

STATE OF NEW JERSEY.

Thirty-third Annual Report

OF THE

State Board of Agriculture

1905

NEW JERSEY STATE LIBRARY

Printed by Order of the Legislature.

To the Hon. Edward C. Stokes, Governor of New Jersey:

SIR—In accordance with the act creating the State Board of Agriculture, adopted April 22nd 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 1905.

FRANKLIN DYE,
Secretary.

Dated Trenton, November 4th 1905.

State Board of Agriculture.

OFFICERS AND EXECUTIVE COMMITTEE FOR 1906.

PRESIDENT.

E. B. VOORHEES.New Brunswick.

VICE PRESIDENT.

JOHN T. COX.Readington.

TREASURER.

WALTER HERITAGESwedesboro.

SECRETARY.

FRANKLYN DYE.Trenton.

H. V. M. DENNIS.Freehold.

GEORGE E. DeCAMPRoseland.

JOHN M. LIPPINCOTT.Moorestown.

STATE CHEMIST.

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

STATE ENTOMOLOGIST.

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

MISS JESSIE V. RUE, STENOGRAPHER OF THE BOARD.

BOARD OF DIRECTORS.

New Jersey State Board of Agriculture.

1906.

Term of office, one year, dating from January 1st, 1906, to December 31st, 1906, for all except County Board Directors.

CLASS. A.

EMMOR ROBERTS	Geological Survey.
CYRUS B. CRANE.....	} Board of Visitors, Agricultural College.
JOHN E. DARNELL.....	
E. B. VOORHEES.	
	} Director of Experiment Station.
	} Professor of Agriculture.

CLASS B.

GEORGE W. F. GAUNT.....	Master of State Grange, P. of H.
HENRY F. BODINE.	Secretary of State Grange, P. of H.

CLASS C.

ALBERT T. REPP.....	} State Horticultural Society.
F. J. TOMLINSON.....	
D. F. DUNCAN.....	Bergen County Pomona Grange.
TYLEE B. ENGLE.....	Burlington County Pomona Grange.
E. L. BOLLIS.....	Cumberland County Pomona Grange.
AUSTIN E. HEDDEN.....	Centre District Pomona Grange
ASA MOORE.....	Gloucester County Pomona Grange.
DAVID H. AGANS.....	Hunterdon County Pomona Grange.
GEORGE E. WEART.....	Mercer County Pomona Grange.
CLARENCE M. WILEY.....	Salem County Pomona Grange.
SAMUEL T. BOWMAN.....	Warren County Pomona Grange.

BOARD OF DIRECTORS.

BOARD OF DIRECTORS.

NAME.	ADDRESS.	TERM.	COUNTY.
L. H. PARKHURST.....	Hammonton.....	2 years...	Atlantic.
JOSEPH BUTTERHOF.....	Egg Harbor City.....	1 year...	"
A. G. SMITH.....	Wyckoff.....	2 years...	Bergen.
MALCOLM H. ANGELL....	Etna.....	1 year...	"
JOHN C. DUDLEY.....	Moorestown.....	2 years...	Burlington
SAMUEL S. FORT.....	Wrightstown.....	1 year...	"
SAMUEL S. BATTON.....	Blackwood.....	2 years...	Camden.
CHARLES BARTON.....	Marlton.....	1 year...	"
DR. E. H. PHILLIPS....	Cape May City.....	2 years...	Cape May.
RALPH H. SCHELLENGER..	Green Creek.....	1 year...	"
ARTHUR SEABROOK.....	Bridgeton.....	2 years...	Cumberland.
W. S. BONHAM.....	Shiloh.....	1 year...	"
JOSEPH B. WARD.....	Lyons Farm.....	2 years...	Essex.
M. W. DECAMP.....	Roseland.....	1 year...	"
JOHN WOLFERTH.....	Clarksboro.....	2 years...	Gloucester.
ALEXANDER P. OWEN....	Mickleton.....	1 year...	"
W. H. OPIE.....	Readington.....	2 years...	Hunterdon.
E. M. HEATH.....	Locktown.....	1 year...	"
SAMUEL B. KETCHAM....	Pennington.....	2 years...	Mercer.
JOHN M. DALRYMPLE....	Hopewell.....	1 year...	"
B. DEWITT GILES.....	New Market.....	2 years...	Middlesex.
R. F. P. VON MINDEN....	New Market.....	1 year...	"
WM. M. MOREAU.....	Freehold.....	2 years...	Monmouth.
DANIEL JONES.....	Freehold.....	1 year...	"
GEORGE E. FELCH.....	Florham Park.....	2 years...	Morris.
W. B. LINDSLEY.....	New Vernon.....	1 year...	"
C. MILTON ROKER.....	Cassville.....	2 years...	Ocean.
CHARLES R. GRAHAM....	Red Valley.....	1 year...	"
EDWIN L. BORTON.....	Woodstown.....	2 years...	Salem.
LEVI S. PRICKETT.....	Woodstown.....	1 year...	"
HUBERT T. PHILLIPS....	Plainfield.....	2 years...	Somerset.
JOHN GROENDYKE.....	Finderne.....	1 year...	"
ROBERT V. ARMSTRONG...	Papakating.....	2 years...	Sussex.
GEO. P. McDANOLDS....	Branchville.....	1 year...	"
GIDEON E. LUDLOW.....	Cranford.....	2 years...	Union.
F. E. WOODRUFF.....	Cranford.....	1 year...	"
CHARLES M. OBERLY....	Shimers.....	2 years...	Warren.
JAMES I. COOK.....	Mount Hermon.....	1 year...	"

OTHER ASSOCIATIONS.

BERT T. EVANS.....	Mt. Laurel Farmers' Club.
W. CASE.....	N. J. Bee Keepers' Ass'n.
IDER.....	American Cranberry Growers' Ass'n.
V. POPE.....	Veterinary Medical Ass'n.

PROCEEDINGS OF THE
THIRTY-THIRD ANNUAL MEETING

OF THE

New Jersey State Board of Agriculture

HELD AT THE STATE HOUSE
TRENTON NEW JERSEY

Wednesday, Thursday and Friday
January 17, 18 and 19, 1906

STATE BOARD OF AGRICULTURE.

Thirty-Third Annual Meeting.

FIRST DAY, WEDNESDAY, JANUARY

The President, Dr. Edward B. Voorhees, called to order, and at his request, the Rev. Mr. Tomlinson

DR. VOORHEES: Ladies and Gentlemen, it is a great pleasure that I welcome the delegates to this meeting. It is with deep regret that I am obliged to inform our very efficient Secretary is confined to his room by fever, probably acquired in his work for the Board. I am sure that you will join with me in the sympathy for him and tend to his wife, and the hope that we have for his recovery. Mr. Dye has asked Mr. Ketchum to take the place of Secretary here as it is possible for him to do. So I will ask Mr. Ketchum to call the roll of delegates as the first order of business. The roll being called a very full representation of delegates was found to be present.

DR. VOORHEES: The order of business is presented by the programme, which was prepared by the Executive Committee for this meeting, and it is necessary that this order or some other order be adopted.

On motion of Mr. George Gillingham the order of business as printed was adopted.

STATE BOARD OF AGRICULTURE.

ORDER OF BUSINESS.

WEDNESDAY.

10:30 A. M.—12:30 P. M.

Prayer

Calling Roll of Delegates. It is hoped every delegate will be present.

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 the Executive Committee's Report.

Report of State Grange.

GEORGE W. F. GAUNT, W. M.

Report of Treasurer.

WALTER HERITAGE.

Report of Secretary of State Board.

Discussion of Report.

Introduction of Other Business.

SECOND SESSION.

2:00—5:00 P. M.

Report of Commission on Tuberculosis in Animals.

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.

Annual Address of President.

DR. EDWARD B. VOORHEES.

Discussion of Address.

3:30 P. M.

"The Elements of Success."

By PROF. H. A. SURFACE, Economic Zoologist, Pennsylvania State Board of Agriculture.

4:00 P. M.

"Natural Physics in Relation to the Laws and Nature of Lightning."

By PROF. WEST DODD, Des Moines, Iowa. Illustrated by clouds and lightning flashes.

Introduction of New Business.

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THIRD SESSION.

7:15 P. M.

"Purpose and Work of the New Jersey State Forestry Commission."

By DR. HENRY B. KUMMEL, State Geologist.

8:15 P. M.

"A Year's Experience With Insects and Insecticides."

By DR. JOHN B. SMITH, State Entomologist.

THURSDAY.

FOURTH SESSION.

9:30 A. M.—12:30 P. M.

Prayer.

Unfinished and New Business.

10:30 A. M.

"The Cow as a Country Home-Maker."

By PROF. G. M. GOWELL, Agricultural Experiment Station,
Orono, Maine.

11:30 A. M.

"The Common Diseases of the Dairy Cow; How Can the Farmer.
Best Prevent Them and How Treat Them?"

By DR. C. D. SMEAD, Logan, New York.

Introduction of New Business.

FIFTH SESSION.

HON. E. C. STOKES, Presiding.

2:00—5:00 P. M.

Address by the Governor.

"Agricultural Education."

By DR. LIBERTY H. BAILEY, Dean Cornell University,
Ithaca, New York.

4:00 P. M.

"The Farmer as a Citizen."

By JESSE H. HOLMES, Swarthmore, Pa.

Introduction of New Business.

SIXTH SESSION.

8:00 P. M. Sharp.

"Birds and Insects."

By PROF. H. A. SURFACE, Economic Zoologist, HASSIS-
BURG, Pa.

NOTE.—This lecture will be delivered in the Auditorium of the State Normal School and will be richly illustrated with colored stereopticon slides.

STATE BOARD OF AGRICULTURE.

FRIDAY.

SEVENTH SESSION.

9:30 A. M.—12:30 P. M.

Unfinished Business.

10:30 A. M.

"Some Poultry Questions."

By PROF. G. M. GOWELL.

Optional Questions for Discussion.

12:00 M.

Closing the Business of the Board.

Mr. Emmor Roberts moved that the reading of the minutes of the Thirty-Second Annual Meeting be dispensed with, which motion Mr. Ketcham supplemented by adding that the minutes be approved as printed.

The amendment being accepted, the motion was seconded and carried.

The President then announced the following Committees appointed by him:

Committee on Credentials—J. B. Ward, Essex; E. L. Borton, Salem; Charles Barton, Camden.

Committee on Resolutions—A. J. Rider, Atlantic; C. B. Crane, Essex; W. M. Moreau, Monmouth.

Committee on Officers' Reports—W. S. Bonham, Cumberland; James I. Cook, Warren; Asa Moore, Gloucester.

Committee on Entertainment of Delegates—John T. Cox, Hunterdon; George W. F. Gaunt, Gloucester.

Vice President J. T. Cox then read the report of the executive committee, which is as follows:

Report of the Executive Committee.

The Executive Committee held six meetings during the year. The first meeting was held at Trenton, January 24th, 1905. The President and the Secretary were appointed a committee to visit the Committee having the Grout Bill in charge and to urge its passage.

The resolution in favor of Parcels Post was endorsed by the Committee and referred to the President and Secretary for action.

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Our Legislative Committee was instructed to co-operate with any proper legislation looking to the regulation of the speed of automobiles with reference to the safety of other travel on our public roads.

It was also decided to ask for an increase of two thousand dollars to the present appropriation, also increasing the amount for clerical assistance four hundred dollars.

The third week of January 1906 was selected as the time for the next Annual Meeting.

A meeting for the purposes of federation of all agricultural organizations in our State was suggested and the President was authorized to call such meeting.

The second meeting was held May 5th last. The President and Secretary reported upon their visit to Congress. The time of adjournment of Congress was too near at hand to accomplish anything.

The details, of a course, of Farmers' Institutes was referred to the Secretary with power. Representatives were appointed to attend the Pennsylvania State Normal Institute.

Third meeting was held June 19th, 1905 at the home of the President. This meeting was called to consider the advisability of having a summer meeting of the Board at the College Farm, so that the farmers might become better acquainted with the work being done.

Fourth meeting, September 19th, 1905 at which meeting the appropriations to the various County Boards were made, also to the State Horticultural Society.

The fifth meeting was held October 27th, 1905. The Secretary called attention to the forthcoming meeting of the National Grange at Atlantic City in November. The Committee expressed their willingness to co-operate with the State Grange in securing a display of agricultural products, &c.

A committee was appointed to attend meeting of American Association of Farmers' Institute Workers.

Mr. H. H. Brehme was re-appointed for two months for special orchard inspection. Mr. E. L. Dickerson, Augusta E. Meske and Prof. Smith were appointed for the next fiscal year.

Sixth meeting held January 16, 1906, when the programme for this Annual Session was adopted.

Reports were considered and the necessary committees appointed. The Committee adopted a resolution of sympathy and directed the President to forward the same to Mrs. Dye in reference to the illness of Secretary Dye.

The President reported that, at the last session of the Legislature, the following laws were passed affecting the interest of the Board of Agriculture, the Experiment Station and the Agricultural College:

First, an amendment to the act establishing the State Board of Agriculture providing for an increase in its appropriation from six to eight thousand dollars.

Second, an act providing for the establishment of short courses in scientific and practical agriculture in the State Agricultural College.

Third, an act to amend an act providing for scholarships at the State Agricultural College; and fourth, to provide methods for destroying mosquito breeding areas.

The President desires to report also the extreme courtesy which these various measures received at the hands of the Governor, the officers of the Senate and House and all committees before whom the members of the Executive Committee had to appear. There was an evident desire on the part of all legislators and officers to assist in the proper promotion of legislation for the benefit and upbuilding of the agriculture of the State in its various departments; the State Board of Agriculture, the State Agricultural College and State Experiment Station.

On motion the report was adopted as read as a part of the annual report. The report of the State Grange was then presented by George W. F. Gaunt, W. M. (See report and list of Granges following.) On motion the report was received and adopted.

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The report of the treasurer was then read by Walter Heritage, the treasurer. On motion the report was referred to the Committee on Treasurer's Accounts.

REPORT OF WALTER HERITAGE, TREASURER, FOR THE FISCAL YEAR ENDING OCTOBER 31, 1905.

Dr.

Total amount received from Comptroller during the year..... \$4,195.70

Cr.

1905		
January 14.	By Delegates' expenses to Annual Meeting.	\$392.15
	Speakers and expenses.....	270.75
	Executive Committee and Speakers'	
	bill at Trenton House.....	51.50
	Stenographer's bill at Annual Meeting.	87.60
	Janitor and lantern service.	40.00
	Appropriations to County Boards of Agri-	
	culture.	630.00
	Appropriation to State Horticultural	
	Society.	300.00
	Express Company's bills.	182.46
	Packing Annual Reports.	10.00
	Postage stamps and postal cards.	166.74
	Executive Committee's expenses.	226.35
	Expenses of Farmers' Institutes.	1,838.15
		\$4,195.70

In the absence of the Secretary, his annual report was read by Mr. Ketcham.

THE PRESIDENT: While it is usual and entirely proper to discuss this report, I think that such discussion as may be made now ought not to be regarded as final, and it is for this reason that the Committee on Officers' Reports was established, to whom reports are to be referred for more careful study and report to the Board. The report is now before you for admission. (See report and discussion following.)

On motion of Mr. Darnell, the report of the Secretary was received and referred to the Committee on Officers' Reports.

There being no new business presented, the meeting then adjourned until 2 P. M.

FIRST DAY—AFTERNOON SESSION.

Called to order by the President.

Mr. Ketcham then read the report of the Commission on Tuberculosis in Animals. In the absence of Mr. Charles Howell Cook, the treasurer of the Commission, Mr. Ketcham read a statement of the receipts and expenses also.

On motion, the reports were received and incorporated as part of the proceedings of the Board. (See report.)

The Committee on Credentials being called, the chairman stated that the committee had no report to make at this time.

A committee, consisting of one member from each county duly represented, to nominate officers for the ensuing year was then named. The Secretary called upon each county to present a name as a member of this committee. It is as follows:

Atlantic County.	Joseph Butterhof
Bergen County.	M. H. Angell
Burlington County.	George L. Gillingham
Camden County.	Charles D. Barton
Cape May County.	Dr. E. H. Phillips
Cumberland County.	Winfield S. Bonham
Essex County.	Dr. J. B. Ward
Gloucester County.	A. T. Owen
Hunterdon County.	David H. Agens
Mercer County.	S. B. Ketcham
Middlesex County.	DeWitt Giles
Monmouth County.	Daniel Jones
Morris County.	William E. James
Ocean County.	(No Response)
Salem County.	Levi S. Prickett
Somerset County.	A. P. Sutphin
Sussex County.	(No Response)
Union County.	G. E. Ludlow
Warren County.	J. I. Cook

PRESIDENT VOORHEES: This committee to nominate the officers has now been appointed subject to the call of the chairman, the gentleman from Atlantic county. Mr. Butterhof will please call this committee together at his convenience for the

THIRTY-THIRD ANNUAL MEETING.

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purpose of consultation and the presentation of the list of officers to serve the Board for the ensuing year.

(Mr. Butterhof called a meeting of the committee immediately after the adjournment of the afternoon session.)

The President, Dr. Edward B. Voorhees, then delivered his annual address.

VICE PRESIDENT COX: Are there any points touched upon in the address of our President that you wish at this time to discuss?

After the discussion the address was referred to the Committee on Officers' Reports. (See address and discussion following.)

THE PRESIDENT: In the absence of Professor Surface, whose name appears next on our programme, I have the pleasure of introducing for the next speaker Professor West Dodd, of Des Moines, Iowa, whose subject will be "Natural Physics in Relation to the Laws and Nature of Lightning."

(Professor Dodd then delivered his address. See address.)

The Board then adjourned until 7:15 P. M.

THIRD SESSION—(Wednesday Evening.)

The Board was called to order at 7:15 by President Voorhees when the "Purpose and Work of the New Jersey State Forestry Commission" was presented by Dr. Henry B. Kummel, State Geologist. (See paper.)

On motion of Mr. Ketcham the paper of Dr. Kummel was received and a vote of thanks extended to him. Motion carried.

A paper giving "A Year's Experience With Insects and Insecticides" was then read by Dr. John B. Smith, State Entomologist. (See paper.)

The meeting then adjourned until January 18, at 9 A. M.

STATE BOARD OF AGRICULTURE.

THURSDAY, JANUARY 18, 1906.

MORNING SESSION.

The meeting was opened with prayer by the Rev. H. B. Mac-Cauley, D. D., pastor of the Fourth Presbyterian Church of Trenton.

Vice President Cox then introduced the following resolution:

Resolved, That we regret the absence of our Secretary at this meeting because of illness, and hereby express a hope for his speedy recovery.

Resolved, That we extend to Mrs. Dye our sympathy in this, her hour of anxiety.

Resolved, That our President be requested to communicate the action of this Board to Mrs. Dye at the earliest practicable moment.

On motion, the resolution was adopted as read.

MR. PANCOAST: I have some resolutions that I wish to present. I could not discharge my conscientious duty to myself, and what I believe to be to the State, if I neglected to bring before this Board questions which I believe are vitally important to the agriculturists of the State, and to the State as a whole.

(Mr. Pancoast then read the resolutions, five in number, and they were referred to the Committee on Resolutions.)

Mr. Barton, of the Camden County Board of Agriculture, introduced a resolution, which was also referred to the Committee on Resolutions.

Mr. Emmor Roberts also introduced a resolution, which took a like course.

On motion of Mr. Case, a vote of thanks was tendered to Professor Dodd for his most excellent and illuminating lecture of yesterday.

Mr. Owens introduced a resolution concerning toll roads, which was referred to the Committee on Resolutions.

Dr. Ward introduced a resolution concerning the Adams' Bill, urging its passage.

The resolution was referred to the Committee on Resolutions.

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The Committee on Nominations, through its chairman, Mr. Butterhof, then submitted the following report.

The Nominating Committee all met and proposed the following for officers of the State Board for the ensuing year :

President.....Prof. E. B. Voorhees

Vice President.....John T. Cox

Secretary.....Franklin Dye

Treasurer.....Walter Heritage

Executive Committee: H. V. M. Dennis, George E. DeCamp, John M. Lippincott.

State Chemist: Prof. E. B. Voorhees.

State Entomologist: Prof. John B. Smith.

MR. BUTTERHOF: All these officers are voted for for one year, except in the case of the Secretary, his term is five years. The Committee instructed me to state that in the case of the Secretary the nomination was made by acclamation.

MR. DENISE: I move that the report of the Committee be received and adopted. Motion seconded.

THE PRESIDENT: Inasmuch as I am an interested party, I will ask Mr. Ketcham to put the motion.

Mr. Ketcham then put the motion and declared it carried. The adoption of the report of the nominating committee carries with it the election of the officers. While upon the floor, with the President's permission, which I know he will cheerfully grant, I will say that only about ten minutes ago I had a telephone message from Mrs. Dye stating that the doctor had just been there on his visit and found that our Secretary was doing exceedingly well; fully as well and even better than we expected. So that everything now, unless something unforeseen should set in, looks favorable to his recovery, and we hope that he will recover. He is very weak, but yet everything is encouraging. (Applause.)

PRESIDENT VOORHEES: I presume my modesty should not forbid me congratulating the Board upon the very excellent board of officers that they have just elected. (Laughter and

applause.) And I think I voice the sentiment of the members of the Executive Committee and other officers, when I say that we fully appreciate the honor that has been conferred upon us from time to time, and that we have a high sense of our responsibility and duty, and that we propose to do our full share of the work of this Board in the promotion of its interests, and the best interests of the farmers of the State of New Jersey. Personally, I thank you very much, and if the other members that have been elected with me, desire to express themselves, now is their opportunity.

Vice President Cox being called for, he said: "I fully appreciate this compliment paid me at the hands of this Board. As I look around upon these familiar faces, I recognize that here I meet my friends, and I appreciate the honor. I accept the office to which you have elected me, and promise you a faithful performance of the duties pertaining to that office to the best of my ability. I don't wish to occupy the time of the Board any further. The President has fully expressed my sentiments.

MR. WALTER HERITAGE: Mr. President and members of the State Board, our President has expressed my views, but nevertheless, I thank you for the confidence that you have placed in me in re-electing me to this important position as Treasurer of the State Board of Agriculture. And I assure you that it will be my aim in the future, as it has been in the past, to keep the books correctly, and they will be at your disposal at any time.

MR. DENISE: I think our member from Monmouth is brimful, and would like to say something.

THE PRESIDENT: We will hear from Mr. Dennis.

MR. DENNIS: You have called upon to me to make a speech, and that is one of the things I can't do. I have no reputation in our community as a talker. My reputation is that of a worker, and when our farmers wish a delegate to represent them and to work, they send me, and when they want someone to talk they send Friend Denise. (Applause and laughter.)

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I am sensible of this honor conferred, and I would like to do something for the people, and if you come down to Monmouth, I will do the best I can to show you how to grow potatoes; or, when you make your will, if you appoint me your executor, I promise you I will distribute all that is left of it, after I get done with it, among your dear ones; and I will also say that I will do my duty as a member of the Executive Committee according to my lights in my small way.

MR. DE CAMP: Mr. President and gentlemen of the Board, I thank you sincerely for this election. Last year when I went on the Board I was put on to help get some laws through. I am not so much of a farmer, although I live in a farming section; but they said I was a kind of a politician and could help them with the laws. I want to say to you that Brother Heritage and I were made a special committee, and we aided in securing every law that you asked for, and I did my duty so far as I know in that regard. We have one other little matter yet, and that is in regard to the appropriation of \$24,000 to establish a short course in agriculture, and also \$6,000 to pay the professors. The Appropriation Committee didn't give us the money last year, but I think if our Committee pushes the matter, no doubt this year we will get the appropriation. Next fall the Executive Committee propose to have a summer meeting of the Board at the farm. It has been talked of for a long time, and the only thing I want to impress upon you people is, when this college is started send boys enough there so that it is not a failure. That is the only argument used against our law, that the farmers would not support it if established. So I hope you will get the money and have the college in running order by next November or December, and then I want the farmers of New Jersey to fill that college up. If you want to establish a short course in agriculture you have got to do it. If the college has not enough scholars, I doubt whether we will get the appropriation. So it lays with you this coming year to make your calculations and save a little money to send the boy for a short course in agriculture. If we should have a summer meeting at the Experiment Station, not at the

expense of the State but at the expense of ourselves, you will then have a chance to go and see the farm and learn more about the good will and intention of the Board in regard to the establishment of this short course of agriculture. I thank you.

