came to that meeting, not for fun, but to see what could be done in a great state like New York to regenerate its agriculture. Wherever you go, men, in the east, the same problem confronts us. Not so long ago I attended the State meeting in Massachusetts. The same situation. We must bring back the productivity of these old soils? Capacity to do beyond measure. You, nor I,—I doubt if the wisdom and the skill of our good president, could measure the

capacity of the State of New Jersey to grow plants to feed man and animals, and of all men he has been successful in increasing plants to large amounts on small acreage. Well, it is the dairy question that interests us at this time.

We need to bend our energies to recover from the frightful and disastrous competition of the two most powerful agencies this country has developed. The building of cities, and the development of the West. Our critics from the West can hardly appreciate what this competition has meant to us. Those who have profited from the advance in land values, may unkindly censure our methods, and those who have the luxury of the city may criticise without respect.

It has been a hard struggle and the victory has not yet been won. Some one will live to a good new time when those who remained upon these Eastern farms holding the breath of life within them, will have to their credit an equal balance upon the ledger, with those who braved the settlers dug-out in the far West.

We are facing a possibility, and it is to this chance more than ever that I want to ask your consideration.

During the past year I have been calling attention to a new point of view and analysis of the dairy business which has given me a great deal of satisfaction and had in my own mind given concrete form to what will finally change the profits and agricultural relationship of the dairy business. Milk has been produced chiefly upon lands not able to withstand continued cropping and upon those which had lost their virgin fertility.

Just as fast as lands of that sort have become non-productive, what did we do? What did we do in the Genesee Valley? What did we do in the Western reserve, in Ohio? What did we do here, and in Northern Illinois, and all over the State of Wisconsin. Then look through the State of Iowa. In 1890 Iowa contained more cows and produced more dairy products than the State of New York. What did they get cows in Iowa for? What were they getting cows in Wisconsin for, and Northern Illinois and the Genesee Valley? To make milk? No, sir. To make manure. They introduced those cows to produce fertility, and the question of the value of milk at that time had little or nothing

to do with the situation but laid the foundation for the present condition of affairs that is almost pitiable, that no one, so far as I know, over a long period of time, has accurate figures showing just what it cost to produce milk.

Now, there are a half dozen men scratching their heads. I don't know of any place on the farm, under farm conditions, over any considerable time, that those records have been kept. There are plenty of records showing the cost of producing milk so far as food is concerned, but none involving the whole question of milk production.

This is a most pitiable condition, and in my opinion, it has come about because we introduced the dairy business for the sake of the manure and not for the sake of the milk. A student of economics would quickly admit that the fertility produced was the essential product and that the milk was a by-product. And, furthermore, it is a well known economic truth that the market value of a by-product has no relationship to the cost of the raw material from which it comes.

Now, just go back a few years. Can't you remember when wheat bran was a waste by-product and was run into the river, in the early days of milling, and it had practically no value? Can't you remember when thousands of tons of cottonseed meal rotted behind the gin mills in the South? It had practically no value. About fifteen years ago, the distillers' wastes had no value in this country, outside of the immediate locality where they were produced; and a little way back of that the same was true with the brewery waste, it had a value about five or six or eight miles from the brewery, and the distillers' grains had a value as far as men could haul them and feed them. To-day we are paying $32, $33 and $34 a ton for the distillers' waste. Now, during this time the price of wheat has only slightly changed; the price of cotton has not changed from the decomposition and no value of the cottonseed meal to $35 a ton. And so we might go through the great lists of by-products that we have got in this country to show that the value of a by-product has no relationship to the cost of the raw material that goes into it.

Had it been otherwise, and milk been produced strictly upon its own merits, we should not have had this great motley crowd

of ill-bred, ill-fed dairy cows with no moral or legal right to exist. In other words, we put cows onto the farm as fast as we could get them, to make manure and not to make milk. I have been abused and not applauded for taking this position both written and spoken, but I maintain that it is coming now to be known, that the cow came to the dairymen primarily to cover the great plains with stable manure.

Stable manure is good; and it is the best asset that we have got on our farms so far as fertility is concerned, but, just the moment that any dairyman ties up to stable manure as his only manurial asset in these days, and gets cows to make manure, he produces milk without any regard to profit. Not because stable manure is not our best fertilizer, but because we learn to grow plants independent of it, and so learn to maintain our business, which holds first the ability of the individual cow to produce milk at a profit. Our general plan of large cow population and small crop production, is fundamentally wrong, and that is the situation to-day all through the East. And it is not very much different in New Jersey, as I have seen it than it is in New York.

Now, we came to this situation almost without any chance on our part to change it. Why? Because we felt that our lands were growing poorer, we found these by-products in the market cheap, and so we bought them. Now, suddenly we found ourselves in the market, with prices extravagantly high, cottonseed meal, wheat bran, everything that goes to make milk, not grown on our eastern farms, is out of proportion to its value on a basis of the milk prices which we obtain.

Furthermore, on this plan, our dairy farms are the low priced lands of the East. That is true in New York, through New England, and I think it is true in New Jersey.

The dairy lands are the low priced lands, with very few exceptions. Why is it that we dodge the real situation? Fruit lands, both large fruits and small, trucking lands of all kinds, are worth double and often many times the price which we could obtain. The last census in New York, if I remember correctly, gives the average value of the dairy lands, so-called, where milk, butter and cheese was the main product, at $40 an acre for the whole State. The fruit lands were valued at over $100, nursery-

men's lands at about $200, trucking lands at something over $100. That was in 1900 or 1899, before values had increased materially, as they have now.

Let me ask you, gentlemen, if there is any fundamental reason why one agricultural business should have any such land value relationship to another? Is there any organic or constitutional reason for the fact that trucking lands are worth and are selling for $200 to $400 per acre, when our dairy farms are worth and are selling for from $25 to $100 per acre? Am I wrong?

A Delegate—It depends upon the section where they are located. There are some not worth $10, and there are others worth over $200. Of course, we know the immediate cause to be the fact that these fruit lands and the trucking lands are more productive.

Again, I ask, is there any underlying reason why the dairy business should be an inferior occupation?

A Delegate—Yes, the low price of dairy products.

Prof. Cook—Or the low price of the men? What would you say to a chance for high priced dairy lands, if cows were uniformly averaging 10,000 pounds of milk, were all registered and had a uniform value of $300 per head? Don't you think that this condition of affairs would mean a corresponding high production from the land? Don't you think men who would have the ability to breed, feed and perpetuate valuable cows of large production would have fields of comparative productive powers? On the other side, we must not lose sight of the human equation in this problem.

Now, see if I can make this clear to you, as it is to me. Material things are valuable exactly in proportion to the ability of the human agency to manipulate and control. A man who has fed hay and straw during the winter, and pasture in the summer, would be lost with a highly organized scheme of dairy production under the soiling system, with almost certain failure to follow.

Now, the location of one man in a community with a highly organized business will be stimulating to all around him, and will no doubt affect the value of his own land, but not to any

appreciable extent. Why? His neighbors give value to the land just in proportion to their ability to use it. Isn't that right?

Now, don't you see what a tremendous handicap it is on progressive men to-day? They are not only carrying their own sins, but the sins of the whole community. That one man in a community exceeds in ability and the science of the times in the production of milk at a low cost, but he is still putting that into the market, competing with a thousand other men who have no regard whatsoever for the cost of that milk. The hardest, the toughest occupation imaginable. I met a man only a few days ago and he said: "I don't fear competition in the milk business, because I am producing milk cheap." Why, my dear friend, you are producing milk in competition with a thousand men who do not know whether it is cheap or dear. Competition! Supposing a man should come into this town and set up a drug store and sell goods for just half price. He would beat the retail business for a while, wouldn't he, and the other men who are selling drugs would, so long as that man lasted, be out of trade?

Now, to repeat, the location of one man in a community with a highly organized business will be stimulating to all around him, and will no doubt affect the value of his own land, but not to any appreciable extent. His neighbors give value to the land just in proportion to their ability to use it. In fact, some of them will actually decry and abuse his whole plan of regeneration. I don't like to dwell upon that, because it makes my mouth taste bad.

Each addition to the community, of men of this type, means added value to the land of the pioneer. The American people have been blessed with so much land that we have grown to place very little value upon it. We have studied systems of increasing the value of moveable or personal property and of labor. Our laws, as well as our customs, have been directed toward labor and personality. It is a well known fact that our more densely populated foreign nations stimulate, both through custom and law, a high land value with a corresponding low wage. I am not pleading for a lower wage, but for a land value commensurate with the wage employed upon it.

I don't think we appreciate the situation as we ought to. If the dairyman had the money to go into the market and pay for the same kind of labor that the skilled manufacturer pays for, he could get all the labor he wants. There is no scarcity of it; but there is a mighty scarcity of money. It is a money question. Don't let us make any mistake about that; it is not a labor question at all. We are paying on our dairy farms a price measured by ditch digging and not by the scale of the mechanic. The dairymen have problems of market control, but it is idle to expect us to control markets which are far distant and now most thoroughly organized, when we have not been able to organize and control the individuals in our dairy barn, not one of which can pass a law or greatly interfere with our plans.

I mean this, a man that has not the capacity or the ability, or if he has, does not use it, to organize his own dairy, he will never be able to organize and fight the milk trust. No matter what our disposition may be, we can not successfully take part in organized effort against skilled men, unless we have learned the methods and machinery necessary.

The same fundamental principles prevail whether you organize a dairy business or a milk combination. Whether you organize a dairy cow into a ten thousand pound machine, or whether you organize a combination of men to try to control the price of milk.

The city milk business is more highly organized than the producing business on the farm, and so pays a larger return, as a rule. Simply to talk against it, so long as they are within the law, is a waste of time until we have a corresponding plan. The manager of the milk plant in our town lives at the hotel, not extravangantly, of course, but how many farm managers producing milk for him, could do likewise, and not become insolvent? Now, I submit, is there any constitutional reason why the producing end of a business should not have equal opportunity with the transportation and handling end?

Is it not true that the producers of manufactured goods are first to collect toll. Why not the producers of milk? Instead of the generally accepted theory that our troubles and their remedy

are without, I say they are wihin and can be remedied and controlled by us, and not by another. Now, some one will say, "Well, this combination is making the prices and is handling all our production." Well, as business men, we should secure a lower rate for the transportation of our product, and I believe to-day that the cost of transportation of milk is out of proportion to the original cost of the article. We pay thirty-two cents a can from our northern New York section for the delivery of milk in New York City, and Philadelphia would be about the same. We average probably about $1.30 to $1.40 per hundred. That makes about one-quarter of the first cost of the milk, required to transport it, an easily transportable product, to New York City. Now, I think that is too high. I don't think it ought to cost thirty-two cents a can, but I doubt very much whether we will be able with the present organization of the producers of that northern section to do any better, unless we get some extraneous power to come in and help us.

I say that there is no business in this land so wretchedly organized and managed, as the production of milk.

Now, if you want that cut out, we will cut it out.

A Delegate—Don't cut it out. Say it again.

Prof. Cook—I say that there is no business in this land so wretchedly organized and managed as the production of milk, and we have even fought a demand that we take the manure from the flanks of the cows. Haven't we?

Prof. Chamberlain—No. Not in Ohio. We keep it on there.

Prof. Cook—I say to you, gentlemen, that we must first put our own house in order. We shall then be able to co-operate, to work together because of a common point of view.

It is a psychological impossibility to form a working unit from a body of men with opposite points of view.

If each one of us had attained an ideal, real, not fanciful, we should then have a common standard of measurement, because success in any business involves the knowledge of, and application of, the same principles and practices. We have, therefore, all discovered a common enemy and stand ready to combat him, whether it be the wickedness of an individual, a threatening

statute, or a false standard in breeding, or an organic need in our dairy sections and dairy business, and this takes in another phase of the dairy business—larger crops. I mentioned this once before.

During the days of cheap by-products, we could buy with safety these feeds now becoming prohibitive. Two methods can be pursued; growing feeds which are well adapted, like corn, silage, clover, mixed hay, oats and peas; or growing some salable crop of high per-acre value, like potatoes and trucking crops, apples, small fruit, etc. Both methods have difficulties. It is very hard to grow all of the feed and get the largest flow. It may be difficult for many men to adjust themselves to trucking. By that I mean that it is hard to produce on our farms a class of raw material that will give the same flow of milk, but we can approximate it pretty closely.

It seems to me, therefore, if we accept the principle that the dairy farm should be self supporting, with the exception of purchased chemicals, and then adjust the method to suit our own likes and dislikes, we shall have made a start, as a people, for more profitable dairying and higher priced lands.

The education alone of growing root crops and those requiring clean, careful cultivation, is valuable in that it teaches soil culture necessary for any crop which the dairyman grows.

We have some interesting figures from our work at the School of Agriculture and they may be useful, they are the result of the growing of crops upon land that was practically abandoned. If there was ever on the face of this footstool an unfortunate piece of property, it was that old farm, and, yet, this year in growing root-crops, we can show a profit, figuring beets and carrots at twenty cents a bushel, a profit of about $30 an acre, after paying all the expenses that went into the crop—manure, fertilizer, laborers, handling, harvesting and the whole business—and on that same ground, this year, which is not quite pertinent to this subject, we grew over four hundred bushels of potatoes at a profit of about $50 an acre.

The dairymen, as a whole, are poor, indifferent tillers of the soil; sod is inverted in the spring, given a scratching, and sowed or planted at once. Immediately the organic matter begins to

develop, and what should go into decay and feed a new and more valuable plant becomes a positive menace. Not only does this root growth interfere, but too much air is thereby introduced into the soil, which, added to the lack of humus, provides a soil unable to stand drought. Seed germination and early growth is hampered, and so a distinct loss follows.

Now, I made some figures last year which showed that St. Lawrence county, a big county, a county which, when you read the statistics from the county, shows enormous production—a leading county of the country in agricultural production—yet I found last year that over a million dollars went out of that great county for cattle feeds, which would make a pretty nice profit on those lands. And they could produce that million dollars.

A purely agricultural section that is not self-supporting is working upon a wrong basis. This situation will continue to perpetuate cheap lands. We should certainly breed and rear our horses, saying nothing about supplying city markets. There is, however, no use in discussing such a proposition until we have something to feed them. We cannot afford to ship feed from the West, paying transportation and profits, to put into horses. They can be raised there and shipped at less cost. During this time that we are paying such vast sums to other people our own farms are actually rusty from lack of use. And you have just such land in New Jersey.

A Delegate—How would it do to call them rusty farmers?

Prof. Cook—Well, that is for you to say. That is what I say in New York, but I am outside of our own confines, and I am a little more cautious.

Our excuse—we excuse our neglect by attributing all failure to the weather. Isn't that queer? In this day of scientific soil and crop knowledge, we are within reasonable limitations, independent of the weather. Pray tell me the use of our scientific labor and expense if it is not to control unfavorable conditions. If we cannot control our crop production, our teaching has been wrong.

I will say this, that under the most unfavorable circumstances, taking potatoes, that a man who produces less than two hundred

bushels of potatoes over a period of ten years, no matter what the weather is, that man is rusty. That is what I mean.

Well, I had something to say concerning the fertilizer business and the use of the cheap goods that are sold all over the country, but I must cut that out, because of the lack of time. We succeeded, within a reasonable radius, because of a little innovation last year, in introducing in our northern section this year, about six hundred tons of chemicals, in the place of six hundred tons of mixed goods, and so made a saving of somewhere around four thousand dollars in our particular section.

Mr. Denise—Mr. President, I think we ought to give this gentleman a little more time on that subject. We pay more money for fertilizer than anything we get on our farms. That is the one question which interests us more than anything else.

President Voorhees—He may go on; he has not exceeded his time much.

Mr. E. T. Gill—How is he going to keep up the fertility of the farm without buying feed or fertilizers, and why buy fertilizers when he can get the same results by buying feed.

Prof. Cook—Well, now, this is more serious than we think, and I don't want to deal lightly with this question. There are men who can safely keep on buying cattle feeds at present prices and make a profit, but the man who is getting eight or ten thousand pounds of low-grade milk, or an equivalent amount of butter fat in a higher grade milk cow, can probably wisely spend the money. It may be better for that man to buy feed than to buy fertilizer. But in sections where the production from our farms is small, where it takes four, five and six acres to keep a cow—now, don't say that doesn't happen in New Jersey, because it does—under those conditions, I say, it is the better business practice to buy chemicals, to buy nitrate of soda, to buy soda acid rock, to buy muriate of potash, if the German government and the Trust will let us have it. But purchase those three ingredients, and then by tillage and culture reduce the organic matter that is in the soil into an available condition, and so profit by the natural conditions that we possess and grow the crops, and that is better than it is to buy the feeds and not

grow the crops. A man like Mr. Gill no doubt is doing both, buying feeds and growing crops, too.

Now, I don't know of any investment to-day, well managed, that will bring better returns than to buy nitrate of soda, if you need nitrogen. But the man who fails to till his soil, the man who fails to put the vegetable matter that is in there into a condition so that the plant can use it, and then buys nitrate of soda, is making a misake. I believe that the man who buys organic nitrogen is making a mistake anyway; and I don't know but what I ought to apologize for talking fertilizers in the presence of a man who knows more about their chemistry and their application than any man in the United States. (Referring to Prof. Voorhees.) (Applause.)

I don't believe any man has any moral right to buy any form of organic nitrogen. I don't know what you will say about that.

Prof. Voorhees—It depends upon the price.

Prof. Cook—At the price we have to pay for it, because when you are buying organic nitrogen, in cottonseed meal, in fish scrap, in tankage and in dried blood, you are buying nitrogen in just about the same form (only it is more finely ground and it acts quicker) that we have right in our own soil, roots, stubble, etc. Now if we want nitrogen in our soil, let us buy something that will enable us to play tunes upon the soil, quickly available. The cheapest of all costs 15 cents a pound, even less than that here.

Now if we want phosphoric acid, I believe the cheapest form in which we can buy it is acid rock, about $12 a ton.

If we want potash, let us buy it in the form of muriate. Maybe you have got some crops down here for which sulphate of potash is better, but we have tried it on our crops over and over again at $40 a ton, and I don't recommend it.

Now if we can use those just as we want them, growing our crops, I believe it is a good business investment; mixing them ourselves or not mixing them at all, mixing them just for the opportunity of applying them easier and quicker.

President Voorhees—The first of those is the necessity of

and second, the dairy business particularly, to grow alfalfa. That is the thing that will unlock and help solve the problem. The great trouble, it seems to me, is that the most of us are too well satisfied not to take things as they come.

Mr. Crane—The speaker told us the remedy was in our own hands, and I believe what he says. There is a difference of opinion in regard to raising milk in the summer or in the winter. A large majority are in favor of the winter milk, and I thing that they are making a big mistake. We produce milk in the summer time when we have the advantage of raising the crops to produce the milk, instead of paying high prices and buying high priced goods. Whereas in the winter it is the other way—we have to buy the high priced feeds, and it takes off nearly all the money. And another thing, the New York Milk Exchange sets the price of our products on our farm. Who are the exchange? I know one of them. He is the biggest tyrant there is in the business, but he is a large dealer, and I have no doubt that the rest of them are of the same type. Now is it right and fair that those men should set a price upon our product? If we will change our tactics a little bit, and raise more milk during the latter part of the summer, say the last half of July, August and September, we can raise that milk from the products of our own farms, without buying the high priced feeds, and we can do that easily. We can change our order of business, as Mr. Cook says; it is all within our own hands, and we must make this change.

A Delegate—How will that regulate the price? The last speaker said if we raised milk the latter end of the fall from the products of our farms that would heal a good deal of the difficulty. I would like to know how that would regulate the price.

Mr. Crane—In this way: The scarcity of milk raises the price during November and December. We all know that; and the probability is that after the holidays the milk will begin to go down. The Exchange has considered that matter and come pretty near lowering the price; they would have done it if they dared to, but the milk was a little bit short, and they did not dare push the price down, least the farmers might kick. Now if you

have less milk during January and February, you will regulate the price. Put that milk in the latter part of the summer and the fall.

Mr. Fort—We organized a Milk Shippers' Union, and raised the price of milk. We gave the farmers the liquid measure law; that was one of the best things for New Jersey, Pennsylvania and Delaware. In one winter that increased our revenue $500,000 from the same number of quarts, and yet they say we amount to nothing. It only costs a man a dollar or two to belong to the Milk Shippers' Union, and there are hundreds of men who have been benefited, and yet who have not given that dollar, and won't give a dollar a year to be benefited to that extent. Now what is the matter with the farmers, when they receive those benefits and are not willing to help secure larger profits on their milk?

Mr. Denise—Mr. President, this milk question has been discussed before the State Board for the last twenty years. These milk producers all stand up here and say it is within the hands of the farmers. Now, I never produced milk; I never thought there was anything in it. They say everything is in the hands of the farmers to control, and why in the dickens don't they do it? (Applause.)

A Delegate—Because the farmers won't stand together. That is the reason, and that is the only reason.

A Delegate—There is one question we have omitted any reference to this afternoon, which I think enters very largely into the business; that is, the cow herself. I maintain that there is more harm being done to the dairyman to-day by keeping poor cows than by any other factor we may mention. The question of feeding is important, but unless you have the cows to feed this feed to, whether you raise it or whether you buy it, the dairy proposition is not going to pay.

A Delegate—Mr. President, I was fortunate enough to be in New England at the time of the formation of the New England Milk Producers' Union, and they did just exactly the same as we are doing, and had just exactly the same row as they are having in New Jersey just at the present time. It was through

the efforts of one man only, Prof. Stanton, that that Union was put on its feet, and the farmers were made strong enough in their belief in Prof. Stanton to form one, and to hold to him, accept his advice and get to work, and there is no question that milk is being produced more profitably in New England at the present day than it has ever been before, although there are still dairymen going out of business there—the men who have not been successful.

President Voorhees—If there is no further discussion of this matter, we will take up the next paper, "The Poultry Industry; Some of Its Requirements," by James E. Rice, Professor of Poultry Husbandry, Cornell University, Ithaca, N. Y. Mr. Rice is also a familiar figure to New Jersey farmers, as he has been here several times. I take pleasure in introducing Mr. James E. Rice. (Applause.)

The Poultry Industry—Some of Its Requirements.

Prof. Rice—I am exceedingly pleased to hear reported that the poultrymen of the State are beginning to get thoroughly organized. Successful organization is one of the best evidences of progress. When the poultrymen of this State organize to develop the poultry industry, a great deal of good is bound to be accomplished. Organization and education should go together. If we win out in the battle of competition with the world, it will be by virture of the knowledge and skill that we put into our business. Through poultry organizations we are enabled to learn what the others are doing. By the holding of shows and poultry association meetings, and by getting together and talking matters over, we are kept up to date; we learn from each other.

The States are now beginning to take an active interest in the teaching of Poultry Husbandry. Your poultry association has taken up the campaign as I understand it, to secure an adequate appropriation with which to establish a Poultry Department in connection with your Agricultural College. From what I know of Dr. Voorhees, I am perfectly certain that he is in hearty accord and sympathy with this, and will be only too glad to estab-

lish a department whenever the interest shown by the poultrymen in the State will warrant it.

There is no reason why the State of New Jersey should not have a Poultry Department as good in proportion to her size as any State. I doubt if there is a State in the Union where the conditions are more favorable for the profitable development of the poultry industry than here. I doubt if there is any place where you have such fine markets, within such easy distance from the point of production as you have here. With Philadelphia on one side, and with Trenton, then New York, within easy shipping distance, and with your splendid seaboard with its vast numbers of hotels and manufacturing enterprises and the suburban residents from the large cities who must be fed, there are no markets anywhere in the world comparable. Your climate is right; for the most part your soil is right; the people are right; everything is ready, and there is no reason in the world why you should not have as profitable poultry husbandry as can be found. All you lack now is a good, up-to-date Poultry Department at your Agricultural College.

I have taken the liberty of letting Mr. Dye choose a text, and then doing what some preachers do, wander wherever I please. I have assumed to change the topic for this afternoon, and will try with the lantern slides that I have brought along, to tell the story of what a Poultry Department may mean to the State of New Jersey, judged by what some of the other States are doing.

It is only a very few years ago—ten or fifteen—that people looked upon the poultry business as simply a side issue, something that the women folks and the children could do, or that men who had failed in health or in business could undertake, and by a very little figuring with lead pencil and pad, and a back lot, start with an old hen or two, and in a very short time reach a comfortable competency. By estimating at the rate of a dollar a year per hen, which is perfectly reasonable, it is easy to reason that with ten thousand hens, they make more money than they could in their chosen profession.

These things are all easy to figure out, but Poultry Husbandry has got out of the infant stage. Poultry keeping now is a

business of stability, a business that can be depended upon to give a good, reasonable, safe, substantial profit, when conducted on conservative farm lines.

The reason for this change for the better is that we have gradually evolved improved methods, through experiments that have been carried on at the Experiment Stations, and by virtue of the good work that the poultrymen have been doing in their own way. Notwithstanding all this, we have not a system in Poultry Husbandry that is comparable to the systems of handling other kinds of live stock and other crops upon the farm. If you should go throughout the United States and examine the large poultry enterprises that are successful, you would be struck by the fact that, while many people are successful with from two thousand to eight or ten thousand hens, there are scarcely any two of them doing it in the same way. It is very remarkable, it seems to me, and it is one of the most convincing evidences of the profitableness of the business—that people can succeed by so many different methods.

It is the work of the Experiment Stations to try to eliminate false teaching, to weed out the unprofitable practices, and to try to teach practical methods of the best application to farm conditions.

It is only within a few years that the subject has been taught at the colleges and experiment stations, and because these are the two in which I am engaged, I will dwell upon them alone this afternoon. Lest I be misunderstood, however, I want to give full credit to the poultry press, the farm papers, the poultry shows, the poultry associations, and not the least in its educational value, to the successes of the men who have been the pioneers, who have worked out these problems for themselves and benefited the world.

The real, substantial justification for the establishment of a Poultry Department in any college for experimenting and teaching is this,—that it is vastly easier and cheaper for all the people to have the State hire a few people to carry out experiments and make the mistakes and assess the cost upon the entire population, than it is to have hundreds and thousands of people in that same State trying experiments for themselves and then having

to foot the bill themselves. The American people are ahead of the world in their appreciation of the fact that it is the State's business to educate its people agriculturally, and they realize the fact that the whole problem is based on the principle that a man is a unit of the family, and the family the unit of a community, and the community the unit of the county and State, and the State a unit of the nation. Whatever tends to make a man more prosperous, that enables him to live better and to have the things of life that tend to happiness, and to educate him in good citizenship, is the foundation principle of prosperity, and education underlies success and prosperity. Therefore, whether we would or whether we would not establish a Poultry Department, if we do not educate our people in poultry keeping in that particular State, we must be spongers upon someone else; otherwise the other States are going to forge ahead of us in the competition, in the race for the markets of the world.

A good Poultry Department helps to teach the boys and the girls and the men and the women,—for they all come to the poultry schools,—some of the things that will help them to avoid making mistakes. We do not, by any means, expect to make expert poultrymen in twelve weeks' time. The education of expert poultrymen depends largely upon experience and practice. But, after all, the easiest, best profits any of us ever make is the money that we save by avoiding mistakes. If everyone of us would be willing to confess it, we would admit that our greatest losses are those due to our not doing things right.

In the poultry schools we are teaching a subject that has not yet been systematized or classified. In this respect we are greatly handicapped.

As an indication of what it would mean to the profits of the poultrymen of New York State, we find that a person, by improved methods of feeding or breeding, or building poultry houses, or rearing chickens,—any or all of which methods may save him the increment of only one egg per hen a year—and that is a reasonable expectation from improved methods—is adding to the wealth of that State tremendously. For example, it is estimated that there are twenty million hens in the State of New York, and that if you increase by any one or by all the modern

methods of improvement, the production of those hens in the State of New York just one egg a year, and these eggs sell for two cents apiece, it would mean four hundred thousand dollars increase in the value of the egg product a year to the Empire State.

New Jersey is one of the most intensive poultry States in the nation, apparently having more value to the square mile in the poultry products than any other State. New Jersey is not alone in not having a Poultry Department. Even the great State of Illinois has not made a move in this direction, and it is only just recently that a few other leading States have undertaken the poultry work.

Hence, to emphasize the importance of teaching Poultry Husbandry at the Agricultural Colleges and Experiment Stations, I am going to show this afternoon a few slides that will give you a glimpse, at least, of what some of the other States are doing in this direction. More than half of the States are doing some kind of work in Poultry Departments. Within three days I have received three letters from three different States widely separated in the United States, one of them from your own State of New Jersey, saying that the poultrymen were organizing for the purpose of establishing a Poultry Department. They wanted to know the experience of those States that already have Poultry Departments. You will rejoice with me, I know, when I tell you what the poultrymen are doing in New York State, through the leadership of Dean L. H. Bailey, who had faith in Poultry Husbandry as a subject to be taught and investigated, and who said, at a time when the Directors of the Experiment Station in almost every State in the Union looked with fear and suspicion upon it, and said it was not worthy of attention,—he said he believed the Poultry Husbandry to be one of the best teaching enterprises, because the best kind of teaching is that which "teaches people in terms of their daily lives," that is, by means of the things that they do to get their living. Poultry Husbandry teaches more people than any other one kind of Animal Husbandry or agricultural occupation. And so we established a Poultry Department, and with the means at his command, he has done his level best to support it. Within the last

week the Board of Trustees at Cornell have not only acceded to the request of our State Poultry Association for $50,000 for a new building for the Poultry Department, but have asked the legislature for $90,000. So great has been the increase that this year we have turned away students. Among our students are three from the State of New Jersey. We now have six applications on file for the course next year.

Why I mention this is that we all know the importance of having a precedent. If the State of New York establishes that precedent, it will be easier for every other State in the Union to get five or ten times as much money next year as they will be able to get this year to prosecute the work.

So much by way of introduction. We will now consider the lantern slides, and try to get a little glimpse of the poultry work being done throughout the country at the Agricultural Colleges, and as we talk I want to leave it with you as to whether or not the work is justifiable. I wish to show a good many slides and therefore will not have very much time to discuss each of these slides. But I want to stay long enough with each one so that you will get the kernel of truth connected with each, because each one of the illustrations tells a story.

Few of us, I think, have ever realized how Poultry Husbandry compares with other agricultural industries in the value of its products throughout the nation. On general principles it will be perfectly fair, I think, to say that, other things being equal, an agricultural industry ought to be given attention as a subject to be taught and investigated somewhat in proportion to its value as a wealth-producer in the State.

We will now see what the value of the poultry products is. Four years ago the American Poultry Association appointed a committee to investigate this subject, and for three years that committee has assembled statistics and made its reports, which are published in the 32d, 33d and 34th Annual Reports. This first slide (Fig. 1) gives a graphic representation of the boiled down facts assembled from all the different States and Territories and Canada. You will see here the proportions represented by the different lines. First of all, notice that in Fig. 1, the black lines represent by the measure of one dollar in value

the poultry products produced throughout the United States. The next line represents by $1.30 the value of the horticulture, the fruit, vegetables and flowers throughout the United States; the third line represents the dairy products throughout the United State by $1.70. Notice the proportionate wealth of those three great agricultural industries. Then in the next set of comparisons notice the way in which the money is expended for teaching and investigating along those three separate lines, and you will see that for every dollar invested in poultry, there is four dollars invested annually for horticulture, and four dollars for dairy, and when it comes to permanent buildings and equipment, as you will see in the top column, for every one dollar invested in poultry, there are six and seven dollars represented for dairy and horticulture respectively. If we were to be fair and treat each of these great industries in proportion to the way they contribute to the wealth of the nation in their production, you will readily see that the lines here representing dairy and horticulture would have to be shortened up to be in the proportion of one to one and three-tenths or one to one and seven-tenths, instead of one to six or seven.

Fig. 2. Way back in 1885, Dr. W. H. Jordan, a man who for twenty-five years has been in Experiment Station work, carried on the first experiments with poultry that were ever attempted in this country, and it was my good fortune to have that bulletin fall into my hands a year or so ago. I feel that it has a historic value, and Dr. Jordan himself was surprised to learn that he had that distinction. The thing that pleased him most, he said, was that in the light of recent investigations, the conclusions of his first experiment were true.

Fig. 3. The next shows thirty-eight bulletins relating to poultry that were published year before last in the different States of the Union and Canada, including the United States Government publications. There are thirty-eight bulletins, every one of them free to anybody who will ask for them. They deal with some of the most important problems relating to the handling of poultry.

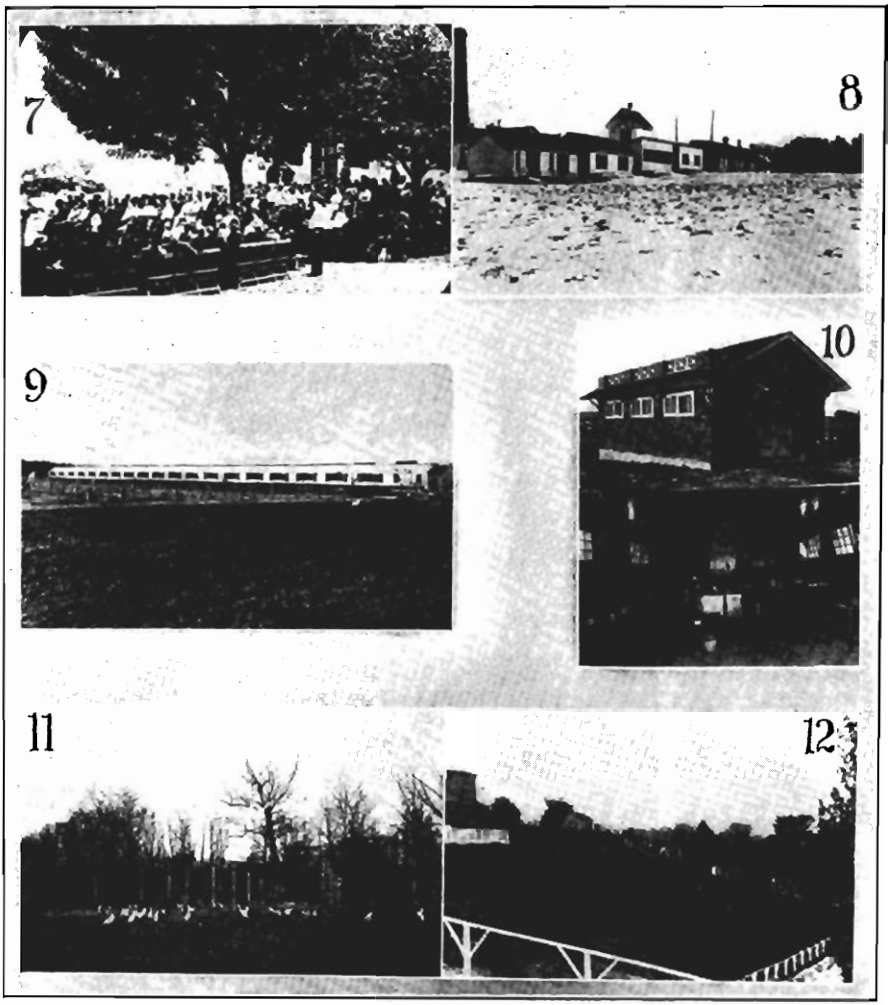
Figs. 4 and 5 show the poultry buildings at Rhode Island Agricultural College. Rhode Island was one of the first to

establish a Poultry Department. Dr. A. Brigham, now in Dakota, one of the early pioneers in poultry instruction, was instrumental in establishing the first school of Poultry Husbandry. A few years ago the State gave five thousand dollars for the brooder house and main administration building here shown. The other building is for investigational work. The pens to the right are where the turkey disease investigations have been carried on. The covered runs where for nine or ten years they have been giving very close attention to the so-called black head disease in turkeys which is threatening to eliminate the turkey business from many of the States, and which they think they now have isolated and under control; they have discovered a germ that works on the liver and lives in the intestine of the fowl and in the turkey, killing the turkey and only weakening the fowl which transmits it from generation to generation. They are now trying to devise some method of prevention through breeding, care, etc.

Connecticut also made an early start in the matter of establishing a Poultry Department. This slide (Fig. 6) shows the main building and the incubator house. To the left the poultry plant. Fig. 7 shows how they have established a custom in Connecticut of an annual summer field meeting; three to five hundred or more people assemble that day to see the college, inspect the Poultry Department, and have, as we might say, a one or two days' poultry school.

Fig. 8 shows a partial view of the Poultry Department at Guelph, Canada. They have more money invested in the poultry plant than any other Province or State. They have a mammoth incubator building, a killing-house, many laying-houses, etc. This picture gives a very small view of the size of their plant. They have been experimenting with the construction of poultry houses for a good many years, and have published their results in large numbers of bulletins, especially along incubation and fattening.

They have bred Barred Plymouth Rocks for ten generations for meat production. They now have the most perfectly developed individuals for the purpose that it has ever been my pleasure to see. They are beautiful to look upon, fully developed,



perfect in shape and size. They are so fixed in this type and have such great prepotency that the offspring resemble their parents in the closest degree. We purchased from them a male and mated him with hens from our own flock, the best I could find, and we had a dozen or fifteen cockerels that were almost perfect pictures of these fowls represented. It is impossible to estimate in dollars and cents the value to the pure bred poultry industry of the dissemination of such fine meat and the stock in building up the quality of table poultry of the country.

Fig. 9 is an illustration of the Experiment Station at Orono, Maine. It is just one view of a good many that I would like to show of this Experiment Station, where for many years they have been carrying on experimental work in the trap nesting of fowls, and are now leading the world in breeding for egg production.

Fig. 10. Prof. James Dryden, formerly at Utah, went to Oregon a few years ago with the expectation of making things move, and he has been doing it in a great many ways. A poultry train, a whole train, for days and days has been going over the State of Oregon, exhibiting poultry, killing and judging poultry and giving various other demonstrations. They have built an incubator house and equipped it with the best scientific apparatus at a cost of $5,000, to discover the causes of various troubles in the incubation of eggs. This house is shown in Fig. 11.

A few years ago I received a letter from Prof. Paterson, College Park, Maryland, in which he said that he would be perfectly willing to establish a Poultry Department if he could be convinced that there was anything to investigate. He said he had talked with a number of poultrymen in his State, and they said there was nothing to investigate, and that they were getting along all right. I immediately dictated a three or four page letter enumerating enough problems to investigate that would keep them busy investigating on till the "crack of doom." It was not very long after this before they sent to us for a reliable man to go there to start the Poultry Department. As a result they have been working on several poultry diseases, and have published three or four bulletins recently. Prof. Paterson now

is one of the most enthusiastic directors in the country regarding the desirability of having a Poultry Department.

Poultry Departments have their "ups and downs." In Tennessee they have a beautiful location for their Experiment Station. I never saw a finer one. Yet their chicken department was built on the side of a hill, where it was so steep that they apparently could not let the cows pasture on it for fear they would get lop-sided. Therefore they terraced it off, built steps and put chickens there. The man who takes care of the chicken plant must go up and down stairs, long flights of five terraces. The Poultry Department was the last one to be established, and as usual, they had to take what was left.

Fig. 13. In West Virginia they have been doing splendid work for many years. They have published nearly a dozen bulletins, dealing with many important problems, among which is the importance of skimmed milk in the feeding of poultry. They secured vastly greater values from skimmed milk as a poultry food than is usual in the feeding to calves or pigs. They recently published a bulletin showing the result of hatching eggs from hens as compared to pullets, and they have proven beyond any question of doubt by those experiments that the hen lays a bigger egg that hatches a bigger chick, that grows to be a larger chicken, and with less mortality. It was also found out that hens gave greater fertility and greater hatching power of the egg. This confirms our general belief that hens are more satisfactory than pullets for breeders.

A Delegate—Mated with cockerels?

Prof. Rice—Yes, when mated with either old or young males. Males should be one or two years, if they are equally vigorous as cockerels. We should never breed from immature males.

Fig. 14. is one of the views of the Cornell University Poultry Department. It shows the main building, feed room, laboratory and laying house.

Fig. 15 is the building for instructing students, which cost $2,000.

Fig. 16 shows the colony houses, holding 200 chickens apiece. In this little nursery out here we keep them a few weeks, and

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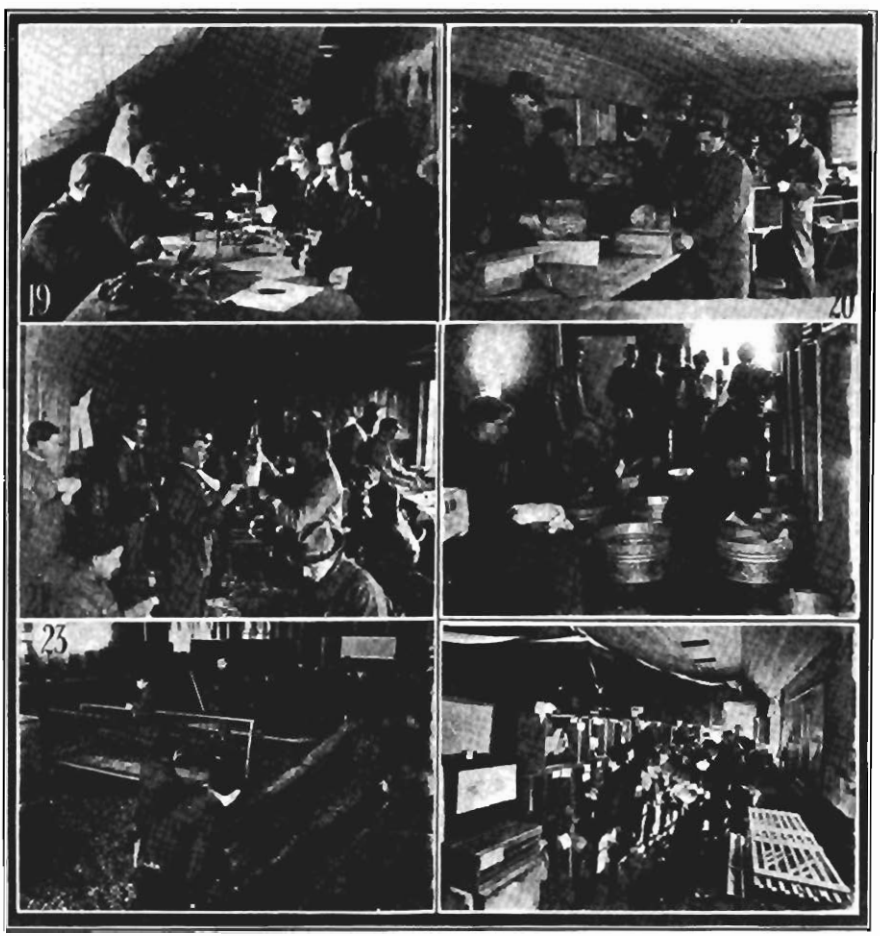


later, when the chicks are about four weeks old, move them further out on the range.

Fig. 17 shows a class studying the egg. They examine raw and boiled eggs, make drawings showing each part, and are instructed as to the function of each part.

In Fig. 18 are seen students studying poultry feeds. They examine sixty or seventy different kinds of grain, as to composition, purity, etc., so that they can name each and give its approximate value.

Fig. 19 is another class of students studying the anatomy of poultry. They measure the length and the sizes of the different organs and the purpose of each.

In Fig. 20 are students making crates with the Cornell stencil, under which the Cornell poultry products are sold, with the Cornell guarantee as to quality, shown in white and red, the Cornell colors.

We find in teaching students that they must do things with their hands if they are to know how; hence the practice courses are made as strong as the lecture courses.

Fig. 21 shows students picking fowls by what was then supposed to be the up-to-date method. To-day it is out of date. I don't happen to have a picture showing the fowls being killed by the new method, which consists of a picking box, which saves time, keeps the feathers clean, prevents bruising and avoids infection.

In Fig. 22 they are washing fowls for the annual Poultry Show. The students are seen at the washtubs, scrubbing them out in good shape before they put them on exhibition.

Fig. 23 shows students preparing for the annual Poultry Show in which five or six hundred birds are shown, where the students conduct the entire enterprise themselves. They finance the show by selling poultry books and papers to the extent of five or six hundred dollars' worth in a single year, which is sufficient to pay for the ribbons and printing and all the ordinary expenses of the show.

Here in Fig. 24 they are judging the fowls. The students are shown with their score cards and books trying to learn to know good poultry when they see it.

It is a lamentable fact that American boys, bright and well-educated as they are, when they come to the college cannot name one-half of the ordinary common varieties of fowls when they see them, to say nothing about knowing a good one of any of the varieties from a poor one. By actual test, when they go through the plant and undertake to name the fowls, they cannot name correctly half of the fowls on our small plant, having only fifteen varieties. When they complete the course we hope and expect that they will not only know every variety at our College by name, but also most of the hundred or more varieties when they see them, and that they will know the good ones from the poor ones.

In Fig. 25 the students are making a colony house. We try to make it possible for the student to build a house each year so that when they go home they will not only have drawings and descriptions of houses, but they will be ready and have right in their fingers how it feels to build a house. No amount of lecturing to young men will ever take the place of driving a nail and hitting your thumb. They have got to do the work in order to know how.

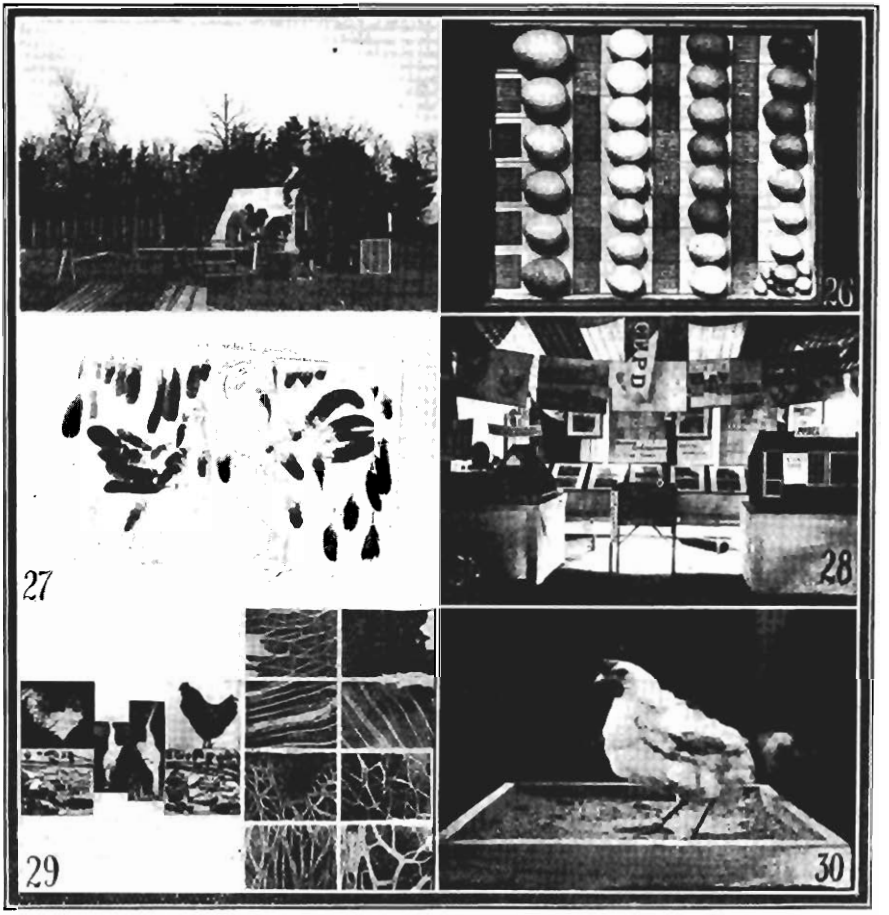
This picture also represents a typical American boy; you can count on him every time to be onto his job.

Our teaching is not simply to the students who come to the College; that is only one way. The great majority of the people never can go to college; but a college can and must go to the people. These are the ways in which it is done by the Poultry Department at Cornell. The following is reprinted from a card which we enclose in all correspondence.

Fig 26 is a collection of eggs from the different varieties of fowls, showing the difference in size, colors and shape.

Here in Fig. 27 is the outline of a fowl showing the different types of feathers. These are taken to the rural schools, to the teachers' conventions to show how the subject may be taught. This represents only one or two lessons out of ten or more which have been prepared to help children to become familiar with the important things to know about chickens.

Fig. 28 is an educational exhibit showing models, charts, photographs, and live poultry which illustrate principles and



modern methods of handling poultry, the result of experiments, and methods of the teaching. These exhibits are carried to the poultry shows and to the fairs each year as an indication of the effectiveness of this method of reaching the people. We secured during the week at the State Fair the names of 995 persons who after the exhibit signed their names and addresses on cards asking that poultry bulletins be sent to them; and this year at Madison Square Garden, right in the heart of the great metropolis, we put up an educational exhibit for the first time, and Mr. Trask, one of our assistants, brought back 1,463 names and addresses for Cornell poultry publications.

That is the way we believe in carrying the message to the people and not waiting for the people to come to the institution.

Then, in addition to that, the best students and assistants go out to attend Grange and club meetings, lecture on poultry subjects and explain the results of experiments.

The remaining illustrations will deal specifically with the experiments which have been conducted by the Poultry Department and in an attempt to show how a Poultry Department may help to solve the poultrymen's problems.

Fig. 29 shows how we are trying to establish the relationship between the dressed weight and the live weight, and the value of different cuts of different breeds of fowls.

For many years investigators have been comparing cattle, sheep and swine and other animals as to their type and slaughter qualities; we are trying to get the same information in regard to poultry. The illustration shown is only one out of many. It compares the White Leghorn alive with the Barred Rock alive, and the dressed weight, size and length of internal organs to get the comparison and get the general average between different breeds. We only show one of each in this picture. First, they are studied alive, then they are killed, picked and photographed as shown here. Then cut up into all the different sections and laid down on the same board in the same way, measured and weighed and then photographed. We find one result, for instance, that if a person should buy a hundred pounds of White Leghorns and a hundred pounds of Barred Rocks and remove the waste parts for cooking, he would have eight pounds more to eat in the case

of Rocks than in the case of Leghorns, due to the fact that there is a larger proportion of interior waste in proportion to edible part than with the heavier breeds. That is condemning the Leghorn as a meat fowl, but the Leghorn is not intended to be any meat fowl; it is an egg machine, and its most valuable attribute is the fact that it does possess a large proportion of internal machinery to total body weight.

You will be interested perhaps to know how the muscular tissues compare with Leghorn and Barred Rock. The illustration shows longitudinal and cross-sections of muscle tissue magnified twenty-five times and photographed. Compare the Leghorn breast-meat cross-section (A) and the Rock breast-meat cross-section (B) and note the long white section of connective tissue; that is the tough part. Compare the dark areas in between which is tender meat. The same differences may be noted in the cross-section of muscle. Barred Rock has great big patches of red meat and a small proportion of connective tissue. In the thigh of the Leghorn, observe that is a large part of the connective tissue with only a narrow layer of red meat in between, whereas in the Barred Rock you have right the reverse.

That shows the reason why the Leghorn is not as desirable a fowl for consumption.

One of the problems we have been facing for a number of years is how to feed the hens so they will lay in the winter. It has been thought that hens can be forced to moult early, and consequently a practice has grown up throughout the country, based on the assumption that if you would starve hens for three or four months in the latter part of the summer, you would stop their laying and stop their development and cause them to shed their feathers, and then, theoretically, they would grow their new feathers earlier and lay earlier than they otherwise would.

That sounds reasonable until you try it. We ran an experiment with six flocks of Leghorns, two hundred and forty hens in all. One hundred and twenty hens were starved for four weeks until they lost about half a pound apiece in weight and stopped laying almost entirely along in July and August. The other one hundred fowls of similar age and variety were fed just as we ordinarily would feed them at that season. We re-

duced their ration gradually, the first week about one-quarter, then a little less, until finally they were eating less than half their usual ration as compared to the 120 hens which were fed all they would eat in the usual way. These were getting the same kind of food, which was a good ration for egg production. We found at the end of the year that the hens that had been starved had not completely overcome the effects a year from the time they were starved, and were not laying as many eggs as the hens that had been allowed to lay all they wanted to the year before through the regular moulting period. When we figured up the cash account, we found we had made 25 and a fraction cents apiece more from the hens we fed well than we did from the ones we starved.

We have come to the conclusion that it is mighty good business to let a hen lay when she wants to.