MR. LIPPINCOTT: I am not a speech-maker, but I can assure you that the sentiment expressed by your honored President of his appreciation of the confidence bestowed upon us in our re-appointment for the coming year, is fully appreciated by me; but we need your support in every way you can give it to us, and any suggestions which you may make as a farmer will be carefully considered and such action taken as the Board's best judgment shall dictate.

THE PRESIDENT: I believe Mr. Ketcham has a word for Mr. Dye.

MR. KETCHAM: I will not attempt to make any statement myself in behalf of Mr. Dye or to respond in his place, but simply say this, that Mrs. Dye was informed of the action of the Committee which it took last evening, and which was unanimous. I didn't suppose that she would tell him last night, but with the consent of the nurse, and believing it would be for his good, she informed me a few minutes ago that she asked him if he would like to have some news, and he told her yes, if it was good news. She then told him what the action of the Committee was, that they had unanimously and by acclamation agreed to present his name to the Board, which, of course, under those conditions, meant his re-election. He simply said, "Thank God! I would like to take each member of the Committee and each member of the Board by the hand." (Applause.)

On motion the President appointed Mr. Charles Collins and Mr. David D. Denise a committee to arrange with the Governor as to his presence with the Board in the afternoon.

The President then introduced Prof. G. M. Gowell, Professor of Animal Industry of the University of Maine, who addressed the Board on "The Cow as a Country Home Maker."

See address and discussion following.

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Dr. C. D. Smead was then introduced and spoke on "The Common Diseases of the Dairy Cow."

Vice President Cox presiding: We have all been delighted with this address, and if there are any questions anybody wishes to submit, this is the proper time to do so.

(See address and discussion following.)

A vote of thanks was extended to Professor Gowell and Dr. Smead for the very able papers submitted by them.

The motion was adopted by a rising vote.

Mr. Fitz-Randolph offered a resolution to appoint a committee of the State Board of Agriculture to confer with any other body in order to procure legislation regulating the use of automobiles. Referred to the Committee on Resolutions.

Board then took recess until two o'clock.

Thursday afternoon session called to order by the President, who said: We have the honor this afternoon of having our Chief Executive with us and I take great pleasure in introducing him to the members and friends of the State Board of Agriculture,—the Honorable E. C. Stokes, Governor of New Jersey. Applause. (See address.)

At the close of his address the Governor, acting as chairman, said: Not having been present with the State Board of Agriculture long enough to be familiar with my duties, I will have to obtain some instructions. I understand Dr. Bailey is not here, and that Professor H. A. Surface who was to have delivered an address yesterday, but was not here, will speak to us now on "The Needs of the Farmer." (See address.)

At the close of Prof. Surface's address, President Voorhees introduced Dr. Liberty H. Bailey, Dean of Cornell University who addressed the Board on "Agricultural Education." (See address and discussion following.)

At the conclusion of the discussion following Dr. Bailey's address, President Voorhees introduced Prof. Jesse H. Holmes, Swarthmore, Pa., who spoke on "The Farmer as a Citizen." (See address.)

MR. KETCHAM: I had intended before the Governor left to move that we extend to him a rising vote of thanks. He left in the middle of an address and we were unable to do it at that time. I now move that we extend to the Governor our thanks for his kindly interest by his presence this afternoon, and by his most excellent words of sympathy showing that he is in harmony with us; and that the President of the Board be requested to send to him our thanks.

Motion seconded and adopted by a rising vote.

Mr. Lippincott then submitted the following report on Treasurer's Accounts:

The Committee on Treasurer's Account report that they have examined all the accounts of the Treasurer, have compared them with his vouchers, and find them correct.

H. V. M. DENNIS,
JOHN M. LIPPINCOTT,
F. E. WOODRUFF.

On motion the report was received and adopted.

Mr. Owens submitted resolutions referring to the enactment of a parcel post law, favoring the increase of the powers of the Interstate Commerce Commission and other matters, which on motion were referred to the Committee on Resolutions.

Mr. Fort introduced a resolution which was also on motion referred to the Committee on Resolutions.

The Board then adjourned until 8 P. M.

THURSDAY EVENING. The session of Thursday evening was held in the Auditorium of the State Normal School, by arrangement with Dr. James M. Green, Principal.

The meeting was called to order at 8:00 o'clock by Vice President Cox who introduced as the speaker of the evening, Prof. H. A. Surface, Economic Zoologist, Harrisburg, Pa.

The subject of the lecture was "Birds and Insects." It was richly illustrated with stereopticon slides and was both instructive and entertaining.

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THIRD DAY—FIRST SESSION.

The meeting was opened by prayer by Rev. Dr. Wight.

The Committee on Officers' Reports made the following report, which was read by Mr. Bonham:

The Committee on Officers' Reports submit the following: We heartily endorse the suggestions contained in the Secretary's able report which was read and discussed, and would recommend that the Legislative Committee prepare a bill and present it to the Legislature, and procure its passage if possible, for making the law requiring the cleaning of milk cans, or other vessels by the consignee before returning the same, effective. (See Chap. 204—Laws of 1904, as noted by Secretary Dye.) We also commend to your careful perusal the scholarly address of our honored President, which will be published in the journal of proceedings. Upon examining the report of the Executive Committee we recommend the resolutions endorsed by the same, asking for a Parcels Post, the regulating of the speed of Automobiles, and an appropriation from the State with which to advance the cause of Agriculture in New Jersey. All of which is respectfully submitted.

W. S. BONHAM,

WM. M. MOREAU,

ASA MOORE.

Committee.

The report was adopted as part of the minutes.

MR. RIDER: The chairman of the Committee on Resolutions then made the following report:

Your Committee has had a somewhat arduous duty to perform and we apologize on account of the ineffective work we have done, on account of the number of resolutions and the limited time in which we had to examine them.

The following resolution is reported favorably:

WHEREAS, It is a fact that large quantities of Seeds spurious as to quality and purity are annually sold throughout the State, thereby occasioning a severe loss to the farmers of this State, therefore be it

RESOLVED, That the Farmers of Camden County assembled in meeting at the Institute at Blackwood, instruct our delegates to the State Board of Agriculture to call the attention of the State Board of Agriculture to the grievance above mentioned and ask that its influence be used to remedy the evil complained of.

BLACKWOOD, Dec. 8th, 1905.

Camden Co., N. J.

Attest: DANIEL W. HORNER,
Secretary Camden County Board of Agriculture.

The report of the Committee was adopted.

The following resolution is reported favorably:

The New Jersey State Board of Agriculture recognizes the value of Experiment Stations in the development of agricultural science and in the improvement of farm practice, therefore be it

RESOLVED, That this Board endorses the bill introduced in the present Congress by the Hon. H. C. Adams, of Winconsin, providing for an increase in the annual appropriations to said Stations, and that the Secretary of this Board send a copy of this resolution to the Representatives in Congress asking their support of the measure.

The resolution was adopted.

The next is a series of resolutions. I will read them altogether, they have been acted on by the National Grange.

RESOLVED, That this State Board of Agriculture is in favor of the enactment of the Parcels Post law.

RESOLVED, That we favor a law increasing the powers of the Interstate Commerce Commission.

RESOLVED, That we favor the removal of the revenue tax on denatured alcohol.

RESOLVED, That the President and Secretary of this State Board be requested to bring this action to the knowledge of our Senators and Representatives in Congress.

On motion the resolutions were adopted.

The Committee favorably report on the following resolution:

RESOLVED, That a committee be appointed to represent the State Board of Agriculture to confer with any other body or organization with a view to procuring proper legislation at this session of the Legislature, regulating the use of automobiles and other motor vehicles on the highways, and that this committee prepare a bill, if that course is necessary.

SPENCER WEART, Jersey City.

J. BLANCHARD EDGAR, Rahway.

ELWOOD I. SAVAGE, Rahway.

On motion the report was concurred in and the resolution adopted, after which the President appointed the following as the committee: Charles Collins, Moorestown; George E. DeCamp, Roseland; Charles D. Barton, Marlton; J. Blanchard Edgar, Rahway.

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The next resolution is as follows, by Mr. Pancoast:

As the Governor has recommended legislation which will permit all parties by a majority vote to nominate their candidate for the United State Senate, since such nomination would probably secure the election of the choice of a majority of the party in power, and would prevent the scandals so often surrounding the election of United States Senators, and the use of influences so corrupting to our legislators.

RESOLVED, That in the interest of clean government we request legislation in harmony with the Governor's suggestion.

RESOLVED, That these resolutions be forwarded to the Governor and the presiding officers of each legislative chamber.

The Committee have recommended a substitute for this resolution in the following words:

WHEREAS, The present method of electing United States Senators, for various reasons, has become unsatisfactory, therefore,

RESOLVED, That the State Board of Agriculture recommends that the people of our State select as their State Senators and Assemblymen only such candidates as will pledge themselves to vote for such men only for United States Senators as agree to support an amendment to the Constitution giving the people the right to vote directly for United States Senators.

Moved that the report of the Committee be concurred in and the resolution substituted by the Committee be adopted.

MR. PANCOAST: I do not know that I clearly understand this resolution, is it that instead of recommending action in harmony with the Governor's suggestion that it relegates the subject to an amendment of the Constitution and prevents direct action by the people until the Constitution is so amended as to allow a direct vote for United States Senator?

MR. RIDER: That is just what will be necessary to make the resolution practicable. It is necessary before United States Senators can be elected by the people that the Constitution be changed. We attain our object by selecting members of our Legislature who are pledged to vote for such men for United States Senators as will agree to vote for that amendment to the Constitution, in that way we expect to reach the result desired.

MR. PANCOAST: That is the way I understand it. The Governor's recommendation will act far more quickly and secure the result desired sooner than the proposed amendment to the Constitution, because his proposition is that the majority of each party recommend to the Legislature a man whom they want elected as United States Senator, and that can be put in effect without any amendment to the Constitution, and there is no question but what the leaders of the parties and the caucuses of the parties would obey the instructions of the majority of that party, as to the men whom they would nominate and elect as United States Senator, and I strongly object to the amendment. If you want the people of each party to say who shall be your United States Senator you will secure that far more quickly by adopting the Governor's suggestion than by adopting the proposed amendment and wait until the United States Constitution is amended.

MR. RIDER: I only wish to say that we believe the sentiment of the Agricultural community is that they want the privilege of voting direct for United States Senators. The Governor's suggestion does not give that and this is in the line of what we desire.

MR. CRANE: So long as the United States Senate is standing like a stone wall against this project, it is not likely that they will listen to anything but the voice of the people direct. We have no security that either of the political parties, while they talk about this thing, would recommend it, but if the action is taken directly by the people and they secure pledges from the candidates, it seems to me it will succeed. I think it will be the most effective way to carry it out.

The question was then put to vote and the substitute declared carried.

The next resolution is:

BE IT RESOLVED, That the New Jersey State Board of Agriculture is in favor of the enactment of a law providing for the abolition of all toll roads within the State.

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MR. RIDER: The Committee think that it will be impracticable to dissolve the charters of toll roads that are in operation and recommends this as a substitute:

RESOLVED, that the New Jersey State Board of Agriculture is in favor of the enactment of a law providing for the gradual abolition of all toll roads within the State.

On motion the report of the Committee was concurred in and the substitute adopted.

We report the following resolution by Mr. Pancoast favorably:

WHEREAS, Governor Stokes, in his recent message to the Legislature, recommends important, radical and far-reaching reforms, in the interests of the common people, and opposed to the financial profits of wealthy individuals and great corporations, which so frequently influence and control executive and legislative action,

WHEREAS, Such independence and devotion to the public welfare should not escape comment;

RESOLVED, That the New Jersey State Board of Agriculture, without distinction of party, cordially approves of all the reforms urged by the Governor, and pledges its support to the essentials of such beneficent and patriotic measures, and especially do we urge legislation to secure just and equal taxation and elections free from bribery.

RESOLVED, That the Secretary be instructed to forward a copy of these resolutions to the Governor and to the President of the Senate and Speaker of the House.

The report of the Committee was concurred in and the resolution adopted.

Mr. Pancoast then offered a resolution in regard to taxation and interest as affecting the borrower of money adversely.

The following action was taken:

MR. RIDER: The Committee are of the opinion that these resolutions on the tax question have been covered by other resolutions and they report these unfavorably.

Moved and seconded that the report of the Committee be concurred in.

After remarks by Mr. Pancoast the motion was put to vote and the report of the Committee was adopted.

The following also by Mr. Pancoast:

RESOLVED, That the Executive Committee be instructed to incorporate, if possible, in its reports, all resolutions presented and its action thereon, unless the Board otherwise directs.

MR. RIDER: The Committee report unfavorably on this resolution. There is a committee that determines what matter shall go in the Annual Report of this Board of which the Governor is a member, and we could hardly interfere with the prerogative of the Governor.

Moved and seconded that the report be received and concurred in.

After remarks in favor by Mr. Pancoast and Mr. Cook and in opposition by Mr. Von Minden, Mr. Ketcham and Mr. Rider, the question was put on the motion to adopt the Committee's report, which motion was carried.

The Committee reported favorably the following resolution. By Mr. Pancoast:

WHEREAS, Discussion in the agricultural press and in farmers' gatherings, abound in technical scientific terms, and for clear comprehension, require some knowledge of the sciences underlying agriculture;

RESOLVED, That the State Board of Agriculture demands that the elementary principles of agriculture be taught in our rural schools, and that graduates of our State Normal School be equipped to teach them;

RESOLVED, That we heartily approve of the efforts of the State Board of Education to secure the desired result.

On motion the report of the committee was concurred in and the resolution adopted.

Mr. Pancoast offered a resolution expressing a desire that Congress shall relieve farmers from such provisions of the Contract Labor Law as forbid them hiring laborers in Europe and paying for their passage to this country; and recommending the Secretary of our State Board to establish such relations between our farmers and individuals or companies interested in the welfare of immigrants as will facilitate their distribution in rural communities to their own, as well as to our farmers' benefit and prosperity.

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MR. RIDER: Your committee, in considering this resolution, concluded that it would make us look impracticable to ask Congress to make an exception in favor of the farmers in the Contract Labor Law. We could not make an exception in favor of one class as against all other classes. The committee, therefore, offer as a substitute the following:

"RESOLVED, That we recommend that the Secretary of this State Board of Agriculture be requested to establish such relations between our farmers and those interested in the welfare of immigrants as will facilitate their distribution among the agricultural communities of our State."

Moved that the report of the committee be concurred in and the substitute adopted. Carried.

Mr Roberts offered the following:

"Resolved by this New Jersey State Board of Agriculture, That all laws and parts of laws now on the statute books of this State for the protection of game and for sporting purposes be denounced and endeavors be made to secure their repeal.

The Committee reported this resolution without recommendation.

After discussion pro and con, the motion to adopt the resolution was then put to a vote and declared lost.

Mr. D. H. Agans then introduced the following resolution, which was adopted without reference.

RESOLVED, That the President of this Board be requested to appoint a committee from the Executive Committee to confer with the State Board of Education in reference to the introduction of nature studies in the rural schools of our State.

The motion, being seconded, was on motion adopted.

Prof. G. M. Gowell was then introduced and spoke on the Poultry question. See address and discussion following.

MR. KETCHAM: A number of the delegates I think would like to leave before the adjournment, and I desire to report as to

Secretary Dye's condition. It was my privilege to see him this morning and I am glad to say that he is doing as well as could be expected, and everything now looks encouraging for his recovery. (Applause.)

MR. FORT: Gentlemen we have listened to a discussion on this poultry question with a very great deal of interest. They tell us how to produce almost everything which is produced on the farm, but none tell us how to sell the products for a fair price. That is one of the most important things on the farm. I expect you all know that milk is produced in large quantities for sale, but you don't know how you are going to get a paying price for it. That has been a great problem, and some years ago we were selling milk on an average of $3\frac{1}{4}$ cents per quart. That was the wholesale price for it, freight deducted it was $2\frac{3}{4}$ cents per quart, which everybody knows is too small. We had a little organization formed in Philadelphia and raised the price to 4c and we have for the last 4 years sold our milk for 4c and I am going to read you an article that came out in the Mount Holly paper. The owner of this paper was a graduate of Princeton College, never does any work on the farm. He lives eight miles from the farm and he likes people to know something about his farm. The following is the article:

Following is the number of quarts of milk shipped from Indian Hill farm last year: January, 8,378; February, 7,818; March, 9,343; April, 8,982; May 10,173; June, 10,382; July, 8,951; August, 8,814; September, 8,875; October, 8,313; November, 6,840; December, 8,224, total, 105,093 quarts. The milk was produced from 45 cows, high-grade Guernseys and the feed purchased off the farm cost less than \$10 a head. Out of 24 dairies shipped to the same dealer this milk tested the highest per centage of butter fat. Last year the product was 89,136 quarts.

I have made the calculation, and he has received three-quarters of a cent more than what he received before we organized this last year. He produced 105,693 quarts of milk, and I tell you what he made. I will read the whole calculation.

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MILK REPORT.

Indian Hill Farm at Upper Springfield.

Product for year 1905.....	105,093 qts. milk
" 4 cts. per qt.	\$4,203.72
" 3 $\frac{1}{4}$ cts. per qt.	3,413.76
Difference.....	789.96
Paying 6 per cent. on.	13,165.50
180 acres in farm.....	73.14

That is, we advanced the price of the farm product so that you get an increased value for your farm. He paid \$81.00 an acre for that farm about ten years ago, and if he has \$789.00 from our organization, he paid too much for it then or else it is worth more than \$81.00 per acre to-day. If it was cheap at \$81.00 per acre, it is worth more than \$100.00 per acre now.

Here is another farm, 200 acres. Sale of milk for 1905, \$5,000. Had he sold it for 3 $\frac{3}{4}$ cents a quart, which was the price the year before we organized, he would have \$937.50 less than he received last year. Here are the figures:

GIBB'S FARM.

Sales of milk for 1905.....	\$5,000.00
" 3-16 of.	937.50
6 per cent interest on.....	15,625.00
200 acres in Farm.....	
Advance in farm value.....	78.12 $\frac{1}{2}$

That is what that organization has done. We organized a few years ago in Camden. We have an Executive Committee that meets in Philadelphia, and we set the prices once a year, and they stand by us, and that is the way we regulate it. You people in Northern New Jersey should organize, and you want to organize on every road leading into New York. The milk sold in New York last year amounted to about Forty million dollars, and the farmers received only Thirteen million, and they should have been entitled to one-half of that Forty million. One-half of that belongs to the producer, and, therefore, you have been beaten out of seven million dollars. Why don't the farmers organize and get together, and unite and break up this milk ex-

change business in New York? They sit in some office in some tall building and fix the price of milk, and rule you with a rod of iron. You have no recognition and no say, and you have been selling milk within forty miles of New York for $2\frac{1}{4}$ cents, which is a starvation price. Why don't you come out and unite and set these people at defiance? Protect your business and don't let every man stand alone. Throw your strength together. We have shipped milk the last four years to Philadelphia, and they received over three million dollars over what they would have received, and that divided among 60,000 cows, we have paid for every cow whose milk is shipped to Philadelphia, in the last four years, \$54.00 a head, that is what the farmers have received from our organization.

This is a true statement of figures, and they won't lie. That is what you can do by organization. Organize by all means, you people in Northern Jersey, you have just as much right to get 4 cents a quart. Mr. Cook, who was here, told me at the meeting at Atlantic City, how they had treated their milk man, their dealer, in New York; had a milk receiving station at the railroad. He would not pay them the price, he was going to tramp them under foot and treat them like animals, but they organized and held a meeting only a few weeks ago, and they demanded recognition, that they should have half the New York retail price for that milk, and no contract is a contract unless there are two parties. What did they do? He was receiving 74 cans at that receiving station, and the next morning after they made their organization he got 16, and the next day he got down to 11, and three or four mornings after he had $4\frac{1}{2}$, and he abused them, and he would not pay and settle up, and they put their Sheriff on him and compelled him to sell out, and they cleaned him out of business and drove him out. They can't do business without your milk, and if you demand your rights you will get them. I talk fast and to the point, and that is all I have to say. (Applause.)

A DELEGATE: My friend seems to think we are entitled to one-half.

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MR. FORT: I said farmers are entitled to at least one-half.

A DELEGATE: I think we are entitled to more. We know in the West they sell it for five cents. Mr. Fort seems to be satisfied, and I am not. I think we should get more than 4 cents per quart for our milk.

PRESIDENT VOORHEES: I think the milkmen are entitled to just as much as they can get. This is a very important matter, and I think as Mr. Fort says, organization will accomplish a great deal. We have evidence right in our community of the relative income received by the men who buy our milk and the men who produce it. The man with a \$25.00 horse and a very common sort of wagon and some old cans, can buy a couple of cans of milk and get more return for it than the man who has \$25,000 invested in a farm, beside the wear and tear and labor of producing it. (Applause).

I know that because right at the entrance of the college farm, there is a man who buys his milk, pays for it when he can, and when he can't he don't, and yet that man gets more net money out of his business than we can get out of our business carrying 40 to 50 head of cattle, besides all the anxiety and wear and trouble of producing the milk. He has no anxiety, if he don't want to pay for it he don't.

MR. FORT: For the information of you people, this last year we have had a suit, and those high fellows who are on the pinnacle of the business, too rich to be sued, were sued. The price was $4\frac{1}{2}$, the price set by our Milk Association, and we have a system that as soon as we set the price the notices are put up in all the receiving stations in and around Philadelphia and Camden. There is the notice. These men receive this milk and know the price is $4\frac{1}{2}$. They took the milk and at the end of the month would not pay but 4 cents for it. These farmers were determined to have their money, and our Association said we would stand by them, and we sued them, and one of the rich dealers declared he would not pay it, and last year they would not hold a confer-

ence with us until we withdrew those suits. We had two meetings and they would not make a deal, and we stood firm and told them there was no contract unless there were two parties. He said they had never made a contract with these farmers, and we took it into court and the Magistrate charged the jury that whenever these notices are put up at the receiving stations, notifying the dealers what the price is, and they take the milk away and use it, they must pay the price, because that is the price, and we got the judgment, and they came up and settled the bill.

MR. PANCOAST: I think my fellow-member of the Executive Committee is a little wrong. I want things to go out straight. The judge charged the jury that if they believed $4\frac{1}{2}$ cents was the market price, then those men were entitled to collect it, but it didn't depend upon our posting those notices.

DR. THOMPSON: I farm in the summer time and live in winter in Trenton. I have to pay 8 cents for my milk in Trenton, and I sell it on the farm for $2\frac{1}{2}$. I don't think that is fair.

ADJOURNED.

Annual Address of the President.

DR. EDWARD B. VOORHEES.

A generation has passed away since this Board was established. It has probably been the most prolific in invention and in great achievements in science and art of any generation in the World's history. In invention, the generation has witnessed a wonderful advance—the introduction of the telephone and the trolley car, are but two examples of the most important factors in the development of business and in social progress, though, on the whole, in no line has there been greater genuine progress than in the application of invention and of scientific discovery to farm practice; machinery has supplanted human labor in a remarkable degree, and science rather than empiricism is now in whole, or in part, the basis of farm practice. What is true in this direction in a general way is true in particular of New Jersey, one of the earliest settled States of the Union, and although the settlers were of many nationalities, Dutch, English, Scotch, Swedes, Norwegians, Welsh, Irish and Germans all came to cultivate the soil; and there is no doubt but that the successful development of the farming areas of the State, and even present progress, are due to the fact that the original purpose of these settlers was to farm; they were not as a rule tenants—they owned their farms and were, therefore, more directly interested in their development. They recognized, too, the value of their location, which has had in the past, and must have in even a greater degree in the future, an important bearing upon farm values. As a text for this address upon farm progress present and future in the State, I quote the following from the first report:—

"The value of its farm lands is greater, by the acre, than any other in the United States. The mixed industry of its people, together with the nearness of the great markets of New York and Philadelphia, cause the products of the soil to bring larger returns than in any of its sister States. Its climate is mild, salubrious and invigorating. There is still a wide field for increased productions and profits, and the never-ceasing demands of our markets are a constant stimulus to greater efforts to supply them."

These statements might be written today, and express quite as truly the advantages of our location. Our opportunities in this direction have not been neglected; great progress has been made, though to those who desire to farm in New Jersey, the conditions are even more encouraging than they were a generation ago. There have been many changes witnessed in this generation, and chief among those which have had a depressing effect, has been the necessity for a readjustment of farm values. This affected all farmers, and was most disastrous for those who during and immediately after the Civil War purchased lands at inflated values, and placed mortgages upon them. These lands, on the readjustment of values, consequent upon the adoption of the gold standard, would not bring the amount of the mortgage. This readjustment has now been largely effected, and the values now prevailing in our good farming districts are such as to enable anyone with energy and industry, not only to make a good living, according to present standards, but to educate his family and secure a reasonable competence. Again, while the statements then made do in a way depict clearly the conditions which exist at the present time, there have been many changes, perhaps not all for the better, though towards, if not in all cases a more profitable, at least a more logical utilization of our location and resources than in 1873. The farmers of the State, as in all other Eastern States at that time were pursuing what may be termed "general farming." That is, the farmer then depended entirely upon the resources of his soil for the production of his crops. The

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soil was to him a mine from which he drew from year to year the constituents needed, and his prosperity was proportionate to the amount of fertility his crops could gather. It came to pass therefore, that about the time this Board was established, the lighter soils, due to the continuous withdrawal of plant-food, were unable to furnish sufficient food to meet the requirements of profitable crops of the cereals and grasses, the crops that were then more generally grown; not altogether because of the lower yields, but because these products of partially impoverished soils were then brought into competition with those of the rich prairies of the West. The result was that in many of the States the farms were sold or abandoned, and the new and richer lands of the West were sought. Not so, however, in New Jersey—the farmers were not only wedded to their homes, but they recognized the value of their location, and also realized that although their farms were becoming poorer through continuous cropping, that with imported fertility and change in methods of practice, the old time prosperity would return. This spirit is responsible for the standing of the New Jersey farmer of to-day, whose values of farm lands and of annual products are greater per acre than any other in the United States. They were among the earliest to recognize the importance of special manures, commercial fertilizers and other amendments which would not only help to restore, but to enlarge the former productivity of their soils, and also enable them to specialize in the growing of those crops in greatest demand in their nearby markets. These crops were well adapted to their lighter soils, and could, moreover, be more easily controlled in both their yield and quality by the special fertilizers then becoming available, than under old conditions.

This special farming, while engaged in as early and even earlier than 1872, has been mainly developed in the generation that has since then passed. Market gardening and fruit growing, as such, were followed in many places, but in a limited way as compared with the present. In fact, our asparagus and our sweet potato industries, and our growing of melons, early truck, early tomatoes, early sweet potatoes, etc., were not then so specialized

as at present, the growing of blackberries, strawberries and cranberries as specific money crops, was then only a possibility; while our greenhouse industries and our special dairy interests, catering to high-class trade, were unknown. These are now so specialized as to make each line distinct in itself, and the farmer engaged in it a specialist in his work. The value of special lines of work, notwithstanding certain unfavorable conditions as pointed out in my address last year, has been encouraged by the larger and the more specific demands of consumers. This specialized farming has necessarily required special knowledge and special practice on the part of those engaged in it, since, as already pointed out, the general farmer may trust more to natural conditions of soil, climate and season, while the specialists must, so far as possible, control soil conditions.

The progress made in these special lines of farming have been due mainly to discoveries and investigations which have resulted in providing a supply of materials containing the essential elements of plant food in forms which can be readily utilized, as well as in supplying facts concerning their proper use. For, while it is a fact that yard manures and natural soil amendments could meet the total requirements and were of great service, they could not be secured in sufficient amounts, nor would they have met the specific requirements in order to fully develop these various lines. The date of the establishment of this Board marked the real beginning in the use of commercial fertilizers. Scientific investigations mainly in England and Germany, begun in the middle of the nineteenth century, had demonstrated both the need of artificial plant-food, and the foundation principles of their use at an earlier period, but the real significance of this work in a practical way, was just beginning to be recognized in this country in the early seventies. I do not wish it understood, however, that no artificial plant-food was used previous to that time, as Peruvian guano, dried fish, ground bone and lime had been used for a much longer time, but the principles involved in their use were not clearly understood, and the amounts applied were relatively very small.

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"A generation ago, the elements of progress amongst our farming population were decidedly feeble; until within a few years of that time farmers had depended entirely upon barnyard and stable manures for enriching their land and growing large crops. To a few, the magic word 'guano,' meant a wonderful growth of crops under the stimulus of the bird dung brought from the rainless islands of the South Western Pacific, but even these few were scarcely aware of the magic power that lay hidden under the dust of the parched and desert plains of Peru, of Chili and of Bolivia, in the little white crystals of nitrate of soda; to these few even, the vast possibilities had not been revealed of the plant-food stores concealed in the phosphate-bearing fossil rock of our Southern States, in the Canadian apatite, in the phosphatic slags of the Bessemer furnaces, even these few, had scarcely dreamed of the wealth of potash, the remains of an ancient sea hidden under the streets of Stassfurt. These materials were welcome enough to those whose lands had become impoverished by constant cropping, but it required years to teach them the advantages of commercial fertilizers. This is abundantly evident from the records of this Board, in the Annual Report for 1874, the year in which the law regulating the manufacture and sale of commercial fertilizers was enacted, but 10 samples of commercial fertilizers were reported and classified as follows: Two of fish guano (a product used by the Indians before the landing of the Pilgrims); 2 of natural guano, (1 a nitrogenous and the other a phosphatic material); 2 of superphosphate; 1 plain superphosphate; 1 dissolved bone; 1 a bone meal; and 1 a muriate of potash—these represented the output of seven manufacturers and dealers. In the Report of 1875, it was stated that there was not less than \$300,000 worth of high-priced commercial fertilizers used in New Jersey every year, though competent judges put the estimate at double that sum. The prices then fixed for the constituents were 22 cents per pound for ammonia; 11.5, for soluble phosphoric acid; 10, for reverted phosphoric acid; 5, for insoluble phosphoric acid; 5.5, for potash, which would make the value of the ordinary general fertilizer carry-

ing "2 — 8 — 2," cost \$30.80 per ton. It would seem, therefore, that about 10,000 tons were used in the State at that time, consisting chiefly of guanos, bones, hair and dissolved and plain superphosphates.

As an illustration of the fact that commercial fertilizers were used in an extremely cautious way, the following is quoted from a report on the subject made to this Board in 1875, by a County Agricultural Society:

"Nearly all the prominent brands are used in the county; Peruvian guano is most popular for wheat; ground bone is fast growing in favor with all classes of farmers for corn, as it is a more permanent improver of the soil, showing its effects in the wheat and other crops following, especially in grass. . . . Our farmers derive most benefit from guano by applying from one hundred to two hundred pounds upon an acre, sowed on a light dressing of manure. In this way, one hundred pounds, with fifteen loads of yard manure, will give better results than twenty-five loads of cow manure alone per acre. The best results on a given outlay for manure, will be obtained by using two or more kinds together, as guano and phosphate, or guano and bone, or guano and manure, marl and manure, &c. . . . We have proved by careful experiment, that it is highly advantageous to use guano and bone together. A lot of clover sod, exactly alike in condition, was marked off in three plots. The first plot was dressed with bone, the second with guano, and the third with guano and bone mixed (one part of guano to two parts of bone), and the same value of dressing, \$9.00 per acre, was given to each plot. The plot dressed with bone started more slowly, and did not make as much stalk as that which received the guano, but there was only a half bushel difference in the yield—shelled corn—the guano being the best. There must have been considerable bone left in the soil for future crops. This will make it the cheapest fertilizer of the two. The plot dressed with guano and bone mixed, produced thirteen bushels of shelled corn more than the second plot, upon which the guano alone was applied. These results

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showed that the greatest advantage was in using these fertilizers together."

It is evident from this report, that commercial fertilizers were in these days handled very gingerly, besides, from the statements made, and conclusions drawn, it is very clear that the functions of the three essential plant-food constituents, as well as the conditions affecting their availability, were not understood. These pioneer experimenters, while groping in the dark, were courageous, and hopeful for better things. They knew that their fair land still possessed possibilities that could some how be developed, and its former prestige maintained. The light that science had revealed, and which had already illumined England and Germany, and which was to spread the world over for the good of mankind, had been sending but feeble rays to this new and far-off country. The light came in due time, and the hope of the courageous few was justified. The farmers of the State to-day, are using more artificial plant-food per acre, and with greater intelligence than is the case with any other State in the Union. The Report of the Experiment Station for 1905, in respect to the use of fertilizers, is in marked contrast of that of this Board in 1875. There were analysed in that year (1905), 420 different samples, representing 96 manufacturers, and 204 samples of home mixtures, especially prepared mixtures, fertilizing materials, ground bone, etc. It has been impossible in recent years to get statistics as to the exact quantities of fertilizers annually used, but it is estimated that at least 75,000 tons of complete fertilizer and about 25,000 tons of raw materials, are now used, at a cost of about \$3,000,000. If the same prices for constituents prevailed now as in 1874, the cost of the fertilizers would have been practically doubled, as the valuations now fixed by the Stations would make the cost of a general fertilizer, containing "2 — 8 — 2", but \$15.10, as compared with \$30.80, in 1873. There has been, therefore, in the generation that has passed, a very large increase in the amount used, and a very marked reduction in the cost of the constituents.

These facts are sufficient evidence that the farmers of this State recognize the importance of artificial plant-food in the development of their special lines of farming, as at least three-fifths of the entire amount purchased is used where special rather than general farming is practiced.

The "special" farmer of to-day knows moreover, that he must be guided not merely by the quantity applied, but also by the different forms and proportions of the different elements, where he is to achieve the best results on soils with varying characteristics, and with crops of the different classes and kinds. The "special" farmer to-day, is not a miner, as the general farmer of a generation ago, who by the simple methods of cultivation and planting was able to withdraw a part of the natural strength of his soil in the form of crops, but rather a manufacturer who, understanding clearly the character and quality of the finished product desired, provides the various raw materials, and uses the soil and natural agencies of temperature and moisture, as a medium by which they may be adjusted and blended into the perfect product. He knows, that while his imported raw materials must consist of products containing nitrogen, phosphoric acid and potash, it is not alone a question of the total constituents, but that the form in which the constituents exist must also be considered. He knows, too, that the changes in the form of the constituent and its consequent availability, or usefulness to the plant, are influenced both by the characteristics of the crop, and by the season of its application. The asparagus grower, for example, after having used his best knowledge in obtaining varieties, in the selection and preparation of his soil, and in the planting of his crop, knows that because of the peculiar characteristics of the growth of this plant in the storing of food, in the necessity for a rapid development early in the season, he must exercise great care in the selection of his plant-food constituents. He knows that he must have an abundance of all of the necessary elements of food, and also that if he is to secure a full crop of high quality, that the kind and form of nitrogen is especially important. It is quite possible for him to apply nitrogen in sufficient quanti-

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ties to grow an abundant crop, and yet not secure an increase in yield, because under the given conditions it is impossible for the plant to appropriate the food and convert it into the product that he desires. The plant has specific characteristics, which require that its nitrogenous food shall be largely in the soluble and available form. The same is true of the grower of early beets, early cabbage, early tomatoes, etc. It is not so much a question of amount as it is a question of the kind of constituent that is applied. Knowledge as to these points has been acquired only in recent years; the very important facts concerning the influence of the kind and form of constituent elements upon rapid development, were not available thirty years ago, and it was, therefore impossible for farmers to profitably specialize their business. This, however, does not apply alone to the specialist in the growing of market garden crops, but applies quite as well to the growers of fruits, grass and grain, though in a less degree from the standpoint of profitable returns.

It does not follow, however, that the larger use of fertilizers is always accompanied by such intelligence as is here indicated. In fact, it is clearly shown by a study of the bulletins of the Experiment Stations, that many farmers now pay exorbitant prices for the plant-food which they secure; fortunately, perhaps, largely by those who buy small quantities for general crops. In other words, it is shown by these reports, that there is a range of over 100 per cent. in the cost of nitrogen, phosphoric acid and potash. There is evidence, too, that the low cost of artificial plant-food, and the ease with which it may be obtained, have encouraged its indiscriminate use, and at the expense of the best utilization of the natural conditions, or the natural sources of supply. The most encouraging feature of this situation, however, is that the farmers themselves are beginning to recognize their mistakes, and desire to correct them. This is abundantly shown by the inquiries received at the Experiment Station, in reference to the use of lime, marl, green manures, cover crops, etc., preparatory to the application of artificials, and is a direct result of the investigations that have been made concerning the natural improve-

ment of soils through these means. It has been clearly shown, that soils in certain localities of this State, which were originally well supplied with plant-food, are now capable of producing full crops of cereal grains and grasses, provided losses are prevented, and their natural qualities are developed by proper treatment; and that the use of artificial manures in these cases are frequently not followed by a large net return, except where such good treatment precedes.

The statement in the first report, that "the never-ceasing demands of our markets are constantly stimulating us to greater efforts to supply them," is in no case so perfectly fulfilled as in the progress that has been made in special lines of dairying. The census reports of 1870 and 1900 furnish important evidence upon this point. According to these, there were in the State in 1870, 133,331 milk cows, which produced 8,304,252 pounds of butter, and 5,373,323 gallons of milk, or a total equivalent to 30,286,079 gallons of milk. In 1900, the number of cows in the State had been increased to 157,407, and the product, 77,714,055, gallons of milk. This would make for 1870 an average of 227 gallons, or about 2,000 pounds per cow, and for 1900, an average of 494 gallons, or 4,347 pounds per cow. In this period, there was an increase of 24,076 cows, in the number of cows, or 18 per cent., and an increase of 2,347 quarts of milk, or 117 per cent. In other words, the efficiency of the average cow was more than doubled during the three decades; 100 cows in 1900 producing as much as 217 in 1870. This does not, however, tell the whole story, for we have in our State today, the largest, best equipped and most progressive dairies in the world, and a considerable proportion of our dairymen are making milk of high quality, for which they receive prices much in excess of the average, a result really marvelous when considered in all its relations, and primarily due to our advance in dairy knowledge.

Our natural conditions, so far as soils are concerned, are no better now than they were in 1870, hence the progress that has been made has been due to the capability of our farmers in taking advantage of our location, and in meeting the demand for high-

grade dairy products. This was made possible, in great part, by our increased knowledge concerning the principles of nutrition, and the opportunities afforded for the securing supplementary feeds, as is abundantly evident from a study of the situation at these two periods. In 1870, the farmers depended largely upon their home-grown crops for the supply of food for their animals; the purchased feeds, aside from the whole grains, were practically entirely derived from wheat bran, buckwheat bran and other residues in the manufacture of flour. It was not possible by the use of these alone to supply the needed nutrients in the proportions necessary for the best results in milk production. At the present time, there is a wide opportunity for selection of materials that will supplement home-grown products, enabling the farmer by judicious purchase, not only to provide properly balanced rations, but to make exchanges of home-grown for concentrated feeds, which will result in an increase rather than a loss of fertility by the sale of milk. These opportunities have been coincident with the progress that has been made mainly in the more complete utilization of the wastes occurring in the manufacture of various products from grain and seed. Until within very recent years, the residues obtained in the manufacture of malt and spiritous liquors from barley and corn, of starch derived from corn, were used in their wet state; later, these together with the wastes obtained in the pressing of oil from flax and cotton seed, were largely exported to Europe, where knowledge of the principles of nutrition was disseminated earlier than here. These exports are still large, but the farmers of this country, and many in this State, do appreciate their value and are using them to their profit. Nevertheless, the tendency as in the case of the fertilizers, has been to purchase feeds, rather than to carefully study how to best utilize their farm resources in the production of those crops, which would best meet the demands of the modern dairy cow, and at the same time conserve the fertility of the farm.

In other words, genuine progress has been made only by those farmers who during the past have made a careful study of their

business who have taken advantage of all that science has revealed, and have applied business methods in their work. There is no doubt in my mind that the success that has come to the farmers in the past few years, particularly those engaged in special lines of work, has been due largely to the fact that they have followed very closely the suggestions that have been made by scientific investigators in reference to the fertilizers that shall be used, the feeds that shall be bought, and the methods of practice that have been shown to be conservative of soil constituents. Those men have been ready to reap the harvest because they have been equipped with all necessary tools. I do not mean to claim that the information alone has been all that is needed, because allied with it, and natural advantages, there must be energy and business ability, but I do claim that with these conditions, the first requirement is a broad intelligence in reference to the underlying principles connected with his business. I feel justified, therefore, in recalling to your minds the importance of the investigations that have been carried out for the benefit of the farmer, and the necessity, if future development shall be in line with advanced thought, that the facts and principles gained by science shall be broadly disseminated amongst the people. The encouraging progress that has been made, is due to comparatively few of the farmers, largely those who have been in close touch with their Experiment Station. The whole lump needs to be leavened. This dissemination of knowledge cannot be fully attained without the work of colleges and schools.

The opinion has been expressed, that the establishment of the Land Grant College of this country, together with those important branches, the Experiment Stations, was one of the most beneficent acts of legislation, ever enacted by this Government. This opinion is concurred in by all who have given the subject careful thought, not only because it has to do primarily with the education and consequent uplifting of the industrial classes, but also because in its best sense it has to do with the development, conservation and use of the Nation's hidden wealth, viz: the elements which constitute its soil, increasing the intelligence and

broadening the views both of the man who directs Nature's energies in the creation of new products, and of him who transforms them into merchantable forms, or transfers them to the consumers.

The Land Grant College is the farmer's college, but it should furnish opportunities for the farmer's boy to secure a training along the lines which shall best suit his inclination, though I believe that those who shall study engineering, or law, or medicine, or other technical or professional pursuits, or shall fit themselves there to be more helpful to their fellowmen in any direction, shall acquire such knowledge of the principles of agricultural science as to enable them to at least understand the relation of this, the primary industry, to the other great industries of the world, and the relation of the latter to the products of the farm, as well as to the progress of the country and the benefit of all the people. This State is an Empire in itself when considered from the standpoint of potential development, and it seems to me, that the responsibility for the development and progress of students who come to its halls, but directly responsible for the agriculture must rest most of all with the college.

I am well aware, that it is the essential duty of an Agricultural College, in common with others, to give proper instruction to its students, yet because the Agricultural College in any State is, or should be, at the fountain-head of the agricultural education, it is not merely directly responsible for the education of the students who come to its halls, but indirectly responsible for the education of the masses engaged in agriculture. It is not sufficient that this work should be touched here and there by the Agricultural College, for the mass of farmers, shall be so instructed as to enable them to take advantage in a practical way of the knowledge now in our possession. The last United States Census showed that there were in the United States, 5,739,657 farms, and about 11,000,000 farmers which with their families constitute nearly three-fifths of our population. The statistics of Land Grant Colleges for 1904, shows that there have been graduated from these Institutions since their organization 57,909 students,

or practically one student for each hundred farms. Had all these students been graduated from the agricultural courses, and had they all engaged in farming, only one per cent. of the farms of the country would have been thus directly influenced by the Agricultural Colleges. The facts are, however, that a very small proportion of this total number of students were graduated from the agricultural courses, and of these a very large proportion were not directly engaged in farming, though interested in allied occupations, as in the manufacture of fertilizers, the management of dairies, or creameries, the editing of newspapers or in teaching. It is a fact, that the number of graduates from the agricultural courses is too small, even now, to make it possible for the various Institutions to secure competent instructors, hence the number of men who have been educated in these Colleges, and who are engaged in farming, is too small to directly affect agricultural practice in the various States. The wonder is, therefore, that any genuine progress has been made at all rather than that greater progress has not been made. Our progress can be accounted for by the wealth of our natural resources, a progress that has been accompanied by woeful waste.

That this would apply to any other industry, which has made proportionately greater progress than has been made in farming, is true in a sense, but it must be remembered that in other industrial lines there are many schools where technical education may be obtained, whereas in the case of the farmer, his only school practically is his Agricultural College, though fortunately there are a few notable exceptions. The only means of education available to him, aside from his Agricultural College, may be found in the various subordinate agencies, such as the Experiment Station, the Farmers' Institutes, the Granges, the press, the various State Boards of Agriculture, and the Agricultural and Horticultural Societies and Farmers' Clubs, and the direct influence of these is really quite limited. The Experiment Stations have been obliged to be educational, and they really are responsible for the advances that have been made. The Farmers' Institutes, which are directly educational in their methods,

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and which secure their teachers largely from the Experiment Station, according to available statistics reaching less than 5 per cent. of those living upon farms, and these attend Institutes because they are already in touch with the Experiment Stations—they do not reach, as a rule, those who are in the greatest need.

I do not desire in any way to belittle the very great service that has been rendered by these organizations, for I appreciate fully their value, but it cannot be claimed even by the broadest interpretation of the term "education". that they have been truly educational factors in the sense that the College or school is, where prescribed studies are required, that are pursued in a logical way. It is impossible to achieve great ends, or to make genuine and general progress in any calling, without having those who are directly interested, so educated and trained in the fundamental principles upon which the industry rests, as to enable them to agree as a unit upon essentials.

It may be said, also, that this education is not selfish in its character, for while it concerns directly the farmer and the farmer's interests, the actual result of the broader dissemination of exact knowledge among the farmers will ultimately redound to the benefit of the entire people engaged in whatever line of industry. This doubtless is true in a degree of all forms of education. Nevertheless, it seems to me, that in this, which is so intimately related to the issues of life, must be considered of relatively greater importance than any other, for it is, in the long run, a pre-requisite either to the material enjoyment, or to the usefulness of man, whatever his education may have been in other directions. This view is based upon the fact, that the capital stock of any country, and, therefore, its present and prospective wealth as well as the means whereby the wealth may be utilized for the uplifting of mankind, lies in the natural resources of that country. "In an agricultural country, these resources are in the soil, and since the value of the soil or its sustained power to produce crops is measured by the content of nitrogen, phosphoric acid and potash, together with the conditions which make them available to plants, it follows that the future progress of that

country is measured by the intelligence with which these constituent elements are used." The wasteful use of these, either in the systems of farm practice adopted, or in the crude transformations that take place in their manufacture and distribution, must reduce the possible value of the resources, and therefore the adequate return in culture or material wealth, which alone permits of those enjoyments accompanying a higher civilization.

Aside from the primary problem of producing crops, and of conserving at the same time the principal elements involved in their growth, we must recognize that the allied problems of labor, transportation, social conditions, political and economic forces, which create so much dissatisfaction and unrest among the farmers, as among others, are the result, in part at least, of the ignorance of the fundamental principles upon which the industry rests. It is a common saying, that farming as a business depends more upon the man than the conditions, and if we will follow up this matter, we shall find that where the individual is successful, he is so because he has either by intuition, or force of character, succeeded in educating himself. He has acquired by his experience and contact with men, those attributes which compel success, which the Agricultural College or School is destined to give. Take the question of labor, which is such an important problem at the present time in our Eastern States, and in the vicinity of large cities in all sections of the country. There can be no good reason, if economic conditions were properly adjusted, why the farming business should not fairly compete in obtaining labor with the manufacturer, whose business it is to prepare for consumption the products which the farmer raises, and yet if the farmer were to pay the same relative rate of wages, and grant to labor the same number of hours that are maintained in the mills, he would not be able to earn living wages for himself, much less secure the profit which the manufacturers demand. John Mitchell, the celebrated labor leader, stated in the public prints a few weeks ago that "labor was the only commodity which permitted the person using it to fix a price for it, and that he proposed in the new arrangements that were to be made,

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that the laborer should fix the price of his labor, just as the manufacturer fixed the price of his manufactured product." This would seem a reasonable demand, yet John Mitchell ignored the fact, that these men, occupying more than five millions of farms, were doing exactly what he claimed was being done only in the case of labor. The farmer seldom fixes the price of his produce, for they are presumably based upon the conditions of demand and supply. If this were actually the case, no legitimate criticism could be made, but the facts are that in too many instances prices are fixed by those possessing superior advantages in the way of capital or intelligence, and without special reference to supply and demand. The producers on these millions of farms should have a share in these adjustments in proportion to their interests, and would be able to exercise a proper and legitimate influence if made familiar with the principles that are involved.