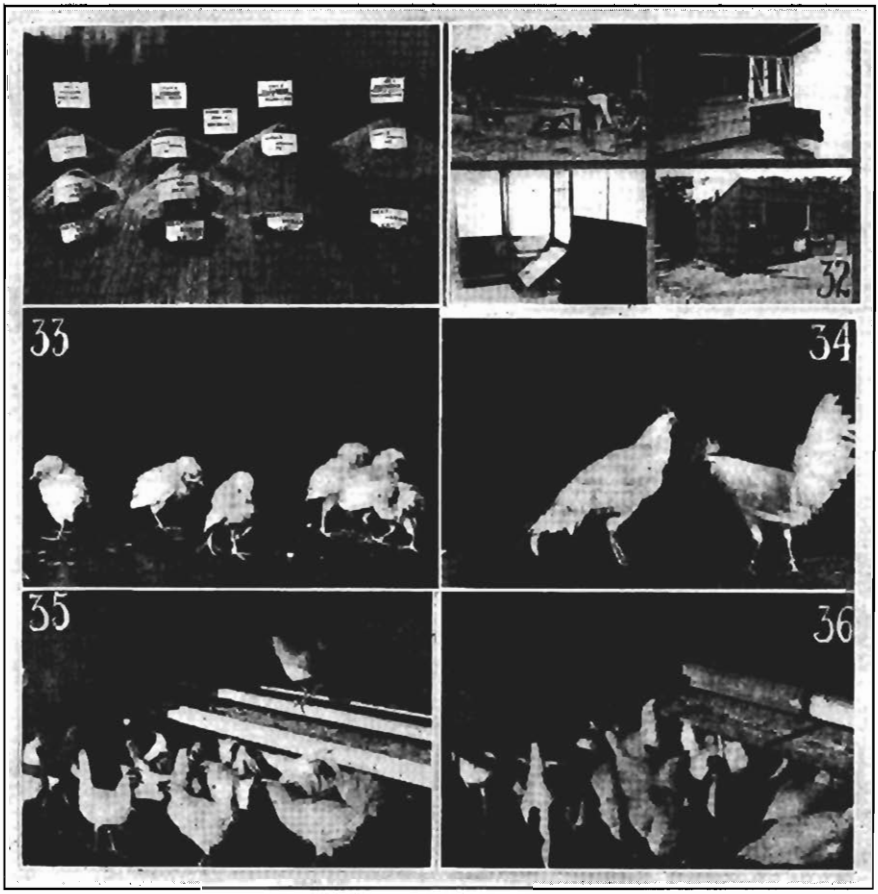
In order that we might find out which hens were moulting and which were not, every one of these 24 hens were dipped in diamond dye until we had six different colored flocks, red, indigo, yellow, pink, and all of the attractive colors of the rainbow. It was interesting to see some of our city friends come up in automobiles to look at the colored hens. I like to get even with our city friends once in a while, because they frequently have so much fun at our expense. They actually wanted to know if we could not sell them some of the eggs from the colored hens for hatching; they wanted to get the same breed. I received a letter from Brazil only a few weeks ago from a man who sent a check for $85.00, asking us to send down as many as we could for the money of different colored hens that he had seen on our place. When they asked the question what we did it for, we simply told them that we were trying to produce a breed of fowl that would lay Easter eggs. We took it all back, of course, later.

Some of the most valuable facts we stumble over and discover by accident. As late as the 28th day of November hen No. 61 (Fig. 30), that had been trap-nested for a year with a good many others, moulted. The illustration shows a week after she was in her worst condition; there was scarcely a feather on her body except the primary wing feathers. She was so bare that

Miss Nixon, who had charge of the experiment, through her kindly sympathies, made a blanket and sewed it on her and kept her in the house for a while. That hen laid 213 eggs in nine months, the best hen we had on the ranch, and she laid 175 eggs the second year, and she was the last one to moult. That gave us a hint. Ordinarily we would have killed her, because we would have said she lacked vitality because she failed moulting, and therefore would not pay us a profit. If you will consult Cornell Bulletin 255, you will find as a rule the highest producing hens are the ones that moult last; the poorest hens are the ones that moult first, because they have plenty of time. Then they strut around in the fall with new plumage on and pose as if they were great producers. They are the ones which were supposed to lay the winter eggs. The hens that lay the most winter eggs are the hens that lay the most eggs all the year. The man who makes the most money is not necessarily the man who gets the most eggs in the year, but the man who gets the most eggs when they sell at highest prices.

Fig. 31. The average amount of food consumed per hen in one of our feeding experiments, in which we compared four methods of feeding early hatched pullets. Eighty White Leghorn pullets were used, twenty in a flock. All were fed for one year. They were divided into four flocks, twenty pullets each. The first two pens were fed whole grain and ground grain; the second two pens had ground grain only. They were all fed the scraps in about the same proportion. The first pen had the ground grain fed in a wet mash; the second pen had the ground grain fed as a dry mash in a hopper where they could go and get it at all times; the third pen had grain fed by hand in a litter three times a day to keep them busy; the fourth pen could go and eat grain from a hopper any time they wanted it. All four flocks had the same kind of ground feed, which consisted of a mixture containing 100 lbs. corn meal, 100 lbs. wheat bran, 200 lbs. wheat middlings, 100 lbs. beef scrap, 50 lbs. alfalfa meal, 25 lbs. oil meal.

The net result of this experiment for one year, expressed in dollars and cents, is that we found that the pen which had the wet mash made us a profit of $21 over and above the cost of food



and loss by mortality. The pen that had the dry mash where they could help themselves, $28; the pen that had the whole grain fed by hand and no ground feed, about $20; the pen that could go and eat whole grain whenever they wanted it, but had no ground grain, $15.50. It will be seen that there was a net difference of $13 between the twenty hens that were hopper-fed whole grain and those that were hopper-fed ground grain, and about $7 difference between those that were fed wet mash, as compared to those that had the dry mash. These are bigger differences than one would ordinarily expect.

Mr. Gillingham—Did the hens that had the dry mash get any dry grain in the litter at all?

Prof. Rice—Yes; both the hens that had the wet mash and those that had the dry mash we fed by hand in the morning, and at night the cracked or whole grain.

A Delegate—What kind of grain was used?

Prof. Rice—A mixture containing 200 lbs. corn or cracked corn, 200 lbs. wheat and 100 lbs. oats.

We ran this experiment through the second and third year, and the final results were essentially the same as the first year.

The reason for this striking contrast in profits apparently is due to the fact that the hens that could go and get dry mash whenever they wanted it always had enough to eat, and apparently did not eat too much of it. As nearly as I can understand the principle involved, the chief value of the hopper system of feeding a dry mash is that it saves labor and serves the purpose of a balance wheel, or to take up the slack, so to speak, which prevents the fowl being underfed or overfed, if one uses good judgment in the feeding of the whole grain. It is important that the hens have enough ground grain in proportion to the whole grain. This should be about one-third to one-half of the former. It can be regulated by the amount and kind of whole grain fed.

We are now feeding practically all of our hens by the dry mash method of hopper feeding.

A good henhouse is an important factor in successful poultry farming. Fig. 32 illustrates a very satisfactory house for this climate. It possesses the desirable feature of a high front with

the windows so placed as to admit plenty of sunlight and fresh air without letting the wind blow on the fowls. The cloth curtain may be closed at night and day times during stormy weather, but for the most part is open night and day the year round. There is a double wall behind and above the perch where the air can circulate between the rafters and the studding. This prevents condensation of moisture on the walls of the roosting room, and makes this portion of the house warmer than it otherwise would be.

Within the house is a covered dust wallow placed under the lower window.

A Delegate—What is the idea of covering the dust wallow?

Prof. Rice—That is to help keep the dust from getting into the room. It does not entirely do this, however, and you can readily imagine the fowls frequently come out and shake off the dust outside.

We find it exceedingly desirable to keep a poultry house cool in summer as well as comfortable in winter. To do this a little window is placed in the rear of the house under the eaves so that we can open it and let the air pass in between the rafters and studding, and out into the room, thus causing a circulation of air, which, when the windows are open, can pass outside. It is surprising how much cooler such a house is during hot weather.

If you have ever had chickens look like those shown in Fig. 33, they undoubtedly gave you the blues. Millions of chickens have been lost throughout the country by what is known as white diarrhœa. The cause or causes we do not know. The investigations which have been carried on along this line are one of the best evidences of what the Experiment Stations are doing to help the poultrymen. We have at the present time bulletins or reports from six different States where trained men have been working for from one to two or three years with capable assistance, with their microscopes and crucibles, trying to find out the cause of white diarrhœa. They think they have found at least six different causes. Each man is certain that his discovery is the right one. It now looks as if all are right, because they have all found a germ or fungus of some sort which produces symp-

toms somewhat similar, at least, sufficiently so, to lead people to call the trouble white diarrhœa.

This summer in Canada they were losing chickens by the thousands all through the country, and they did not know the cause. One of the Professors at MacDonald Agricultural College, Quebec, discovered a little mold, called Aspergillus, living upon the internal organs of the little chickens, and he traced its origin to the musty straw used as litter in the pens. All through that country that season the peculiar local conditions affecting the straw and the air were favorable for the growth of the mold. Wherever the chicken houses were littered with this straw, the baby chickens contracted the disease and died by the thousands. In order to find a remedy several experiments were conducted. Chickens were divided in different lots for comparison with clean and infected litter. The chicks grew well where good straw was used, while those kept in the musty straw contracted the disease. An account of this experiment was printed in the *Canadian Poultry Review* for October.

One of the most important considerations in the successful handling of poultry is to breed from strong, vigorous stock. We recently published Bulletin No. 45 on "Constitutional Vigor" which deals with this problem. Only one or two illustrations can be used here to show what is meant by constitutional vigor. You should get these types shown in Fig. 34 thoroughly fixed in your mind so that you will never forget them. Look at them, then shut your eyes and see if you can see them. If you do, you will then be able to remember how they look when you get home. Try and recall the contrast between this cockerel with strong constitution and the one with weak constitution. Note the heavier shank, strong, deep body, large comb, short, thick shanks, blocky, round head, short, heavy curved beak, bright comb and wattles, etc., and compare them with the fowl of low vitality having small comb sunken eyes, narrow head, long, thin, flat beak, long, thin body, thin shanks and drooping tail. Notice the fowls of strong constitutional vigor, how their legs are set wide apart, which indicates that the body is wide, thus spreading the legs apart, and therefore the fowl has larger digestive capacity, that is to say, plenty of room in which to hold the vital organs. To

have strong vitality the fowl's body should be deep from back to keel, to reach well down between the legs, and have reasonable width at the same time. A good laying hen must have room for egg-making machinery. This statement is not mere guess work. It is based on careful measurements of many trap-nested hens. Miss Nixon, who has been doing some of this work for us, has examined, measured and weighed the internal organs of 88 hens that have been trap-nested for three years, and she compared the production of these hens and the size and length of their internal organs. She found that the vital organs of the hens that lay a large number of eggs are larger than those of the hens that lay a small number of eggs.

A Delegate—You spoke of a bulletin just now. What is the number of this bulletin?

Prof. Rice—No. 45, on breeding for constitutional vigor.

In Fig. 35 is shown a pen of hens that we picked for low vitality. You will notice that in spite of this fact they are a pretty decent looking lot of fowls. Not one was sick, but they were a somewhat narrower chested, thinner shanked, less rugged lot of hens than the ones which we selected from the same original flock for high vitality. These so-called low vitality fowls would ordinarily have been kept by most farmers or poultrymen.

Fig. 36 shows the flock of fowls that were selected for strong vitality. We picked these out because they were deeper in the body, had brighter and bigger combs, brighter eyes, and showed better constitutional vigor. They were the ones which we thought would lay the largest number of eggs.

In the spring eggs were saved from each flock and placed in the same incubator at the same time and pedigrees were used to keep the chickens from getting together. When hatched, the chicks were leg banded and were placed in the same brooder and received the same feed and care during the summer. When they were five or six months old, they were weighed and photographed, and here you see in Fig. 37 the chickens that came from the high vitality, and below them are the chickens that came from the hens of low vitality. The pullets from the low vitality stock weighed one-half pound per chicken less, when five months old,

than did the chickens of high vitality of the same age. The chickens that came from the high vitality stock look as though they were four to six weeks older than those from the low vitality stock, notwithstanding the fact that they were hatched by the same machine on the same day and were reared together.

It was found in this experiment that the hens of high vitality laid 11 9/10 eggs per hen per year more than the hens of the same variety selected for low vitality, and that the pullets hatched from hens of high vitality laid fourteen eggs apiece more than the pullets that were hatched from eggs laid by hens of low vitality. The hens of high vitality paid a net profit, over and above the cost of feed and loss by mortality, of 41 cents apiece per hen more than did the hens of low vitality. There was ten per cent. difference in the fertility of the eggs and four per cent. in the hatching power of the eggs in favor of the hens of strong vitality.

I will not have time to dwell longer on this subject, except to say that it must be apparent to everyone that one of the most important factors in the successful handling of poultry is to so breed, feed, house and rear our stock that we may have the strongest and most efficient machine that is possible for us to secure. A hen is a living machine that we must use to transform our raw material, the feed, into a finished product, the egg.

Just a word now on the importance of knowing the temperature, and the way we should keep eggs for hatching. Vitality can be lost by the manner of keeping eggs for hatching. If we are to have stock of high vitality it is a question of selection all the way through life—the egg, the chick, the chicken and the whole fowl. I look upon it as a crime for a person, after he has so cared for his fowls by proper method of housing, feeding, breeding, etc., to secure a strong, hatchable egg, and then because of carelessness or ignorance lose this hatching power and vitality through improper methods of holding the eggs for hatching.

Let us see what difference it makes in the fertility and hatching power of the eggs how they are kept. We have carried on experiments for two seasons in keeping eggs for hatching. Three lots of eggs were selected equally and handled exactly

alike, except that one lot was kept in a living room, another in a cold storage room, and the third in a furnace room. Fifty eggs were put in each of these places and kept for fourteen days under the different temperature conditions. All were then incubated in the same machine. The eggs kept in the living room averaged 65 degrees, and from these we found 85 per cent. fertile; those kept in the cold storage room at an average of 50 degrees were 90 per cent. fertile; those kept in the furnace room at a temperature of about 80 degrees were 24 per cent. fertile. All were tested at the same time on the seventh day of incubation.

We hatched 52 per cent. of the eggs from those that were kept in the living room, 76 per cent. from those kept in cold storage, and no chickens were hatched from those kept in the furnace room.

A Delegate—How do you account for that,

Prof. Rice—Simply because the germ is killed while it is in the tender, delicate stage of its existence. It has been found by Prof. Edwards, of Harvard University, that a chick begins to develop within the egg at 70 degrees Fahrenheit. Imagine, then, what happens to the eggs in the average country grocery store at 95 degrees in the shade. Another matter of importance in keeping eggs for hatching is the time eggs may be kept without loss of vigor. Five lots of eggs of fifty each were kept in a living room at a temperature of about 65 degrees, and were turned daily. Different lots were kept one, two, three, four and five weeks, respectively. Note the difference in the fertility on the seventh day of incubation. Of the eggs that were held for thirty-five days there were fertile 8 per cent.; twenty-eight days, 19 per cent.; twenty-one days, 52 per cent.; fourteen days, 78 per cent.; seven days, 80 per cent.; one day, 86 per cent. The percentage of chickens hatched from eggs that were kept thirty-five days was 6 per cent.; twenty-eight days, 12 per cent.; twenty-one days, 36 per cent.; fourteen days, 52 per cent.; seven days, 54 per cent.; one day, 86 per cent.

You would not ordinarily expect as large a contrast as this between one and seven days, but it nevertheless happened to come out this way. You can readily see the very great decline

in hatching power, due entirely to the length of time the eggs were kept under similar conditions. The longer we hold eggs, even under fairly decent conditions, the greater is the decline in hatching power. It is also important that they be kept at a temperature not above 50 degrees.

The proper place to keep the thermometer in an incubator is an important consideration for good hatching. Fig. 38 shows what happens to the eggs where one runs the machine with the bulb of the thermometer in three different positions; first, on top of the eggs; second, down between the eggs; third, hanging above the eggs. Notice where the thermometers are placed, and then what happens to the eggs. A similar result has been obtained in other experiments which we have tried. The machines were all run at the same temperature, but in each instance a different thermometer was used to take the reading. The result in hatching indicates the importance of knowing where the thermometer is to be placed when we determine the temperature at which we will run the machine.

The number of chicks hatched from fifty eggs, when the bulb was down between the eggs, 3 chicks; where the thermometer was resting on the eggs, 23; where it was hanging just above the eggs, 30 chicks. The results are due to not getting enough or giving too much temperature. There was a difference during the first week of from three to five degrees between the temperature reading of the three thermometers in the same machine. If we had run the machines with the same thermometers in the same positions, but at different temperatures corresponding to the height of the bulb, the eggs probably would have hatched all right in each instance. In conducting this experiment, we undertook to carry out the written directions to run the machine at a certain temperature, with the thermometer placed in the position indicated.

Fig. 39 shows where we rear our chickens for the first few weeks. Miss Nixon is in the foreground. My experience is that, if you want to raise a large percentage of chicks, you had better leave it to the woman folks to do it.

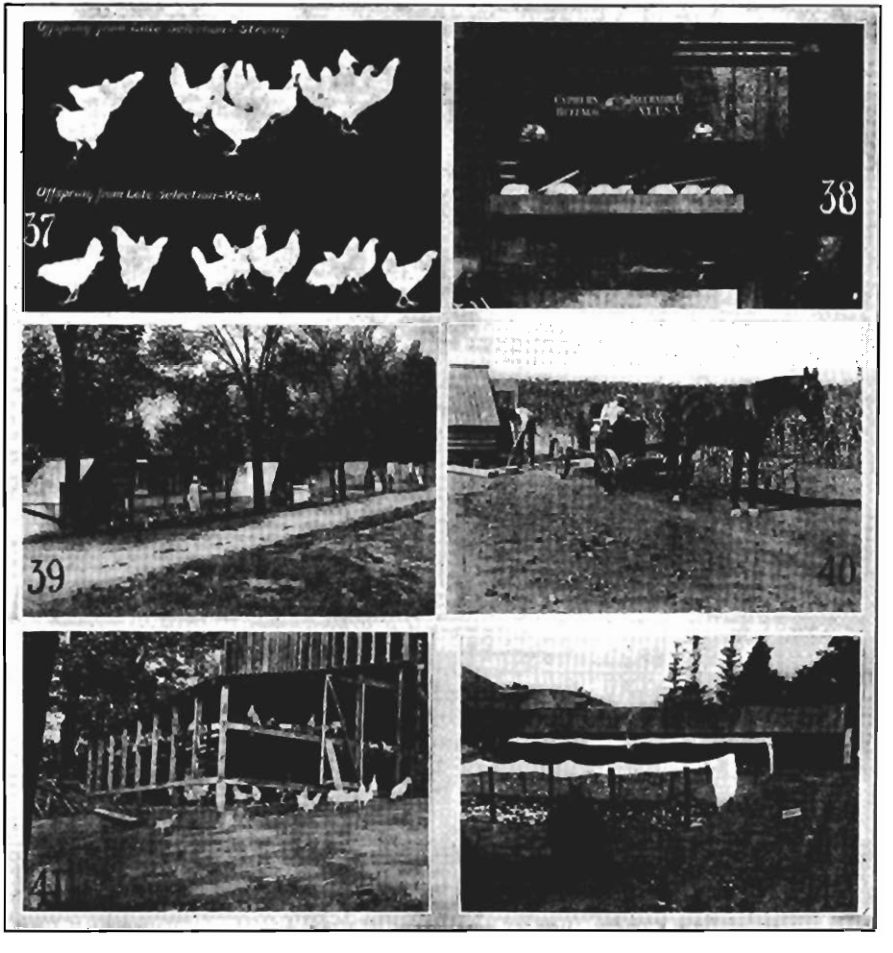
We are trying to bring to bear upon our poultry enterprise business methods which will enable us to rear chickens success-

fully in a wholesale way. This means, if we are to succeed in keeping poultry in large numbers, we must do so in a large way, and at the same time reduce the cost for labor to the minimum amount.

The great weakness in modern Poultry Husbandry—and it has been true for all time—is that we are dealing with so many little individuals. One man's capacity to handle fowls is limited by virtue of the detail attention which must be given. Poultry Husbandry, therefore, is measured by the ability of a man as a unit to deal with a large number of individuals. Small flocks have almost invariably given the largest egg production per fowl. Our whole effort for the past twenty years has been to devise wholesale methods by which we can reduce the labor element without at the same time sacrificing proportionately the net returns in growth or production.

One way in which we have been trying to solve the labor problem in rearing chickens in large flocks in range is shown in Fig. 40. This is an attempt to raise chickens by horse power. With the outfit shown, consisting of a wagon and horse, two men, with boxes, cans, and a barrel, a vast amount of labor can be saved in rearing several thousand chickens. The illustration shows the outfit ready to go out into the corn field at the University plant, three-quarters of a mile away, where there are twenty-five hundred young chickens in twenty-one colony houses eight feet square. One of these houses is shown in the illustration. It is a gasoline-heated colony house, that you can heat without having to fill the tank but once in two weeks, heated with a gasoline burner that has no wicks to trim because it burns with a blue flame. The house holds two hundred chickens from the day the get out of the machine until the sexes are old enough to be separated. It is a house that you can use the year around for hens when you are not using it to rear chickens. It can be used as a brooder house, convenient to the other buildings when the chickens are young, then drawn out into the corn field and on the pasture or meadow, permitting the chickens to grow on free range. The house is a permanent investment, and never idle.

We found that two men could load the wagon with boxes of feed, corn and meal, fill up the barrel with water, and the cans



with milk, drive out to the field and feed, water, and give milk to the twenty-one flocks, get back and put up the horse in less than an hour's time a day. They have done this day after day, week after week, during the past summer. The only other work in caring for the chickens was simply to close the doors at night and open them in the morning, and to go out one afternoon a week with two men with a straw body on the same wagon, to take out the old litter, clean the houses, and place new straw.

A Delegate—Have you a bulletin showing this house?

Prof. Rice—No, sir, but we are working on one now that we hope to publish early this spring.

A Delegate—What will be the number of that bulletin?

Prof. Rice—I do not know. Simply ask for the bulletin on Cornell poultry appliances and you will get it.

We tried this year for the first time a house which we very much like as a summer home for cockerels. Where one raises three or four thousand chickens each year, as we do, it is necessary to have some place to care for the finest surplus cockerels. They should be kept separate from the rest of the flock, and locked up from the chicken thieves. It must be cool and roomy enough, so that the chickens will not crowd. The house shown in Fig. 41 you will see is a simple shed on the north side of a building, covered on all sides and ends with chicken wire. The entire space within the house is devoted to perch room, with the exception of the space next to the building where the water cans and grit hoppers are placed. The chickens can leave and enter the house when they desire to do so.

The next illustration (Fig. 42) shows a brooder house where we have been conducting experiments to test seven different methods of feeding young chickens. Seven flocks of 110 Leghorn chickens each, were used in this experiment. The chickens were kept for six weeks without changing the method of feeding. The following table gives the results in amount and cost of food consumed, mortality, etc. A bulletin, giving all the results of this experiment, will be published early in the spring. This will also include the records of these seven flocks during six weeks,

when they were fed the same ration in order to prepare them for market. The contrast in the mortality and the size of the chickens in the different flocks is very great. No chickens have been lost from one of the flocks during the six weeks, and in some of the flocks the chickens were nearly twice as large as those in other flocks fed differently.

Fig. 43 shows the development of the egg in the domestic fowl. I have shown this to emphasize the complexity of the egg and the process by which it is manufactured.

The yolk of the egg is formed in the ovary, which is a collection of ova, large or small, depending upon the laying condition of the fowl. The yolk, when full grown, falls into the oviduct, where the white of the egg is deposited. Further along, the shell membranes are laid on, and later the shell itself is deposited. The entire operation requires about 18 hours, 12 of which are frequently required for the making of the shell.

Fig. 44 is a cross-section of muscular tissue taken from the ovary of the fowl. The little ova may be seen with a miscroscope, so small that they could not be recognized with the naked eye. These gradually grow to the surface and work through the tissue, and develop into a full-sized yolk. One of the most important principles in the philosophy of egg production is the fact that these little ova which develop into the yolk are made up of 64 per cent. fat. This is the only fat to be found in the egg, except a bare trace in the albumen. How, then, can a hen lay; how can she begin to make the first part of the egg if she has not any surplus fat? She should have surplus fat if she is to be in the best laying condition.

We have made observations which, I think, prove the fact that fat hens lay better than lean hens, and that lean hens cannot lay. A few years ago a customer sent in an order for a good fat hen. I went out among the flocks where I knew we had some good, fat Barred Plymouth Rocks, and picked out a hen that was so fat that I really felt as did Colonel Curtiss, who once remarked about a fat hog, that he would have to kill her in order to save her life. This hen was worth $1.25, and I felt that if I left her for a few weeks, she might be dead of fatty degeneration. She was apparently in perfect health, so far as plumage, color of comb

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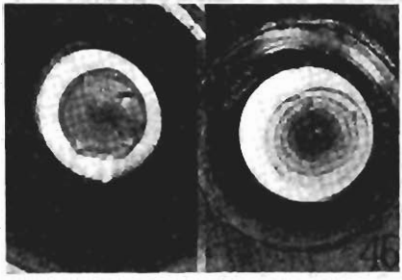

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Ways in which the Department of Poultry Husbandry is endeavoring to assist the Poultrymen of the State.

1. By conducting experiments with Poultry
   Ask for the Poultry Bulletins
2. By Correspondence
   Write to us.
3. By special instruction in regular and winter courses
   Send for announcement and take a course.
4. By allowing visitors the Poultry Department.
   Come see us.
5. By personal assistance in selecting breeding pens
   Perhaps we can help you.

The Department of Poultry Husbandry in Co operation with the Extension Department.

6. By Poultry reading course lessons
   Send for them.
7. By Educational exhibits at the Fairs and Poultry Shows
   Go look at one
8. By Lectures and Demonstrations at Poultry Meetings and Poultry Shows.
   Arrange for a meeting
9. By Lectures in Poultry Husbandry for Rural Schools
   Ask for Rural School Leaflet
10. By cooperative experiments with poultry
    Try one

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and actions were concerned. She was simply over-fat, but had not yet reached the stage of degeneration. She was so excessively fat that her body hung down almost to the ground; there was nearly a pound of surplus fat in her body. To my amazement and humiliation I found her in full laying condition, with an egg in her body, hard-shelled, and any quantity of yolks, which would indicate that she would continue in full laying for weeks to come. This observation set us to thinking. When we were killing a lot of hens a little later we noticed that the fat hens were laying. We therefore made a careful examination. We took out the egg organs and laid the hens down in the order of their fatness, then laid the egg organs out in the order of their development and were surprised to find that they tallied almost exactly. We selected the three fattest hens and put their egg organs under them, then picked out the three leanest hens and did the same. The body of the hens which were fattest had the largest developed egg organs. The oviduct in each instance was nearly a foot long and very much enlarged. The hens that were leanest had oviducts that were only three or four inches long and not much larger around than lead pencils.

In Fig. 45 you will see that the three fattest hens are the ones with full sized eggs, all developed, with hard shell ready to be laid and any quantity of full sized yolks, while the three lean hens are perfectly dormant.

Fig. 46 shows the way in which we are trying to find out what goes on inside the hen. It was once stated by Governor Hoard that the darkest place on earth was on the inside of a dairy cow; we now think that it is just as dark on the inside of a hen. We learned two or three years ago from Dr. Riddell of the Chicago University that by feeding hens on aniline dye, called Soudan III, it had the peculiar power of coloring the fat red. This was clearly shown in its effect on the color of the yolk of the egg. Prof. Rogers of Cornell has been trying several experiments to find out the rapidity of the development of the egg and the various changes that take place in the growth of the fowl. As a result of these experiments a new dye, called Rhodamine Red, has been found which does not color the fat but does color the protein of the egg or the feather. By

feeding these dyes one can determine the changes which take place in the development of the egg or the feathers.