In the matter of transportation, too, it would seem that if economic conditions were properly adjusted, more equitable terms for the distribution of the products of the farm would be provided. Transportation companies depend for their income to a greater degree upon the products of the farm, in both the raw and manufactured state, than upon the products of any other industry. The tonnage of corn, wheat, hay and cotton, greatly exceeds that of iron, coal or oil, yet there are no rebates or cut rates offered the farmers; he is charged all the traffic will bear. One of the chief causes of depression of agriculture in many sections of the country, and especially in our Eastern States, which are within a short distance of our large cities, is the cost of transportation. It is not possible to have perishable products transported in such a way as to enable them to reach the consumer at a cost and in a condition that would allow the producer to compete with products that are raised upon lands located at greater distances from points of consumption. The social conditions existing in many, if not all, farming communities, also need to be improved. The advantages to be derived from education accrue only when the social nature of man is properly provided for. The farmer now is, in many instances, content to

make money on the farm, but is not content with it as a home for his family; in fact, many use it as a means of securing a competence that would enable them to live elsewhere.

All of these problems, which affect both directly and indirectly the true progress of agriculture, and in a sense the stability of our government, can be solved, and will be solved in a satisfactory manner, only when the essential principles which are involved are understood, by the masses engaged in the work.

The Agricultural Colleges must recognize the gravity of these problems, and give their moral support, not only, but should be the leaders in solving them; they must be in close touch with the educational facilities in their States so as to make it possible for the boy on the farm to obtain an elementary knowledge of his business, and likewise of its relation to all the other, in a sense, subordinate industries. The Colleges do, as a rule, recognize their responsibilities in this direction; many States have made provision for the establishment of courses ranging from ten weeks or less, to two years, and open to all citizens, without special qualification for entrance, and adapted to meet the immediate needs of students who return to the farm. The regular four year courses being still maintained for those who desire the broader training which will fit them for wider usefulness as scientists in Experiment Stations, or as teachers of natural science in our schools of higher grade.

These shorter courses in agriculture, notably in Wisconsin, Minnesota, Iowa, Illinois and New York, have supplied the needs in a marked degree, and have been of the greatest service, the number of students seeking admission now taxing the utmost capacity of these Institutions. The result is felt in the notable advance in the character of the farming in the respective States. The need for this kind of work is not local—it is widespread, touching every State in the Union. The progress that has been noted in farming in our State in the past thirty years has been in many ways encouraging, but a careful observer soon learns that it is not because of a widespread development—it is confined to certain areas and not always to those best located or

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capable of the highest development. This progress has been due in no small degree to the educational influences already effective. What progress the next thirty years will witness if to these are added the influence that may be exerted by a real live Agricultural School, which is now made possible by Chapter 55 of the Laws of New Jersey for 1905, it is not possible to predict, yet it is the manifest duty of this Board, representing the agricultural interests of this State, to see to it that the possibilities shall have fruition. That the boys and girls upon these more than 30,000 farms of ours may receive the stimulus that comes from a study and appreciation of Nature's laws, and thus continue to make the State noted, not only for good farming, but for the intelligence and character of its farmers.

MR. CRANE: I feel that this admirable address of our President ought not to go by without some notice by this Board. In a great many respects he has taught us a good lesson in regard to fertilizers. He compares the present time with a number of years ago when we were paying enormous prices for our fertilizers, and those enormous prices were going into the pockets of some of our millionaire fertilizer manufacturers. To-day we have the fertilizer at about half the cost because of the help that the Experiment Station has given us. I know that last winter or two years ago this winter I was persuaded to take the agency of a fertilizer company. I had several tons sent to me for my own use and I was quite well pleased with it. When I came to see the Station bulletin, I found that they were charging me about five to ten dollars a ton more than it was actually worth, and I threw it right away, I would not be an agent for them. Another point the Professor has given us in regard to the use of fertilizer in connection with our own home fertilizer or manures. It is my practice to use both when I can; so in planting corn we used to go to the trouble of manuring every hill. Sometimes that course of manuring was an awful job to get through with, but of late years my practice has been to plow in our own fertilizer and use a chemical fertilizer on top and not put any fertilizer in the hill at all, which I think is very much better, for

often times the fertilizer destroys the seed and ruins the crop, and I found a great benefit in this way of proceeding.

MR. EMMOR ROBERTS: One point that the Professor alluded to that I have often thought about, and it is not very much commented on. It is in reference to the part played by the agricultural schools; schools that were initiated, as it were, and supported by the Government grants to them, for the general public. You may remember that when the United States Government gave a grant of land to each of the several states for the organization of agricultural schools, or for the benefit of agricultural schools, each state applied that money according to its own judgment. New Jersey gave its grant to Rutger's College on certain conditions. I believe that Rutger's College in accepting that grant endeavored to carry out the spirit of its contract with the State faithfully, and I have often thought that we owed a great deal to Rutger's College, in connection with which is our Agricultural Experiment Station, for the manner in which it has executed the trust. It is a good many years ago and I was young then. I remember one incident connected with it. Some of the officers of the college, did me the honor to write me a letter, asking me what I deemed would be the proper course to give a student in agriculture. I answered, giving him exactly the same course they would give any other student, only making it a little broader and a little more general. I don't know that I could make it better now. I believe that the influence growing out of that grant and that Experiment Station, has been as productive to our State, as has any other State's disposition of the grant.

MR. PANCOAST: I wish to call attention not only to the original thought and wisdom contained in the address, but also to its beauty and clearness of expression, and literary finish. I am proud that New Jersey has a professor at the head of the State Board of Agriculture that is capable of writing as well as that. (Applause).

MR. C. B. CRANE: I would like to express the pleasure I have had in listening to this address, and also my experience at the State College. It was my good fortune to listen to a lect-

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ure by Professor Voorhees on agricultural chemistry, and upon the information they received there, it occurred to me it would be well if all young men could attend that. It would give them a peculiar view of life. My point is this, if those who are here, when this matter is fully under way, and the appropriation is received, as we hope it will be, to carry on this work, that the members of this Board should encourage the young men to go to this school. Professor Voorhees spoke of other States where they are already overcrowded, and the danger apparently has been that our State has not appreciated this as other States have, and I think it would be well to encourage young people to go, the benefit derived would undoubtedly be very large.

MR. ISAAC S. CRANE: One word in regard to education. I wrote to Professor Voorhees a year ago to know if I could send my youngest son, a boy of fifteen years, but a man in stature, and a fine looking fellow. I wrote to the professor to know if we could send him to take a short course in agriculture, and the reply I received was, that while the law had gone into effect last winter, they had received no appropriation for this purpose, therefore the school would have to stand off for another year, and I lost the use of the school this winter for my boy. Now, I would advise the farmers here to-day to see that their representatives have this matter in line, and that there is a fair appropriation made this winter for that purpose.

Address by Hon. Edward C. Stokes, Governor.

Members of the State Board of Agriculture: I see by the programme that I am to serve as presiding officer on this occasion. I esteem it no little honor to be even the temporary President of the State Board of Agriculture. My eligibility however to sit among the agriculturists of the State is based more upon desire than upon knowledge. Every man you know turns to the soil in advancing years, and this is particularly true of the politician, who looks forward to the days of political oblivion, and associates those days with the bucolic delights of farm life, and never did the life of a farmer appear more attractive than in these days; for farming is about the only thing in this country that at present does not promise to be the subject of investigation. (Applause and laughter).

The importance of agriculture to the happiness and prosperity of the people needs no elucidation at my hands. The farmer not only furnishes food for those who follow industrial occupations, but he in turn furnishes a large part of the market which their output supplies. His failure is therefore their failure and his success means to them employment and profit.

Farming today is a vastly different occupation from the agriculture of those times when the Shepherds watched their flocks by night, and when fields were cultivated by alternating periods of crops and rest. Chemistry today has taken the place of crop rotation. A successful farmer to-day combines business capacity and education; he farms with the head more than with the hand. In my own section of the State, in what is generally regarded as a barren waste, is an agricultural college. The boys in that school have made that waste, where formerly sand burrs grew with reluctance, blossom like a garden; they farm scientific-

ally; they understand the chemistry of the soil; they know what elements each crop takes out of the soil, and what is necessary to-day to restore the soil to its wonted fertility. During their periods of vacation, they are sought at fair wages as directors and managers in the farms of our own and adjoining States.

Last year the Legislature of this State in recognition of the necessity of educating the man who tills the soil, provided for short courses in scientific agriculture in the State Agricultural College covering instructions on soils, crops, fertilizers, manures, drainage, farm machinery, farm buildings, breeds of live stock and all matters pertaining to general and specific lines of farm practice.

Let us hope that the present Legislature will provide means to make this proposed instruction practical and effective and that the agricultural interests of our State will profit thereby.

Now it is quite a leap from education to taxation and I suppose that the questions of taxation are always tiresome and trite subjects. No one, however, it seems to me is more interested in this matter than the farmer himself. I believe that real estate and farm lands, particularly under our present lax methods of enforcing tax laws, are paying an undue share of the taxes. There is something at fault somewhere. A glance at the increased income of our taxing districts is significant. The last ten years the State has been increasing its returns to taxing districts either in the way of cash or assistance in the payment of local expenses, until last year that return amounted \$2,800,000 a year.

Not a dollar of this money is raised by local tax payers and practically all of it has accrued within the last ten years and yet in that space of time municipal bonded indebtedness and municipal taxes have increased.

We are continuously seeking new sources of revenue. This Legislature will doubtless add to the revenue of the State, and the municipalities, large sums of money from corporate sources. Is it not time that the taxpayers turned their attention, not alone to an increased revenue, but to the query of how that revenue

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shall best be used for their benefit and for the reduction of their tax bills. It seems to me it is one of the unfortunate conditions of to-day that the public interest ceases with the raising of revenue, and is not equally keen in the proper expenditure of the revenue.

Businesslike methods should dominate the expenditure of municipal and State income, and wise policies should be adopted in the methods of raising that income. When a man receives a legacy he is considered unwise if he permits it to be wasted, and does not use it in a way that benefits either himself or his neighbors. Equally important is it that the taxpayers should see that the revenues for their benefit should not be diverted by lax business methods from this fundamental object.

In order that the interest of the taxpayer might be aroused in his own behalf and that he might be charged with the responsibility of participating in the financial management of his township or municipality, the Legislature passed an act giving the people the right to vote upon the tax rate when that tax rate exceeded what the Legislature deemed to be a reasonable rate. I believe in the principle of that act. I think that the old town meetings where the voters assembled and determined the amounts of money to be spent for the year, conduced to good and economical government. I believe that the right of the tax payer in any district of the State to have a voice in fixing the tax rate is not only a matter of right but a matter of supreme importance. Next to life what is more important than property? The power of taxation is the power of confiscation. You can tax property until you have exhausted it. The exercise of that power should, I believe, always be limited by the votes of the people. Moreover public officials should always be willing to render an account to their constituents. When municipal officers have ascertained the amount of the tax rate which they deem necessary for the expenses of government, why should they not be willing to explain to the people the necessity for those expenditures? If the people have a right to vote upon the tax rate, such explanation would always be demanded. This necessary publicity would

conduce to economy and good business methods in conducting municipal affairs. Valuations are made in May, the tax budgets are generally fixed in August. The tax rate is thus easily ascertained. The people should then be allowed to vote upon that question on Primary day or some other convenient season. In a short time interest in financial management would be so keen that better systems of municipal government would result, property that now escapes taxation through hiding would be brought to light, and real estate which I firmly believe is bearing its unfair share of the tax burden, would be accordingly relieved to the advantage of the farmer, the home owner, and the rent payer.

Every day agriculture is growing in importance as a business and as a profession. New Jersey with its adjoining markets of Philadelphia and New York and the rapidly increasing population in this vicinity, offer special advantages to the farmers of this State. Whatever assistance the State can render to aid the agricultural interests of our Commonwealth will rebound to the benefit of all. (Applause,)

Annual Report of the Secretary.

The agricultural interests of New Jersey are in a prosperous condition. Farm values are advancing. The average returns, both in crops and prices for the year 1905 justify the statement that the farmers, with few exceptions, have been liberally rewarded for labor and money expended.

The year 1904 was an exceptionally good year, but 1905 has exceeded it by more than half a million dollars.

The uniformity and duration of good prices for some truck farm and market-garden crops have been quite extraordinary, and farmers whose productions have been mainly of this character have made money.

Farms are being improved, buildings repaired and outstanding financial obligations met; all which gives an encouraging outlook for the coming year. True, there have been local adverse conditions; as, at times, insufficient or too much moisture, late spring frosts, insect depredations, blights and the like. Such hindrances to highest results go with the business. But when they do not prevail over the entire State, nor assail all crops where they do exist, their injurious effects do not reduce to any great extent the total yields.

Furthermore, whatever tardiness nature may have shown in the spring time, she has most generously made up by continuing pleasant weather late into the autumn, thereby coaxing to maturity late planted crops and providing most favorable conditions for the ingathering.

In no other State in the Union is the diversification of crops greater than in New Jersey. This is so for two reasons: First, the demands made upon our farmers, by our summer resort customers especially, are for all truck-farm and market-garden

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crops and small fruits *fresh from the field*. And for milk, cream and eggs untainted by age.

Second, the soils of the State are so varied in their character and adaptation to the needs of a variety of crops that a farmer in New Jersey can engage in any branch of the great agricultural industry best suited to his purpose and purse.

Any one who is willing to work and who will work intelligently any of New Jersey's productive soils, need not suffer for the good things of this life in their season. And a judicious expenditure of labor and capital will be rewarded with a reasonable profit.

While all crops produced in any section of the State can be grown in nearly every other part, certain localities are devoted more especially to certain crops as a *commercial industry*.

The general farm crops, as reported, are below last year in yield, with the exception of wheat and hay, and the price, as made up November 1st is lower also, except for white and sweet potatoes. The former are advancing in price and, when the total crop is marketed, may exceed the total value of 1904.

*The following table gives the November estimate, both of yield and value:

TABLE I.

Crop.	Acres.	Yield.	Production.	Price.	Total Farm Value.
Corn.	274,999	39	*10,724,961	\$0.56	\$6,005,978
Wheat.	104,673	18	p1,884,114	.85	p1,601,496
Rye.	69,967	18	*1,259,406	.58	730,455
Oats.	63,143	32	*2,020,576	.35	707,201
Buckwheat.	13,005	20	*260,100	.50	130,050
Hay.	424,568	1 $\frac{3}{4}$	p583,781	14.00	8,172,934
White Potatoes.	62,876	107	*6,727,732	.65	4,373,025
Sweet Potatoes.	20,588	133	p2,738,204	.70	p1,916,742
					\$23,637,881

*Less than in 1904.

p Greater than in 1904.

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According to the foregoing estimate, the total decrease of the above named crops below last year is \$327,114. On the other hand, the vast truck-farm crops of tomatoes, cantaloupes, water-melons, egg plant, peppers, etc., of which we get no adequate returns, would, if tabulated, more than overcome the above deficit; for, the season of 1905 for those crops has been a record breaker both in yield and price.

If the Twelfth United States Census value of miscellaneous vegetables in New Jersey, which is \$4,914,803 is right for that period it is not in excess, even if it is high enough, for this. Restoring that estimate to its former place in our second table, with the increase in milk production given below, will make the total gross earnings for 1905 exceed that of 1904 by \$1,741,781.

The number of farm animals for the State with their estimated value is given in Table III. The number of dairy cows is there placed at 186,464. Believing that our dairy farmers are producing more milk per cow annually than ever before, we have placed the yield per cow twenty-four quarts per year higher than it was in 1900; viz., 500 gallons or 4,400 pounds per cow, allowing 2.20 pounds to the quart. This makes our annual yield of milk 372,928,000 quarts which, at three and one-half cents totalizes \$13,052,480.

TABLE II.

Clover and Grass Seed.	\$ 2,795
Miscellaneous Vegetables.	4,914,803
Dry Beans and Peas.	6,754
Onions.	105,327
Small Fruits.	1,406,049
Grapes and their product.	81,758
Orchard Fruits, with Cider, Vinegar, etc.	1,594,981
Flowers and Plants.	1,953,290
Seeds.	43,191
Nursery Products.	339,926
Nuts.	20,660
Forest Products.	469,005
Poultry and Eggs.	2,204,120
Wool.	31,266

\$13,273,925

Summing up the valuations, they are as follows:

Number of farms of all areas in New Jersey—34,650.

Average value of farms—\$4,692.

Average acreage of farms—82 acres.

Average value per acre—\$57.23.

Value of Land and Buildings (12th Census).....	\$162,591,010
Implements and Machinery.....	9,330,030
Domestic Animals.....	23,049,677
	\$194,970,717

FARM PRODUCTS 1905.

Cereals, Hay and White and Sweet Potatoes.....	\$23,637,881
Miscellaneous Vegetables and Small Fruits.....	13,273,925
Milk.....	13,052,480
	\$49,964,286

Deducting the interest at five per cent. on the 34,650 farms, at the Twelfth Census valuation, from the \$49,964,286 gives a return for the products named of \$40,935,396, which is equivalent to a gross average earning per farm for the year of \$1,179.00 or \$14.50 per acre, which is an increase over last year.

While the above calculations are for all farms, averaged to one standard of productiveness, there are thousands of farms the earnings of which are greatly in excess of the figures given. Then, too, expenses vary, and each farmer who knows his business knows his per cent. of profit from year to year above taxes, repairs, etc.

The above average per cent. of earnings is highly encouraging even though there are poor farms, poorly farmed, below the average that may receive but little, if any, profit above costs and living expenses.

Animals sold on the hoof and slaughtered for market, such as beeves, veal calves, swine and lambs are not included in the foregoing calculations, as we have no reliable data at hand covering such sales. But the total sum for all crops for the State would crowd the \$60,000,000 mark for 1905.

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In Table III the number and value of farm animals is taken from the February, 1906, Crop Reporter of the United States Department of Agriculture. It is given here for reference.

TABLE III.

Number and Value of Live Stock not including Poultry.

AVERAGE PRICE.

	Number.	Average price per head.	Value.
Horses.....	100,877	\$112.32	\$11,330,486
Mules.....	5,223	120.96	631,773
Milch Cows.....	186,464	40.65	7,579,762
Other Cattle.....	81,191	20.18	1,638,431
Sheep.....	44,644	4.61	205,587
Swine.....	158,537	10.50	1,664,638
			\$23,049,677

In the yield and value per acre of agricultural crops, as compared with other States, New Jersey stands in the front rank, being exceeded by only three States; viz., Massachusetts, Rhode Island and Connecticut.

In this connection, a quotation from the Swedesboro, Gloucester County correspondent of the Philadelphia Ledger for September 24th, 1905, is pertinent:

"Never in the history of agriculture in this section have the farmers had a better season than the present. This is evident everywhere for miles around. The markets have been good and anything in the way of produce found a ready sale at unheard-of prices. This has been the rule all summer.

Sweet potatoes are coming on and excellent prices are being obtained. All the truckers have money this year. Many of them have deposited in the local banks, which are making better showings than at any time in the history of the institutions.

Few persons outside this immediate vicinity have a conception of the amount of produce shipped along this and the Pennsgrove roads, and it would seem to the casual observer that enough truck is grown right here to supply the entire United States. There will be an immense crop of sweet potatoes and the only

difficulty the grower has to contend with is the help to get them out of the ground.

Nearly every farmer has been making or is contemplating improvements on his farm. New machinery, latest sanitary improvements to homes, wind mills and the like are being purchased. Many mortgages have been lifted, and there are several instances where a farm bought last year has been paid for this season from produce alone. Last year was a banner one in the shipments, but this is far ahead and the crops have not all been moved."

In other sections of the State, devoted to mixed husbandry, a record similar to that in Gloucester County has been made.

New Jersey farmers spend more per acre for work done than any other State, except Massachusetts, and that State is only one cent greater per acre. More is spent for plant food, or fertilizers, per acre in New Jersey than in any other State and the wisdom of this is shown in the crop returns.

It is no wonder that people who are looking beneath the surface of the business world are turning their attention to farming lands as an investment. They are beginning to realize what was considered sound financial doctrine in old times; viz., that the land is the safest form of investment. It is so, both as an investment of surplus savings, and for practical purposes. For it is evident to business men that, with intelligent direction, aided by scientific discoveries, farming will pay. With such management, farming lands in New Jersey will continue to advance in price.

But not only for this reason will they increase in value. Our population is increasing with unrealized rapidity. The large cities within our territory and on our borders are of necessity constantly spreading outwards, and even upwards twenty stories high.

The rich business man and the laboring man alike are seeking a country home in proximity to his business and New Jersey presents inducements on every hand for such people. The increasing means of quick transit afforded by railroad and trolley, which are traversing the State in all directions and will continue

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to extend their lines year after year, is another inducement to locate in this State.

Therefore, farmers look to your interests. Boys of the country, don't sell your birthright to the old homestead for the privilege of taking a clerkship in the city. Keep it, keep it as a sacred heirloom and an inheritance.

When the farmers of New Jersey, who are working in the old ways and for the old time crops only and receiving but a nominal sum per acre annually, wake up and study their geographical location, as compared to the centres of population, and realize that these consumers want from the New Jersey farmers, not corn, wheat, oats and the like, which can be and are grown in the west so much more cheaply; but the fresh truck-farm and market-garden crops and that they are willing to pay good prices for them—turn their attention more generally to the production of such crops; so much sooner will they receive such reward as is possible from New Jersey farms.

Directors' Replies to Questions.

During the latter part of summer a letter and blank, asking for statistics of crop yields, was sent to the Directors of the State Board. Those figures furnish the basis of the foregoing statistical report. There were also five questions relating to the condition of prosperity of the farming interests throughout the State for the year 1905.

The answers to the questions are here given in a composite form and cover quite fully the replies received. The comments of the Secretary follow each question and are a part of his report. Questions, replies and comments follow :

Question I. State causes that have injured any crop.

Quite generally the replies to this question speak of "dry weather early in the season, which delayed the germination of early planted crops, and reduced to some extent the probable yield of hay and of early potatoes. There was some rot in late potatoes, and injury to fruit by the Scale."

The San Jose Scale has become a general menace to our fruit interests. It is an enemy most subtle and destructive in its silent ravages. To hold it in check, even, will require united, persistent and wisely directed effort, aided by scientific skill.

Question II. Has the year been a prosperous one for farmers?

To this question, two only answered "No"; other replies are "Medium", "Fair", "Yes, for truck farmers", "Good crops of fruit and good prices", "Yes, good crops and good prices", "Yes, above the average", "Yes, for up-to-date farmers".

The answers given represent the localities from which they come. Other similar replies received are not here recorded, but the tenor of nearly all is encouraging and they express more than usual satisfaction with the results of their years' work. The

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last reply named is suggestive. There is a vast difference between the farmer who utilizes the latest and best knowledge and applies business principles in the management of his farming affairs and the one who does not, and this difference is apparent in the same neighborhood.

Question III. Are the average good farms being run at a profit? If so, what per cent. above cost of living and expenses?

To this double question the answers are very encouraging. The average per cent. for the State, as made up from the replies, would indicate a per cent. of earnings equal to twelve per cent. Without full and accurate data as to farm values, cost of production of the several crops and their market value, cost of maintenance, taxes, etc., it is not possible to state accurately the per cent. of profit. There seems to be no tendency anywhere, however, even in the most productive and prosperous farming localities to overstate the annual farm income, from which we conclude the per cent. of profit named is not exaggerated.

Question IV. What causes, if any, are injuring the popularity and prosperity of agriculture in New Jersey?

To this question, "lack of good help both on the farm and for housework" is emphasized in several replies. Two speak of "high freight rates", one of "high taxes", two "tendency of young men to leave the farm for the city", another says "reckless running of automobiles", "lack of agricultural education in our public schools".

Other replies are "Indifference, idleness, general lack of effort", "Lack of enthusiasm and business management by farmers", "People of wealth turning our agricultural lands into public parks and paying high wages for short hours", "The large number of shiftless, out of date farmers who know more about everything else than they know about their own business."

The help question is still a perplexing one, notwithstanding the vast number of immigrants to our shores. Organizations for selecting and placing farm laborers and domestic help on

their arrival in this country, might possibly be made more useful, if they could be well organized and sustained.

It is interesting to note in this connection that there is a National Association of Civic Clubs, composed of Commissioners from every State in the Union, Mr. August Belmont, President, to which his Honor, Governor Stokes, has appointed members to represent New Jersey.

This Commission will consider the following questions:

What is the character and net increase of the United States from immigration?

Do we need more excluding legislation?

Should there be a change in the system of inspection? If so, what change?

Is the contract labor system situation stimulated by immigration?

What is the nature, extent and demands of the United States for labor of immigrants?

What domestic industries and what labor crafts are most effected by the influx of alien labor?

What percentage of European immigration remains in the ports of entry, New York, Boston, Philadelphia, Baltimore?

How can this labor be distributed, especially in the agricultural sections?

What effect would the distribution south of a large percentage of this immigration have on the industry, education and social betterment of the negro race?

Should the Chinese labor exclusion law be made more rigid?

Should it be extended to include the Japanese and Chinese?

As farmers we are deeply interested in this general question and we will look for the report of this Commission in the hope that some of the most perplexing problems of immigration and labor may be solved to the good of all concerned.

High freight rates affect some localities quite seriously. The question should be taken up by those interested with the Companies in question. Probably in this way a satisfactory arrangement might be made to both parties.

The taxpayers also must take up the taxation problem, and find a reasonable solution. It is quite possible for them to do it.

As to the boys leaving the farm, until the farm can present more substantial attractions to farmers' sons than the cities do, it is probable that some of them will leave the old homestead.

The harmful effects of reckless driving of automobiles is serious. Not only are they a menace to safety and even life itself on the public highways, but they are robbing rural residents of one of their inherited rights, that of driving for business or pleasure on the public roads. There are farmers who own valuable farms that are paying a splendid profit, who say they want to sell. Why? Because, chiefly, the wife and daughters are deprived of the old pleasure of driving out as formerly, as their safety is menaced by the frightful automobile. In pioneer days, as the country became more thickly settled and when railroads were projected, the old and prior right of way of vessels on our navigable streams was guaranteed to them. The bridge is turned for them to pass along while the railroad train waits. Is it any less a natural and prior right that vehicles drawn by horses or other domestic animals should have the right of way on the public roads? If automobiles, which are but railroad engines without their own track and frequently without competent engineers, are allowed on the public roads at all, it should be only by well guarded, legal provisions and not, as is now the case, by usurpation; and they should in all cases guard against frightening or injuring other travellers, their vehicles and animals.

It is to be regretted that the introduction of this new means of locomotion should have been, in so many cases, by reckless and speed-wild drivers. The machines, or engines, are capable of much usefulness, and if they were driven with common sense and due regard to the rights of all other users of the public roads, they would not be so much of a terror.

The question of agricultural education and more intelligent farm management are pressing to the front, and it is encouraging to know that more and more is being done each year to meet these demands by means of the bulletins of the State Agricultural

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Experiment Station, the annual reports of the State Board of Agriculture and Horticulture, and the lectures given in the State and County Boards of Agriculture meetings, and in the Farmers' Institutes.

The plans that are being perfected for larger usefulness of our Agricultural College, when in active realization, will be of inestimable value to the boys of the farm. The outlook in this direction is very encouraging. The farmers should cooperate with the Legislature and the Chief Executive in placing our Agricultural College on a sound financial basis, with the strong arm of the State supporting it.

Question V. What remedy do you suggest?

Four replies to this question say "Till less land and give more thorough work to small farms." Two others, "Join Granges and kindred societies", "Attend the Farmers' Institutes, profit by what they hear and fall in line of progress". Other replies are: "More intelligent and well directed effort", "Improved machinery", "Better education", "Farmers should understand farm economics and decreased cost of production", "Reduce speed limit of automobiles to ten miles an hour on public roads and make a State Prison penalty in place of fines", "Make home more attractive", "Give the boys an interest in the farm", "Regular hours and more time for recreation".

The several answers to question five are very suggestive. They show a comprehensive realization of certain needs in connection with farm management, agricultural education and home affairs worthy of the consideration of all farmers.

They reveal, too, an awakening of the agricultural mind and a desire for such assistance as is in the power of our Agricultural College and of this State Board of Agriculture, through the Farmers' Institutes and in other ways to supply.

Extracts from County Secretary's Reports.

FARM HELP AND WAGES.

Farm laborers are reported to be less numerous, by fourteen Secretaries. One says there is an increase, due to immigration. The tendency of farm wages is higher. The average wages per month with board is \$19.00. Where farm laborers furnish their own board, the average is \$32.00 per month. Day work without board is \$1.25 to \$1.50 per day.

CROP BAROMETER.

Five Secretaries report truck and market-garden crops on the increase. Four—grass, corn and potatoes. Atlantic reports a falling off in grape production. Hunterdon and Somerset less fruit being grown. Monmouth, less wheat. Morris and Salem, less potatoes. Union, less grain.

SILOS.

Gloucester reports twenty-six in six townships. Salem, thirty-five for county. Union, twenty-five. Hunterdon, twelve. Mercer, twenty. The other counties report, all told, sixteen.

I believe the number for the State, if all were reported, would run into the hundreds.

CREAMERIES.

Hunterdon reports twenty-five. Salem, ten. Middlesex, Monmouth and Warren, two each.

CANNING ESTABLISHMENTS.

Atlantic reports one with a pack of 1,000 cases. Cape May, five, output not stated. Gloucester, one cannery with 12,500

dozen gallon cans of tomatoes. The pickling establishments with 4,200 barrels of pickles; one with 1,200 cases and four others pack not given. Hunterdon, two. Mercer, one with a pack of 179,000 cans of the finest fruit heretofore packed. The price paid farmer was \$8.00 per ton. Monmouth reports four factories and Union one.

The Industrial Directory of New Jersey for 1906, published by the Bureau of Statistics reports fifty-nine establishments in the State for canning fruits and vegetables.

SPRAYING FRUIT TREES.

Thirteen counties report spraying on the increase. Burlington, decrease. Morris, none to speak of. Salem, not increasing.

MILK.

The wholesale price paid farmers on the farm for milk is 3.6 cents per quart. Price received at retail is seven cents.

HEALTHFUL MILK.

Complaints have come to me from dairymen in the northern part of the State, who ship their milk to the cities: Newark, Jersey City, etc., that the milk cans are returned to them in such a filthy condition that they are not able to put them in proper order for shipping milk in on the following day.

Being in some of the localities in the sections named over night, I saw some of those cans as they came from the railroad station. They were coated with dried milk and the odor was beyond endurance; and the farmer, with his ordinary facilities, and his knowledge of bacterial life, who would try to make such receptacles in proper condition for carrying milk to the city the following morning, would fail to make a successful job of it; yet the milk goes.

Now, who is to blame? There is law which, if it were heeded, would go far to remedy the conditions named.

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Chapter 204, Laws of 1904, reads as follows:

"A Supplement to an act entitled 'An Act to secure the purity of foods, beverages, confectionery, condiments, drugs and medicines, and to prevent deception in the distribution and sales thereof,' approved March twenty-first, one thousand nine hundred and one.

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

1. It shall be the duty of any person, persons or corporation to whom milk is shipped by any person in this State, before returning to such shipper the can or vessel used for transporting such milk, to remove all milk from such can or vessel and to thoroughly rinse such can or vessel with pure water or to cause the same to be done; and it shall be the duty of any person, persons or corporation shipping milk to any point or points within or without this State to thoroughly cleanse, or cause to be cleansed, the can or vessel used for transporting such milk before the milk is placed therein.

2. Whenever any person, persons or corporation shall violate any of the provisions of the first section of this act, such person, persons or corporation shall be liable to a penalty of twenty-five dollars, which shall be recovered in the same manner and in any court or before any magistrate that any penalty is recoverable under the provisions of the act to which this is a supplement.

3. This act shall take effect immediately.

Approved March 30, 1904."

Section 14 of the original act, Chapter 82, Laws of 1901, gives the method of procedure in cases of violation. I quote the opening paragraph only.

"14. Every district court and every justice of the peace in any city or county, and every police justice or recorder in any city, is hereby empowered on complaint under oath or affirmation made according to law that any person or persons has or have violated any of the provisions of this act, to issue process, in the name of the Board of Health of the State of New Jersey, as prosecutor, for the use of the State of New Jersey."

Milk producers and consumers who are interested should take up the matter in their own behalf. It seems a small thing to ask of those who receive the milk and who empty the cans, that they should wash such vessels with pure water and thoroughly cleanse them before returning the cans or vessels to the shipper, and they ought to be compelled to do it. The health of the people, especially of infants, is at stake.

SCIENTIFIC FARMING.

In my report last year I suggested co-operative or syndicate farming. I still believe such a scheme could be made successful in every way. We certainly need at this age of the scientific study of agriculture, and present agricultural practice, the application of scientific principles to the individual farm, either singly or in groups.

Syndicate or co-operative farming would be just that. But, in lieu of that for the present, would it not be of advantage if the farmers of a given neighborhood or township would share the expense of employing an agricultural chemist, of known ability, to point out defects in present management of soils, stock, poultry, fruits and other crops, and suggest such new methods as would, if put in practice, greatly increase the yields and overcome some of the present wastes.

I cannot here go into details on this suggestion, but I feel that the majority of our farmers are not utilizing the discoveries of science as related to agriculture as might be done to their great advantage, were the way pointed out to them in their homes and on their own farms by the right sort of man.

True, thousands of our leading farmers are going hand in hand with science in their work, and they are succeeding, and the other class would succeed better could they be induced to apply the discoveries and teachings of science, with the methods of advanced farm practice, in their farm work.

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CO-OPERATION.

Another matter of great importance to all producers is a broader co-operation. Certain neighborhoods adapted to the same crops, should assist each other in all possible ways in growing them. By this course their output would be so large as to attract buyers to their particular section; and they should, of course, co-operate in using such means and methods as would produce the best article.

This would be far better than competing the one against the other and then marketing in dribblets. Then, having co-operated in producing, by all means co-operate in marketing. This is a vital point and merits the best thought and careful study of all producers of farm crops.

Manufacturers give strict attention to the two points named, did they not do so, failure would frequently follow. The farmer is a manufacturer and he cannot afford to ignore the importance of a more helpful co-operation, thus giving each farming neighborhood, producing certain kinds of crops, a commercial identity and standing, that would soon come to be known, and, if worthy, sought by the buyers and dealers in the cities. Furthermore it would enable your Secretary to direct buyers, who were seeking certain products, where to find them.

GAME LAWS.

Our code of game laws and the methods of their administration seem to be growing worse, if reports are to be credited. I refer to the subject to suggest that, if the State assumes to own the game, as it seems to—although the entire list of wild animals and birds are fed and supported by the farmers—and to place penalties, some of which are very severe, against shooting or trapping this game, even by farmers when those animals or birds are destroying their property; then I suggest that a law be formulated making the State responsible for the damage done, in every case. That such damage be appraised by proper persons

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to be appointed, and the bill for damages be presented to the State for payment. Something should be done.

STATE BOARD WORK.

The State Board of Agriculture has carried out the requirements of the law governing its work and of the several divisions committed to its care.

The Annual Meeting of the Board was held in the fore part of January, 1905. At this meeting the several reports were presented and discussed, and those adopted are published in the Annual Report, with the minutes of the meeting. Addresses were also made on the important questions connected with agricultural practice, up-to-date, at-the-front questions, in the solution of which is involved the life, progress and financial success of the industry. The most valuable of these are included also in the published report.

This report is distributed amongst the farmers of the State in various ways so as to reach as many as possible. But the number published is so small, we have but one report for seven farmers. A larger edition would enable us to reach a larger number and the good done would thereby be increased.

From almost every State, the older as well as the newer, come requests for our regular annual issue, and many of these requests are for the entire set. To meet such requests, any numbers of any year that are retained in the vault are used. They are all needed. Numerous testimonials from farmers and scientists have been received expressive of the value of these reports and their appreciation of them.

FARMERS' INSTITUTES.

The number of Farmers' Institutes held in 1904 and reported to the Annual Meeting was thirty, covering thirty-six days and one hundred and six sessions.

Not before in the progress of this work has the interest been more marked, both in attendance and intelligent participation in

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the questions discussed. The growing demand for this method of agricultural education, it is a pleasure to say, the Board will be able to meet by means of the increase in the appropriation for the work made by the last Legislature and by Executive approval.

For the coming fall and winter, beginning with November 20th, 1905, and ending last of February, 1906, forty Institutes have been arranged for; and others may be held.

THE STATE ENTOMOLOGIST.

That part of the work of the State Entomologist for the past year over which the Executive Committee of the State Board of Agriculture has some supervision, is concisely stated by Dr. Smith as follows:

"The primary and most important work of the State Entomologist is the inspection of nursery stock grown and sold within the State to prevent the further introduction and spread of injurious insects. For the shipping season of 1904-5, 81 certificates were issued to nurserymen and dealers and several nurseries were found so badly infested that the stock was not allowed to be sold. Several nurseries were inspected two or even three times before the stock was found in satisfactory condition.

The result is that several hundred thousand trees and plants were kept out of the market and fruit growers were saved large sums of money. The importance of this work is scarcely realized because no one sees the stock that would be foisted upon the grower but for this inspection.

Up to date, certificates for the shipping season 1905-6 have been issued to 54 nurserymen and dealers and a considerable number of inspections have been made upon which certificates have been refused until the stock is cleaned up. The department is in touch with similar officials in other States, and it is not easy now for a nurseryman to ship infested stock without detection.

The actual inspection work has been largely done by Mr. Edgar L. Dickerson who has also had the general care of the material collected, besides carrying on such general observations

as were deemed necessary to carry out the full intent of the law.

The greater danger threatening the horticultural interests of the State at the present time is the possibility of introducing the Gypsy or Brown-Tail moths which are now causing enormous loss in Massachusetts. That State has already spent nearly \$2,000,000 in its fight against these insects and their introduction into New Jersey would be little short of a calamity. Two visits were made to Massachusetts to determine conditions and the possibility of preventing, or, at least delaying the spread of the insects into New Jersey.

Winter orchard inspections were continued and Mr. H. H. Brehme was engaged for two months in this service, chiefly in parts of Bergen and Union counties where nurseries were threatened.

All these features are preventive in character and make no obvious showing; but their importance is proved by the better stock now sold in this State and by the gradual improvement of orchard conditions.

It is believed to be within the province of the office to aid all communities attempting to control insects on shade and ornamental trees and many inspections were made for Shade Tree Commissions and Improvement Societies, who were also advised as to the best methods of dealing with such pests as were discovered.

Under the provision of the law giving fruit growers a right to ask for inspections, a very large number of orchards were examined and much assistance and advice was given."

THE FEEDING STUFFS LAW.

The enactment of this law by the Legislature of 1900, Chapter 29, affords a safeguard, not only to farmers and dairymen, but to all persons who have horses or other domestic animals to feed. As in the vast number of mixtures for the humans called "break-fast foods", so in the combinations of feeds for dairy and other farm animals; their name is legion.

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Three hundred and ninety-seven brands were analyzed by the State Experiment Station during the past year. This large number shows that there is money in the mixing, and a possibility of adulteration below the published feeding value.

To detect adulterations and thus protect the purchaser and his stock is the object of the law.

The Director our Experiment Station, Dr. Edward B. Voorhees, says:

"In the inspection of concentrated feed stuffs for the year ending November 1st, 1905, 397 brands of feeds were analyzed. On the whole, the manufacturers were in sympathy with the spirit of the law, and complied with its provisions, so far as filing the guarantees were concerned.

The samples examined represented 159 different brands, which statement is evidence in itself of the necessity of careful supervision, as these vary widely in their contents of both protein and fat. As was the case in 1904, many feeds derived in the manufacture of corn products were low in their content of protein, due probably to the poor quality of the corn from which the feeds guarantee could not be excused on that ground. Linseed meals showed a great improvement over last year—the average sample were residues, though the failure of the feeds to reach their containing 2.28 per cent. more protein.

An increasing number of brewery and distillery products were found upon the market, and because of the variations in the methods of manufacture, and the sources of supply of materials it seems difficult to maintain a uniformity in the composition of these products. The feeds, however, are not inferior, but rather superior, in the sense that they are rich in the constituents protein and fat, not only, but feeding experiments show them to possess a high nutritive value. Nine samples of the feeds examined were unquestionably adulterated, though seven of these samples represented one feed, and were the product of one manufacturer, which were duly reported, as required by law.

The Station has made in the past, not only the analyses required by the law, but has investigated many problems connected

with the purchase and use of feeds, which is highly appreciated not only by farmers, but by those interested in the proper utilization of feed residues. I quote from a letter received this morning from one of the largest manufacturers touching upon this point, as evidencing the appreciation of the work that is being done: 'I beg to state that I use the bulletins of the different Experimental Stations a great deal in my work, and find New Jersey usually more accurate and explicit than any of the others.' "

The several cases referred to in Dr. Voorhees' report were each and all taken up with the dealers, after consultation with the Attorney General, and a satisfactory adjustment made.

MR. FORT: That part of the Secretary's report that refers to the law in regard to the cleansing of milk cans was secured by the Milk Shippers' Union. The matter was left in my hands to secure the passage of a law to meet the case. I consulted with Mr. Robbins of Moorestown and he secured the passage of that law. Afterward, in the hot months of summer, the cans were coming home in a filthy condition, I went to a lawyer to prosecute the dealers who left them in such filthy condition, but he found the law defective and we could not bring them to punishment unless there was a short amendment, and that I hope will be passed this Winter. We can secure that amendment and punish those people if they fail to cleanse the cans.

MR. EMMOR ROBERTS: There is an item there that appeals to me—the Game Laws, and I have a suggestion to make in reference to it. I think the whole subject can be best handled by a short law, something of this character: "That all acts and parts of acts for the protection of game for sporting purposes be and the same are hereby repealed." (Applause.)

Composition of Fodders and Feeds.

A number of dairy farmers who attended the Farmers' Institutes during November and December, 1905, conducted by the subscriber, and who heard Edward Van Alstyne on dairy matters, requested that the analysis of the various dairy feeds as shown on the chart of Mr. Van Alstyne be published in our next Annual Report for reference.

On consultation with President Voorhees, it was deemed advisable to publish such a table, but to extend the list so as to include all the fodders and feeds that have been analyzed at our State Experiment Station: Accordingly the subjoined list is published.

It shows the number of pounds of water, crude fat, crude fibre, protein, ash, nitrogen-free extract, nitrogen, phosphoric acid, and potash contained in each one hundred pounds of the various crops and feeds contained in the list.

Farmers and others having stock to feed, will find the table of much value in determining what are best crops to produce for dairy purposes and also what feeds are the most profitable to purchase.

Furthermore, emphasis should be given both in thought and practice to the value of the constituents: nitrogen, phosphoric acid and potash, carried in these crops; and that if any part of them is wasted it will cost the farmer their market value per pound to replace them.

FRANKLIN DYE,
Secretary.

AVERAGE COMPOSITION OF FODDERS AND FEEDS.

Analysed at the New Jersey Experiment Station.

Number of Analyses.		POUNDS PER HUNDRED.								
		Water.	Crude Fat.	Crude Fiber.	Protein.	Ash.	Nitrogen-free Extract.	Nitrogen.	Phosphoric Acid.	Potash.
	GREEN FODDER.									
	Cereal Grasses.									
23	Corn (Maize).	74.8	0.5	5.8	1.7	1.6	15.6	0.28	0.13	0.33
1	Leaming Corn.	76.4	0.6	4.9	1.9	1.0	15.2	0.30	0.13	0.32
1	Red Kaffir Corn.	81.6	0.6	4.8	1.8	1.3	9.9	0.29	0.13	0.45
1	White Kaffir Corn.	83.4	0.7	4.6	1.9	1.4	8.0	0.30	0.12	0.50
1	White Thoroughbred Flint Corn. . .	80.3	0.6	3.8	1.7	0.9	12.7	0.26	0.12	0.28
1	Southern White Corn.	73.5	1.0	5.3	1.5	1.0	17.7	0.24	0.10	0.24
1	Evergreen Broom Corn.	77.1	0.5	8.6	2.0	1.7	10.1	0.32	0.17	0.70
1	Stowel Evergreen Corn.	77.9	0.6	4.5	1.8	1.2	14.0	0.28	0.14	0.38
1	Teosinte.	90.1	0.3	2.7	1.4	1.4	4.1	0.23	0.05	0.65
1	Rural Branching Doura	85.9	0.4	4.7	1.7	1.3	6.0	0.28	0.15	0.46
1	Yellow Millo Maize.	83.2	0.6	5.5	1.7	1.5	7.5	0.27	0.11	0.57
9	Rye.	77.0	0.6	10.1	2.3	1.9	8.1	0.37	0.24	0.64
3	Sorghum	72.6	0.3	6.2	0.8	1.0	19.1	0.13	0.05	0.19
2	Sugar Cane.	84.2	0.5	4.0	1.2	1.1	9.0	0.20	0.09	0.44
2	Japan Millet.	79.8	0.6	5.7	2.0	1.9	10.0	0.32	0.16	0.65
1	Japan Broom Corn Millet.	77.4	0.9	6.2	4.0	2.4	9.1	0.64	0.16	0.78
5	Barnyard Millet.	81.7	0.6	5.4	1.5	1.6	9.2	0.24	0.12	0.50
1	Pearl Millet.	83.0	0.4	5.5	1.1	1.7	8.3	0.18	0.15	0.71
1	Barley.	81.7	0.9	4.2	2.9	1.7	8.6	0.46	0.10	0.54
7	Pasture Grass.	63.1	1.5	7.4	5.6	3.2	19.2	.90	0.26	0.74
1	Wheat	77.3	0.7	5.9	2.4	1.8	11.9	0.38	0.16	0.60
	Legumes.									
3	Red Clover.	71.9	0.8	8.4	3.0	3.5	12.4	0.48	0.12	0.83
12	Crimson Clover.	84.0	0.5	4.1	3.0	1.4	7.0	0.47	0.12	0.39
29	Alfalfa.	75.0	0.9	6.5	4.5	2.2	10.9	0.72	0.14	0.70
11	Cow Pea.	82.5	0.7	3.8	3.1	1.7	8.2	0.50	0.14	0.46
8	Canada Field Pea.	81.7	0.6	4.8	2.4	1.6	8.9	0.38	0.17	0.46
9	Soy Bean.	80.0	0.8	5.3	3.0	2.0	8.9	0.49	0.15	0.50
1	Velvet Bean	82.2	0.7	5.1	3.5	1.9	6.6	0.55	0.14	0.57
1	Sand Vetch.	88.1	0.5	2.6	3.5	1.5	3.8	0.56	0.15	0.54

AVERAGE COMPOSITION OF FODDERS AND FEEDS.