In the illustration shown the egg was laid by hens that had been fed Soudan III at stated intervals. By counting up the yellow rings and pink rings one can tell how many days it required for the yolk of the egg to develop. It will be seen that it requires about eight to ten days for the yolk of the egg to develop. We carried this experiment still further, and incubated the eggs which had been laid by hens fed on color pigments. The young chicken showed very clearly that the chicken assimilated the fat in the yolk of the egg and transformed it into body fat, which was indicated by the color of the fat deposit. This shows us that chickens may be born either fat or lean, depending upon the condition of the hen that laid the egg. Young chickens that were fed at the time their first feathers were growing showed very clearly the red pigment in the feathers. White chickens were made very pink in color. Where the dye was not fed for a week or so there was a white band in the feather and when the material was again fed the pink color was shown. We are using these color pigments to find out the changes that take place within the egg in the development of the chick. Prof. Rogers is expecting soon to publish a paper giving the results of these experiments.

The last illustration shows a group of the men who are doing the work in the Poultry Departments throughout the United States and Canada. This picture was taken at a meeting at Cornell University where two years ago was formed the International Association of Instructors and Investigators. I have thrown this slide on the screen in order that you may be duly impressed with the fact that Poultry Husbandry has at last come to be recognized as a business of sufficient importance to warrant its being given the same consideration by the colleges and experiment stations as is given to dairying, horticulture, or to any other agricultural occupation.

SECOND DAY—SIXTH SESSION.

The Board met in the Auditorium of the State Normal School, and was called to order by Vice-President Cox.

The following paper on the subject, "Some Insect Invasions, and the Fight Against Them," was read by John B. Smith, State Entomologist:

Some Insect Invasions, and the Fight Against Them.

BY JOHN B. SMITH, STATE ENTOMOLOGIST.

It seems almost absurd to speak of insect invasions, or of fights or wars against insects. They are such insignificant, contemptible, disgusting creatures that it seems ridiculous to consider them at all seriously. They are so helpless, so incapable of resistance, so easily crushed between the fingers, that a real fight with or against them seems unthinkable—to the unthinking.

But let us follow the matter just a little more closely, and we will find, to our surprise, that insects are no mean foes; that from them, directly or indirectly, come losses to health, strength and fortune, and that, while an individual insect may be a contemptible antagonist, an army of insects may be quite another matter.

From the earliest times we have records of insect injury. In the tenth chapter of Exodus, verse 15, the plague that visited Egypt is described as follows: "For they covered the face of the whole earth, so that the land was darkened, and they did eat every herb of the land and all the fruit of the trees which the hail had left: and there remained not any green thing in the trees, or in the herbs of the field, through all the land of Egypt."

Although this is the earliest record of the kind, it is by no means the latest, nor did Egypt suffer more than other countries have since. Even in the United States we have had invasions of a similar character, and not so many years ago the Governor of a Western State appointed a day of fasting and prayer to persuade an angry God to mitigate the plague then infesting his State.

Within the last two years South Africa has locally suffered from locusts to a terrific extent, and in the fight against them eighteen tons of their eggs were gathered on a single estate and destroyed! Now when we take into consideration that these grasshopper eggs are only about 1/6 of an inch long and less than 1/32 of an inch in diameter the perfectly terrific number required to make up these eighteen tons will be appreciated.

In the first chapter of Joel, 4th verse, we read "That which the Palmer-worm hath left hath the locust eaten; and that which the locust hath left hath the canker worm eaten; and that which the canker worm hath left hath the caterpillar eaten."

Now that seems to make a pretty strong record of complete destruction; but it is none too strong for some much later occurrences, when chinch bugs and army worms have passed over a grain country.

Does this seem as if it were a local matter, and hit only a local industry? Has it occurred to any of my hearers that were all members of the insect order *Diptera,* or flies, destroyed it would mean at the same time the complete elimination of yellow fever, jungle fever, Dengue and other tropical fevers, all malarial fevers, the sleeping sickness, plague, certain eye diseases, a variety of tropical ulcerations and a number of cattle and bird diseases? It would mean also the reduction, and in some cases the elimination of consumption, typhoid and typhus fevers, cholera and a variety of other enteric troubles, leprosy and a number of pulmonary and bronchial troubles.

We do not dread insects because of our ignorance of their dangers, and we are contemptuous until, for some reason, we find it necessary to deal with them.

And as for invasions, how many even of our farmers realize that the most troublesome pests that they are dealing with are not native to our State—most of them not even to our country?

The potato-beetle came to us from the arid West.

The San José scale came to us from Asia.

The Angoumois grain moth, the Hessian fly, the asparagus beetles, the pear midge, the sinuate pear borer, the common white cabbage butterfly, the strawberry leaf-roller, the horn-fly, the elm-beetle and the wood-leopard moth came to us from Europe.

New England is just now engaged in dealing with the gypsy and brown-tail moth, which came to them from Europe, and lest you think that a small matter, let me tell you that the State of Massachusetts during the year just past expended $991,000 in the fight—some say over a million, directly and indirectly.

The United States appropriation for the same period was $250,000, while Maine, New Hampshire, Rhode Island and Connecticut spent smaller sums, making a total of over $1,500,000 expended in one year, and the fight is by no means over. In this work 150 power-sprayers and 200 hand-spraying machines were employed. Three hundred tons of arsenate of lead were used as an insecticide and an army of 2,700 men was on the rolls at one time. Just let this matter sink in—an army of 2,700 men in one State alone, fighting just two species of insects, which cover an area of 3,950 square miles! Seven thousand acres of woodland were trimmed, brushed and sprayed, and an entirely new battery of methods has been developed.

In Texas and the Southwest the fight is now on against the cotton boll weevil, and States are maintaining quarantine regulations against each other as strict as that to keep out yellow fever. This beetle came in from Mexico, and is marching north and East steadily, in spite of all efforts thus far. Nearly a million dollars has already been spent in this campaign, and its end is not yet.

Louisiana is now fighting an invasion of the Argentine ant, a species introduced from South America, and which is gradually spreading north and west.

The Pacific Coast has a small army of inspectors constantly at work guarding its ports of entry against the introduction of undesirable citizens of the insect persuasion, and expended many thousands in its campaigns against the cottony cushion and other scales that came from Australia.

New Jersey has gotten off very well so far, but she stands now at a point where it means a careful guarding of ports or grave danger of joining ranks with Massachusetts in an expensive fight. And even New Jersey has a tale to tell, for who would dare to estimate the loss caused by San José scale in amounts less than six figures? But this loss has been widely

distributed, and over a considerable period, so that its extent is not appreciated.

The *Argentine ant* in Louisiana and adjoining States is causing trouble in cities and towns more than in country districts, and it is interesting city dwellers in the fight against insects. It is the most offensive of all household species that we have ever had to deal with, and there is practically no way of killing them off fast enough in summer to keep up with their powers of reproduction. But the insects are from a semi-tropical climate, become dormant as soon as the weather gets even moderately cold, and that gives us our opportunity. In neighborhoods where they are very abundant, boxes are partly filled with manure and decomposing vegetable matter, which remains warm and attractive to the insects when elsewhere matters are cold. They resort to such boxes for winter quarters in great numbers and when in midwinter the insects are entirely dormant, a dose of bisulphide of carbon serves to kill them out—queens and workers as well.

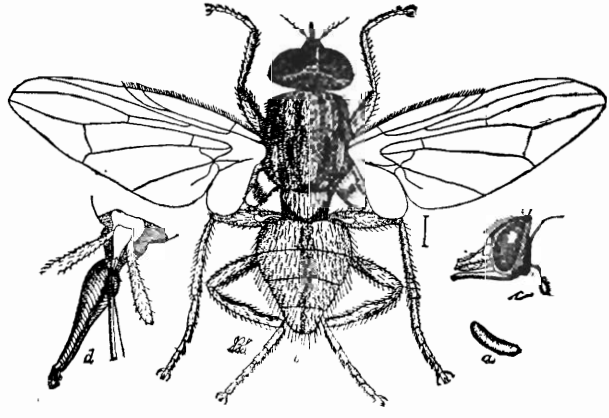

Figure 1.

The Horn-Fly, with details of structure.

The *horn fly* is one of those insects that created a scare about twenty years ago. It was introduced into New Jersey from some Mediterranean port, and from New Jersey spread throughout the country. It was exceedingly abundant for a very few years, and for a time seemed to threaten the continuance of the dairy indus-

try; but, like some other species, it did not really succeed in maintaining itself permanently against conditions here, and soon became reduced to such a point that it was no longer noticed. The history of its spread throughout the country repeats the experiences of our own State. For a very few years after the insects made their appearance they were exceedingly troublesome and then gradually became reduced in numbers. At the present time the species has reached the Pacific coast and the Canadian northwest. The flies are frightfully troublesome there now; but there seems to be little doubt that there also they will disappear after a few years.

Figure 2.

The imported cabbage-butterfly, female.

An insect that is with us continually and that for years has done harm to our truck growers is the common *cabbage butterfly*. We have gotten so used to this and to its abundance that we assume it to be a native species. As a matter of fact, our native cabbage butterfly has been completely exterminated by this European invader, and what we have to deal with now, is a European species and not an American. Raising cabbages on any large scale without dealing with this insect is practically impossible, and the natural checks are so peculiarly adapted to the habits of the insect that, whereas they kill off over 90 per cent. of the hibernating chrysalids yet the early broods are so little infested by parasites that in late summer the butterflies are frightfully abundant and their larvæ do mischief to all sorts of crucifers unless active measures are adopted against them.

The *asparagus beetle* extends now as far as asparagus is cultivated in the Eastern United States. The species was probably

introduced a great many years ago in the north and has found this country to its liking, so that is flourishes as well as the plant itself.

Within the last few years another species, the *12-spotted beetle,* has made its appearance and, working north from the vicinity of Baltimore, is gradually covering the asparagus growing districts. I have watched it invade the southern part of our State and it is gradually moving toward New York. It has not yet reached our northern boundaries, and has by no means extended over the entire asparagus growing area of the State. It probably will in time cover the same field that the other species has covered; but will never be as abundant or troublesome, because it appears later in the season, and apparently does not breed quite so fast.

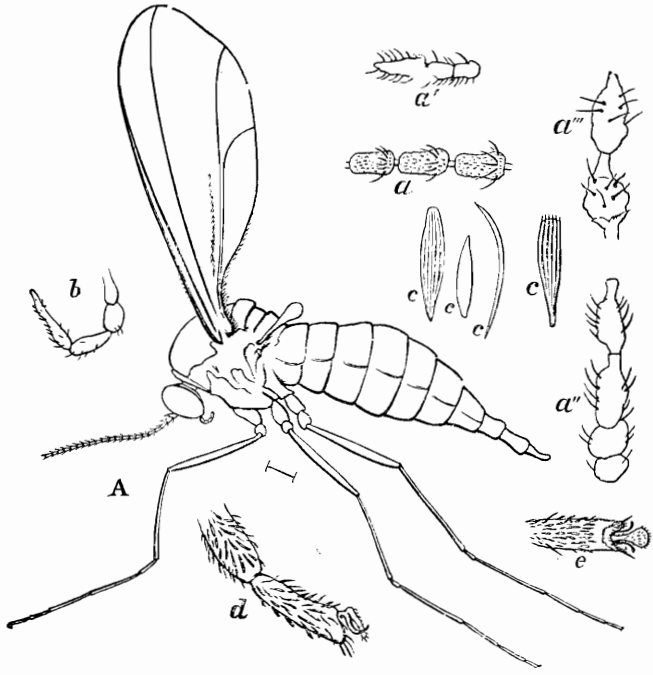

Figure 3.

The "Hessian fly," with details of structure.

The *Hessian fly* has been with us almost ever since wheat growing began in the country. It became so abundant for a

time in the State of New York that this crop was simply abandoned. Wherever winter wheat is grown the insect is troublesome and some seasons so bad that not even the seed is returned. It is impossible to reach this creature with insecticides, and while it is subject to parasitic attack and other natural enemies, these do not serve to keep it in check. We have found, however, that it can be controlled by adjusting our methods of planting and the date at which the wheat is put into the ground, so that now we feel in better position to deal with the pest and the intelligent farmer can raise wheat in spite of it.

The *Angoumois grain moth* is another introduced species, and is one that does severe money injury in the State of New Jersey. It does not affect the amount of the crop raised. It attacks the crop after it is matured, and feeds on the grain after it has been harvested. The longer the grain is left in the field after it is harvested, and the longer it remains in the mow before it is thrashed, the worse the attacks of this insect will be, and it was only a few years ago that a large percentage of the wheat grown in some parts of this State was absolutely rejected by the millers because of the injuries caused by the moth. Wherever this species occurs the farmer must adapt his methods to its habits or suffer the consequences.

The *pear midge* was introduced into this country a little over twenty years ago, and I had the pleasure of investigating it when it was still confined to a small area near Meriden, Conn. At that time it would have been possible to exterminate the species completely at a comparatively small expense; but no one heeded the warnings that were given by the U. S. Department of Agriculture, for which I was working at that time. The insect spread from Connecticut to the Hudson river and along the Hudson river into New Jersey. Fortunately its life history contained a weak spot, and after this weak spot had been discovered, it was possible to adapt our methods of cultivation to it, so that at the present time the insect is almost completely eliminated from the pear growing districts. I would not know at present just where to go to find specimens, and the last examples that I know of were found in my own garden.

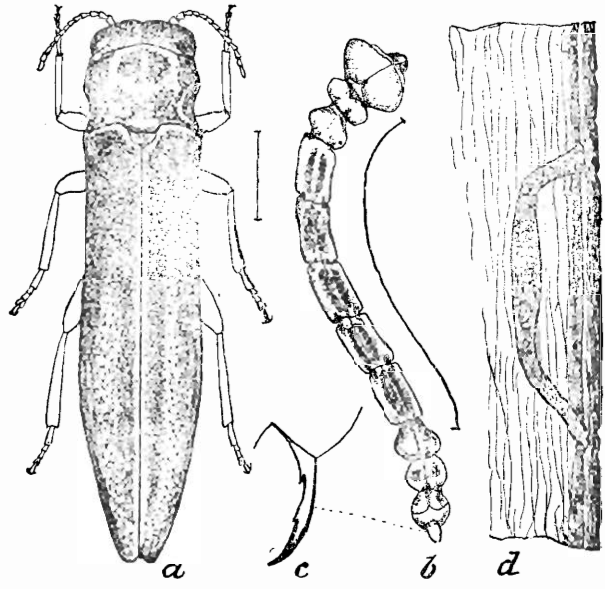

Figure 4.

The "sinuate pear borer": *a*, adult beetle; *b*, larva; *d*, pupa in its cell.

A similar history may be recorded for the *sinuate pear borer*. The fight against this insect was never realized by the community at large. It established itself in the vicinity of Irvington and elsewhere in Essex county, N. J., and was distributed by some nurseries in Union county. After we had discovered its character and life history, and the fact that it required two years to come to maturity, we found it possible to recognize it in the young trees while they were still in the nursery, and in the course of our inspection work we simply eliminated all the infested trees and prevented them from being distributed. Where trees that were infested had already become established, they were either taken out or the borers were cut out and destroyed, so at the present time this insect also is one of those that we have practically controlled, and for which there does not seem now to be any future spread.

The *wood-leopard moth* on the other hand, which also seems to have been introduced somewhere about 1888 or 1889 has had a

different career. This is a borer and attacks shade trees. In fact it is quite a general feeder; but fortunately its habits in the larval stage are such that it easily becomes a victim of birds where native birds are allowed to breed undisturbed. Sparrows will not touch the insect, and therefore the distribution and the injuries caused by this wood-leopard moth may be said to be coincident with sparrow distribution. Wherever sparrows are abundant this species also is likely to be abundant and troublesome. Cities and towns therefore suffer while villages and the country are practically exempt. The insect seems inclined to spread to the northeast rather than to the south, and has within the last few years established itself in the State of Massachusetts and principally at Boston and in Cambridge.

Elm leaf beetles have spread practically throughout the eastern United States wherever elms are grown. The insect was introduced from Europe, and there is no native or other parasite or predatory insect that keeps the species in check. In favorable or wet seasons a disease attacks and destroys great numbers of specimens; but a season that is dry at the time when the insects undergo their change to the pupal and from thence to the adult stage, favors the development of the insects to such an extent that serious injury is caused and in some cases the death of the tree. An elm will stand defoliation for two years in succession. If complete defoliation is carried on for three years in succession, the trees are seriously weakened or die. That is the condition of a great many trees in New England and of some in this State. We have had two years of serious infestation. If next year favors the insects as much as the past two years have done, we can count on many dead elm trees. It is quite possible to keep this insect in check, and within the limits of the City of New Brunswick we have had excellent examples during the past season of the difference between sprayed and unsprayed trees. Some of our cities are now spending a great deal of money each year in preserving the trees from the ravages of this and other shade tree pests.

The *San Jose scale* has been already mentioned, and the effect of this insect has been to practically change the general character of fruit culture in the State. Soon after it was first in-

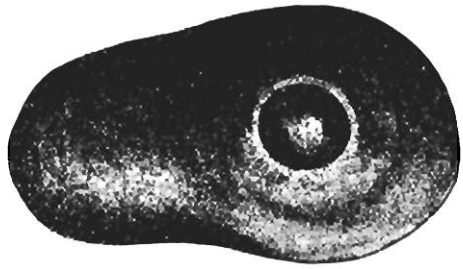

Figure 5.
San José Scale, male; much enlarged.

troduced into New Jersey the claims of the Californians that the scale was kept in check by parasitic and other insects were considered and a trip was made to that State. As the result of the studies made on that trip a number of predatory species were introduced into New Jersey, and among them was a species of lady-bird that was secured from Japan. None of

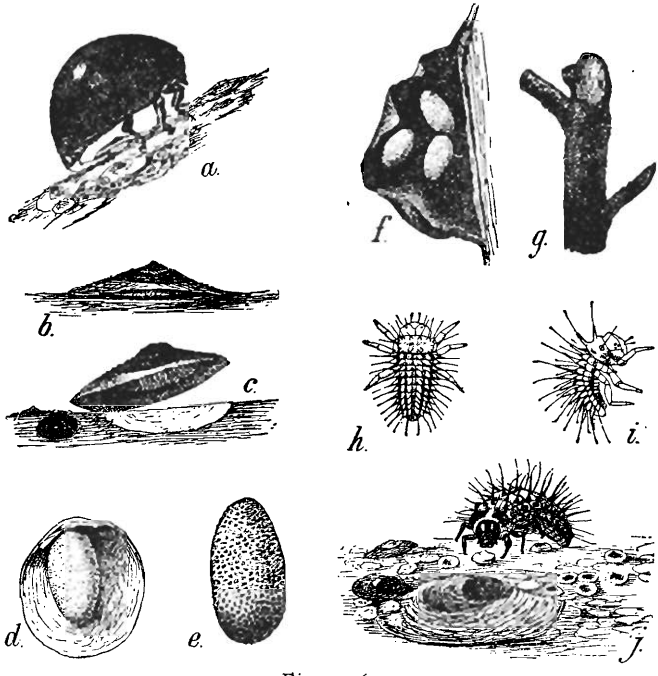

Figure 6.

The Asiatic lady-bird, *Chilocorus similis: a,* adult laying egg beneath scale; *b,* egg in place; *c,* scale lifted to show egg; *d,* egg under turned scale; *e,* egg of beetle; *f, g,* eggs under a bark scale; *h, i, j,* young larvæ.

these species lived here. A few years afterwards the United States Department of Agriculture succeeded in introducing from China the same species of lady-bird that I had previously received from Japan; but those insects flourished at Washington, D. C., and later in Georgia, and became so abundant after two years that it seemed as if they would really become effective agents in controlling the scale. I made a trip into Georgia and secured specimens of the species in the hope that after two or three generations in the south, the insect would succeed in es-

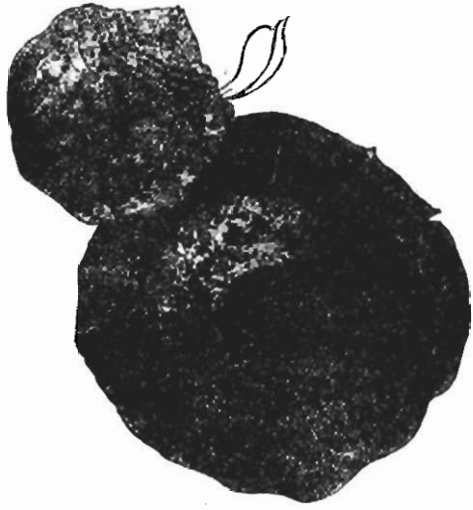

Figure 7.

San José Scale, female, with the insect detached.

tablishing itself in our own State. I succeeded in keeping the specimens alive through one winter, but found the season after that they were subject to the attack of a parasite, which keeps our closely allied native species in subjection, and at Washington they had the same experience. In Georgia a combination of climatic conditions, parasites and other adverse conditions almost completely wiped out these Asiatic lady-birds and at the present time it is doubtful whether the species can be found in the country at all. We do have some native species that keep the scale in check to some extent, and there are both predatory species

and parasites as well as a fungus disease included in the list of enemies; but after all it is still necessary to fight this insect with insecticides, and we have developed these insecticides now to such a point that it is possible to control the scale and to raise fruit in spite of it.

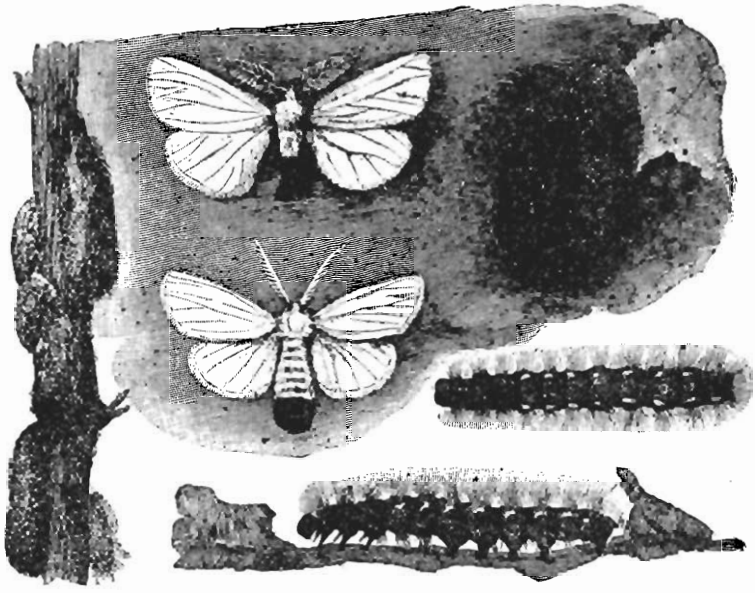

Figure 8.

The brown-tail moth, in all stages.

The species that have been most in evidence and under consideration of late are the *brown-tail* and the *gypsy moths.* The brown-tail moths were introduced accidentally on nursery stock into the State of Massachusetts. They have spread from Massachusetts through New England and into Canadian territory. Their natural spread is not to the south or to the west, and if we can keep the insects out by guarding against accidental introduction, we may be able to avoid the fight against them. The species is troublesome, not only because of the feeding habits of the caterpillar, but because the hairs that cover the caterpillar are more or less poisonous and, where they come into contact with the skin, are apt to set up what is known as the brown-tail

rash. This is an exceedingly painful and irritating trouble, and, in localities where the brown-tail moths are abundant, the tendency is to abandon the summer homes. Thousands of dollars have been lost in some sections of Maine, simply because people would not come in summer where they knew the brown-tail moths occurred.

Figure 9.

Gypsy moth, female.

The *gypsy moths* were introduced many more years ago and the past history of this species makes interesting reading. The caterpillar eats everything; there is apparently nothing that grows that will not be attacked, and the fight against the insect must be carried on along the roads, in the woodlands, in the orchards and in the open fields. Not so many years ago the pest was practically under control, and it would have needed only a year or two more to have made it impossible for the insect to regain its position. In fact, it had been reduced to so low a point that the Legislature of the State of Massachusetts was inclined to consider the work done and refused to make further appropriations. They were warned that in five years, if nothing was done, the insects would be beyond control. The legislators believed that this was scare talk on the part of the entomologists and refused to consider it. At the present time money is being spent at the rate of a million dollars a year, simply to keep the insect in check, and all hope of extermination has been abandoned. The fight at present is being carried on by scouring the world for parasites and for predatory

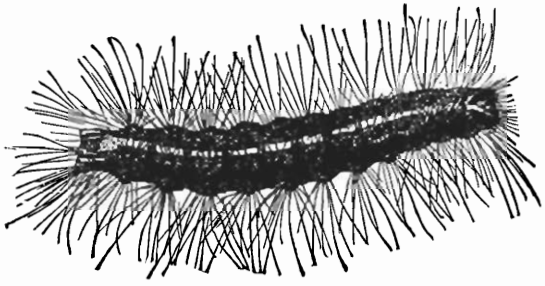

Figure 10.

Caterpillar of gypsy moth.

species known to feed on this insect. Every country where the species naturally occurs has been visited, and every parasite that is known to feed or to infest this gypsy moth has been introduced into this country. It has been an interesting study and a hard fight to introduce the parasites without their own peculiar natural enemies, but at the present time our only hope of controlling the species is to spread these parasites along the line of the insects distribution, so that we try to duplicate in this country the control-conditions that exist in the countries where the gypsy moth is a native. The danger to the State from invasions, or rather from the accidental introduction of winter nests has been already mentioned, and to the dangers from nursery stock, should be added those that come from the possible

Figure 11.

Pupa of gypsy moth in its flimsy cocoon.

introduction by means of woodland products. During the season of 1909 a single district was discovered in which there were 480,000 feet of lumber intended for distribution in five different States, including New Jersey. On that lumber were found over 5,000 egg clusters of the gypsy moth. All these were destroyed; but if by any unholy chance some of this lumber had come into New Jersey, still infested, there would have been no possibility of controlling the spread as conditions are here at present.

The fight against injurious insects is one that taxes all our powers. It is an expensive fight and it must be a continuous one. It would seem to be the part of policy to keep out these pests as far as possible, rather than to permit them to come in and fight them afterward. A small sum, comparatively speaking, invested in preventive measures will give results that we cannot hope to get from many times the amount spent for destructive measures after the insects have once become established.

The Board then adjourned till Friday, January 21st, 1910, at 9:30 o'clock A. M.

THIRD DAY—SEVENTH SESSION.

FRIDAY, January 21st, 1910, 9:30 o'clock A. M.

Secretary Franklin Dye in the chair.

Secretary Dye—Dr. Voorhees wishes me to say to you that he received word last night which obliged him to go to Harrisburg.

And then later I heard from our Vice-President that he had to go home this morning, so that you are without a President or a Vice-President. It will be in order for you, therefore, to elect a President *pro tem.* Who will you have?