Analysed at the New Jersey Experiment Station. (Continued)

Number of Analyses.		POUNDS PER HUNDRED.								
		Water.	Crude Fat.	Crude Fiber.	Protein.	Ash.	Nitrogen-free Extract.	Nitrogen.	Phosphoric Acid.	Potash.
	GREEN FODDER.									
2	Dwarf Essex Rape.	87.9	0.5	1.7	2.4	1.6	6.4	0.37	0.13	0.47
3	Oats and Peas.	79.5	0.7	6.2	2.0	1.6	10.0	0.33	0.15	0.50
	SILAGE.									
23	Corn (Maize) Silage.	79.6	0.7	5.8	1.5	1.3	11.1	0.24	0.12	0.33
6	Sorghum Silage.	75.8	0.3	6.3	0.8	1.0	15.8	0.13	0.15	0.19
1	Red Clover Silage.	72.6	0.9	8.6	3.8	2.7	11.4	0.61	....	....
4	Brewers' Grains Silage.	70.3	2.1	4.5	6.3	1.2	15.6	1.01	....	....
1	Rye Silage.	80.8	0.3	5.8	2.4	1.6	9.1	0.38	....	....
1	Cow Pea Silage.	83.3	1.3	3.9	2.8	2.0	6.7	0.44	0.15	0.46
1	Soy Bean Silage.	74.9	1.5	6.1	4.5	4.1	8.9	0.71	0.16	0.75
	HAY AND DRIED COARSE FODDER.									
12	Corn Fodder, Field-cured.	25.3	1.7	20.3	5.3	4.9	42.5	0.86	0.36	1.07
16	Cornstalks, Dried.	14.7	1.2	27.3	5.1	5.5	46.2	0.82	0.28	0.95
2	Cornstalks, Field-cured.	37.7	1.5	18.9	3.8	3.4	34.7	0.61	0.33	0.83
	Hays from Grasses Named.									
3	Orchard Grass.	6.9	1.8	32.3	5.7	5.2	48.1	0.91	0.28	1.64
15	Timothy.	11.2	1.9	28.5	6.0	4.2	48.2	0.96	0.36	1.26
8	Hungarian Grass.	7.4	1.8	28.0	7.3	6.1	49.4	1.16	0.35	1.29
1	Short Sedge.	8.5	2.4	21.3	7.3	10.6	49.9	1.16	0.14	1.13
2	Creek Sedge, Field-cured.	41.8	1.1	16.2	2.0	6.6	32.3	0.33	0.03	0.53
1	Herd Grass.	7.5	1.5	26.6	6.3	4.8	53.3	1.00	0.35	1.57
3	Salt Marsh Hay.	8.1	2.0	25.8	4.5	6.1	53.5	0.73	0.09	0.82
4	Black Grass.	9.3	2.5	25.7	6.7	6.9	48.9	1.07	....	....
1	Marsh Rosemary.	7.8	2.0	25.1	5.3	5.8	54.0	0.84	0.66	0.27
2	Bog Hay.	8.1	2.2	25.1	7.7	8.3	48.6	1.23	0.18	0.73
	Hays from Legumes Named.									
12	Red Clover.	8.2	2.3	28.3	12.3	6.6	42.3	1.97	0.40	1.75
1	Alsike Clover.	7.5	1.6	29.5	11.4	6.4	43.6	1.83	0.39	2.15

AVERAGE COMPOSITION OF FODDERS AND FEEDS.

Analysed at the New Jersey Experiment Station. (Continued)

Number of Analyses.		POUNDS PER HUNDRED.								
		Water.	Crude Fat.	Crude Fiber.	Protein.	Ash.	Nitrogen- free Extract.	Nitrogen.	Phosphoric Acid.	Potash.
	HAY AND DRIED COARSE FODDER									
	Hays from Legumes Named--Con.									
1	White Clover.	7.1	2.1	27.3	14.1	9.0	40.4	2.25	0.25	1.06
3	Crimson Clover.	9.0	1.9	29.8	15.5	8.1	35.7	2.48	0.62	2.11
7	Alfalfa.	8.7	2.7	27.1	16.5	7.8	37.2	2.66	0.54	2.46
4	Cow Pea.	11.2	2.2	22.0	15.5	9.1	40.0	2.48	0.66	2.36
2	Oats and Peas Hay.	6.1	2.7	31.2	8.4	7.0	44.6	1.35	0.61	1.81
2	Oats and Peas Straw.	7.4	2.2	35.2	4.6	7.2	43.4	0.74	0.39	3.20
15	Wheat Straw.	7.5	1.6	37.9	2.7	3.7	46.6	0.43	0.13	0.74
6	Rye Straw.	6.6	1.3	38.2	3.1	3.3	47.5	0.50	0.29	0.79
7	Oat Straw.	8.1	2.1	36.3	4.0	4.8	44.7	0.65	0.22	1.22
1	Buckwheat Straw.	9.0	0.7	37.2	7.8	6.5	38.8	1.24	0.13	1.14
	ROOTS.									
4	Sugar Beets.	82.0	0.1	1.1	1.6	1.2	14.0	0.26	0.12	0.48
1	Mangelwurzel.	91.8	0.1	0.7	1.2	0.9	5.3	0.19	0.06	0.46
	GRAIN AND OTHER SEEDS.									
15	Corn (Maize) Kernel.	15.4	4.1	1.5	9.1	1.3	68.6	1.48	0.61	0.36
6	Sorghum Seed.	12.3	3.6	1.8	8.6	1.8	71.9	1.38	.....	.....
20	Oats.	11.4	4.8	9.9	11.3	3.1	59.5	1.81	0.77	0.57
6	Rye.	12.0	1.7	1.7	10.2	1.8	72.6	1.62	0.81	0.52
21	Wheat.	12.7	1.7	1.9	10.8	1.9	71.0	1.73	0.96	0.35
1	Buckwheat.	10.8	2.5	8.7	10.1	2.3	65.6	1.62	0.78	0.59
1	Soy Beans.	9.6	19.0	5.0	35.4	4.8	26.2	5.67	.....	.....
2	Cow Pea.	10.9	1.5	3.4	19.5	3.3	61.4	3.12	1.01	1.20
1	Black-eyed Pea.	12.2	1.6	4.1	21.6	3.3	57.2	3.46	.....	.....
1	Hungarian Grass Seed.	9.5	4.7	7.7	9.9	5.0	63.2	1.59	0.47	0.38
1	Broom Corn Seed.	8.9	2.6	.....	10.7	4.5	73.3	1.71	0.72	0.52
1	Rice.	12.0	0.3	0.1	7.4	0.2	80.0	1.18	.....	.....
1	Oats and Peas.	99	3.8	10.9	16.7	4.7	54.0	2.68	1.02	0.92

*Includes fiber.

AVERAGE COMPOSITION OF FODDERS AND FEEDS.

Analysed at the New Jersey Experiment Station. (Continued)

Number of Analyses.		POUNDS PER HUNDRED.								
		Water.	Crude Fat.	Crude Fiber.	Protein.	Ash.	Nitrogen-free Extract.	Nitrogen.	Phosphoric Acid.	Potash.
	OIL CAKE MEALS.									
144	Cottonseed Meal.	7.6	10.5	4.9	44.6	6.6	25.8	7.14	3.09	1.82
9	Cottonseed Meal, Undecorticated.....	8.8	7.4	18.5	25.3	4.9	35.1	4.04	1.85	1.48
4	Cottonseed Feed.....	10.4	2.7	35.6	9.3	3.3	38.7	1.49	0.45	1.10
191	Linseed Meal, Old Process.....	9.8	7.8	7.3	33.9	5.5	35.7	5.43	1.88	1.31
7	Linseed Meal, New Process.....	9.3	3.2	8.1	35.6	5.7	38.1	5.70	2.16	1.49
9	Flaxseed Meal.....	8.3	34.7	5.1	23.9	4.2	23.8	3.82	1.30	0.93
2	Palm-nut Meal.....	8.5	12.6	22.8	14.8	3.6	37.7	2.37	....	....
1	Cocoanut Cake.....	....	14.0	....	23.8	....	....	3.81	....	....
3	Corn Oil Meal.....	9.0	13.5	6.7	24.8	2.4	43.6	3.97	1.40	0.18
1	Germ Oil Meal.....	8.7	22.4	5.7	19.6	2.0	41.6	3.13	0.91	0.08
	CORN PRODUCTS.									
19	Chicago Gluten Meal.....	9.8	4.5	1.9	35.9	0.9	47.0	5.74	0.34	0.06
1	Cream Gluten Meal.....	7.4	15.6	1.5	41.8	1.6	32.1	6.68	0.31	0.06
3	Hammond Gluten Meal.....	8.2	11.1	0.9	28.4	1.0	50.4	4.54	0.50	0.08
2	King Gluten Meal.....	8.3	18.5	1.4	37.2	1.4	33.2	5.95	0.66	0.06
63	Buffalo Gluten Feed.....	8.5	3.4	6.8	26.0	2.8	52.5	4.16	1.15	0.57
7	Davenport Gluten Feed.....	7.7	4.6	7.4	24.5	1.2	54.6	3.92	....	....
18	Globe Gluten Feed.....	8.2	3.0	7.9	25.9	1.5	53.5	4.14	0.62	0.12
2	Iowa Golden Gluten Feed.....	8.3	11.6	3.1	29.4	1.0	46.6	4.70	0.43	0.08
1	Nebraska Gluten Feed.....	8.0	3.0	6.3	19.6	1.3	61.8	3.14	0.44	0.08
1	Pekin Gluten Feed.....	....	3.1	....	26.1	....	....	4.18	....	....
15	Queen Gluten Feed.....	8.5	2.8	6.6	24.2	1.7	56.2	3.87	0.37	0.04
6	Rockford Diamond Gluten Feed.....	....	3.6	....	27.0	....	....	4.32	....	....
2	Star Gluten Feed.....	7.6	2.4	6.5	23.2	0.9	59.4	3.72	0.33	0.00
2	Warner's Gluten Feed.....	9.1	2.7	6.5	17.8	1.1	62.8	2.80	0.32	0.05
4	Waukegan Gluten Feed.....	....	3.9	....	26.8	....	....	4.29	....	....
86	Hominy Meal, or Feed.....	9.0	8.6	3.6	11.0	2.8	65.0	1.75	1.40	0.75
24	Cerealine Feed.....	9.6	7.8	5.4	10.5	2.6	64.1	1.68	1.27	0.67
8	Maizeline Feed.....	6.8	7.8	6.7	9.9	3.6	65.2	1.58	1.41	0.78
18	Corn Bran, Fancy.....	9.2	3.4	12.2	12.6	2.6	60.0	2.02	1.01	0.62
28	Corn Bran, or Sugar Feed.....	8.4	5.7	11.8	10.0	1.2	62.9	1.60	0.22	0.09

AVERAGE COMPOSITION OF FODDERS AND FEEDS.

Analysed at the New Jersey Experiment Station. (Continued)

Number of Analyses.		POUNDS PER HUNDRED.								
		Water.	Crude Fat.	Crude Fiber.	Protein.	Ash.	Nitrogen- free Extract.	Nitrogen.	Phosphoric Acid.	Potash.†
	CORN PRODUCTS--Continued.									
4	Starch Feed, Wet.	68.8	3.0	2.9	5.0	0.4	19.9	0.80	0.05	0.02
2	Starch Feed, Dried.	9.1	8.3	6.7	14.6	0.9	64.0	2.34	....	....
110	Corn Meal.	12.7	4.1	1.7	9.0	1.5	71.0	1.44	0.63	0.37
18	Cob Meal.	12.6	3.2	5.6	7.6	1.4	69.6	1.22	0.55	0.46
4	Corn Cob.	31.5	0.3	24.0	1.5	1.0	41.7	0.24	0.07	0.29
2	Corn Germ Meal.	7.2	10.8	7.8	11.4	1.6	61.2	1.82	0.39	0.21
1	Corn Sprouts.	8.3	2.3	5.8	26.0	5.6	52.0	4.16	1.54	1.84
88	Corn and Oats (Provender).	12.0	4.2	3.3	9.8	2.2	68.5	1.57	0.71	0.44
	OAT PRODUCTS.									
5	Ground Oats.	10.0	5.0	9.8	11.1	3.8	60.3	1.78	0.76	0.50
2	Oat Middlings.	7.8	7.7	8.2	16.3	3.8	56.2	2.61	1.27	0.72
4	Oat Chop.	6.8	3.1	22.1	8.3	5.9	53.8	1.34	0.66	0.69
11	Oat Hulls.	7.4	1.3	30.7	3.4	6.7	50.5	0.54	0.24	0.52
1	Hulled Oats. ....	....	7.6	....	16.2	....	....	2.59	....	....
3	Canada Oat Feed.	7.3	2.1	28.4	4.4	5.9	51.9	0.71	0.31	0.62
1	Cream Oat Feed.	7.4	3.2	21.7	7.1	8.8	51.8	1.14	0.56	0.66
10	Chester Stock Food. ....	....	3.4	11.1	7.4	....	....	1.18	....	....
12	Friends' Oat Feed.	5.9	3.4	21.0	8.6	5.9	55.2	1.38	0.62	0.65
1	Iowa Oat Feed.	8.7	2.9	18.8	10.6	4.8	54.2	1.70	0.48	0.53
4	Monarch Oat Chop.	10.1	4.0	9.0	8.9	3.4	64.6	1.42	0.63	0.46
13	Royal Oat Feed.	7.2	2.8	24.9	7.0	7.3	50.8	1.12	0.48	0.70
17	Vim Oat Feed.	7.2	2.8	25.6	7.0	5.7	51.7	1.12	0.56	0.69
1	"X" Oat Feed.	6.9	3.1	22.5	7.5	6.1	53.9	1.20	0.61	0.73
	WHEAT PRODUCTS.									
6	Wheat Flour.	12.4	1.2	....	12.0	0.4	74.0	1.92	....	....
4	Ground Wheat.	12.0	2.0	1.8	10.2	....	....	1.63	....	....
190	Wheat Bran.	11.2	4.6	8.1	16.0	6.0	54.1	2.56	2.92	1.57
91	Wheat Middlings, White.	11.3	4.2	3.5	15.8	2.7	62.5	2.53	1.34	0.70
57	Wheat Middlings, Brown.	10.6	5.3	5.5	17.8	3.8	57.0	2.85	1.87	0.94
49	Feeding Flour.	10.1	5.3	2.6	19.4	....	....	3.10	....	....

AVERAGE COMPOSITION OF FODDERS AND FEEDS.

Analysed at the New Jersey Experiment Station. (Continued)

Number of Analyses.		POUNDS PER HUNDRED.								
		Water.	Crude Fat.	Crude Fiber.	Protein.	Ash.	Nitrogen-free Extract.	Nitrogen.	Phosphoric Acid.	Potash.
	WHEAT PRODUCTS--Continued.									
35	Wheat Feed.	10.8	4.7	5.1	17.0	4.3	58.1	2.72	2.04	0.54
2	Wheat Chaff.	11.1	1.4	29.2	4.3	6.5	47.5	0.69	0.95	0.56
3	Wheat Bran and Oil.	...	7.9	...	15.4	...	...	2.46	...	...
	RYE, BUCKWHEAT, RICE, Etc.									
1	Ground Rye.	12.0	2.1	...	9.1	...	...	1.46	...	...
11	Rye Bran.	11.7	2.9	3.5	13.9	3.3	64.7	2.25	1.54	0.95
5	Rye Middlings.	11.8	2.9	2.4	14.3	1.7	66.9	2.29	0.56	0.49
18	Rye Feed.	12.0	1.8	1.5	9.6	1.7	73.4	1.54	0.77	0.47
13	Buckwheat Bran.	12.5	5.4	4.3	20.0	4.2	53.6	3.20	1.77	0.93
30	Buckwheat Middlings.	13.6	8.0	3.1	30.5	5.6	39.2	4.88	2.60	1.33
12	Buckwheat Feed.	12.3	5.1	18.3	18.9	4.0	41.4	3.02	1.58	1.05
5	Buckwheat Flour.	14.1	0.8	...	4.8	0.7	79.6	0.77	0.52	0.16
3	Rice Bran or Feed.	9.0	9.3	13.0	11.5	9.2	48.0	1.84	...	...
1	Rice Polish.	9.5	11.2	3.3	14.3	6.3	55.4	2.29	3.29	1.19
4	Rice Hulls.	...	1.2	33.5	2.9	...	...	0.47	...	...
1	Rice Meal.	8.5	14.1	8.0	14.4	7.4	47.6	2.30	...	...
7	Barley Feed.	9.5	4.3	8.7	14.4	4.5	58.6	2.30	1.29	0.90
2	Pea Meal.	10.8	2.2	...	27.4	2.5	*57.1	4.39	0.91	0.99
1	Pea Feed.	10.1	1.2	...	14.9	3.0	*70.8	2.39	0.72	0.72
1	Bean Meal.	10.9	1.5	3.8	23.2	5.7	54.9	3.72	0.94	1.45
2	Peanut Bran.	...	4.4	14.2	8.5	...	...	1.36	...	...
1	Peanut Middlings.	...	6.5	39.3	9.7	...	...	1.55	...	...
1	Peanut Meal and Hulls.	10.9	2.4	62.9	7.0	2.1	14.7	1.13	0.15	0.62
1	Cocoa Shells.	2.7	16.5	9.9	15.5	10.7	44.7	2.48	1.14	2.39
1	Clover Meal.	...	3.3	29.2	5.8	...	...	0.93	...	...
1	Sugar Beet Feed, Wet.	89.9	0.1	...	1.1	...	...	0.17	...	...
4	Sugar Beet Feed, Dried.	9.4	0.7	17.9	8.1	4.4	59.5	1.29	0.24	0.57

*Includes fiber.

AVERAGE COMPOSITION OF FODDERS AND FEEDS.

Analysed at the New Jersey Experiment Station. (Continued)

Number of Analyses.		POUNDS PER HUNDRED.								
		Water.	Crude Fat.	Crude Fiber.	Protein.	Ash.	Nitrogen-free Extract.	Nitrogen.	Phosphoric Acid †	Potash ‡
	RYE, BUCKWHEAT, RICE, Etc. Continued.									
1	Molasses-Beet Feed, Dried.	7.6	0.4	15.7	9.6	6.9	59.8	1.54	0.15	1.81
1	Marsden Feed, No. 2.	1.3	28.4	4.0			0.64			
2	Cornaline (Coffee Hulls).	0.6	58.2	2.7			.43			
	BREWERY AND DISTILLERY PRODUCTS.									
107	Malt Sprouts.	9.6	2.2	10.6	25.8	6.9	44.9	4.13	1.61	1.78
13	Brewers' Grains, Wet.	74.1	2.1	3.7	6.4	1.0	12.7	1.02	0.26	0.03
119	Brewers' Grains, Dried.	8.5	7.0	13.6	25.7	3.8	41.4	4.11	1.01	0.08
1	Brewers' Swill.	94.3	0.8	0.7	1.9	0.3	2.0	0.30		
9	Distillery Grains, Dried.	7.0	10.9	12.8	23.7	1.6	44.0	3.79	0.60	0.17
6	Molasses Grains.	11.4	2.8	10.6	19.3	7.7	48.2	3.09	0.85	2.11
2	Molasses Feed.	10.8	2.8	8.3	18.6	6.6	52.9	2.98	0.82	1.96
3	Atlas Gluten Meal.	15.7		35.0			5.60			
4	Ajax Flakes.	6.5	12.0	13.0	32.4	2.3	33.8	5.19	0.68	0.18
1	Corn Protegran.	7.6	10.8	12.2	31.3	1.7	36.4	5.01	0.58	0.11
4	Sucrene Dairy Feed.	10.2	7.0	9.0	19.6		3.14			
6	Grano Gluten Feed.	6.0	11.5	11.6	26.9	2.6	41.4	4.30	0.65	0.19
	FEED MIXTURES.									
5	Blomo Feed.	13.3	1.0	10.9	16.3	11.6	46.9	2.61	0.45	2.54
8	Boss Corn and Oats Feed.	9.2	4.5	12.3	8.8	4.1	61.1	1.40	0.88	0.63
1	Buffalo Dairy Feed.	7.8	4.3	11.8	15.6	3.8	56.7	2.49	0.89	0.56
1	Buffalo Horse Feed.	8.2	5.5	9.0	13.3	3.8	60.2	2.13	1.01	0.70
1	Buffalo Stock Feed.	4.6	17.6	9.1			1.46			
1	Cornelia Dairy Feed.	9.0	5.4	5.2	22.7	3.6	54.1	3.63	1.45	0.85
2	Crackerjack Dairy Feed.	7.1	12.1	7.6	30.7	7.0	35.5	4.92	2.24	1.70
2	De Fi Corn and Oats Feed.	3.1	14.3	8.7			1.39			
1	Diamond Corn and Oats Feed.	5.8	8.9	9.7			1.55			
1	Durham Corn and Oats Feed.	2.8	13.1	7.5			1.20			
1	Empire Feed.	11.1	4.0	7.3	7.8	2.6	67.2	1.25	0.83	0.54
2	Excelsior Corn and Oats Feed.	8.9	5.8	9.0	9.9	6.7	59.7	1.58	0.99	0.73

AVERAGE COMPOSITION OF FODDERS AND FEEDS.

Analysed at the New Jersey Experiment Station. (Continued)

Number of Analyses.		POUNDS PER HUNDRED.								
		Water.	Crude Fat.	Crude Fiber.	Protein.	Ash.	Nitrogen-free Extract.	Nitrogen.	Phosphoric Acid.	Potash.
	FEED MIXTURES--Continued.									
15	H. O. Dairy Feed.....	8.3	4.3	12.0	18.6	3.6	53.2	2.98	0.86	0.61
18	H. O. Horse Feed.....	9.5	4.4	9.2	13.2	2.7	61.0	2.11	0.99	0.60
1	Imperial Dairy Feed.....	7.6	3.1	20.0	8.3	4.7	56.3	1.32	0.47	0.51
1	Marsden Feed, No. 1.....	....	5.1	12.0	13.7	....	....	2.19	....	....
1	Nutro-Glen.....	8.9	4.9	7.4	20.2	4.7	53.9	3.23	2.05	1.20
1	Puritan Ground Feed.....	11.1	2.6	13.7	7.5	3.9	61.2	1.20	0.55	0.58
26	Quaker Dairy Feed.....	7.3	3.8	15.3	14.4	5.5	53.7	2.30	0.98	0.89
10	Schumacher's Stock Feed.....	8.9	5.6	9.0	12.7	4.8	59.0	2.03	1.15	0.75
1	Star Chop.....	....	3.7	11.8	8.5	....	....	1.36	....	....
33	Victor Corn and Oats Feed.....	9.0	4.4	10.5	9.1	4.7	62.3	1.46	0.77	0.60
	STOCK, CALF AND POULTRY FEEDS.									
3	American Calf Meal.....	....	8.0	2.3	17.3	....	....	2.77	....	....
8	Blatchford's Calf Meal.....	9.0	5.1	4.6	25.2	5.5	50.6	4.03	1.45	1.13
5	American Poultry Feed.....	10.2	6.5	4.3	13.8	3.7	61.5	2.21	1.21	0.91
15	H. O. Poultry Feed.....	9.0	5.5	4.7	17.5	2.9	60.4	2.80	1.32	0.73
3	H. O. Scratching Feed.....	10.7	4.1	2.2	12.5	2.1	68.4	1.99	0.95	0.48
1	Paine's Stock Food.....	11.3	10.3	10.1	11.3	10.1	46.9	1.80	1.98	0.82
1	Nutrium Milk Powder.....	....	0.7	....	33.8	....	....	5.41	....	....
7	Animal Meal.....	4.8	10.4	....	38.0	....	....	6.08	....	....
16	Beef Scrap.....	7.9	15.0	....	55.5	....	....	8.88	....	....

Report of the State Entomologist

JOHN B. SMITH, S.C.D.

Report of the State Entomologist.

JOHN B. SMITH, SC.D.

In general, the work done during the year 1905 has been similar in character to that heretofore reported, at least so far as nursery inspections are concerned.

As there has been, at time complaint that the inspections were not made early enough to permit of the certificate being incorporated into Fall catalogues, a somewhat different proceeding was followed for the larger nurseries. Instead of depending upon the inspections made after September 1st, the nurseries were kept under observation more or less continually during the entire growing season. In most cases the visits were made by Mr. Dickerson who, in this way became very familiar with conditions as they existed in the various localities. By drawing upon my own experience and referring to reports of previous inspections of conditions and surroundings, it was possible to determine with a fair degree of accuracy what might be expected after September 1st, and all nurserymen whose premises were clean, received their certificates under date of September 1st, and within a few days thereafter. It was understood by them and agreed to, that if any unsatisfactory conditions were discovered later, these conditions were to be remedied and any infested stock destroyed. In case of failure the certificate was to be withdrawn.