Mr. A. J. Rider was then nominated, and unanimously elected.

Chairman Rider then assumed his duties.

Secretary Dye—Mr. Chairman, it seems to me the first business would be the unfinished business, including resolutions or reports of committees.

Mr. Crane—Mr. Chairman, the Committee on Nominations is ready to report.

Chairman Rider—The Board will receive the report.

Mr. Crane—The committee take pleasure in presenting the following nominations:

For President, Dr. E. B. Voorhees; for Vice-President, John T. Cox.

In regard to the Treasurer, the Committee was obliged to make a change, for the reason that Mr. Heritage, being a member of the Legislature, cannot legally hold the office, and so Mr. Rider is recommended as the candidate for Treasurer.

For Members of the Executive Committee—Walter Heritage, John M. Lippincott, George E. DeCamp.

Chairman Rider—Gentlemen, you have heard the report of the Committee. What is your pleasure?

A Delegate—I move that the report be received and the Secretary cast a ballot for its election. (Carried.)

The Secretary then cast the ballot, and the Chairman declared those gentlemen elected to the respective offices for the ensuing year.

The following resolutions were adopted:

Resolved, That having heard the addresses of E. M. Tousley, Secretary-Treasurer of the Right Relationship League, explaining co-operation, the New Jersey State Board of Agriculture hereby recommends for consideration the plans and methods of said league in establishing co-operative enterprises, and recommends such plans to the farmers of New Jersey as a means of improving their condition.

Introduced by Mr. E. R. Collins.

WHEREAS, The farmers in the State furnish the game and hunting grounds; therefore, be it

Resolved, That we wish it enacted in the game laws of the State that all grounds are closed to hunting unless the owner or person in possession

posts notices on the grounds that hunting is permitted, or unless the said grounds are apparently thrown open to commons by the owner.

Introduced by Mr. E. R. Collins.

WHEREAS, The oleomargerine interests of this country are preparing an attack upon the present law imposing a high tax on colored oleo; therefore, be it

Resolved, That this Gloucester County Pomona Grange, No. 8, here assembled, knowing that a reduction in the tax on oleo colored in imitation of butter means millions of pounds of oleo thrown on the market in competition with butter and sold as butter, thereby reducing the price on the same, and as we here assembled, representing the agricultural interests of this country and State, do earnestly petition each and all of you to do all in his power to protect the dairy interests of this country and vote against any repeal of the present law or amendments thereto hurtful to the dairy interests of this country.

The above resolution was unanimously adopted by Gloucester County Pomona Grange, Number Eight, in session assembled on January 8th, 1910. Signed by the Master and Secretary of that Grange. This resolution was reported by the Committee on Resolutions:

WHEREAS, The Tuberculosis Commission of this State are doing all in their power to eradicate this dread disease; therefore, be it

Resolved, That this State Board commend the work done by the said Commission and recommend that a more stringent law be enacted to increase their power to prevent diseased cattle being imported into this State.

Introduced by Mr. A. Clark Gardiner.

The following Committee on Fish and Game Laws was appointed by President Voorhees:

J. T. Allinson, Charles Collins, E. T. Gill, Theodore M. Roe and George E. DeCamp.

Mr. Charles Collins—Mr. Chairman, the Committee on Deceased Members offer their report, as follows:

Since last we met in annual session, death has invaded our ranks and taken from among us our co-worker Henry F. Bodine, who was for several years a member of the Executive Board of this Association; therefore, be it

Resolved, That we hereby express our appreciation of his worth and services and lament his removal from our midst.

Resolved, That this record be made a part of the minutes of this meeting.

(Signed) JOHN T. COX,
CHARLES COLLINS,
THEODORE BROWN.

The report was received and spread on the minutes.

Secretary Dye—Mr. Chairman, in receiving the report of the Committee on Transportation and Freight Rates yesterday, a motion was made that it be received, but, unintentionally, a motion to continue the Committee was not offered, and I now offer a motion that the Committee be continued for another year. The Committee consists of Messrs. E. R. Collins, A. J. Rider and Theo. Brown.

This motion was carried.

Mr. John G. Borton—Mr. Chairman, for the Credential Committee I am ready to report:

We find on examining the credentials that the delegates are all present, with the exception of P. Kennedy Reeves, Geological Survey, also three changes which have been made, two from Salem county and one from Morris; in Salem county, Esher B. Waddington in the place of Levi Prickett, and from the Salem County Pomona Grange, Linwood Borton in the place of Davis S. Fogg; and in Morris county, S. E. Young, in the place of W. R. Lindsley.

The report was adopted. (See list in front page of this report.)

Secretary Dye—That appears to be all the business to be offered at the present time.

Chairman Rider—We will now listen to the address of Mr. Carey W. Montgomery, of Newark, Ohio, on the "Methods of Agricultural Education."

Mr. Montgomery read a paper on the subject named above, of which the following is a brief:

Methods of Agricultural Education.

BY CAREY W. MONTGOMERY.

At Columbus we have (as you have at New Brunswick) the State University with its Agricultural Department.

They have a four-year and a two-year course. They have fine buildings and laboratories; a fine dairy herd with all modern dairy apparatus; fine specimens of all the improved breeds of live

stock, cattle, sheep, hogs and horses; fine fields of alfalfa. They also grow forage crops, grasses and grains, indeed, have everything necessary to give the boy a thorough training in the principles and practice of agriculture.

Every county agricultural society may appoint two students and this will entitle the boy to free tuition. Then, there is opportunity for quite a number of boys of limited financial resources, to work their way through.

But notwithstanding, the facilities for imparting this education and the very low cost of obtaining it, we find that only three farm boys out of every hundred attend that college.

Now, when the facilities and opportunities are so good and only three boys out of every hundred take advantage of them, it is concluded that the boy must not "want to" must not have a desire to obtain this education. So in order to create in the mind of the boy a desire to obtain this education, the college has established an extension department. It is the business of this department to visit the rural schools, and village and city schools as well, and try to create in the mind of the boy and girl, or in the minds of their parents, a desire to obtain this education, also to introduce nature studies or first principles of agriculture into the schools. But we also recognize that notwithstanding there be a desire on the part of the boy and girl to attend the college, they cannot for various reasons, spend two or four years at the college and some are no longer boys and girls, and yet a desire may have arisen to obtain agricultural knowledge. So we have the ten weeks short course beginning this year, January 10th. Three years has proven the value of this method but we recognize that many cannot or will not attend even these short courses, so we have this year thirty-six one-week schools, held in various parts of the State. The appropriation not being sufficient to hold one in each county. These schools have been very successful.

Domestic science is taught in a separate room from the classes in agriculture. Recitations and lectures in the forenoon and demonstration work in the afternoon.

AGRICULTURAL EXTENSION SCHOOL PROGRAM

Home Makers' Course

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
A. M.		Digestion Cooking of Vegetables	Meats Soups	Flours and Yeasts Bread-making	House Furnishing	Question Box Household Economy
	NOON INTERMISSION					
P. M.	Foods Cooking of Cereals	Fatty Foods Making of Beverages	Milk and Eggs	Bread Judging	Demonstration Batters and Doughs Cakes and Cake Baking	

Additional talks *selected* from the following subjects will be given:

The Selecting of Meats, Care of Milk, Home Butter-making, Baking, Qualities of Ohio Wheats, Farm Poultry, How Plants Grow, The Kitchen Garden, The Farm Orchard, Decorative Plantings, Baking Powders and Flavoring Extracts, Pure Foods and Pure Food Laws.

AGRICULTURAL EXTENSION SCHOOL PROGRAM

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
9:00 to 10:00		*Soil Fertility* The Nitrogen Problem	*Soil Fertility* Humus and Rotations	*Soil Fertility* Manure: Preservation and Application	*Soil Fertility* Fertilizers: Buying and Home Mixing	*Soil Fertility* Lime
10:00 to 12:00		*Farm Crops* Seed Corn Selection	*Farm Crops* Seed Corn Selection	*Farm Crops* Seed Corn Selection	*Farm Crops* Tillage and Cultivation.	*Farm Crops* Tillage and Cultivation.
	NOON INTERMISSION, ONE HOUR					
1:00 to 2:00	*Soil Fertility* Sources of Plant Food	*Soil Fertility* Drainage and Tillage	*Soil Fertility* Manure: Value and Losses	*Soil Fertility* Fertilizers: Sources and Availability	*Soil Fertility* Fertilizers: Uses: Reinforcement	
2:00 to 4:00	*Animal Husbandry* Talk on Breeding A discussion of successful breeding, illustrated by pedigrees.	*Animal Husbandry* Talk on Feeding Feeding Stuffs and their uses Illustrated	*Animal Husbandry* The selection of horses Illustrated by a lesson in practical judging	*Animal Husbandry* The selection of cattle Illustrated by a lesson in practical judging	*Animal Husbandry* The selection of sheep or swine Illustrated by a lesson in practical judging	

One prominent idea in all our work in Ohio, is, that we require the individual or local people to do something. As Prof. Bailey puts it, "It is not the object to test the farmer's seed corn, but to teach him to test his own corn."

We have an Agricultural Experiment Station and I am proud to say, as you are proud to say of your station, that good work

has been done and valuable knowledge obtained. But how best to get this knowledge into the hands of the people?

This year we put up two exhibits illustrating work from various departments, and visited twenty county fairs. Three or four men acquainted with the work accompanying each exhibit to explain to the visitors. This year at each and every Farmers' Institute a table must be given by one of the State speakers on the work of the Agricultural College, the Ohio Experiment Station and the State Board of Agriculture. The idea being that it is futile to ask for large appropriations and then the knowledge thus obtained not given to the people. Our idea is to develop a great mass of intelligent, industrious and efficient people.

But why introduce nature studies or first principles of agriculture into the rural or into all schools?

The great argument for introducing agriculture and domestic science along with other industrial studies, in the schools, is because it is the business of the State to fit its people to live. To fit its people to be industrious, intelligent and useful citizens in the community in which they live. For every idle and inefficient man must be supported by some industrious man.

Chairman Rider—The next matter on the programme is an address by Mr. E. M. Tousley, "Co-operation Among Farmers, and the Ethical Principles Involved." We listened to Mr. Tousley yesterday with pleasure, and we will listen to him again to-day.

Mr. Tousley read a lengthy paper on the subject mentioned which was enthusiastically received.

Chairman Rider—I believe that completes the programme.

Secretary Dye—Mr. Chairman, I want to say in behalf of Dr. Voorhees, who had an intimation yesterday that he would be re-elected President, that he wished to thank the Board for their renewed expression of confidence in him, and that he would, of course, endeavor to fill his place as well as he could, according to his health and strength.

I want to say, too, if there are any persons here who expect to have anything to do with the coming census, that I have some of the circulars here which will be very helpful to them, and I hope that the farmers will take especial interest in it that we may have a correct census of the farms, stock, etc., of New Jersey, as a basis on which to work.

Furthermore, I want to say, as Secretary of the Board, that I shall go on with my work as heretofore, and give my strength, doing the best I can, and I bespeak your co-operation and your sympathy, as I go throughout the State to every point and in every duty I may have to perform, and will indulge the hope that we shall be permitted to come together in another annual meeting favored by God with His continued blessing. (Applause.)

Chairman Rider—I fear that Brother Crane did not quite make it clear to all of you, just why I succeeded in capturing that desirable prize, the Treasurership of the State Board of Agriculture.

The Committee found itself in a very embarrassing position. It was thought that Bro. Heritage, being a member of the Legislature, could not legally hold the office of Treasurer of this organization, and the Committee suggested that Bro. Heritage and I change places.

With that understanding I accepted the work for the coming year, with the distinct understanding that I am only filling in temporarily in an emergency.

I thank all of you gentlemen for your confidence in electing me as treasurer, and hope you will not have any cause to regret it. I will try to take good care of the money and spend it to good advantage.

Mr. Tousley—Mr. Chairman, I want to most sincerely thank the Board for the resolution they adopted this morning, endorsing and recommending the co-operative plan of the League. I have only come here at the request of your Secretary to try and do what I could to help the people along, and he asked me what compensation I wanted. I told him I would leave that entirely with him. We ask nothing. And I want to thank you, gentlemen, most heartily for your kind reception of my addresses.

Mr. Hulsart—I move that the paper read by Mr. Tousley this morning be incorporated in the minutes; there is so much in that paper, we cannot all of us remember it, and we want it in the record. We must have more co-operation, and we want this paper where we can refer to it. I move that the paper be published in the annual report. This motion was carried. The Board then adjourned.

Infectious Diseases of Animals Reported by the State Board of Health.

To the State Board of Agriculture:

GENTLEMEN—Following is a brief history of the action taken by the Board of Health of the State of New Jersey during the year ending October 31st, 1909, for the prevention of the spread of infectious diseases of animals in this State:

ANTHRAX.

This disease, which has appeared from time to time in several of the counties located in the southern portion of the State, was reported for the first time in Camden County. On August 5th, 1909, Dr. T. B. Rogers reported that microscopical examination of specimens taken from animals located on a farm outside of Camden showed that the animals had anthrax. Five animals died on one farm, but the disease did not extend to other farms. Preventive vaccination of all cattle on the farm where the disease appeared, and all animals on adjacent farms, was at once ordered. This action was taken as nearly all the cattle grazed on meadow lands through which a stream ran, and the infection was therefore liable to be carried from one farm to another. Three carcasses of animals dying of the disease were, before the cause of death was known, taken to a rendering establishment. The remaining two were buried deeply, covered with quicklime and the place of burial was fenced in. The total number of vaccinations of animals that were liable to contract the disease was 66, and there being no further appearance of the disease, the quarantine which had been placed on the farm where the deaths of animals occurred was raised on September 5th, 1909. The origin of the disease was doubtless due to infection of the water in the stream flowing by the pasture lands, as the report of the veterinarian stated that the stream and meadows were polluted by the refuse from several wool

washeries, starch and soap factories. The owners of cattle in the vacinity of the infected farm were instructed to vaccinate all cattle with anthrax vaccine before placing them on the same pastures next spring. If this advice is followed there should be no recurrence of the disease in this locality.

BLACKLEG.

Dr. Whitfield Gray, of Newton, reported the death of three animals from this disease, which is also known as symptomatic anthrax. The cases were in the same locality in Sussex county where the disease has appeared yearly for several years. Preventive measures were immediatly adopted, and over fifty animals were injected with anti-blackleg virus. No new cases were reported. The pasture lands in this section of the State are on mountain sides, and the carcasses of animals dying of blackleg are often not discovered until decomposition is far advanced and the pastures have become infected. The farmers and stock raisers have been advised as to measures to be adopted to prevent recurrence of the disease.

FOOT AND MOUTH DISEASE.

In the early part of November, 1908, cases of this disease were discovered by the Federal authorities in New York State and Pennsylvania. Within three weeks after these cases were reported other cases were located in Maryland, Delaware and Michigan. Under the supervision of the Federal authorities strict quarantine of infected animals was maintained, and extensive inspections of cattle in the infected localities were instituted. In correspondence with the chief of the National Bureau of Animal Industry, an arrangement was effected by which notification of any case occuring in New Jersey was to be made directly to the National Bureau, and that the State Board of Health was to assist the National authorities in preventing the bringing of cattle or infected articles into New Jersey from States that were under quarantine restrictions. As a preventive and precautionary measure the following notice was sent to each veterinarian in the State:

"BOARD OF HEALTH OF THE STATE OF NEW JERSEY.
TRENTON, November, 24th, 1908.

Dr. ....
....., *N. J.:*

DEAR SIR—The fact has been determined by the Secretary of Agriculture, at Washington, D. C., and notice has been given that a contagious, communicable disease, known as foot and mouth disease, exists among live stock in the States of New York and Pennsylvania. The United States Department of Agriculture has placed the above-named States under quarantine, which in itself is a decided protection to New Jersey. While no positive cases have yet been detected in this State, it is thought best by the State Board of Health to take every precaution possible to ward off this disease and prevent its entering our State. We are, therefore, asking all veterinarians of the State to be on the alert, and if they find any cases where animals are showing symptoms indicating foot and mouth disease, to immediately inform the State Board of Health by telephone or telegraph, in order that prompt quarantine measures may be taken. Will you please observe this request?

Very respectfully,

BRUCE S. KEATOR,
Secretary."

On November 20th, 1908, Dr. T. B. Rogers, of Woodbury, reported a suspicious case of illness in an animal on premises near Swedesboro, Gloucester county. Orders were immediately given for the destruction and proper burial of the animal and disinfection of the premises. The diagnosis in this case was not clear, but the gravity of the situation led to the action which was taken. Close supervision was kept over other animals on the premises, and no cases of illness of any character developed.

On December 1st, 1908, Dr. Whitfield Gray, of Newton, notified this board by telephone that a car containing 16 cows, 12 sheep and 2 calves, had been shipped over the Delaware & Hudson, the Erie and the New York, Susquehanna & Western railroads, and unloaded at Unionville, two miles from the New York line. The cattle were driven into New Jersey to the farm of one McNish, two miles from Sussex. Two of these cows were sold and two calves died. As soon as this information was received it was communicated to the Bureau of Animal Industry, at Washington, D. C., and a government official was at once detailed to proceed to Newton and investigate. The animals were placed under quarantine pending the government investigation for the purpose of ascertaining whether the government

regulations had been disobeyed, and to learn whether the animals came from infected localities or had been exposed to foot and mouth disease. The Federal authorities took the cattle under their direct supervision, and informed the State Board of Health that legal action would be taken against the owners of the animals if the proof of the violation of the National regulations was sufficient. That no cases of the disease appeared in this State, while other States were affected, is due in part to the effort made by the veterinarians of this State to discover cases, and to the co-operation of the State and National authorities.

GLANDERS.

There have been no extensive outbreaks of this disease in the State, and the average number of cases have been reported. When a case of glanders is reported to the board the method of procedure is to have the case investigated by a duly qualified veterinarian, and if necessary to quarantine the infected animals and the premises on which they are located. It is required that the animals shall be destroyed, and the premises upon which they are located be thoroughly disinfected before the quarantine is removed. The total number of cases reported during the year was 78, and the distribution of cases was as follows: Bergen county, 3; Cumberland county, 1; Essex county, 41; Gloucester county, 1; Hudson county, 9; Middlesex county, 3; Passaic county, 18; Somerset county 1 and Union county, 1. An arrangement entered into with the health officer of the City of Newark by which the health officer, Mr. D. D. Chandler, has been appointed to represent the State Board of Health in dealing with cases of glanders in the City of Newark, will doubtless secure in future more complete reports of cases, and by the early knowledge of cases thus obtained will result in limiting the spread of the disease.

Very respectfully,

BRUCE S. KEATOR,
Secretary.

Officers of the State Grange of New Jersey, P. of H., 1910.

Master—GEORGE W. F. GAUNT, ...Mullica Hill, Gloucester county
Overseer—JOHN M. WOOLMAN, ...Elmer, Salem county
Lecturer—DAVID H. AGANS, ...Three Bridges, Hunterdon county
Steward—FRANK O. WARE, ...Deerfield, Cumberland county
Assistant Steward—C. C. BASLEY, ...Maywood, R. D., Bergen county
Chaplain—EVI VANDRUFF, ...Sussex, Sussex county
Treasurer—CHARLES COLLINS, ...Moorestown, Burlington county
Secretary—JOHN T. COX, ...White House Station, Hunterdon county
Gate Keeper—D. HOWARD JONES, ...Freehold, R. D., Monmouth county
Ceres—ELIZABETH WALLACE, ...Tuckahoe, Cape May county
Pomona—ELIZA PERRINE, ...Cranbury, Middlesex county
Flora—MRS. LILLIAN RALEIGH, ...Berlin, Camden county
Lady Assistant Steward—PHEBE HUTCHINSON, ..Robbinsville, Mercer county

EXECUTIVE COMMITTEE.

GEORGE W. F. GAUNT, ...Mullica Hill, Gloucester county
ALBERT HERITAGE, ...Mickleton, Gloucester county
NICODEMUS WARNE, ...Broadway, Warren county
JOHN T. COX, ...White House Station, Hunterdon county
C. C. HULSART, ...Matawan, Monmouth county
HENRY LOVELAND, ...Cohansey, Salem county

SUBORDINATE GRANGES.

	GRANGES.	MASTERS AND ADDRESSES.	SECRETARIES AND ADDRESSES.	LECTURERS AND ADDRESSES.
1	Pioneer, ...	Frank B. McGill, Cranbury, Middlesex co.,...	Walter Scott, Cranbury, Middlesex co.,.....	Mary Grover, Cranbury, Middlesex co.
2	Marl Ridge, ...	J. E. Harrison, Jacobstown, Burlington co.,...	W. H. Davis, Cream Ridge, Monmouth co.,....	Mrs. E. P. Harrison, Jacobstown, Burling'n co.
3	Hammonton, ...	A. J. Rider, Hammonton, Atlantic co.,.....	Kathryn E. Berry, Hammonton, Atlantic co.,.	Adelia Dudley, Mammonton, Atlantic co.
5	Swedesboro, ...	Wilbur Beckett, Swedesboro, Gloucester co.,..	Caddie J. Hill, Swedesboro, Gloucester co.,...	Mary R. Brown, Swedesboro, Gloucester co.
7	Somerset, ...	Wm. Crist, New Brunswick R. D. 5, Som. co.,	L. McCracken, New Brunsw'k R. D. 6, Som. co.,	Mrs. C. E. Kline, N. Br'sw'k R. D. 6, Som co.
8	Moorestown, ...	Benj. Lippincott, Riverton R. D., Burling'n co.,	Sadie E. Collins, Riverton, Burlington co.,....	Samuel R. Coles, Merchantville, Camden co.
9	Woodstown, ...	A. B. Waddington, W'dstown, R. D. 1, Salem co.,	Carrie R. Atkinson, Woodstown, Salem co.,...	A. A. Borton, Woodstown R. D. 1, Salem co.
11	Vineland, ...	G. A. Mitchell, Vineland R. D. 3, Cumbl'd co.,	G. H. Putnam, Vineland, Cumberland co.,.....	W. T. Struthers, Vineland No. 3, Cumbe'd co.
12	Ringoes, ...	H. C. Sutphin, Ringoes R. D. 1, Hunter'n co.,	J. S. Williamson, Ringoes R. D. 1, Hunt'n co.,.	Miss J. Fullerton, Ringoes R. D. 2, Hun. co.
16	Hopewell, ...	Henry L. Davis, Shiloh, Cumberland co.,.....	Walton E. Davis, Shiloh, Cumberland co.,.....	Eric Carlson, Shiloh, Cumberland co.
18	Cumberland, ...	Samuel L. Watson, Greenwich, Cumberland co.,	Morris Goodwin, Greenwich, Cumberland co.,..	Anna T. Goodwin, Greenwich, Cumberland co.
20	Fenwick, ...	J. P. Ridgeway, Hancock's Bridge, Salem co.,.	Anna E. Harris, Harmersville, Salem co.,....	S. H. Ridgeway, Hancock's Bridge, Salem co.
25	Mannington.	Samuel Ridgeway, Salem, Salem co.,.....	Walter B. Crispin, Woodstown, Salem co.,...	Margrett Ridgeway, Salem, Salem co.
26	Harrisonville, ...	Wm. Seehousz, Woodstown, Salem co.,.....	Belle Kirby, Harrisonville, Salem co.,.....	Lizzie B. Kirby, Mullica Hill, Gloucester co.
29	Elmer, ...	George M. Graf, Monroeville, Salem co.,.....	Mary W. Gaunt, Monroeville, Salem co.,....	Laura Evans, Elmer, Salem co.
32	Bridgeport, ...	Chas. B. Vickery, Bridgeport, Gloucester co.,..	S. L. Kille, Swedesboro R. D., Gloucester co.,.	E. Richardson, Swedesboro R. D., Glouce'r co.
34	Cedarville, ...	Lynn Y. Dare, Fairton R. D. 1, Cumberl'd co.,	N. E. Diament, Cedarville, Cumberland co.,..	Lewis R. Diament, Cedarville, Cumberland co.
36	Medford, ...	Francis A. Branin, Medford, Burlington co.,..	May D. Hollingshead, Medford, Burlington co.,	Anna R. B. Engle, Medford, Burlington co.
38	Haddon, ...	Joseph Sharp, Haddonfield R. D., Camden co.,.	Amos G. Haines, Ashland, Camden co.,.....	Arabella Haines, Marlton R. D., Camden co.

SUBORDINATE GRANGES—CONTINUED.

Number.	GRANGES.	MASTERS AND ADDRESSES.	SECRETARIES AND ADDRESSES.	LECTURERS AND ADDRESSES.
39	Mantua, ...	Charles Scott, Sewell R. D. 2, Gloucester co.,.	Hiram S. Leap, Wenonah, Gloucester co.,....	Anna Sweeten, Wenonah, Gloucester co.
40	Windsor, ...	Hiram Mount, Trenton R. D. 2, Mercer co.,	R. D. Perrine, Windsor, Mercer co.,.....	Mrs. Eudora Rue, Windsor, Mercer co.
43	Hope, ...	J. Flanigan, Bridgeton R. D. 4, Cumberl'd co.,	Mrs. N. W. Wheaton, Br'geton R. D. 4, Cum. co.,	Mrs. E. L. Brown, Bridgeton R. D. 4, Cum. co.
45	Marlton, ...	G. P. Lippincott, Marlton, Burlington co.,....	Walter B. Winner, Marlton, Burlington co.,..	Caroline S. E. Wills, Marlton, Burlington co.
50	Pemberton, ...	J. C. Gauntt, Pemberton R. D. 2, Burl'gton co.,	John B. Evans, Birmingham, Burlington co.,..	Mrs. J. B. Evans, Birmingham, Burlington co.
51	Mullica Hill, ...	George Wurst, Sewell, Gloucester co.,.....	P. Howard Avis, Mullica Hill, Gloucester co.,.	Mary Reece, Mullica Hill, Gloucester co.
52	Deerfield, ...	Allen Ackley, Deerfield, Cumberland co.,.....	Wm. H. Van Lier, Jr., Deerfield, Cumber'd co.,	Clifford Woodruff, Deerfield, Cumberland co.
57	Centre Grove, ..	Chas. F. Earl, Millville, Cumberland co.,.....	Furman R. Taylor, Millville, Cumberland co.,.	.....
58	Columbus, ...	George Black, Columbus, Burlington co.,.....	Bessie Bunting, Burlington, Burlington co.,...	Eliza Deacon, Columbus, Burlington co.
59	Thorofare, ...	Wm. R. Gibbs, Thorofare, Gloucester co.,.....	Charles H. Budd, Thorofare, Gloucester co.,..	Mrs. Maggie Clook, Thorofare, Gloucester co.
60	Courses Landing,	Mortimer J. Ware, Sharptown, Salem co.,....	Abie L. Ware, Woodstown R.D. 2, Salem co.,.	Marion C. Pancoast, Sharptown, Salem co.
61	Crosswicks, ...	L. F. Kline, Crosswicks, Burlington co.,.....	D. P. Brown, M. D., Crosswicks, Burling'n co.,	Mrs. M. B. Woodward, C. Ridge R. D., Mon. co.
64	Pennington, ...	J. C. Errickson, Pennington R. D. 1, Mer'r co.,	J. R. Burroughs, Pennington R. D. 1, Mer. co.,	Mrs. N. F. Woodward, Pen'gton R. D. 1, Mer. co.
67	Vincentown.....	W. R. Henry, Vincentown, Burlington co.,...	Mrs. F. Githens, Vincentown, Burlington co.,.	Ethel Robbins, Vincentown, Burlington co.
73	Ewing, ...	J. L. Herbert, Trenton R. D. 1, Mercer co.,..	W. H. Cadwallader, Trenton R. D. 1, Mer'r co.,	Mrs. W. H. Cadwallader, Tren'n R. D. 1, Mer. co.
77	Mercer, ...	P. O. Voorhees, Skillman R. D. 1, Mercer co.,	J. M. Dalrymple, Hopewell, box 116, Mer'r co.,	Mrs. E. Jones, Jr., Hopewell, Mercer co.
78	Wantage, ...	James A. Wilson, Sussex, Sussex co.,.....	Lewis M. Hardin, Sussex, Sussex co.,.....	Simeon M. Parcell, Sussex, Sussex co.
79	Hamilton, ...	M. V. Nutt, Hamilton Square, Mercer co.,...	Mrs. M. M. Nutt, Hamilton Square, Mercer co.,	Mrs. H. Burke, Hamilton Square, Mercer co.
81	Friesburg, ...	Henry H. Padgett, Cohansey, Salem co.,.....	Lydia M. Horner, Elmer R. D. 3, Salem co.,..	Phebe Padgett, Cohansey, Salem co.