This arrangement worked well. There was trouble with one firm only, who took the matter rather lightly; but almost their first shipment was detected and held up and after a telegram suspending their certificate they began an earnest and effectual campaign that resulted in a clean nursery.

Two growers sold and shipped without a certificate and were detected. As it turned out that the stock was not subject to scale attack in one case and was clean and fumigated in the other, no prosecutions were made.

It is quite probable that some of the small nurseries send out trees and plants to local purchasers, or deliver directly to them where they are not lawfully entitled to do so; but it is practically impossible to get track of such transactions and, so long as purchasers will buy stock of that kind knowingly, such places will continue to exist. All nurseries known to us, where a certificate was refused on first inspection, have been kept under continued observation and the owners are realizing that they cannot sell without a greater risk of detection than it pays to run. All the large nurseries whose certificates were dated September 1st, were carefully re-inspected in October.

Up to the present time 64 certificates have been issued to the following parties:

LIST OF CERTIFICATES FOR 1905.

- No. 1. T. C. Kevitt, Athenia, (limited to strawberries).
- No. 2. Henry A. Dreer, Inc., Riverton (special shipment).
- No. 3. Charles Black, Hightstown (general).
- No. 4. Jos. H. Black, Son & Co., Hightstown (general).
- No. 5. Bobbink & Atkins, Rutherford (general).
- No. 6. Stanton B. Cole, Bridgeton (general).
- No. 7. Henry A. Dreer, Inc., Riverton (general).
- No. 8. Elizabeth Nursery Co., Elizabeth (general).
- No. 9. William Flemer, Springfield (general).
- No. 10. Peter Henderson & Co., Jersey City Heights (general).
- No. 11. Hiram T. Jones, Elizabeth (general).
- No. 12. J. T. Lovett, Little Silver (general).
- No. 13. George A. Steele, Eatontown (general).
- No. 14. Wm. F. Bassett & Son, Hammonton (general).
- No. 15. I. D. Cole, Rutherford (dealer).
- No. 16. Arthur J. Collins, Moorestown (dealer).
- No. 17. North Jersey Nursery, Newark (dealer).
- No. 18. A. S. Wallace, Montclair (dealer).
- No. 19. George H. Peterson, Paterson (dealer).
- No. 20. A. D. Rose, Montclair (dealer).

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- No. 21. Hartung Bros., Jersey City (dealer).
- No. 22. J. F. Randolph, Rutherford (dealer).
- No. 23. T. E. Steele, Palmyra (shade and ornamentals).
- No. 24. W. G. Eisele, West End (dealer).
- No. 25. James L. Hall, Farmingdale (dealer).
- No. 26. Fred. Menzi, Irvington (general).
- No. 27. Charles Momm, Irvington (general).
- No. 28. G. O. Gerard, Washington (dealer).
- No. 29. Henry E. Burr, South Orange (general).
- No. 30. W. A. Manda, South Orange (general).
- No. 31. D. V. Higgins, Ringoes (limited to peach).
- No. 32. S. T. Hillman, West Cape May (dealer).
- No. 33. Wm. Henry Maule, Hightstown (dealer).
- No. 34. Wm. B. Ellis, Vineland (general).
- No. 35. Michael N. Borgo, Vineland (limited to dewberry)
- No. 36. John Casazza, Vineland (limited to dewberry).
- No. 37. Carlman Ribsam, Trenton (dealer).
- No. 38. Theo. A. Ball, Westfield (general).
- No. 39. J. H. O'Hagan, Little Silver (general).
- No. 40. James McColgan, Red Bank (shade and ornamentals).
- No. 41. W. H. Forristel, Plainfield (shade and ornamentals).
- No. 42. Chas. A. Bennett, Robbinsville (shade and ornamental).
- No. 43. Red Towers Nursery, J. J. Phelps, Hackensack (general).
- No. 44. Edwin Allen & Son, New Brunswick (general).
- No. 45. George H. Peterson, Paterson (general).
- No. 46. J. C. Williams, Montclair (shade and ornamentals).
- No. 47. J. C. Williams, Montclair (dealer).
- No. 48. Samuel C. DeCou, Moorestown (dealer).
- No. 49. John T. Garrison & Sons, Bridgeton (limited to strawberries).
- No. 50. S. B. Stevens & Son, Bridgeton (limited to strawberries).
- No. 51. Ellsworth Pedrick, Bridgeton (limited to strawberries).
- No. 52. Chas. L. Stanley, Plainfield (dealer).
- No. 53. Wm. M. Simanton, Asbury (general).

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- No. 54. Wm. H. Morgan, Westmont (dealer).
- No. 55. J. H. Lindsley, White House (dealer).
- No. 56. Warren Shinn, Woodstown (limited to peach).
- No. 57. Charles B. Horner & Son, Mount Holly (shade and
ornamentals).
- No. 58. Jos. J. Ayars, Williamstown (dealer).
- No. 59. Ralston Bros., Allenhurst (general).
- No. 60. Wilfred Everingham, Woodsville (limited to peach).
- No. 61. David Baird & Son, Baird (general).
- No. 62. J. B. Crate, Lebanon (limited to peach).
- No. 63. W. S. Pullen, Hightstown (general).
- No. 64. S. E. Rogers & Son, Mount Holly (general).

The following were issued during the early months of 1905, but belong to the series of 1904 and are in addition to the list published in the Report of the last preceding meeting. Together these form one list including about all those doing a nursery business within the State.

- No. 65. John Borgo & Sons, Vineland (limited to strawberries).
- No. 66. George H. Peterson, Paterson (dealer).
- No. 67. T. C. Kevitt, Athenia (limited to strawberries).
- No. 68. W. S. Pullen, Hightstown (limited to peach).
- No. 69. S. B. Stevens & Son, Bridgeton (limited to straw-
berries).
- No. 70. J. T. Garrison & Sons, Bridgeton (limited to straw-
berries).
- No. 71. Ellsworth Pedrick, Bridgeton (limited to strawberries).
- No. 72. Charles L. Stanley, Plainfield (dealer).
- No. 73. C. A. Conover & Son, Lebanon (limited to peach).
- No. 74. Warren Shinn, Woodstown (limited to peach).
- No. 75. J. H. Tice, Port Norris (dealer).
- No. 76. D. M. C. Perrine, Tennent (dealer).
- No. 77. Roscoe DeBaun, Caldwell (limited to strawberries).
- No. 78. J. B. Crate, Lebanon (dealer).
- No. 79. Fleming Bros., Parker (dealer).
- No. 80. Wm. H. Morgan, Westmont (dealer).
- No. 81. H. D. Opdyke, Martinsville (special).

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For convenience of reference different forms of certificates have been prepared for the different classes of business, and these are as follows:

Fumigation certificates, issued to all growers of stock that have a satisfactory fumigating house and treat all their stock with hydrocyanic acid gas.....	21
General certificates making no reference to fumigation, issued to all growers of stock that have no satisfactory house or box of their own; but either fumigate in a temporary chamber, in the house of another nurseryman or not at all.....	18
Strawberry certificates issued to strawberry growers when they request them for use in shipping to other States; no certificates for local trade in strawberries are required	5
Dealers' certificates who grow no stock of their own or only one line which for any reason should not be used to base a claim for a general certificate.....	20
Total.....	64

Blanks are now prepared which are sent to all dealers in early fall, and these are filled up and executed as soon as each individual has decided where to get his supply of stock for the year. All this facilitates business and the prompt business man need never be delayed even a single day by this office provided his stock is fit to sell.

The plan of orchard inspection has been continued and extended. For two months a special deputy was kept constantly in the field and many orchardists were warned of the presence of scales and other insects where they had suspected none. During the summer, orchards were examined all over the State to determine the effects of spraying work done during the winter. Bad work was pointed out and bad effects were explained so far

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as possible. This has been of considerable importance because many fruit growers are apt to become discouraged when the first attempt does not succeed as well as was expected.

The work in cities and towns has been continued and several municipalities now own spraying outfits with which considerable effective work was done. This sort of municipal improvement is sure to continue and extend and the persons in charge of the actual work have been assisted in every possible way to make sure of a correct start.

Twice during the season I visited that district in Massachusetts now infested by the Gypsy and Brown-tail moths to determine, in the first place whether there was immediate danger of spread into New Jersey and, in the second, whether any precautions could be taken to prevent the introduction. While I have no present advice to give, I can say that I can conceive of no greater misfortune to our State than the establishment of either or both of these insects within its borders.

A meeting of the Association of Official Inspectors was held at Washington, D. C., in mid-November and this also I attended on behalf of the office. Over twenty States were represented at the meeting and conditions in New Jersey seem to be not much if any worse than in many others. The practical outcome of the meeting was an agreement upon a number of points bearing on the relation of inspectors and nurserymen to each other and the appointment of committees to simplify certificate systems and if possible to agree upon uniform tags, so that nurserymen need not attempt to fill different requirements for every State.

The New Jersey law proves on actual test to be as simple, effective and flexible as any other thus far enacted and no amendments are suggested.

Mr. Edgar L. Dickerson still continues to act as assistant and a large proportion of the routine inspection work is now done by him.

Respectfully submitted,

January 15th, 1906.

State Entomologist.

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A DELEGATE: Do you recommend spraying apple trees during the winter?

DR. SMITH: Certainly.

A DELEGATE: With oil?

DR. SMITH: Yes, soluble oil. I prefer spraying in the fall, but if, for any reason, you didn't spray in the fall, then winter spraying, and spray just as soon as you can get on the ground and get the proper time to spray.

MR. PANCOAST: What effort has Massachusetts made to secure aid from the National Government to exterminate this pest?

DR. SMITH: They have asked their Congressmen to apply for protection on two occasions, and the answer has been that it was purely a State matter, and that the Government of the United States has no constitutional rights to do anything in the way of giving assistance. They have asked the assistance of their specialists in an attempt to secure the introduction of a parasite, and that is the line upon which they are working at the present time. I understand that a further application is to be made by Massachusetts, and that New Hampshire will join in the application, because the insect, now, is in New Hampshire and it is no longer a single State matter, and so possibly the United States may do something to control the insect, just as it has done with insects in the South.

MR. PANCOAST: I think it would be a very good thing to aid these States in securing Congressional action.

A DELEGATE: Is there any possibility of these two moths being imported from Massachusetts on nursery stock?

DR. SMITH: Yes, there is. That is one of the points that they are guarding against very carefully, both in Massachusetts and in this State. There is co-operation in regard to that point between the State Entomologist of Massachusetts and myself, and we are doing all we can to guard against the introduction of the moth into this State in that way.

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A DELEGATE: Is there danger of killing the peach buds by the application of lime, sulphur and salt in the fall?

DR. SMITH: No, that has been tested. The only materials that are likely to kill the peach buds when applied in the fall, are those things like caustic soda or of a similar nature. Those materials dissolve the resinous covering of the fruit bud.

A DELEGATE: How about the soluble oils?

DR. SMITH: Do not affect them in the least.

There is an insect called the yellow necked caterpillar. They sometimes come in great numbers and they eat one or two branches before you notice them, and then in a few days they are gone.

A DELEGATE: Are they dangerous?

DR. SMITH: No, they feed so openly and are so easily reached that they are not considered dangerous.

A DELEGATE: Regarding the apple trees, the "Ben Davis," they are so far gone that they are not worth keeping, and I was going to take out about forty or fifty of them, and in doing so I noticed many offshoots, and some of those offshoots grew six inches last summer and some more. Is it necessary to dig those out, or can I next season bud those shoots and trim them off on top?

DR. SMITH: You can do that if the trunk is still in good condition. There is no reason why, by cutting out all the bad wood we should not let the tree grow up again, using the soluble oil on the trunk so as to get everything cleaned off, and particularly see that the shoots you leave are thoroughly treated, so that they will be clean.

A DELEGATE: Is it better to bud four or five of those?

DR. SMITH: Why should you bud them at all? Why not let them grow up the same variety?

A DELEGATE: I didn't want that variety. What pump is that you spoke of, and do they use an agitator for that?

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DR. SMITH: An agitator for lime, sulphur and salt is desirable in order to keep it from settling. Naturally the tendency of any lime mixture is to settle, and you want to keep it stirred, and as for an agitator, there are as many varieties as there are pumps, and almost any variety is effective.

A DELEGATE: Is it just as safe to spray a peach orchard in February as it is just before the buds commence to swell?

DR. SMITH: With what material?

A DELEGATE: With lime, sulphur and salt.

DR. SMITH: Yes, the only trouble there is the sappy shoots. It has the effect of absorbing moisture, and if you get the material on unmaturred wood it may and sometimes does kill some of that, but that is not enough to be an injury to the tree.

A DELEGATE: All these experiments seem to be on a large scale. Suppose a man has a few trees, is it best to spray or buy the peaches?

DR. SMITH: Naturally in some cases it is better to buy the peaches, but if you want trees, you can get almost anything in the way of pumps or sprayers, and you can buy that soluble oil in any sized can from a pint up to a barrel, so that you can make a small quantity of mixture just as readily as you can make a large quantity.

Purpose and Work of the New Jersey State Forestry Commission.

BY DR. HENRY KÜMMEL, STATE GEOLOGIST.

Purpose and Work of the New Jersey State Forestry Commission.

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When last December your Secretary suggested to me that I occupy a place on this program and speak upon the work of the Forestry Reservation Commission, he did not do it because of my accurate and extended knowledge of trees or of tree culture. In fact he may have heard of a recent experience of mine when I was driving with a friend in the vicinity of Cedar Grove. We were close to the place, and my friend called in question the applicability of the name. "But there are the cedars," I replied, pointing to a clump of tall evergreens a few rods ahead. "Yes," he remarked drily, "only five of them are pines and the other hemlocks." But whatever the motive of your Secretary, I accepted his invitation with pleasure and alacrity for this reason.

It is my wish, as it is the wish of every member of the Commission, that so far as possible every citizen of the State of New Jersey, and in particular every farmer in the State, should fully understand the object and purpose of our work. These being understood, we have no doubt but that we shall have the cordial support of all, for I have no hesitation in saying that the preservation and extension of the forests of this State with all that that implies is one of the most vital problems confronting us, as a similar question confronts the citizens of every State in the Union.

But before discussing the work of the Commission let me emphasize what forestry is and a few things which forestry is not. In the first place forestry is not a sentimental consideration of a few visionary people for "the forest primeval, the murmuring pines and the hemlocks." Now do not misunderstand me. I would not belittle one iota that attitude of mind which finds joy

and pleasure in noble trees or untamed woodland and desires their preservation. Only that is not forestry. Forestry does not demand the preservation of the trees and the cessation of all lumbering and tree cutting. As one of the foremost foresters of the country recently said, "I am not a preserver of trees. I am a cutter-down of trees. It is the essence of forestry to have trees harvested when they are ripe and followed by successive crops. The human race is not destroyed because the individual dies. Every individual must die but the race lives on. So every tree must die but the forest will be extended and multiplied." The same eminent authority has defined forestry as "the art of using the forests continuously to meet the needs of men. In the United States forestry has to do primarily with the supply of wood for various purposes, with the maintenance of water-flow in streams, with the prevention of floods and with the supply of foliage for grazing animals within the forests. Nowhere else are forest problems of more vital importance to the welfare of the people than here, and in no other country of civilization has so little progress been made in their solution."

"Forestry is the art of *using* the forest *continuously* to meet the needs of men." Forestry must then be practical. It must make use of the forest. It must meet the demands which men have for lumber and other forest products and it must plan for the *continual* use of the forest. The forest must therefore be preserved, but preserved for use to meet the needs of mankind in some way. Utilization, preservation, perpetuation, these are the key words to successful forestry.

While the principles of forestry are fixed, yet the methods must vary to meet conditions. What would be good forestry practice in one region, might not be good in another. Clean cutting of the forest without provision for its regeneration is not forestry, whereas clean cutting and replanting may be good practice under some circumstances. The selective cutting of good trees only is not forestry, because under such a practice, the forest will steadily deteriorate. The annual cutting of mature trees, the

weeding out of poor trees, the thinning necessary for the vigorous growth of the survivors, may be good forestry practice or it may not, according to the amount so cut. For a forest must be regarded as so much invested capital. The annual growth is then the interest which may rightly be taken. If this is exceeded the principal is impaired and bankruptcy threatens.

Until recently conditions were such in this country, that it has not been possible to practice forestry along these lines. The forest was something which had to be cleared away. It blocked progress, it interfered with the settlement of new territories, it was something to be destroyed. Such being the conditions the practical lumberman with his money invested in timberland could not afford to practice forestry. It was his task to turn the trees into merchantable lumber at a figure which would leave the balance on the right side of the ledger. To do this, he found it necessary to cut and slash with no regard for the future. But conditions have changed. Many of the large lumber companies are fully alive to the necessity of husbanding our forest resources and providing for the perpetuation of the forest at the same time that they make their annual cuttings.

What then are the conditions in New Jersey which make it advisable for the State to establish and maintain a forestry commission and what does the commission expect to accomplish. *First as to conditions.*

In probably no other State in the Union is there a greater demand for wood than in New Jersey. The population of the State notably in Hudson, Essex, Bergen, Passaic, Union and Camden counties, and in seashore resorts is increasing rapidly, with correspondingly large demands for lumber for building. The steam railroads of the State use annually 1,200,000 ties for renewals alone, to say nothing of thousands needed for new construction and the rapid spread of trolley lines in all directions. Telegraph and telephone lines are being built in every direction and the demand for poles is an ever increasing one. The mines of the State are absolutely dependent upon a supply of cheap timber for mine props, lagging and other construction. You know better

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than I, the extent to which the profitable marketing of your cranberries, sweet potatoes, tomatoes, apples, and other crops depends upon a cheap supply of lumber for the thousands of crates, baskets and barrels you annually need. And you perhaps know better than I the rate at which our cedar swamps and mature pine is being cut to supply this demand. The brick, tile and glass industries annually demand enormous quantities of cord wood; and every farmer must have fence posts if not fence rails for his farm. But it is hardly necessary for me to enumerate the extent to which wood enters into the life of every individual. It enters into the manufacture of the house we live in, the furniture we use, the machinery and tools on our farms, our wagons and sleighs, the trains in which we travel, the roads on which we ride, the papers we read, the shoes we wear, sometimes even the nutmegs with which we flavor our apple pies, and finally the coffins in which we are buried.

Pause for a moment and consider what a wood famine would mean to the industry of the country, and remember that when the famine is once upon us, there is no way to remedy the ill, but to await the slow growth of the forest. In fifteen minutes an expert axeman can destroy a tree which nature cannot replace in thrice fifteen years, and the forest once destroyed cannot be restored in less than half a century. But I have said enough in emphasis of the importance of wood in the industries of this State. Let us consider another phase of the matter. Excluding tidal marshes, about 45 per cent. of the area of New Jersey is forest land today, including in this term all kinds of timber, brushland, sprouts, young growth and mature forest. By far the larger part of it is better adapted to the growth of trees than for agriculture, and, therefore, as a matter of wise economy it should never be cleared. The quantity of forest land is highly encouraging, but what of the quality? In the northern counties it is not so bad. Careful studies made a few years ago indicated that there was less cleared and brush land than about 60 years ago, when the wide use of charcoal caused extensive deforesta-

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tion. But even where at its best, the forests could be much improved by the application of forestry principles. In the southern counties, however, the outlook is far from promising. Extensive cutting and repeated burning over large areas have practically destroyed the reproductive power of the forest. Much of the land has been pre-empted by useless and worthless varieties. From the forestry standpoint the land has no future without extensive replanting.

Taken as a whole, the forest lands of the State do not yield a fair rate of interest to their owners, in spite of the increasing demand for timber. The reasons for this are perhaps many and complex, but first and foremost among them all stands forest fires. During 1902, 1903 and 1904 a careful canvass of the State showed that 225 fires occurred; 225,000 acres were-burned over, and the loss was estimated to be \$667,480,—these are conservative figures based on careful examination of the burned tracts. Candor compels me to add that of these 225 fires, 56 or 25 per cent. were started by farmers. During the same period, the railroads started 72, or 32 per cent., so that it is evident that the latter, although by no means guiltless, are not the sole offenders. One hundred and forty-five fires, or 64 per cent., occurred in the months of April and May, and 109, or nearly 50 per cent., were in the counties of Ocean, Burlington, Atlantic and Cape May. The more one studies the forest conditions of New Jersey, the more is one impressed with the importance of the problem of forest fires. Until these are successfully prevented, but little improvement can be expected from our forests. On the contrary, steady deterioration must ensue until large tracts capable of producing good timber are given over to worthless scrub oak and stunted, charred pines.

And now let me allude briefly to one other condition which exerts an important bearing upon the forestry problem in New Jersey. The population is steadily growing; the supply of potable water is fixed or rather is steadily decreasing with the increased contamination necessarily resulting from dense populations. That the presence or absence of forests have a marked

effect upon our streams is not open to question, although there is some difference of opinion as to the exact nature of that effect. Some have held that forests increased the rainfall. As has been well said,—

"There's that dear old rainfall theory once held in such esteem,
By which a dampness was produced by such a simple scheme.
As Aaron smote the rock of old and found a water power
So might we plant a tamarack and start a summer shower.
Behold the forester of old, the optimistic fellah—
A planting trowel in one hand; in the other an umbrella."

But, while we may fairly doubt whether forests increase the rainfall of a region, we cannot question the relation between the stream-flow and the forest growth. Foresters and hydrographers are of one mind in asserting that deforestation means more frequent floods, with consequent greater waste of water and longer spells of low water flow in the dry months. This is a serious problem in a State in which there is strong probability that in the near future every drop of available potable water will be needed to supply the demand of our growing population.

In brief then the conditions are these; a constantly increasing demand for timber of all kinds at prices which are sure to advance rather than decline; a large part of the State as yet uncleared and better adapted for forest growth than for agriculture; forest fires practically unchecked; the consequent impossibility of any practical forest methods by individuals, and a demand for water which requires the great watersheds of the State to be kept in forests.

The State may wisely undertake some things which the individual cannot. In his inaugural address, Governor Stokes advised the appointment of a forestry commission and the acquisition of forest lands for State Reservations. In accordance with his recommendations, an act was passed, money was appropriated and the commission appointed. The Governor and the State Geologist are *ex officio* members of the Commission, the latter being the Executive Officer. John C. Smock, formerly State Geologist; E. B. Voorhees, President of your society, and T. P. Price, of Tuckerton, are the other members of the Commission.

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The law under which the Commission was appointed, and which defines their powers, is Chapter 47, Laws of 1905. Briefly the duties of the Commission are first, to acquire in the name of the State, lands for State forest reservations, and to hold and manage them. Second, to disseminate information regarding forestry methods. Third, to assist individuals in the management of their forest lands on approved forest methods.

Forest Reservations. New York State has acquired over 1,000,000 acres of forest land in the Adirondack and Catskill mountains which for years has been held as a State reservation. Pennsylvania has within a few years purchased upwards of 700,000 acres for the same purpose. Connecticut starting two or three years ago, now has a State reservation of about 2,000 acres. The forest reservations of the National government are to be measured by square miles and not by acres. New Jersey has made a beginning, and within the past few months has acquired 970 acres, partly by gift, partly by purchase. The Commission has also received an offer of a large tract of approximately 25,000 acres in Hamilton Township, Atlantic County, the acceptance of which is contingent upon the appropriation of the necessary funds by the Legislature.

I have been sometimes asked why the State should own large tracts of forest lands and what we propose to accomplish? The answer to the second question is necessarily bound up in the answer to the first, and since some of my audience may themselves have asked these questions, let me give a few reasons why the State can wisely establish forest reservations.

In many parts of Europe and India deforestation of mountain slopes has been attended by disastrous consequences. Torrential streams have deeply gullied the slopes and destroyed vast tracts of arable land. Landslides, avalanches and floods have wrought destruction in the valleys below. Along the coasts, vast areas of drifting sands have buried buildings and forests. In our own country the sources of our streams have been threatened, water powers have been diminished, and in the arid west, water famines

threatened by the deforestation of the mountain slopes. Individual action has not been competent to meet these evils. The State has been compelled to establish reservations, to plant trees, restrain cutting and in some cases to spend vast sums to repair this damage or prevent its occurrence.