SUBORDINATE GRANGES—CONTINUED.

Number.	GRANGES.	MASTERS AND ADDRESSES.	SECRETARIES AND ADDRESSES.	LECTURERS AND ADDRESSES.
85	Williamstown, ..	H. S. Bateman, Williamstown, Gloucester co.,	James M. Tweed, Williamstown, Gloucest'r co.,	Mrs. W. McIntyre, Franklinville, Glouces'r co.
88	Locktown, ...	J. N. Smith, Flemington R. D. 2, Hunter'n co.,	L. B. Sherman, Flemington R. D. 2, Hunt. co.,	M. F. Sherman, Flemington R. D. 2, Hun. co.
90	Blackwood, ...	Harry Clark, Chews, Camden co.,	Martin Schubert, Laurel Springs, Camden co.,	Emma Trefz, Turnerville, Gloucester co.
92	Monmouth, ...	Geo. W. Blatchly, Freehold, Monmouth co.,	I. B. VanDerveer, Freehold, Monmouth co.,	J. L. Pittenger, Freehold, Monmouth co.
96	Hightstown, ...	Geo. R. Thomas, Cranbury, Middlesex co.,	Frank C. Danser, Cranbury, Middlesex co.,	Mrs. E. Davison, Cranbury, Middlesex co.
98	Allentown, ...	Isaac Bergen, Sharon, Monmouth co.,	Sara G. Chamberlin, Cream Ridge, Mon. co.,	Mrs. George Hunt, Davis, Monmouth co.
99	Liberty, ...	G. C. McDowell, Wickatunk, Monmouth co.,	S. B. Wells, Marlboro, Monmouth co.,	C. R. Storm, Marlboro, Monmouth co.
101	Sergeantsville, ..	F. V. D. Fisher, Stockton R. D. 2, Hunt'n co.,	W. O. Merrill, Sergeantsville, Hunterdon co.,	N. B. Rittenhouse, Sergeantsville, Hunter'n co.
104	Livingston, ...	H. B. Van Ness, Chatham R. D., Essex co.,	August W. Fund, Chatham R. D., Essex co.,	George W. Gamble, Chatham R. D., Essex co.
105	Morris, ...	G. H. Cook, Hanover, Morris co.,	Wm. A. Howell, Florham Park, Morris co.,	A. M. Webb, Hanover, Morris co.
106	Kingwood, ...	Alvah L. Larason, Barbertown, Hunterdon co.,	E. B. Huffman, Frenchtown R. D. 1, Hun. co.,	Mrs. Kate Thatcher, Barbertown, Hunter'n co.
107	Caldwell, ...	A. E. Hedden, Verona, Essex co.,	Miss Mary V. Lindsley, Verona, Essex co.,	Mrs. J. W. Dobbins, Verona, Essex co.
108	Roseland, ...	Ellwood S. Campbell, Roseland, Essex co.,	Witsel R. DeCamp, Roseland, Essex co.,	Mrs. E. S. Campbell, Roseland, Essex co.
110	Warren, ...	N. Warne, Broadway, Warren co.,	Mrs. N. S. Albertson, East Stroudsburg, Pa.,	Henry J. Beers, Stewartsville, Warren co.
111	Mickleton, ...	Edgar Thompson, Clarksboro, Gloucester co.,	Walter Heritage, Swedesboro, Gloucester co.,	Cora D. Heritage, Paulsboro, Gloucester co.
115	Hurffville, ...	Harry Johnson, Sewell R. D. 3, Gloucester co.,	Walton H. Chew, Sewell R. D. 1, Glouces'r co.,	Mrs. J. Eldridge, Sewell R. D. 3, Glouces'r co.
116	Rocksburg, ...	John H. Young, Belvidere R. D., Warren co.,	Warren Herman, Belvidere R. D., Warren co.,	Irvin Miller, Phillipsburg R. D., Warren co.
117	Washington, ...	S. T. Bowman, Washington, Warren co.,	Mrs. Jos. Bodine, Washington, Warren co.,	M. L. Rush, Washington, Warren co.
119	Oak Grove, ...	Burris Snyder, Pittstown R. D. 1, Hunt'n co.,	Frank Burd, Flemington R. D. 1, Hunt'n co.,	Dr. Frank Grim, Baptisttown, Hunterdon co.

SUBORDINATE GRANGES—CONTINUED.

Number.	GRANGES.	MASTERS AND ADDRESSES.	SECRETARIES AND ADDRESSES.	LECTURERS AND ADDRESSES.
20	Spring Mills, ...	R. T. Crouse, Milford, Munterdon co.,.....	Mary E. Woolf, Milford, Hunterdon co.,.....	S. A. Carter, Bloomsbury, Hunterdon co.
21	Stewartsville, ...	Harris A. Godfrey, Stewartsville, Warren co.,.	J. C. Boyer, Stewartsville, Warren co.,.....	Mrs. Mary Hagar, Stewartsville, Warren co.
22	Aura, ...	John Martin, Glassboro R. D., Gloucester co.,.	Joseph W. Guest, Aura, Gloucester co.,.....	Elizabeth Kandle, Clayton, Gloucester co.
23	Cross Keys, ...	Jacob Harper, Cross Keys, Gloucester co.,....	Edw. B. Gant, Williamstown, Gloucester co.,..	Mrs. Maggie Duncan, Cross Keys, Glouce'r co.
24	Grand View, ...	Wm. Y. Holt, Flemington, Hunterdon co.,....	T. B. Hampton, Flemington R. D. 1, Hun. co.,	Myrtle Holt, Flemington, Hunterdon co.
25	Riverside, ...	W. T. Hageman, Three Bridges R. D., Hun. co.,	W. W. Foster, Three Bridges, Hunterdon co.,.	Cora Agans, Three Bridges, Hunterdon co.
26	Delaware, ...	Wm. F. Earye, Delaware, Warren co.,.....	J. H. Albertson, East Stroudsburg, Pa.,.....	Elizabeth Hartung, Delaware, Warren co.
27	Iona, ...	Geo. W. Karge, Monroeville, Gloucester co.,...	Bertha Atkinson, Franklinville, Gloucester co.,	I. H. Hinchman, Franklinville, Gloucester co.
28	Cape May, ...	Charles P. Vanaman, Dias Creek, C. May co.,	Edward W. Tuttle, Dias Creek, Cape May co.,	A. T. D. Howell, Dias Creek, Cape May co.
29	Bergen, ...	Geo. E. Van Orden, Ridgewood, Bergen co.,..	Arthur Lozier, Ridgewood, Bergen co.,.....	Mrs. W. J. Voorhis, Ridgewood, Bergen co.
30	Franklin, ...	B. K. Lawlin, Wyckoff, Bergen co.....	Mrs. L. Pikaart, Midland P'k, R. D. 1, Ber. co.,	Edwin S. Maulsby, Wyckoff, Bergen co.
31	Rancocas, ...	Tylee B. Engle, Bougher, Burlington co.,.....	Miss C. S. Wills, Burlington R. D., Bur'n co.,	Mrs. W. H. Rogers, Mt. Holly R. D., Bur. co.
32	Cold Spring, ...	Frank E. Bate, Fishing Creek, Cape May co.,.	J. G. Corson, Rio Grande, Cape May co.,.....	Mrs. Minnie Bate, Fishing Creek, C. May co.
33	Hickory, ...	A. B. McCrea, Pattenburg, Hunterdon co.,...	Wm. A. Bird, Pattenburg, Hunterdon co.,....	Mrs. J. R. Bowlby, Pattenburg, Hunter'n co.
34	Vernon Valley,..	T. W. DeKay, New Milford, New York.....	Mrs. C. H. Givens, Glenwood, N. J., Sussex co.,	Miss Lena Day, Vernon, Sussex co.
35	Ramsey, ...	James D. Carlough, Saddle River, Bergen co.,.	Margaret Wilson, Allendale, Bergen co.,.....	Edward Smith, Allendale, Bergen co.
36	Lincoln, ...	F. J. Ludig, Westwood R. D. 2, Bergen co.,..	John F. Bomm, Westwood R. D. 2, Bergen co.,	Mrs. A. R. Ackerson, Westwood, Bergen co.
37	Mountain View,.	E. W. Clark, Branchville R. D. 2, Sussex co.,.	Grace Clark, Branchville R. D. 2, Sussex co.,.	Herbert Hockenbury, Sussex, Sussex co.
38	Berlin, ...	William Raabe, Berlin, Camden co.,.....	H. F. Ottiger, Berlin, Camden co.,.....	Nancy K. Kramer, Berlin, Camden co.

SUBORDINATE GRANGES—CONTINUED.

Number.	GRANGES.	MASTERS AND ADDRESSES.	SECRETARIES AND ADDRESSES.	LECTURERS AND ADDRESSES.
139	Upper Township,.	E. D. Burley, Tuckahoe, Cape May co.,.....	Z. A. Townsend, Tuckahoe, Cape May co.,...	Mrs. Emma Shaw, Tuckahoe, Cape May co.
140	Montague, ...	Loren T. Cole, Port Jervis, New York,.....	Rose A. Reinhardt, Port Jervis, New York,...	John Scheets, Port Jervis, New York.
141	Pascack, ...	G. J. Wortendyke, Woodcliff Lake, Bergen co.,	F. C. Pilkington, Woodcliff Lake, Bergen co.,.	Mrs. J. E. Mabie, Westwood, Bergen co.
142	Olive Branch,....	Alfred Hardy, Morganville, Monmouth co.,...	J. H. Douglass, Matawan R. D., Monmouth co.,	Mrs. M. E. Stemler, Matawan, Monmouth co.
143	Delaware Valley,.	John B. Rosenkrans, Layton, Sussex co.,.....	Geo. E. Hursh, Normanock, Sussex co.,.....	Chas. A. Dalrymple, Layton, Sussex co.
144	Saddle River,....	J. N. Carlock, Westwood R. D. 2, Bergen co.,.	J. Fred Koopman, Waldwick, Bergen co.,....	A. Van Nostrand, Westwood R. D. 2, Ber. co.
145	Wayne Township,	D. F. Duncan, Paterson R. D. 1, Passaic co.,.	H. M. Berdan, Paterson R. D. 1, Passaic co.,.	Mrs. H. M. Berdan, Pat'son R. D. 1, Pas'c co.
146	Egg Harbor,.....	L. P. Schmidt, Egg Harbor City, Atlantic co.,.	Henry Tapkin, Egg Harbor City, Atlantic co.,.	Henry Pfeiffer, Cologne, Atlantic co.
147	Wrightstown, ...	Alexander C. Buck, Jacobstown, Burling'n co.,	Samuel P. Fort, Wrightstown, Burlington co.,.	Mrs. John Tilton, Wrightstown, Burlington co.
148	Stanton, ...	John W. Rhinehart, Hamden, Hunterdon co.,.	Jos. B. Anderson, Lebanon R. D., Hunt'n co.,.	Alice N. Smith, Three Bridges R. D., Hun. co.
149	North Arlington,.	G. P. F. Millar, North Arlington, Bergen co.,.	F. A. Koch, Arlington, Bergen co.,.....	Mrs. W. Brandenburg, Jr., N. Arl'on, Ber. co.
150	Burlington, ...	John Baner, Burlington, Burlington co.,.....	Grace Gilbert, Burlington, Burlington co.,....	Miss Margaret Ashby, Burlington, Burli'n co.
151	Milltown, ...	G. Redshaw, Jr., N. Br'sw'k R. D. 3, Mid. co.,	F. H. Smith, South River, box 18, Mid. co.,..	Earle J. Owen, New Brunswick, Middlesex co.
152	New Market,....	B. DeWitt Giles, New Market, Middlesex co.,.	F. O. Nelson, New Market, Middlesex co.,....	Mattie Giles, New Market, Middlesex co.
153	Raritan Valley,..	A. G. Van Nest, South Branch, Somerset co.,.	Mrs. C. S. Phillips, South Branch, Som'set co.,	Mrs. C. S. Hamilton, Somerv'e R. D. 4, Som. co.
154	Union, ...	John Riggins, Leesburg, Cumberland co.,.....	Mrs. S. A. Sharp, Leesburg, Cumberland co.,..	Herbert J. Smith, Leesburg, Cumberland co.
155	Fairlawn, ...	A. I. Ackerman, Ridgewood R. D. 2, Ber. co.,.	Walter Bogart, Fairlawn, Bergen co.,.....	P. D. Henderson, Ridgewood R. D. 2, Ber. co.
156	Raritan, ...	Charles Smith, Keansburg, Monmouth co.,...	H. M. Aumack, Keyport R. D. 2, Monm'h co.,	J. C. Hendrickson, Keyport R. D. 1, Mon. co.
157	Farmingdale, ...	J. H. Morris, Farmingdale R. D. 2, Mon. co.,.	Mrs. Cora Thompson, Allenwood, Mon. co.,..	Miss M. Craig, Farmingdale R. D. 2, Mon. co.

SUBORDINATE GRANGES—CONTINUED.

GRANGES.	MASTERS AND ADDRESSES.	SECRETARIES AND ADDRESSES.	LECTURERS AND ADDRESSES.
Lafayette, ...	Robert L. Everett, Lafayette, Sussex co.,.....	Miss Anna Everett, Lafayette, Sussex co.,....	Mrs. C. V. Runion, Lafayette, Sussex co.
Whitehouse, ...	Peter D. Reed, Whitehouse, Hunterdon co.,..	H. M. Messler, Whiteh'e Sta. R. D. 1, Hun. co.,	W. H. Opie, Whiteh'se sta. R. D. 2, Hun. co.
Frankford, ...	Jacob M. Van Auken, Branchville, Sussex co.,	Stephen M. Case, Branchville, Sussex co.,....	Mrs. W. R. Bale, Augusta, Sussex co.
Shrewsbury, ...	J. W. Thompson, Red Bank, Monmouth co.,..	F. A. Bloodgood, Red Bank, Monmouth co.,..	A. C. McLean, Red Bank, Monmouth co.
South Seaville,..	Volney Van Gilder, Ocean View, C. May co.,.	Eli Townsend, Clermont, Cape May co.,.....	L. T. Swain, Swainton, Cape May co.
Titusville, ...	J. Warren Fleming, Titusville, Mercer co.,...	Theo. B. Hunt, Titusville, Mercer co.,.....	Miss Mary F. Titus, Titusville, Mercer co.
Hardyston, ...	Harry E. Watt, Hamburg, Sussex co.,.....	Mrs. M. L. Smith, Hamburg, Sussex co.,....	Lester Drew, Hamburg, Sussex co.
{ Farmers' { Enterprise, ...	John Roy, Newton R. D. 2, Sussex co.,.....	C. M. Crawn, Newton R. D. 2, Sussex co.,..	Laura Stickle, Blair, Sussex co.
Blue Anchor,....	James Russell, Cedar Brook, Camden co.,....	Wm. H. Marvin, Blue Anchor, Camden co.,..	Mrs. L. Gardiner, Winslow, Camden co.
Palermo, ...	J. Edward Baner, Beesley's Point, C. May co.,	Jesse T. Young, Beesley's Point, Cape May co.,	Sarah Young, Palermo, Cape May co.
Glendola, ...	W. S. Willett, Belmar R. D. 2, Monmouth co.,	E. C. White, Belmar R. D. 1, Monmouth co.,.	M. E. Slocum, Belmar R. D. 1, Monmouth co.
Millstone Valley,.	G. B. Randolph, Bound Brook R. D. 2, Som. co.,	P. N. Williamson, Millstone, Somerset co.,...	Mrs. H. S. VanNuys, Jr., Millst'e R. D. 1,So. co.
Lawrenceville, ..	Thomas C. Hill, Lawrenceville, Mercer co.,...	Chas. H. Smith, Trenton R. D. 4, Mercer co.,.	Mrs. J. E. Hulfish, Trenton R. D. 4, Mer. co.
{ Washington { Valley, ...	H. D. Opdyke, Martinsville, Somerset co.,....	Lincoln Wallace, Martinsville, Somerset co.,..	Wm. F. Way, Martinsville, Somerset co.
Salem, ...	David S. Fogg, Salem, Salem co.,.....	Anna L. Reeves, Salem, Salem co.,.....	Hannah Reeves, Salem, Salem co.
Anchor, ...	John W. Jamison, Cassville, Ocean co.,.....	C. Milton Rorer, Cassville, Ocean co.,.....	Ella N. Jamison, Cassville, Ocean co.
Pleasantville, ...	B. Frank Martin, Pleasantville, Atlantic co.,..	Mrs. W. Adams, Pleasantville, Atlantic co.,...	W. L. Turpin, Pleasantville, Atlantic co.
Pompton Valley,.	A. J. N. Lockwood, Pompton Lakes, Passaic co.,	L. R. Lines, Pompton Lakes, Passaic co.,....	Mrs. W. L. Siebold, Riverdale, Morris co.
Swartswood Lake	Richard L. Sherred, Swartswood, Sussex co.,..	A. W. Huff, Swartswood, Sussex co.,.....	Robert Van Stone, Swartswood, Sussex co.

SUBORDINATE GRANGES—CONTINUED.

GRANGES.	MASTERS AND ADDRESSES.	SECRETARIES AND ADDRESSES.	LECTURERS AND ADDRESSES.
Stillwater, ...	John W. Earl, Stillwater, Sussex co.,.....	William C. Earl, Stillwater, Sussex co.,.....	O. Van Horn, Stillwater, Sussex co.
Pequest, ...	E. E. Cooper, Tranquility, Sussex co.,.....	Clarence Cooke, Newton R. D. 1, Sussex co.,.	Charles E. Drake, Tranquility, Sussex co.
Clayton, ...	Francis Nelson, Clayton, Gloucester co.,.....	J. F. Blakeborough, Clayton, Gloucester co.,..	Mrs. M. Bowers, Clayton, Gloucester co.
Pedricktown, ...	George Gaventa, Pedricktown, Salem co.,.....	Carl B. Green, Pedricktown, Salem co.,.....	Mrs. Sarah Sailor, Pedricktown, Salem co.
Pennsgrove, ...	J. Ford Thompson, Pennsgrove, Salem co.,....	Charles G. Turner, Pennsgrove, Salem co.,...	Mrs. J. B. Summerill, Pennsgrove, Salem co.
Westville, ...	Elmer E. Stone, Westville, Gloucester co.,....	S. H. Hewett, Westville, Gloucester co.,.....	Levina Headley, Westville, Gloucester co.
Acquackanonk, ..	Henry Isleib, Paterson R. D. 2, Passaic co.,..	Herman Rubins, Paterson R. D. 2, Pas'c co.,.	Mrs. J. B. Jackson, Albion Pl., Pat'son, Pas. co.,
Plainsboro, ...	Abel H. Updyke, Princeton R. D., Mercer co.,	F. E. Darrow, Plainsboro, Middlesex co.,.....	Mrs. J. B. V. Wicoff, Plainsboro, Middle'x co.
English Creek,...	C. C. Lee, Mays Landing R. D. 6, Atlantic co.,	E. Hickman, Mays Landing R. D. 6, Atl'c co.,	J. W. Gifford, Mays Landing R. D. 6, Atl'c co.
Rio Grande,.....	Miss H. G. Hildreth, Rio Grande, C. May co.,	Mrs. Louisa Kimble, Rio Grande, C. May co.,	Jonas B. Hand, Rio Grande, Cape May co.
Moravian, ...	J. I. Cooke, Delaware R. D. 2, Warren co.,..	F. L. Kerr, Delaware R. D. 2, Warren co.,..	Mrs. J. Hoyt, Gt. Meadows R. D., Warren co.
Passaic Township	Algernon T. Sweeney, Millington, Morris co.,	Charles A. Cornish, Gillette, Morris co.,.....	Elbert Bebout, Millington, Morris co.
Johnsonburg, ...	Clinton Kerr, Johnsonburg, Warren co.,.....	L. E. Savacool, Newton R. D. 1, Warren co.,.	Lucy Kerr, Johnsonburg, Warren co.
Manalapan,.....	H. W. Herbert, Englishtown R. D. 2, Mon. co.,	C. V. Aumack, Englishtown R. D. 1, Mon. co.,	L. V. Dey, Englishtown, Monmouth co.
Cologne, ...	J. Huenke, Egg Harbor City R. D. 1, Atl'c co.,	W. Holmeison, Jr., Egg Harbor City, Atl'c co.,	Mrs. M. Mauroff, Egg Harbor City, Atla'c co.
Sparta, ...	Eugene Cory, Sparta, Sussex co.,.....	Henry Folk, Sr., Sparta, Sussex co.,.....	Mrs. S. Pullis, Sparta, Sussex co.
Allenwood, ...	Wm. L. Morton, Allenwood, Monfouth co.,...	Peter Tilton, Allenwood, Monmouth co.,.....	Mrs. Elma Morton, Allenwood, Monm'th co.

Statistical Tables---Farm Crops.

STATISTICAL TABLE OF FARM CROPS AS REPORTED BY SECRETARIES OF THE COUNTY BOARDS.

COUNTIES.	CORN.			WHEAT.			RYE.			OATS.		
	Product compared with last year—per cent.	Average yield per acre—bushels.	Average price.	Product compared with last year—per cent.	Average yield per acre—bushels.	Average price.	Product compared with last year—per cent.	Average yield per acre—bushels.	Average price.	Product compared with last year—per cent.	Average yield per acre—bushels.	Average price.
Atlantic,	90	25	$0 75	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bergen,	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Burlington,	70	50	72	90	20	$1 15	80	20	$0 70	25	15	$0 45
Camden,	80	28	70	100	20	1 00	.....	.....	.....	.....	.....	.....
Cape May,	105	35	75	100	15	1 25	.....	.....	.....	.....	.....	.....
Cumberland,	80	35	65	70	15	1 00	.....	.....	.....	65	35	40
Essex,	100	50	85	.....	.....	.....	100	25	1 00	.....	.....	.....
Gloucester,	90	25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hunterdon,	70	35	82	100	14	1 00	100	14	75	83	25	55
Mercer,	90	35	70	98	20	1 00	100	18	80	65	25	50
Middlesex,	85	30	80	95	17	1 00	80	14	75	50	7	48
Monmouth,	70	42	70	100	25	1 05	90	16	72	.....	.....	.....
Morris,	80	25	.....	90	25	1 10	75	33	50	.....	.....	.....
Ocean,	65	30	80	.....	.....	.....	.....	.....	.....	.....	.....	.....
Passaic	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Salem,	35	35	60	75	15	1 00	.....	.....	.....	.....	.....	.....
Somerset,	75	25	80	110	16	1 00	100	20	78	40	25	60
Sussex,	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Union,	75	35	80	.....	.....	.....	100	16	85	.....	.....	.....
Warren,	75	75	70	100	20	1 00	25	12	90	.....	.....	.....

STATISTICAL TABLE OF FARM CROPS AS REPORTED BY SECRETARIES OF THE COUNTY BOARDS.

COUNTIES.	BUCKWHEAT.			HAY.			WHITE POTATOES.			SWEET POTATOES.		
	Product compared with last year—per cent.	Average yield per acre—bushels.	Average price.	Product compared with last year—per cent.	Average yield per acre—tons.	Average price per ton.	Product compared with last year—per cent.	Average yield per acre—barrels.	Average price per barrel.	Product compared with last year—per cent.	Average yield per acre—barrels.	Average price per barrel.
Atlantic,	.....	.....	.....	75	1¼	$18 00	125	60	$2 25	125	50	$1 50
Bergen,	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Burlington,	.....	.....	.....	75	1¼	18 00	60	40	2 00	90	75	1 50
Camden,	.....	.....	.....	110	1¾	18 00	75	70	2 00	90	80	1 85
Cape May,	.....	.....	.....	100	1½	16 00	110	35	2 25	80	30	1 75
Cumberland,	.....	.....	.....	95	1	16 00	70	14	1 90	115	40	1 75
Essex,	.....	.....	.....	90	1½	20 00	50	20	2 75	.....	.....	.....
Gloucester,	.....	.....	.....	85	1½	.....	90	45	1 90	75	60	1 25
Hunterdon,	112	28	$0 60	65	1	13 00	.....	.....	.....	.....	.....	.....
Mercer,	.....	.....	.....	95	1¾	16 50	100	30	2 25	105	40	1 75
Middlesex,	100	18	80	80	1¼	18 00	80	30	2 50	100	75	2 50
Monmouth,	.....	.....	.....	100	2	19 00	50	35	1 55	100	50	2 00
Morris,	.....	.....	.....	80	.....	19 00	60	.....	2 25	.....	.....	.....
Ocean,	50	20	80	.....	1½	15 00	60	60	2 25	90	50	2 00
Passaic,	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Salem,	.....	.....	.....	75	1	18 00	100	35	2 00	100	55	1 50
Somerset,	80	20	85	65	1	15 00	50	.....	2 25	.....	.....	.....
Sussex,	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Union,	.....	.....	.....	80	1	18 00	.....	.....	.....	.....	.....	.....
Warren,	25	15	75	100	.....	14 00	75	15	1 60	80	20	2 00

STATISTICAL TABLE OF FARM CROPS AS REPORTED BY SECRETARIES OF THE COUNTY BOARDS.

COUNTIES.	APPLES.			PEARS.			PEACHES.			GRAPES.		
	Product compared with last year—per cent.	Average yield per acre—barrels.	Average price per barrel.	Product compared with last year—per cent.	Average yield per acre—barrels.	Average price per barrel.	Product compared with last year—per cent.	Average yield per acre—baskets.	Average price.	Product compared with last year—per cent.	Average yield per acre—pounds.	Average price per pound.
Atlantic,	100	5	$3 00	100	20	$2 50	150	60	$1 25	125	3000	$0 03
Bergen,	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Burlington,	50	.....	3 00	50	.....	1 35	200	.....	85	.....	.....	.....
Camden,	30	.....	2 00	70	75	1 40	.....	.....	.....	100	6000	02¼
Cape May,	.....	.....	.....	.....	.....	.....	50	.....	1 25	105	4000	01¼
Cumberland,	30	20	3 00	50	12	1 25	80	150	1 00	100	50000	01½
Essex,	125	.....	2 50	.....	.....	.....	75	.....	1 25	.....	.....	.....
Gloucester,	.....	.....	.....	80	.....	1 25	90	.....	1 50	100	2000	.....
Hunterdon,	25	.....	1 60	25	.....	1 75	.....	.....	1 25	.....	.....	.....
Mercer,	100	15	2 50	.....	.....	.....	.....	.....	.....	.....	.....	.....
Middlesex,	80	16	2 25	.....	.....	.....	100	.....	1 00	.....	.....	.....
Monmouth,	25	.....	2 00	.....	.....	.....	100	.....	1 50	100	.....	.....
Morris,	25	.....	.....	.....	.....	.....	.....	.....	.....	125	.....	.....
Ocean,	20	.....	80	.....	.....	.....	30	.....	1 25	.....	.....	.....
Passaic	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Salem,	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Somerset,	70	.....	2 75	10	.....	2 25	75	.....	70	110	.....	02
Sussex,	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Union,	25	.....	.....	.....	.....	.....	85	.....	1 25	.....	.....	.....
Warren,	20	.....	1 75	60	.....	1 50	75	100	1 00	20	.....	04

STATISTICAL TABLE OF FARM STOCK AS REPORTED BY THE SECRETARIES OF THE COUNTY BOARDS.

COUNTIES.	VEAL CALVES.		SHEEP.		LAMBS.		SWINE.		TURKEYS.		CHICKENS.		WINTER WHEAT.		WINTER RYE.	
	Total number compared with December 1st, last year, per cent.	Average price per pound for season.	Total number compared with December 1st, last year, per cent.	Average price per head for store sheep.	Total number compared with December 1st, last year, per cent.	Average price per head for spring lambs.	Total number compared with December 1st, last year, per cent.	Average price per pound December.	Total number compared with December 1st, last year, per cent.	Average price per pound November and December.	Total number compared with December 1st, last year, per cent.	Average price per pound November and December.	Area sown compared with last year—per cent.	Average condition December 1st.	Area sown compared with last year—per cent.	Average condition December 1st.
Atlantic,	100	$0 07	.....	.....	.....	.....	100	$0 11	.....	.....	125	$0 16	.....	.....	100	100
Bergen,	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Burlington,	100	07	105	$5 00	100	$6 00	100	09½	100	24	100	26	100	100	100	100
Camden,	100	07½	.....	.....	.....	.....	100	10	.....	.....	100	20	100	100	100	100
Cape May,	90	06½	.....	.....	.....	.....	85	10	100	25	100	16	.....	.....	.....	.....
Cumberland,	90	08	.....	.....	.....	.....	75	10	90	22	85	18	95	.....	.....	.....
Essex,	100	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	100	.....
Gloucester,	100	.....	.....	.....	.....	.....	90	.....	.....	.....	95	.....	.....	.....	.....	.....
Hunterdon,	100	08	.....	.....	.....	.....	95	10	80	20	105	13½	105	80	100	80
Mercer,	100	08	100	5 50	.....	5 50	100	10	.....	.....	100	18	100	85	100	95
Middlesex,	85	08	80	5 00	100	5 00	80	10½	.....	.....	100	16	110	100	110	90
Monmouth,	100	08	100	5 50	100	6 00	100	09	100	25	100	18	100	100	100	100
Morris,	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ocean,	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Passaic.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Salem,	100	07	100	.....	100	5 00	100	10	.....	.....	100	25	100	100	.....	.....
Somerset,	100	09½	100	6 00	100	5 50	100	09½	40	20	100	14	100	80	110	90
Sussex,	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Union,	80	09	.....	.....	.....	.....	.....	.....	.....	.....	100	18	95	80	80	75
Warren,	75	07¼	25	5 00	25	5 00	50	07½	25	25	50	12	100	90	80	90

STATISTICAL TABLE OF FARM STOCK AS REPORTED BY SECRETARIES OF THE COUNTY BOARDS.

COUNTIES.	HORSES.		MULES.		COWS.	
	Total number compared with December 1st, last year, per cent.	Average price between 3 and 7 years old.	Total number compared with December 1st, last year, per cent.	Average price between 3 and 7 years old.	Total number compared with December 1st, last year, per cent.	Average price between 3 and 7 years old.
Atlantic,						
Bergen,						
Burlington,	100	$200 00	100	$250 00	90	$40 00
Camden,	100	175 00	100	200 00	100	50 00
Cape May,	100	150 00	100	160 00	100	40 00
Cumberland,	100	175 00	100	200 00	100	50 00
Essex,					100	55 00
Gloucester,	100	100 00	100	125 00	100	55 00
Hunterdon,	100	180 00	100	105 00	105	55 00
Mercer,	100	225 00	100	200 00	95	50 00
Middlesex,	105	200 00	100	180 00	95	45 00
Monmouth,	100	250 00	100	260 00	100	50 00
Morris,	100	175 00			100	50 00
Ocean,						
Passaic,						
Salem,	100	175 00	100	175 00	100	65 00
Somerset,	100	150 00	100	150 00	110	40 00
Sussex,						
Union,	100	175 00			70	65 00
Warren,	100	150 00	25	175 00	75	45 00

Reports of County Boards of Agriculture.

Reports of County Boards of Agriculture.

ATLANTIC COUNTY.

OFFICERS FOR 1910.

President, JOHN HUENKE, ...Egg Harbor City, R. F. D.
Vice-President, A. J. RIDER, ...Hammonton
Secretary, VALENTINE P. HOFMANN, ...Egg Harbor City
Treasurer, WILLIAM LIEPE, ...Cologne

DELEGATES TO STATE BOARD.

JOHN L. PURZNER, two years, ...Egg Harbor City, R. F. D.
J. E. HOLMAN, one year, ...Hammonton

With a rather belated and cool spring, the season of 1909 nevertheless proved favorable to the farming community of this county.

Hay, corn, round and sweet potatoes gave good returns.

Keiffer pears and peaches bore bountiful crops. Apples were scarce. Strawberries and dewberries proved remunerative.

The grape crop was free from rot again this year, and in consequence an exceptionally large crop was harvested, with slightly lower prices.

The prices on all other farm products were higher than in previous years, and as a result the farmers were well satisfied with the prices realized.

Domestic farm animals were immune from contagious diseases during the year.

There were two Farmers' Institutes held during the year. One at Hammonton, on November 10th, 1909, with following speakers and topics: J. T. Campbell, on "Economic Maintenance of Soil Productivity"; "Poultry Houses and Fixtures," and "Business Side of Poultry Management." Carey W. Montgomery on "Commercial Fruit Growing," and "What Do We Owe to Our Community?"

The other was held at Germania on January 14th, 1910, which on account of very inclement weather was not as well attended as usual, and the sessions and programme were therefore curtailed. W. D. Zinn spoke upon "Cover Crops and Their Importance"; C. W. Montgomery upon "Commercial Fruit Growing, Bush and Tree Fruits," and J. H. Wolsieffer upon "Winter Eggs, and How to Get Them."

VALENTINE P. HOFMANN,
Secretary.

BERGEN COUNTY.

OFFICERS FOR 1910.

President, WILLIAM BRANDENBURGH, JR., ...North Arlington
Vice-President, FREDERICK M. CURTIS, ...Harrington Park
Secretary, JOHN M. MEYERS, ...Westwood, R. F. D. No. 2
Treasurer, FRED. V. STROHSAHL, ...Park Ridge

The Bergen County Board of Agriculture did good work during the year just passed. The spring Institute held under the direction of the State Secretary, was a success, not having as many in attendance, perhaps, as Institutes held in other counties, yet there were a number of farmers who received the knowledge with a determination of using it.

This Board planned several field meetings for the season. The first was held at the farm of William Brandenburg, Jr., in North Arlington. This meeting was well attended, farmers being shown the actual growth and production.

Bergen County seems to be losing in agriculture. As four of our members, with their families, have moved to other parts, we have not enrolled as many as in former years.

Bergen County farmers on the whole, did as well as in past years, although the season was very dry, it is so near the large market we could take advantage of the higher prices.

JOHN M. MYERS,
Secretary.

BURLINGTON COUNTY.

OFFICERS FOR 1910.

President, A. G. GAUNT, ...Moorestown
Vice-President, HULINGS COLES, ...
Secretary, H. H. ALBERTSON, ...Burlington

The drouth of the past summer was the source of more apprehension and comment than all other topics. It was everywhere serious, and in some places disastrous, and yet few crops suffered as badly as was for a time feared. The effects of the dry weather were much less apparent on good land which was well cultivated than on some poorer farms.

While late potatoes suffered severely, hay and corn were by no means failures, and were fair crops in most localities. Wheat was a little below the average, but brought a good price. Oats were too poor to thresh in many cases. Tomatoes and strawberries were abundant crops, although the weather prevented the best prices being realized.

While apples and pears were few, peaches were a very full crop, and considering their abundance, good prices were realized, and weather conditions were ideal for their harvest. Peach orchards are being largely planted, but newly set apple orchards are not so frequently seen. The apple does not seem to be receiving its share of attention, although the opportunities for successfully growing and marketing apples are very wide in this locality.

The importation of cattle from other States, notably New York and Pennsylvania, have not offset the decrease in the herds, and on the whole the dairy industry shows some falling off. There appears to continue to be considerable prevalence of tuberculosis among the cattle of this county, in common with most sections of the east, while there is a noticeable lack of interest by both producer and consumer in this subject. Either through a lack of confidence in the test or an unwillingness to make a sacrifice for the public good, which the public is unwilling

to pay for, the majority of dairymen do not avail themselves of the tuberculin test, and there is no adequate inducement, either by the State or by the consumer, for them to do so. There is need of more positive knowledge on the question of the transmissability of bovine tuberculosis to the human family.

The labor market in the country seems to be a barometer for the general prosperity of the nation, and the increasing scarcity of good men seeking work on our farms indicates a renewed activity in the cities. There is always with us a large number of men whom the saloons have unfitted for trustworthy positions in factories and workshops, but they are not the best sort of help.

The organization of the Burlington County Farmers' Exchange is an important event of the year. This organization has been incorporated to do all kinds of business for its members, and aims to furnish the farmer with the facilities for disposing of his crops to the best advantage. It is in line with the recommendations of the Country Life Commission, has been tried out with successful results in other sections, and should have the hearty support of all.

H. H. ALBERTSON,
Secretary.

CAMDEN COUNTY.

OFFICERS FOR 1910.

President, J. FRANK BREWER, ...Blackwood
Vice-President, JOHN GARWOOD, ...Ashland
Secretary and Treasurer, DANIEL W. HORNER, ...Merchantville

The twenty-sixth annual meeting of the Camden County Board of Agriculture was held in Grange Hall, Haddonfield, December 17th. To a well filled house President Brewer extended the usual greeting. A program embracing a variety of well chosen and interesting subjects, both of a commercial and social character, was presented and listened to with interest and brought out considerable discussion.

"Telephone on the Farm," was treated by S. H. Croxton and others, who spoke elaborately on the great advantages of those who had been provided with telephones and of the willingness of the telephone company to cater to the farmers in the construction

of rural telephones. T. Lane Moore, commission merchant of Philadelphia, contributed a paper on the subject, "The Market End," bristling full of good suggestions and laying much emphasis on the importance of observing the old adage that honesty is the best policy, and as applicable to the farmer in packing his products as to the commission man in selling them.

The afternoon session was opened by Mrs. Edwin Grice of Philadelphia, who gave a "Talk" on mission work and on the proper education of the child. Mrs. Grice recited interesting experiences received while visiting schools devoted entirely to Americanizing the children of immigrants, of their aptness and of their interest in the struggle of the patriots of '76 for freedom.

D. Howard Jones of Freehold, N. J., spoke of the Farmers' Commercial Exchange of that place, its formation, what it had done for the farmers and of its success as a money maker.

His remarks were supplemented by others as the formation of a near-by exchange was under consideration. Chas. Barton, a successful local fruit grower, spoke of the essentials in fruit growing. Mr. Barton's success in this line and his familiarity with the subject, secured for him the earnest attention of all present, and as fruit growing is increasing in this community, Mr. Barton was obliged to submit to an exhaustive questioning.

The question, "Green Crops" as plant food, was treated in a masterful manner by Benj. Lippincott, he being a recognized authority upon this subject and with long experience in this neighborhood in giving object lessons upon this matter. His talk was especially well received.

The previous summer or season being an extremely dry one, tended to direct the thoughts of our progressive farmers to "conserving the moisture in the soil." On this subject Benj. Barrett gave a thorough talk showing much familiarity with the subject and involving deep research. This was followed and sustained by John Garwood who recited personal experiences corroborating those who advise continual surface cultivation. The dry season seriously affected many crops, some were a total loss. The conditions seemed to favor the tomato crop, which in the general market commanded a very low price.

DANIEL W. HORNER,
Secretary.

CAPE MAY COUNTY.

OFFICERS FOR 1910.

President, FREDERICK SCHMIDT, ...Woodbine
Vice-President, RICHARD LLOYD, ...Dias Creek
Secretary, RALPH SCHELLINGER, ...Green Creek
Treasurer, VOLNEY VAN GILDER, ...Ocean View

The Cape May County Board of Agriculture held its Annual Meeting November 13th, 1909, when the officers were elected for the ensuing year and the following crop report submitted and approved.

Corn, 5 per cent. better than last year; yield 36 bushels to the acre; selling at 75 cents.

Wheat, 15 bushels to the acre; price $1.25.

Upland hay, 1½ tons; $15 per ton.

Round potatoes, 10 per cent. better than last year; yield 35 barrels; $2.25 per barrel.

Sweet potatoes, 20 per cent. less than last year; 30 barrels to the acre; $1.75 per barrel.

Peaches, a half crop; selling price, $1.25 per basket.

Grapes, 5 per cent. better than last year; a ton to the acre; selling price, 1½ cents per pound.

Strawberries hardly paid for the picking.

Watermelons, a full crop, selling at 10 cents each.

Citron, 15 per cent. better than last year; 35 cents per basket.

Canteloupes, 10 per cent. better than last year, 35 cents per basket.

Cucumbers, 20 per cent. better than last year, 15 cents per basket.

Tomatoes, for market, 6 tons to the acre, 35 cents per basket; for cannery the largest crop ever set, 7 tons to the acre, $8 per ton.

Horses, $150; mules, $160; milch cows, $40; veal, l. w., 6½ cents per pound; swine, 15 per cent. less in numbers than last year; dressed, 10 cents per pound; poultry, dressed, 16 cents to 25 cents per pound.

Farm laborers slightly on the increase owing to the lack of work in other lines; wages, $18 per month with board; $35 without. In the southern townships, lima beans were given most attention and strawberries the least. Eleven silos were operated in the county and all to advantage. There are no creameries; milk, at retail, 8 cents per quart. The eight canneries of the county were run to their fullest capacity.

The address of the meeting was by Prof. Harry Lewis and upon "Poultry-Keeping for Profit." Prof. Lewis is a graduate of the Rhode Island school of poultry and in his two years in Cape May county has modified his best knowledge attainable and his New England experiences to suit local conditions. He did not hesitate in saying "no branch of agriculture will pay better than poultry-keeping," and again, "no one need hesitate to venture in the business of winter egg production in Cape May county." At Woodbine the 250 laying hens had averaged 120 eggs a year and at a cost of $1.25 per hen. The ten dozen at 25 cents, which was less than average price the past year, would give a profit of $1.25 per hen. But he believed the yield could be increased without adding to the cost. For this there must be vigorous stock, suitable housing and good feeding. Cape May soil is admirably adapted to the business in being sandy with gravelly subsoil and thus always sweet and healthy.

RALPH SCHELLINGER,
Secretary.

CUMBERLAND COUNTY.

OFFICERS FOR 1910.

President, WALTON E. DAVIS, ...Shiloh
Vice-President, ANDREW MILLER, ...Shiloh
Secretary and Treasurer, CHAS. H. DUNSAFE, ...Cedarville.

At the Annual Meeting of the Cumberland County Board of Agriculture the Treasurer made his annual report and the officers were elected for the ensuing year.

Mr. Robert Peacock gave a very interesting report of the Annual Meeting of the State Board of Agriculture.

The milk question was presented in such a way as to prove conclusively that the wholesale price should be five cents per quart.

Growing potatoes was considered profitable, but carefulness in securing good seed was very essential.

Bordeax mixture should be used frequently; should not allow little rain to prevent spraying.

The sense of the meeting was, put plenty of lime on your alfalfa.

Whitewashing the barns and keeping the cows clean was recommended as good farming.

Mr. Arthur Seabrook read a very interesting paper touching on co-operation on buying seed potatoes, irrigation of lands, etc

Mr. G. A. Mitchell, of Vineland, gave an outline of the work of the Farmers, Demonstration Society, and in his many good remarks said that it had been demonstrated that alfalfa could be grown to a certainty and with profit. He recommended 100 pounds of nitrate of soda to the acre on grass land.

At the afternoon session Dr. John B. Smith, State Entomologist gave an address that was full of instruction and valuable information. He touched upon economic entomology and destroying breeding places of mosquitoes by drainage. This was illustrated by stereopticon views.

CHARLES H. DUNSAFE,
Secretary.

ESSEX COUNTY.

OFFICERS FOR 1910.

President, DR. JOS. B. WARD, ...125 Chancelor Ave., Newark
Vice-President, AUSTIN E. HEDDEN, ...Verona
Secretary—JUSTUS W. DOBBINS, ...Verona
Treasurer, GEO. E. DE CAMP, ...Roseland

The Board has held three meetings during the past year, with regular programs at each.

Topics were assigned to members, who prepared papers to be followed by a general discussion.

Our delegates to the State Board and Horticultural Society gave us full reports, and many points were brought out and discussed with profit to our members.

We are adding new members, but the growth of our Board is slower than we would like.

Our Farmers' Institute was held at Livingston this year, on November 14th.

The topics were of special interest and the speakers were very good. The Institute was a success.

Farmers who practiced thorough cultivation and the newer methods received fair crops, while those who farmed in the old way met with nearly a complete failure.

Prices for produce have been high, and on the whole the returns were satisfactory.

Fruit cut by drought; quality good, yield about seventy-five per cent. and prices very good.

New meadows were good, old ones very light. Potatoes were very unsatisfactory; early ones cut by the drought and were almost a complete failure. Some late ones were setting when the fall rains came on and did well, yielding about thirty per cent. of a crop.

Several of our farmers are trying alfalfa. Some have had to re-seed several times. Those who persevered are finally getting a good stand.

Silos are being built, but on the whole milk production among the farmers is not satisfactory and many are giving it up.

The production of milk is gradually drifting into the hands of a few large dairy companies.

JUSTUS W. DOBBINS,
Secretary.

GLOUCESTER COUNTY.

OFFICERS FOR 1910.

President, JAMES C. WHITE, ... Sewell, R. F. D.
Vice-President, DAVID T. BROWN, ... Swedesboro
Secretary, ESTHER RULON, ... Mickleton
Treasurer, WM. H. BORDEN, ... Mickleton

Gloucester County Board of Agriculture held four quarterly meetings and a two days' Institute the past year. There was an average attendance of ninety-two at the quarterly meetings, and the Institute was one of the largest and most successful that has been held.

On the whole, Gloucester County farmers have had a successful year.

Owing to the fact that the railroad companies have not their reports ready for publication, I am unable to give a full detailed statement of the produce shipped from the different stations in the county. 2,500 solid cases were shipped from Swedesboro. There were shipped through the Farmers' Exchange from Mullica Hill, 154 cars, netting $58,442; from Harrisonville, 35 cars, netting $13,596; from Richwood, 34 cars, netting $10,986, and from Mickleton, 30 cars, netting $10,200. These shipments were principally from members of the Exchange, and did not include poultry and dairy products, which on many farms furnish a large part of the income. From Mullica Hill and Swedesboro large quantities of asparagus is sent by express to available markets.

The canning factory at Glassboro packed 59,654 cases, principally tomatoes, for which about 500 acres were contracted at $9.00 per ton.

The John Repp Ice and Cold Storage Company, Incorporated, of Glassboro, gathered from its farms and orchards 10,000 barrels of apples, 2,500 barrels of pears, 80 tons of grapes and 3,000 bushels of corn.

The Pomona Fruit Farm, also located at Glassboro, owned by S. H. Stanger & Sons, gathered 4,000 baskets of peaches, for which they received $8,000, and in addition 500 baskets of apples.

JOHN TONKIN,
Secretary.

HUNTERDON COUNTY.

OFFICERS FOR 1910.

President, JAMES LANE, ...Readington
Vice-President, W. H. OPIE, ...Readington
Secretary, JOHN T. COX, ...White House Station
Treasurer, F. J. TOMLINSON, ...Pittstown

Two meetings of the Board were held during the year, at Three Bridges and Flemington, both of which were very poorly attended. At the annual meeting at Flemington the canvassing of crop yields for the year 1909, and the discussion of the future course of the board, were the main business of the session.

Farm values still retain their upward trend, accompanied by a better price for farm products in general, while the immigration of Jews, Italians and others still continues, mainly from New York. A few are moderately successful, but many soon grow weary of the struggle, but their places are generally taken by those eager for rural surroundings. The trouble is that most of these parties are induced to pay more for broken down farms than they should.

The season of 1909 will go down in the history of our county as one of the dryest on record, yet withal the season has been a fairly prosperous one, and while there has been a general dearth of water, and wells that have never been known to be dry before have failed. Crops in general were fairly good, owing to light rains that kept the surface moist enough for most crops, but not enough to aid the water supply. In fact, the ground was not soaked once between June 1st and December 1st, and at the latter date we stand face to face with a short water supply for stock for winter.

Fruits of practically all kinds were again short in product and quality. Apples and pears, what few there were, readily taking the market at $1.50 and $2.00 per barrel. Peaches have about dropped out of sight, not a single station shipping ten thousand baskets for season, while most of them did not handle any.

Horses still remain high with an upward tendency in price, and large imports from the West find a ready market.

Dairy cattle range fully five dollars per head higher than one

year ago, accompanied by a slight increase in price of product, also in price of feeds.

Hogs are still declining in number, but with the rapid advance in the price of pork at 10 cents per pound, all weights. The business is likely to look up.

Poultry and eggs are booming, and the flocks that were greatly reduced the past two years will, under the stimulus of rise of nearly 25% in the price of eggs the past year, soon be back to or higher than ever before. The average price of eggs for the past twelve months being 25 cents per dozen and firm December 1 at 40 to 45 cents per dozen.

The dairy business is still firm, with a slight increase in prices paid for product and a stationary price for feeds. Milk shipping stations pay slightly higher prices than last year, and creameries using Locktown as a basis show about 1 cent advance in price for butter fat. The report of the Association is appended in full to this report. It, however, shows a falling off in milk receipts of about 160,000 pounds compared with last year.

REPORT OF LOCKTOWN CREAMERY FOR THE YEAR ENDING OCTOBER 31ST, 1909, AS COMPILED BY ELLIS COMPTON, FOREMAN.

	Number Pounds Milk Received.	Number Pounds Butter Made.	Butter Sold.	Skimmed Milk Sold.	Average Test of all Milk Received.	Price Paid per Pound for Butter-fat.
1908.						
November,	98,980	5,712	$1,692 52	$60 16	4.30	$0 37
December,	96,636	4,831	1,698 56	53 22	4.36	40
1909.						
January,	91,864	5,239	1,836 92	51 89	4.40	40
February,	93,068	4,405	1,454 27	48 83	4.20	35
March,	106,569	5,369	1,735 52	55 87	4.07	35
April,	104,572	4,916	1,495 13	58 44	4.07	33
May,	132,462	6,135	1,761 85	69 30	4.08	31
June,	137,097	6,643	1,886 97	76 82	4.04	31
July,	127,700	5,890	1,795 36	79 61	4.04	33
August,	118,884	5,675	1,728 78	76 66	4.05	34
September,	122,054	5,791	1,886 89	71 97	4.04	36
October,	108,702	5,775	1,934 26	59 49	4.15	40
Total,	1,338,588	66,381	$20,907 03	$762 26	4.15	$0 35 5/12
Average,					4.15	$0 35 5/12

Neither gypsy nor brown-tailed moths have been reported as yet, but many forest trees were literally covered with aphids, which produced honey dew enough to practically ruin all early honey, the honey crop totalling not more than 40% of last year's crop, and that generally of inferior quality. Brood diseases are still rampant, and the necessity of a rigid foul brood law becomes greater every day.

Corn yielded an average crop of 35 bushels per acre, and of superb quality. Wheat, while producing tremendous crops of straw, generally proved unsatisfactory in threshing, yields as low as 3¼ bushels per hundred sheaves being recorded, and but little exceeding 4½ bushels. Rye yields about same as wheat, while oats was a fair crop of fine quality. Buckwheat yielded well, instances of fifty bushels per acre being recorded with a general average of about 28 bushels per acre, while hay yielded one ton per acre.

JOHN T. COX,
Secretary.

MERCER COUNTY.

OFFICERS FOR 1910.

President, J. T. ALLINSON, ...Yardville
Vice-President, FERDINAND A. BLACKWELL, ...Pennington, R. F. D.
Secretary, FRANKLIN DYE, ...Trenton
Treasurer, R. ELLSWORTH HAINES, ...Robbinsville, R. F. D. 2

The soils of Mercer county are varied in their composition, character and adapability to the production of the various farm crops grown in this latitude. One seeking a soil suited to general farming, the production of the cereals, grasses, etc., or to market gardening, and small fruits, can find just what he needs in this county.

Added to this are market opportunities unsurpassed—local markets, as in Trenton, Princeton, Hightstown, Hopewell and other smaller towns. Railroad facilities by the Pennsylvania on the southern border and through the center of the county, and

the Reading on the west and north to Philadelphia, New York and Newark.

A large proportion of the milk, fruit and vegetables produced in the county are sold direct from the producer's wagon to the consumer, thus better prices are received by the farmer (and at a reduced cost to the consumer) than are usually obtained when those products are sold through a dealer, who very naturally must receive proper compensation for his services to both producer and consumer, as well as the other expenses connected with his business.

Another advantage possessed by Mercer county is the numerous high grade schools. In addition to the State Model and Normal Schools, Princeton is a world noted center of secular and theological education. Hightstown has its Peddie Institute, and Pennington its progressive seminary for both sexes. Farmers with families of children growing up can locate in no better section, we are quite sure, than in Mercer county.

This county, too, abounds in good roads, and the State House being located here, makes it the center of State business and political interest.

While there are farms throughout the county that can be purchased at former prices, the tendency of farm values is advancing in common with other progressive sections of the State. Our farmers are improving in their methods as they study the semi-scientific questions connected with crop production and dairy management, and this is an essential requirement if one would succeed in fullest measure. One of the means that has proved to be of much value in developing agricultural thought and leading to better farming is the agricultural organization. In addition to the County Board of Agriculture and the several Granges, the Mercer county farmers have the exceptional advantage of the annual meetings of the State Board of Agriculture and the State Horticultural Society held in their midst. The County Board holds its annual meeting in March, a Field Meeting in the fall, and a Mid-winter Meeting in connection with a Farmers' Institute. At the annual meeting held March 13, 1909, President Allinson in his annual address said in part as follows:

"The way a farmer lives is generally governed by the way he treats his land. The Chinese have ruined great parts of their empire, and large areas exist where no man can live. The Irish did not take good care of their inheritance, and in consequence they are emigrating by the thousands, for the land which they maltreated will no longer support them. Many of us were taking from the land all the profit we could, regardless of the condition we would leave it in. We were poor stewards, pursuing the penny-wise, pound-foolish policy of devoting little or nothing to the maintenance of the property, which was diminishing in productiveness.

"In the past few years, however, the instructions and suggestions on these lines offered by speakers at our Farmers' Institutes, and the experiments carried on at our N. J. Experiment Farm, so ably described and explained by its director, Dr. E. B. Voorhees, have not only been listened to with interest, but their advice has been heeded, and as a result the farms of Mercer county are yielding more and better crops to-day than ever before. The haphazard way of farming, perhaps a good crop last year and a failure this, is a condition of the past. We have been taught how, and we do raise good crops every year.

"Perhaps the most serious questions that confront us to-day are the labor problems and the sale of the products of our farms through the commission merchants. The establishment of Farmers' Exchanges, if economically run and heartily supported by the farmers as they should be, will eventually lead to greatly improved conditions on this line. Bring the farmer nearer to the consumer by cutting out the middleman, and give the producer the two or three commission men's profits. This would relieve the labor question, inasmuch as we could then afford to pay better wages and offer greater inducements to bring skilled laborers back to our farms. At the same time the returns on our investments would be more satisfactory.

"Again, I am a believer in consolidating the efforts and energies of a neighborhood to raising of one *main* crop. Buyers will not come to a station for one car of potatoes (for instance). But let it be known that several cars a day will be shipped from one point during the season, we would have *buyers* from many mar-

kets, and so get the best prices. And further, where there is a large acreage in a neighborhood of one particular crop, the government and our own experiment station would send experts there to study out the cause and remedies of diseases, and the more economical productions of the crop. But the farmers are interested in something else, as well as the tilling of the soil and selling its products. With other good citizens they are interested in public affairs, in which they are taking an active part, not as fault finders, or obstructionists, but are endeavoring to assist and encourage our law makers, guiding legislation along lines that we believe will conserve the best interests of our citizens and the State.

"In this county we have one of the best organized farmers' legislative committees in the State. This committee, under the auspices of the Mercer County Pomona Grange, has been meeting at the State House every Monday afternoon during the legislative sessions to talk over matters of special interest to the farmers, with our Senators and Assemblymen. As a result, I am sure there is a much kindlier feeling and better understanding between this committee and the legislators.

"The proposition that the State funds be loaned on farm property will not meet with much enthusiasm here. First, because it does not look to us as if there was enough cash in the treasury to bother about, and second, there are very few farmers in Mercer county who employ that sort of cover crop."

Concerning our first Field Meeting, he said:

"This meeting was of three-fold importance: First, we were enabled to see the practical results of careful culture in fruit growing. Second, the productiveness of a farm after years of cultivation on intelligent, scientific lines, and Third, back of it all was the holiday—the pleasant social intercourse which it afforded to meet friends and co-workers from all parts of the county was, to say the least, helpful. The afternoon was so pleasantly and profitably spent, and in every way such a splendid success, I am sure you will want to make it an annual affair."

During the afternoon session Dr. E. B. Voorhees addressed the Board on "Fertilizers, Their Composition and Use." He emphasized the importance of applying a maximum amount *fully*

enough for the crop throughout the entire growing season. The material should be available. He was followed by Edward Van Alstyne, who spoke on "Commercial Feeding Stuffs." He displayed a chart showing the chemical analysis of the different feeds on the market and home-grown as to their contents of water, ash, protein, crude fiber, carbohydrates and fat, and the per cent. of digestibility of each. This was very helpful to the audience in determining the best feeds to carry on dairying profitably.

The crop returns for the county are as follows:

Crop.	*Acreage.*	*Bu. Per Acre.*	*Total Bushels.*	*Price.*	*Total Value.*
Corn,	2,200	35	77,000	$0 70	$53,900
Wheat,	1,500	20	30,000	1 00	30,000
Rye,	4,000	18	72,000	80	57,600
Oats,	9,000	25	225,000	50	112,500
Hay,	23,000	1¾ tn.	40,250	16 50	664,125
White potatoes,	2,000	80	160,000	75	120,000
Sweet potatoes,	200	110	22,000	80	17,600
Miscellaneous vegetables and fruits at $30 per farm, on 1,573 farms,					47,190
Milk of 13,700 cows at 2,044 qts. per cow, per year at 3¾ cents per quart,					1,050,105
Poultry, eggs, veal calves, pork, etc., at $100 per farm,					157,300
Total for county,					$2,310,320

The second annual Field Meeting of the Board was held at the farm of Mr. J. T. Allinson. The attendance was large, more than one hundred carriages bringing the farmers and their families to the meeting from miles around, and the short talks on the several topics presented were interesting and profitable. Such summer meetings held at the farms of the different members of the County Board tends to increase its popularity and usefulness, and we recommend a trial of similar meetings to other County Boards.

John M. Dalrymple, Esq., reports that "The Hopewell Valley Canning Company has had a very successful year for the canning of tomatoes, although the forepart of the season was very discouraging. Considerable trouble was experienced in getting the

plants ready to set. It was thought at first that the seed was not good, but it was proven later that the seed was all right. The cause was that the heavy rains packed the ground so hard that it could not get up. Plants had to be purchased from other parts, and it was the opinion of the growers that they did not do nearly as well as home-grown plants. During the past fiscal year 522⅓ tons of tomatoes were received at the factory, for which the growers were paid $9.00 per ton ($4,701.00). The year's pack of tomatoes was equivalent to 193,000 No. 3 cans, all of which have been sold and delivered at the close of the season, $4,020.00 was paid the company's employes, and amounts aggregating $730.00 were paid various business concerns of the borough and vicinity. The company is free of debt and has a surplus of several hundred dollars. This is a good enterprise for the farmers of this community, and also for the day laborer, as well as the merchants. It is a good thing all around, it makes business and helps *all,* and why farmers generally do not wake up to the establishing of some enterprise adapted to their community I cannot understand."

FRANKLIN DYE,
Secretary.

MIDDLESEX COUNTY.

OFFICERS FOR 1910.

President, B. DEWITT GILES, ...New Market
Vice-President, JOHN B. PERRINE, ...Cranbury
Secretary and Treasurer, LEWIS D. WALKER, JR., ...
New Brunswick, R. F. D. No. 1

The Middlesex County Board of Agriculture has held two meetings since its last report, which was made after the November meeting last year. At the meeting held in February we had a report of the State Board meeting by Mr. George W. Mount, of Monmouth Junction. Mr. Mount also gave a talk on "Asparagus Growing," which was very instructive. There were several members present who grow the grass for market, and each gave his experience, so that a number of points were brought out that

will be of help to the members. This discussion was followed by a talk on "Education and Our Public School System," by Mr. Noah Runyon, of Stelton.

At the meeting in May addresses were given on "Fruit Growing" by Mr. George Smith and on "Potato Growing" by Mr. D. J. Perrine. These speakers are members of our board and practical farmers. Each one makes somewhat of a "specialty" of the subject given them, and their talks with the questions and discussions which followed proved to be very helpful, and we consider these meetings the best we have had in some time. In August the Board went on an excursion with Captain Smith, as they have done for several years, and spent a very pleasant day.

At the "Field Day," held at the College farm, a large attendance of farmers from all parts of the State were present. Addresses were given in the morning on interesting topics, and after lunch we were shown over the farm, and the various crops were explained as to manner of planting, cultivation, fertilizers applied, yield, etc. Our Board was well represented at this meeting.

In parts of our county many of the farms have been sold, some to real estate companies and some to city people, for large prices, and the result is that the agricultural interests are very much hampered in these sections. The real estate people plow up some streets and put up signboards, and the land is allowed to grow up in weeds year after year and seed the adjoining farms, to say nothing of the distressing appearance it gives the neighborhood. Perhaps they sell a few lots, and the tax assessors can't find the owners and scarcely any tax is collected, making the rate higher for the farmers who do pay tax.

On the other hand we have some progressive farmers, who are improving their land and producing good crops, who are making good use of the means provided by our State to improve and educate the farmer to make the best of himself and his opportunities.

The past season has been one of long dry spells, and crops have been shortened considerably, especially oats, and in part of the county, potatoes. Hay and wheat were fairly good, though no second crop of hay was gathered. Corn stood the drought fairly

well, and where well cared for a fair crop is being harvested. Good prices prevail for most all farm products, which will help to offset the lower yield.

LEWIS D. WALKER, JR.,
Secretary.

MONMOUTH COUNTY.

OFFICERS FOR 1910.

President, D. HOWARD *Jones,*.....Freehold, R. F. D. No. 2
Vice-President, H. L. LEHR,.....Keyport, R. F. D. No. 1
Secretary, D. AUGUSTUS VANDERVEER,.....Freehold
Treasurer, WILLIAM M. MOREAU, ...Freehold, R. F. D. No. 4

The first meeting of the year was held February 27th. Reports of the delegates, H. W. Buck and C. D. B. Forman, to the State Board of Agriculture, and C. C. Hulsart, to the State Horticultural Society, were read. The reports were very complete, and gave the important points contained in the various papers presented at the annual meeting of the two State societies. George T. Reid read a paper on "Agricultural Training for the Farmer's Boy." The meeting was well attended, and the members had a full discussion of the various topics presented. A summer meeting of the State Horticultural Society was held July 21st at Tennent. It was largely attended by prominent horticulturists and farmers from other parts of the State. A short historical address was given by Rev. Frank R. Symmes, pastor of "Old Tennent." An address on "Potato Growing in South Jersey" by Samuel Ansink, of Salem county, followed by discussion. After luncheon on the church grounds the visitors and others were taken in carry-alls and autos to see some of the orchards and fields of potatoes and canning house crops, for which Monmouth county is noted. Farmers' institutes were held at Red Bank November 12th, at Matawan November 13th, Freehold November 26th, and Allentown November 27th. These meetings should be attended by all farmers and others interested in agriculture and horticulture, as a great variety of subjects are presented for discussion. The Granges in the county are flour-

ishing and are doing good work in bringing the farmers together. The Farmers' Exchange of Freehold has increased its membership since last year, and now has 525 members. Its main business is in potatoes, asparagus and fertilizer. A large building has been erected at Marlboro, of brick and cement, for the storage of seed potatoes and the mixing of fertilizer. Another will be erected at Freehold next season. Horses and cows are higher than last year. Swine higher, and in some localities there has been quite a loss by disease. There was less injury by insects and scale than usual. Several sections report damage to the wheat crop by the Angumois grain moth. There is a good demand for farms, and many changed owners the past year. There was a very light fall of snow during the winter and unusually mild weather. Very little ice gathered. The weather conditions during March and early April were favorable for plowing and planting. Too much rain and cold last part of April caused potatoes to rot in low places. Too cold for corn. These conditions were followed by a severe drought, causing great damage to nearly all crops. Later rains greatly improved all late crops. Hay, wheat, rye, sweet potatoes, peaches, grapes, melons and tomatoes were an average yield. Potatoes, the money crop of the county, were 50% of an average yield, producing from almost nothing to 100 barrels per acre. One expert grower of potatoes had a yield of 2,900 barrels from 30 acres. Another a yield of 90 barrels per acre. They saved their crop from drought by continuous cultivation. The peach crop was good in all parts of the county, selling for $1.00 to $1.75 per basket. The yield of all small fruits was reduced by the drought.

D. AUGUSTUS VANDERVEER,
Secretary.

MORRIS COUNTY.

OFFICERS FOR 1910.

President, GEORGE E. FELCH, ...Florham Park
Secretary and Treasurer, WILLIAM F. ELY, ...Madison

It was resolved that the secretary, at his option, should call a meeting for the formation of a Live-Stock Breeders' Association at Morristown.

It was further ordered that, upon the discovery of the San José scale, the fact should be at once reported to the secretary.

The secretary presented to the Board a number of complaints from various parts of Morris, Sussex and Monmouth counties relative to improper practices by commission men in Newark, New York and Brooklyn, and it was resolved to request those who had suffered from fraud to present their cases to the secretary, that the same might be published throughout the State in the agricultural papers, so that commission men guilty of improper practices should be shown up.

WM. F. ELY,
Secretary.

OCEAN COUNTY.

OFFICERS FOR 1910.

President, C. M. RORER, ...Cassville
Vice-President, P. DAVITT, ...
Secretary, R. C. GRAHAM, ...Holmeson
Treasurer, H. R. WILLS, ...

The year 1909 has not been very successful to some farmers, but the business or progressive farmer who avails himself of the opportunity of obtaining the scientific knowledge available through the State and County Boards of Agriculture has nevertheless pulled through the worst and most discouraging year on record, and will find on their balance sheet a fair dividend, while the old-fashioned farmer finds nothing to his credit, and a disposition to find fault.

Too much rain early in the season, followed by late spring frosts, and this, with a hot dry summer, greatly reduced most crops.

Hay was a short crop, but of fine quality; rye, a full crop, the best in years past; potatoes about 60%, and small sweet potatoes, a fair crop and plentiful, the increased acreage making the price of both about the same. Strawberries, with the increase of acreage, is not a paying crop, while the other small fruit was during

the season a failure, owing to the extreme heat drying them on the bushes.

While there was only about 70% of a crop of cranberries, there were nearly 70% more berries than in former years, making the price very low, according to the prices of other produce.

Corn was a fair crop owing to the fine fall weather, giving it a chance to ripen, and with the extra acreage making up the yield.

Apples, peaches and pears where not sprayed properly were a failure, with the sprayed fruit bringing high prices. While grain feed is high, pork has reached 12½ cents a pound wholesale. Poultry has ruled high; eggs, 39 and 42 cents per dozen. Butter, 28 and 30 cents per pound.

Dairying is not followed by those living in the remote parts of the county from railroads. Fattening calves in summer and butter making in winter seems to be their hobby.

There is little or no sickness among animals as yet reported, as they went in winter quarters looking fine, in spite of the short pasture. Provender is high to those that have to buy it, causing many to sell their surplus stock in preference to wintering them, and while we have many things and reasons to complain of, yet we feel that the Lord out of his bountiful love has meted out to us more than we deserve. While there has been a scarcity of water in some parts of the State, Ocean county is supplied with several large streams, with lots of small tributaries, furnishing the most healthful water in the State, and situated so that the scarcity is not felt to any great extent.

Winter grain looks promising for the next crop, and fall sowed grass looks fine, with a little extra acreage sowed.

The game laws seem to be inadequate, as the more law the less game. We want a law to protect the landowner, and he will protect the game. As it is now there is too much red tape business, and those who would protect the game see no actual benefit in so doing.

R. C. GRAHAM,
Secretary.

PASSAIC COUNTY.

OFFICERS FOR 1910.

President, D. F. DUNCAN,.....Paterson, R. F. D. No. 1
Vice-President, IRA MITCHELL.....Paterson, R. F. D. No. 1
Secretary, AARON LAAUWE,.....Paterson, R. F. D. No. 1
Treasurer, F. T. TORBET,.....Paterson, R. F. D. No. 1

Passaic county Board has held three meetings during the year, two being business meetings, and one was in the form of an Institute in connection with the Wayne Township Grange Fair, at which meeting we brought out a great many farmers, who listened with much attention to the speakers. Professor K. C. Davis spoke on "Alfalfa." The many questions asked the Professor proved that the farmers were interested in that great plant. Mr. C. C. Hulsart spoke on practical farm management.

Passaic county farmers have not had a very prosperous year, the severe drought cut the crops very badly, especially hay and grain; early potatoes not being over one-quarter crop; prices, too, were very low.

Dairying has about held its own. The price of feed is about the same as last year. The price of milk has slightly increased over last year, selling at the door for 4½ and 4¾ cents per quart, reailing in Paterson from 7 to 9 cents.

AARON LAAUWE,
Secretary.

SALEM COUNTY.

OFFICERS FOR 1910.

President, JOHN G. BORTON, ...Woodstown
Vice-President, ...
Secretary, GEORGIE A. DUELL, ...Woodstown
Treasurer, JOEL BORTON, ...Woodstown

Our society has held three meetings during the year 1909, which were well attended, much better than a few years ago. Farmers seem to be awakening to their interests.

Not many farmers in the county have been successful in growing alfalfa, but more experiments are being made, and it is to be hoped that in the near future there may be greater success. Farmers are sowing a little of the alfalfa seed with the other grass seed, hoping in this way to get the ground properly inoculated.

At the April meeting a committee was appointed to take measures for the forming of a Farmers' Exchange, which resulted in the organization of the South Jersey Farmers' Exchange. This has in the first year done a business of over $500,000, being a great saving for the farmer. They sold over 1,000 car loads of white potatoes, besides car loads of other produce. They have delivered over sixty car loads of seed potatoes, and have a very large order for fertilizers. Of course they have met with great opposition from outside buyers, but as new members are constantly joining, it is thought the year 1910 will far exceed that of 1909.

The dry weather has been a great hindrance to the successful maturing of the crops for the year, the dairyman especially feeling this. Many farms are yet without water, and farmers are either obliged to drive their stock to water or haul great quantities. Many wells in the towns are dry also.

Notwithstanding this great drawback, the year has been a fairly prosperous one, and so great has been the freight traffic that there is talk of the W. J. R. R. extending their line from Pennsgrove to Salem to make greater facilities for handling the freight.

GEORGIE A. DUELL,
Secretary.

SOMERSET COUNTY.

OFFICERS FOR 1910.

President, LOUIS H. SCHENCK, ... Neshanic Station
Vice-President, JOHN GROENDYKE, ... Finderne
Secretary and Treasurer, ARTHUR D. SUTPHIN ..... Somerville

This Board has held three meetings during the year. The annual meeting December 19. No special speaker being present, the President gave an enthusiastic annual address, followed by a general discussion, after which officers for 1909 were elected.

On April 24th a regular meeting was held in the new and beautiful Court House. Dr. William H. Merrell read a paper on "The Care of Dirt Roads." Charles S. Hamilton delivered a very interesting address of education value on the subject, "The Improvement of Stock," being applicable to the improvement of the human race. Dr. E. B. Voorhees gave an address upon his chosen subject, "The Contribution of Science to Agriculture."

These addresses were all interesting and instructive, and were listened to with pleasure and profit by an audience of one hundred and fifty persons, mostly farmers.

At the third meeting, held in the Court House on October 16th, we were favored with an excellent address by Secretary Dye on the subject, "Agricultural Knowledge, Its Acquisition and Application." It is to be regretted that on account of public sales and other meetings at the same time, this meeting was slimly attended, as under favorable conditions Secretary Dye always draws a good audience, and his address at this time was worthy of a full house.

Notwithstanding the severe drought the farmers of Somerset have been favored with fair farm crops, higher prices have obtained, and a better feeling seems to exist among the farmers. We hear less complaint from them, and the impression that they are not being pushed to the wall seems to predominate.

Why our farmers do not take advantage of the opportunity to plant more fruit trees seems to be the question, as the San José scale is slowly disappearing, and fruit is very high. Good money can be obtained in apples, peaches and cherries.

William J. Logan, Esq., a valued member of this Board, has a cherry orchard of about five acres, from which he received this year from the sale of the cherries an income of more than six hundred dollars, and raised besides two tons of hay to the acre, worth $18.00 per ton; thus making an income of $156.00 per acre. This was accomplished with practically little work.

He gives the soil a good coat of barnyard manure every year.

This Board was organized January 15, 1892, and we believe the association has proved very profitable to many farmers.

ARTHUR P. SUTPHIN, *Secretary.*

SUSSEX COUNTY.

OFFICERS FOR 1910.

President, GEO. P. MCDANOLDS, ...Branchville, R. F. D. No. 2
Vice-President, T. C. ROE, ...Augusta
Secretary and Treasurer, GEO. A. DICKERSON, ...Beemerville

The season of 1909 was not on the average a very favorable one for Sussex county farmers. Although the ground was in condition to begin working early and some oats and potatoes were planted very early for our section, the cold, wet weather which followed and continued nearly through May, proved a serious drawback to those crops already planted and prevented a great deal of work being done in proper season.

Grass did not start well; the result of the late drought of 1908 and the crop was not up to its usual standard.

Oats was a poor crop owing to rust in the early part of their growing season, followed by very warm and dry weather, the straw was very short, and grain light.

Winter grains were good.

Corn and buckwheat variable, some reporting good yields of both, and others very poor.

Fruit growing is again receiving considerable attention in some parts of this county and where spraying is done to prevent the ravages of the scale and the trees are otherwise well cared for they are returning as good, if not better, results than they did in the '90's when nearly every farm had a peach orchard. Besides peaches, apples are receiving more attention than in previous years, those who set them with peaches twenty years ago are well repaid this harvest and find it a profitable one too.

One may find occasionally a farmer who takes great interest in strawberries and reports good profitable results.

Poultry raising goes on as usual, some engaging in it quite extensively, others not so much, but where one stops, another begins, and so this branch is kept up at about an even thing from year to year, though I think more farmers are getting pure

bred, or at least a much higher grade of stock than a few years ago.

A great many are now trying the open front houses this winter.

What has just been said of poultry is true of dairying and dairy stock, except that there is more uniformity in the stock, nearly all preferring the Holstein cow.

The price of milk has been somewhat above the average during the past year, but so have feeds, so there has not been much money made by farmers in the milk business unless it is those who have a silo, and thus provide themselves with a first-class feed which lowers the cost of production.

Dairy stock sells from $45 to $90 per head for grades.

Horses are also high priced and more colts are being raised every year and preference is now being given to stallions of heavier breeds and types instead of the trotting stock, which our farmers have found by experience does not produce their ideal.

Hogs and sheep are not very plentiful on our farms, but hogs especially have been very high priced this last year.

GEORGE A. DICKERSON,
Secretary.

UNION COUNTY.

OFFICERS FOR 1910.

President, E. R. COLLINS, ... Westfield
Vice-President, G. E. LUDLOW, ... Cranford
Secretary, C. H. BREWER, ... Rahway
Treasurer, OGDEN WOODRUFF, ... Elizabeth

The annual meeting was held December 2d. Eleven regular meetings were held at the Board rooms in Elizabeth, and one Institute meeting, held January 21st, in Westfield. The average attendance was larger than ever before, being thirty-three, and eleven new members were received during the season. Some of the topics discussed at the meeting were "The Milk Question,"

"School Garden," and "Has the Farmer Any Rights the Public Is Bound to Respect?" The Institute, held under the auspices of the Board in Westfield, was one of the largest held in the State. The list of speakers included the best talent in the State, upon the subjects taken up, and in the evening session Drs. Smith and Gaskell illustrated their talks with stereopticon views, showing insects, trees, forests and woodlands to a great advantage in carrying out the principal thoughts and facts in the great work being done in the destruction of insects and preservation of forests. The entire season was unfavorable to the growth of most crops, and in no case have maximum crops been obtained. Peaches and grapes were fine throughout the county. Apples, small and poor crop, owing to drought. Pears, an entire failure. Small fruits did not have favorable weather conditions, and only about half crops were realized, the early part of season being cold and wet, followed by severe drought, lasting until late in autumn. Early-planted corn yielded well, as it had obtained a good start before drought set in; later plantings did not yield much. The potato crop was again an entire failure throughout the county, and many farmers are becoming disgusted with trying to grow this crop. Fertilizers were not of much benefit, there not being moisture enough to make it soluble for the use of the plants. Tomatoes were a good crop, but prices averaged low. Frost held off until late in the season, giving late truck crops plenty of time to mature, but owing to exceptionally dry weather yields were light, and much late cabbage failed to make marketable heads.

In the matter of protection from thieves and stealing of crops, which from all reports is getting to be very common in the county, the President appointed a legislative committee to go into this matter with others interested.

C. H. BREWER,
Secretary.

WARREN COUNTY.

OFFICERS FOR 1910.

President, JAMES I. COOK, ...Mt. Hermon
Vice-President, NICODEMUS WARNE, ...Broadway
Secretary and Treasurer, CHARLES M. OBERLY, ...Phillipsburg

The Board held four meetings the past year.

At the June meeting held at Stewartsville, June 2d, after the routine business of the morning session, President Cook stated that during the afternoon session in order to make our meetings more popular and to receive expression from all parts of the county, the following subjects would be discussed:

The Improving of Our Public Highways and Keeping Them in Repair.

The suggestion of Secretary Dye that County Boards of Agriculture hold summer meetings at the homes on the farms of practical farmers, inspect their crops and methods of farm management.

The advance of dairy feeds of all kinds.

Strawberries and asparagus: Preparing the seed bed and planting.

The short courses at the College Farm was highly recommended for our young men to attend.

The different types of horses and dairy cows were discussed.

This meeting was interesting and instructive.

At the meeting held at Broadway, August 4th, Prof. K. C. Davis, of the College Farm, spoke of the losses on the farm of the fruits and the dairy product, from neglect; said the dairy cow cannot keep up her flow of milk, fighting flies and being on dry pasture. The cow should have green feed through the summer months, especially in drought.

Next meeting was held at Allamuchy, November 17th. Arthur J. Farley, assistant in Horticulture and Soils, spoke on spraying fruit trees and setting young trees and fruits of all kinds, and how to care for them. Also, spraying potatoes for blight

and bugs; one good spraying with the right kind of material was better than a half dozen poor ones.

Our annual meeting was held at Belvidere Court House, February 2d, 1910. Topic discussed—High Price Milk Feeds, Butter Fat, Eggs, Pork, Beef. The President said that a large number of farmers that used to raise pork and beef now have none, being in the dairy business; as the milk is shipped to the city, there is none left for the young pigs—that is one reason why pork is high.

CHARLES M. OBERLY, *Secretary.*

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