In New Jersey, as already indicated, the question of potable water is a vital one, and it is the duty of the State in those cases where the watersheds of important streams have been deforested, or where such deforestation is threatened either by fire or by cutting, to take necessary steps to establish protective forest reservations, if the results cannot be attained in other ways.

But further than this. No one can doubt or question the importance of the forest in the life of the Nation or the great necessity for its perpetuation. It is difficult to overestimate the industrial importance of the products which it yields. It is true that every day witnesses the invention of some substitute for wood, but it is equally true that every other day witnesses the discovery of some new use for wood. True it is that iron, steel, brick, stone and cement have largely superseded wood in some lines of structural work, but there is more building than ever before and the demand for wood in structural work is in no wise lessened. The new uses to which it is put, and the increased demand in old lines with increased population, more than makes up for the substitutions, and as I said before, in no State is the demand for forest products greater than in New Jersey.

It is self-evident, therefore, that the State should own and control those districts where forestry cannot be properly and profitably conducted by private parties. This condition prevails over a large part of New Jersey today. Repeated fires have so dwarfed the forest, stunted its growth and destroyed the valuable species, that forest methods are impossible to the private owner. Even where the quality of the forest is such as to give good returns at maturity, he cannot afford to wait until the growth will yield the best lumber, for the chances of fire are too great. Hence he is compelled to cut as soon as there is any

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profit at all. He cannot afford to spend money in replanting, nor can he cut selectively to improve the forest, for here again the danger of fire is too great. He cannot effectively protect against fire, for his neighbor will not. Under these conditions, the forests particularly in the southern counties have steadily deteriorated and there can be no improvement. I hold, therefore, that it is the duty of the State to acquire large tracts of this land, and to spend money, generously yet economically and judiciously, in improving, restoring and perpetuating the forest. The individual must look for profits within a reasonable period, if not within his own life, yet within the life of his children. The State can take a broader view. The individual dies, the State goes on. In view of the indirect benefits to the citizens from large forest areas, in view of the raw material which they produce, in view of the industries dependent upon them, the State can wisely maintain them for a long period at no profit or even at an annual expense. But while I am insisting upon this principle, I am not willing to admit that the maintenance of large forest reserves by the State will entail a tax upon the treasury for an indefinite period. If the experience of European countries teaches us anything and if the present indications in our own country have any significance, they are that in the not distant future, large state reservations in New Jersey will be a source of revenue to the State, and that money invested in them will pay a larger rate of interest than allowed by the banks on the daily balances of the treasury.

Furthermore, the State may wisely maintain forest reservations for experimentation and instruction, just as it has already established and maintains a farm for these purposes. The methods of forestry are not well understood. I know from actual experience that many woodland owners are desirous of initiating forestry work, only they are ignorant of what can be done. Many farmers are conscious of the fact that their woodlots are a valuable feature of their farm, and yet they realize that in many cases the returns fall short of what could be obtained under other treatment.

The State can wisely, therefore, establish small reservations in various parts of the State, on which the methods of forestry treatment can be illustrated, and practical demonstrations made which shall be a help and guide to the small landowner as well as to the proprietor of thousands of acres.

I have indicated briefly some reasons for State reservations and at the same time indicated what the Forestry Commission hopes to accomplish, but in doing so, it must be remembered that I speak not for the Commission, but for myself.

But before closing, I must refer to one other matter—the most vital of all, and yet one over which at present the Commission has no control. The great obstacle to better forest practice in New Jersey is forest fire. Until forest fires are prevented, all forest effort, State as well as private, will fail. Under the present law the Commission has power to spend money to protect the State reservations, but not to prevent or extinguish forest fires on private property. The existing fire laws are more honored in the breach than in the observance. The law permitting the appointment of township fire marshals and offering State aid to townships, has during the four years of its existence had little effect. Very few townships have taken any action in the matter, and those of us who have studied the question, have become convinced that more strenuous efforts are necessary. There must be more centralization of authority. The matter cannot be left to the option of townships. A single community, careless of its duties and forgetful of its responsibilities, may start a fire which will sweep away the growth of years and put to naught the efforts of its more progressive neighbors.

Here again it is the duty of the State to do what the private owner cannot, what the community cannot or will not, and by the unification of local effort under State direction and State aid, give that protection which will warrant and permit the preservation and betterment of our forests. The Commission has prepared a bill along these lines, which will be introduced in the Legislature and which, if passed, will, I firmly believe, be instrumental in a reform which we are all agreed is greatly needed.

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MR. FORT: Has the Commission any suggestion to make as to how they are going to prevent these forest fires? In a portion of Burlington County we have a large area of pine forests. In the month of May the forest fires generally start, and there are some oak and pine that are not as large as they were years ago because of these fires. They grow and then the fire comes and burns them down, and then they start another growth. It is my idea that if somebody would start this fire some time in March and burn up the accumulation of leaves on the ground, there would be very little destruction of the timber. There would be no sap then, but it is generally in May and then the sap is running and it makes a hot fire and scorches the trees.

MR. BUTTERHOFF: I would like to state what experience we had in Mullica Township with the fire law. We put this law into operation and appointed a fire warden, and the next year we stopped it because we had more fires. Some people who wanted to make that money started the fire. So we abandoned it. Unless there is some very sure way of getting at these people I don't think it will do any good.

MR. JONES: Is there any way of getting at the railroads who start these fires? I have had some experience in that. The timber was cut off about forty years ago and it was just getting in good shape when along came the railroad and set fire to it. It was their own carelessness, leaving the rubbish and grass on the tracks, and they set fire to it and it jumped over and got into my timber land. Is there no redress except going into court, and then one has got to spend more than he gets without getting anything out of it. We had a big law suit in our county this last summer against the Pennsylvania Railroad.

MR. KÜMMEL: I do not know that there is any way of recovering from the railroads, if they refuse to settle without a law suit, otherwise than by going to court. It has been the result of my observation along the southern lines, that is the West Jersey and Seashore, that the railroads are doing more than any other one agency, at least those lines are, to prevent forest fires.

On the main line to Atlantic City and on some other branches through the pines they have wide strips along the track, and in some cases they plow a furrow or two along the outer edge, along that cleared strip, so as to prevent ground fires from spreading after they are started.

I also know from our inquiries that the section men do make efforts to put out fires. I do not doubt that in some cases they do not succeed or that the fire spreads; but I want to emphasize the fact that some of the railroads are doing something to stop the spread of the fire. I do not think the railroads like to be sued any more than a private individual, and I believe that if the State takes some definite action towards stopping forest fires, the co-operation of the railroads will be assured. We cannot stop the railroads. The running of the train is absolutely necessary, and I do not know that any effective means have been devised by which the sparks can be entirely prevented escaping from the locomotives. So it seems to me there will always be danger of fire from the railroads. The most we can expect is to secure their co-operation, in preventing fires from spreading when they do start, either by extinguishing them or by plowing furrows along the tracks to keep them on the right of way, as has been done by some of the Pennsylvania lines. Where they are clearly negligent and responsible, I suppose they can be sued in court. I know that in some cases they have been sued, and have settled. I know that in the last year the Erie Railroad burned about one thousand acres of mature oak and chestnut on the Abram S. Hewitt tract, in the northern part of the State, and they settled the matter out of court. It was referred to Mr. Meier, who has acted as Consulting Forester for the State Geological Survey, and upon his statement of the damage the railroad settled. It was agreed to leave it to him and accept his award, and his award was on the whole satisfactory to both parties.

MR. JONES: I wrote to the Superintendent of the Pennsylvania Railroad after this fire, asking him if he would come or

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send someone to adjust the damage, without any law suit or anything of that kind. He did come in about a month or two and offered me the paltry sum of \$3.00 per acre. I think the damage was at least \$25.00, and I refused to accept it and put the matter in the hands of a lawyer for collection. In my neighborhood they never cleared up their road at all for a year, not a particle of brush cut or cleared away. They didn't take any trouble to prevent fire. The fire started within six feet of the rail, and then jumped the ditch and went into my woods and burned over eleven acres.

MR. A. J. RIDER: I have had some experience in forest fires, and I want to hear Professor Kummel as to the suggestion made by one of our members, as to the burning over of the forests during the months when the sap is not in the wood. I have several cranberry plantations, and I have always taken precaution as against fire to burn over all the ground of the plantation during the winter or during the period when the ground is frozen. The result is, that we are protected against fire during the season when fires are prevalent, and another result is, that all around there we have a fine forest of growing timber, whereas all about it the timber has been destroyed by fire. It would seem to me that there is a secret whereby individual holders of land may protect their own lands by burning, if they only burn a certain section or strips through their holding of forest lands during the winter time, they can protect the timber on that and prevent the intense forest fires that we have so often.

DR. KÜMMEL: My answer to that would be, that if there is no other means of preventing forest fires, if it is a question of running a ground fire through your timber land early in the season, and burning up the dead leaves, etc., without destroying the mature growth, or of running the chance of having a disastrous fire, and killing all the growth, I presume the former is the best alternative. But if the fire can be kept out altogether, it would be still better. A fire never does any good, because the leaves act as a manure to the ground, and while the trees do not

take from the ground as much as some other crops, yet they do take something, and part of the way in which that something is returned to the ground is through the leaves which fall and form the humus, and if that is destroyed you are impoverishing the soil. If the forest can be saved only by burning the leaves and forest litter, this plan is permissible. But there is always danger that the fire will get away. Even if it is done in March the fire may be carried beyond the owner's lands into property owned by somebody else, and damage that property perhaps much more than it did his own property.

MR. RIDER: If they start the fire at four o'clock in the afternoon it is easily controlled, and of course, they don't usually burn anybody else. We always burn when the wind is blowing towards the water.

MR. FORT: This burning of the humus and leaves in March would not be necessary oftener than once in three or four years. It is only those fires that come along in May when the young trees are full of sap, that scorch the young trees and kill them. You will never get away entirely from forest fires as long as there are men living down there who deal in wood. They start the fire in May and then go there and get the dead wood and then have something to sell. When a fire starts in the pines, they don't care where it goes or how much it burns. The more it burns the more dead wood there will be, and that is their harvest, and it will last until next winter. But if this ground is burned over, and there is not a coat of leaves to make a hot fire then their trade is done, and they can't get fire wood enough to carry on their trade. I think that will be a remedy.

MR. EMMOR ROBERTS: There is another cause for fires, and that is very hard for us to appreciate. When young timber is growing the berry business is poor. Huckleberries and that kind of berries don't flourish much after the timber gets started. That is a great business throughout Southern New Jersey, and there are lots of fires started to kill the timber that

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the huckleberry business may thrive, and I am sorry to say that there are papers all through the southern part of the State that count themselves respectable journals, that will preach the doctrine that a good crop of huckleberries is worth more than several years' growth of timber. (Applause.)

Agricultural Education.

BY L. H. BAILEY,

Director of the College of Agriculture, Cornell University.

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The movement for agricultural education is widespread and it is also old. We are likely to think that it is of recent development because we hear so much about it in these later days. As a matter of fact, agricultural education has been discussed for centuries. One of Milton's friends devised an elaborate scheme for the organization of an agricultural school. It is an interesting commentary on the times that one of the provisions in this proposed school was to the effect that if a professor found himself in error he would retract.

It would be difficult to trace the beginning of the discussion for agricultural education in this country. The earliest crystallized movement that I know was in Pennsylvania. As early as 1794 a scheme was outlined in that State by a committee of the Philadelphia Society for Promoting Agriculture. It was proposed to ask the Legislature for an act of incorporation. This scheme failed because of an adverse vote of the committee in 1799. As early as 1819 discussion began in New York State looking to the establishment of an agricultural college. In that year a pamphlet was issued on the subject at Albany. In 1826 Hon. James Talmadge, then lieutenant governor of New York, who was chairman of a committee to inquire into the condition of the College of Physicians and Surgeons of New York City, recommended that agricultural education be considered. He used the phrase "Agriculture and Mechanical Arts", which finally became embodied in the Land Grant Act of 1862. In 1836 the New York Legislature granted a charter for an agricultural college. The college failed to be founded, however; and in 1849, by direction of the Legislature, the Governor appointed a board of eight commissioners to make recommendations for an

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agricultural college and experimental farm. The Commission reported to the Legislature in 1850. In 1853 a new charter was granted. Land was chosen and an organization effected, but because of the death of the president in 1853 the project came to an end. Two years thereafter another effort was made to secure an agricultural college and this time with success. Land was secured, and it was taken possession of in 1857. In 1859 the corner stone was laid. In 1860 the college was opened. The breaking out of the Civil War, however, brought it to a close. The old building is now part of one of the State asylums. In New York State, agricultural education was not permanently established until after the passage of the Land Grant Act. In 1856 an act of incorporation for an agricultural college was secured in Maryland. In 1859 the college was opened. In 1855 the Legislature of Michigan chartered an agricultural college. This institution, which is the oldest existing agricultural college in North America, was open to students in 1857. The fiftieth anniversary of the opening of the college is to be celebrated next year.

Various other early efforts were made, but the institutions which were founded no longer exist as agricultural institutions. For example, an "agricultural seminary" was opened at Derby, Conn., in the spring of 1824. This institution also provided for co-education. It was discontinued after one or two years. A more successful effort was made at College Hill, near Cincinnati. A literary academy was started there by F. G. Cary in 1833. It gradually took hold of the affairs of the community and became "The Farmer's College." The head of this interesting institution, Mr. Cary, was a cousin of the Cary sisters—Alice and Phoebe. Although not officially designated as such, Mr. Cary was practically the first professor of agriculture in this country, since he seems to have been the first to successfully organize a college for this kind of work. The college was suspended for three or four years succeeding the Civil War, but was re-organized afterwards. It finally passed into a military

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institute. An agricultural college was opened at Oberlin, Ohio, in 1854. After continuing one year at that place and two years at Cleveland, it was removed to Columbus and became a part of the Ohio State University, under the leadership of Dr. Townsend.

I have not attempted in this sketch to give a complete history of agricultural education movements in this country, nor have I examined the records as to New Jersey. I have said this much in order to show that the movement is really older than most of us think and that the present institutions have their roots deep in the past.

One is interested to note the gradual evolution of the idea that the State in some way should foster agricultural education. The question is often asked why the State should provide for agricultural education more than for other education. This question is usually asked with the feeling that it is class education. The fact is, however, that the agricultural colleges really do not stand for a class of people, but for a phase of our national life. Their primary object is not to make farmers, but to make citizens; and the State is always justified in educating citizens. These citizens who live on farms should be educated in terms of their own lives if they are to be efficient citizens. Moreover, there is no other agency that can provide for agricultural education. Agriculture is unorganized and unsyndicated. It is not the field for monopoly. Each farmer stands essentially by himself. The organized and monopolized industries receive great benefits from the Government in the tariffs and other special legislation. These pieces of legislation usually benefit the farmer only indirectly if at all. The State may well consider, therefore, that the maintenance of agricultural education is only in part an off-set for the special privileges it gives to other classes of citizens. It is now well accepted that the Government should maintain enterprises of this sort. This was established by the great Land Grant Act of 1862; thereby, there is founded in every state and territory, on public funds, a college of agriculture and mechanic arts.

In 1890 Congress supplemented this grant by an appropriation that eventually amounted to \$25,000,000 per year for each state and territory, thus re-affirming the policy of state maintenance. Moreover, in 1887 Congress also provided funds for the establishment of an experiment station in each state and territory, to be established preferably at the Agricultural College. There is now pending before Congress a bill (introduced by Hon. H. C. Adams, of Wisconsin, and known as the Adams Bill) to double the federal income of these experiment stations. There are votes enough to pass this bill and to spare, if only it can be allowed to come to a vote. Some of the states also, by one act or another, have established a policy of maintaining agricultural education and reasearch. I have some fear that the states are tending to rely too much on Congress for the support of these institutions. There is some danger that the Government may do so much for the farmer that he will lose his own initiative and independence. There is also danger that the states may become so engrossed in looking to Washington for aid that they will fail to do their part in developing their own citizenship. It is fairly accepted by Congress that the various states, so far as they are able, shall supplement the funds given for agricultural education and research. In order to show you what some of the states are doing I will read the figures from some of those in which the agricultural colleges have been highly developed. The specific figures are omitted from this printed report; it may be interesting to know that the highest of them are for the agricultural college of Illinois, which is a part of the State University, which receives each year for agricultural experimenting and teaching the sum of \$199,500.00.

(After the address attention was called to the fact that one of the earliest experiment stations of this country was established in New Jersey. This I recognize. It was my privilege to have met Dr. Cook. I also fully recognize the great value of the work conducted by the department of agriculture at Rutger's College. One of the very earliest professors of agriculture in this country

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was connected with that institution. However, my address was not intended to give a complete history of institutions in New Jersey or any other State, but merely to show that the movement for agricultural education began early, and to illustrate the general development of Governmental supervision. The fact that excellent work is being done at Rutgers's, both in education and research, was taken for granted, since it needs no argument in New Jersey.—L. H. B.)

We may now inquire what these agricultural colleges have accomplished. For a great many years they were relatively unknown to the educational public. Their experimental phase extended up to, say, 1890, for at about that time some of the states began to arouse themselves to the necessity of giving liberal aid to these institutions. The great forward movement has taken place within the past ten years.

It is not strange that there was this long period of experiment and proving. It requires a long time to put any great new system into working order. There were very few agricultural books, very few agricultural leaders, and a very little fundamental knowledge of the subject when the Land Grant Act was passed in 1862. At first the agricultural colleges followed very largely the ideals of the old literary colleges; that is, they conceived the instruction as best given by means of lectures and books; when farms were employed they were to be used very largely as "models," or as a place on which animals and operations could be exhibited. The full significance of the laboratory idea, whereby the farm becomes a laboratory as much as the chemist's establishment is a laboratory, has been of tardy growth. During all these years of experiment, however, the colleges made distinct progress, although it was made slowly. They worked at the very foundation of the problem and that is one reason why they are coming into such universal favor today. The men who had charge of these institutions in the early days were pioneers and deserve all the credit that we can give them.

Naturally the emphasis has been placed very largely on the teaching of technical agriculture; that is, it has been placed on

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determining how to make the land more productive and how to make the farm more remunerative. This is the fundamental work in any agricultural college. Having established a usable body of facts and having developed the pedagogy of the subject, we are now able to attack other phases. Every farm consists of two parts; the farm itself and the home. While we shall always put the main emphasis on the farm itself as we have in the past, we are now ready to develop a body of fact and experience regarding the farm home. The home is really a part of any efficient farm enterprise. Whenever the farmer puts one dollar's improvement on his land or his stock he is adding that much to the value of his home, for the home is on the land. The whole question of the relation of the home to the community, to the church, the school, the rearing of children, and to the social affairs of the country are now to be considered. Several words or terms have been proposed to cover this group of home subjects. Perhaps the best one now current is "Home Economics" because it is larger than mere house-holding and house-keeping subjects and infers that the home is a part of the general economics and social status of our civilization. Along with these subjects the instruction must also be carried to such topics as domestic science and whatever else relates to the health and well-being of the members of the family. It is significant that sanitary science has developed its applications first in the towns and cities. The unsanitary conditions that are so common in the country that we never think of them would not be tolerated for an instant in the town. If I had the power to do one thing for a farming community and only one, I should introduce sanitary waterworks for the care and comfort of the family. No one thing would so soon develop the quality of living. By way of further illustration, let us consider the subject of clean milk. Of all the materials used for food, milk is probably the most uncleanly. The barns are dusty and dirty; the animals are dirty and no pains is taken to prevent the dirt from falling into the milk. We ordinarily think that we clean the milk when we strain it; but few persons would relish the bread even after they had taken the

mouse's nest out of the bread-can. Moreover, a good part of the dirt that falls into the milk is soluble and can never be strained out. Even if all the dirt could be strained out it would carry with it into the milk various kinds of germs which would contaminate it. I should like to see a monument erected to the person who first used the phrase "clean milk." One cannot make clean milk without having clean stables, clean cows, clean hands, and clean habits; and if he has these he will have a clean farm and be fairly likely to have a clean character.

I should also like to see the architecture of farm buildings improved. In parts of the east the old buildings are falling down. I sometimes think it is too bad that they have stood so long. Every building is a silent and persistent teacher. One cannot go into a building and out of it even once a day all his life without being impressed by it. If he is unaware that he is being impressed the impression is probably the deeper. Now, good architecture consists in having the building perfectly adapted to its use and then in having good proportions. Every building, whether it cost \$5.00 or \$5,000.00, is good architecture or poor architecture. Usually we think the architecture to be a matter of adornment, but this is an error. It should cost no more to build a building of pleasing proportions and of convenient arrangement than to build one of another kind. In fact, one is likely to get more real satisfaction for his money by leaving off the mere gewgaws and meaningless things, for the money that would have been put into them can then be used for something worth while. Inasmuch as farm buildings cost so little, the professional architects give them no attention; and, in fact, there seem to be no architects in the country now who have made any careful study of common farm buildings. All this being the case, it will rest on the agricultural colleges to develop the best in rural architecture and to give advice for the buildings that hereafter are to be constructed.

These are very large subjects that the agricultural colleges are now considering. The farm is a part of the community. The large agricultural questions are phases of national questions. It

is just as important that the farmer be fundamentally set right on taxation as that the city man should be. The question of good roads is not apart and of itself, but is one phase of our national development. The relation of the farmer to schools, to churches, to organizations, to markets, to other persons in the community are now being studied and taught; and these are beginning to be expressed in courses of study by such phrases as "Rural Economics" and "Rural Sociology."

All this means that the agricultural colleges are not narrow class institutions; neither should they be merely technical institutions. The technical agricultural questions will, of course, always be their chief concern, but they also must consider the agricultural phases of our national life; this all means that we are developing a country life education. In this sense the agricultural colleges stand over against most other institutions of learning, for practically all of the others stand for the town and city, or for affairs that center chiefly in the cities. It will therefore be seen that the field of the agricultural college is really as broad as our national life.

The result of all this work has come to be that the general tone of farm life has been greatly elevated. This is the final result of the teaching of the agricultural colleges and the investigating in the experiment stations, and is sufficient return for all the expenditures and endowments, and it condones all the mistakes. Living in the midst of the progress we may be unable ourselves to measure it. The older men in the audience, however, if they reflect on it, will know that almost every agricultural practice is performed either in a different way or in a different spirit from that in which it was done twenty-five or fifty years ago. As I came I saw silos. This means winter dairying or some kind of winter feeding, which is itself essentially a new idea; it means new methods of feeding, even to the fundamental principles (the old method was not founded on principles at all); it means new crop schemes; it means new attitude towards the market. In other words, a silo is merely an exponent

of a new philosophy in farming. Comparable illustrations could be taken from other current practices, as the spraying of fruit trees.

We now feel that if country life is to be made as efficient as it is possible for it to be made, some concrete effort must be applied to the country schools. Perhaps you are familiar with the inquiries of Professor Earl Barnes in two of the agricultural counties of New Jersey. He asked the school children of these counties what they wished to do when they were grown up. Of those at seven years of age, 26 per cent. desired to live in the country. Of those at fourteen years of age, only 2 per cent. desired to live in the country. There certainly must be a reason for this great falling off. Professor Barnes considers that the schools are very largely responsible. They point cityward rather than countryward.

The agricultural colleges are now taking hold of the rural school problem and they are likely to exert more influence on it than any other class of institutions. In fact, I am convinced that the most marked progress in school work to come within the next twenty-five years is to be the result of the influence of the colleges of agriculture. I have taken pains to correspond with the department of education of the various states, territories and provinces. I have heard from all the states and territories with the exception of two (Connecticut and New Jersey), but so far as I know these two have not taken up officially concrete in this direction and therefore their omission will not greatly modify the results. About forty of the states, territories and provinces have taken some kind of official action, looking towards the introduction of agriculture and nature-study into the schools. This action may be expressed in the making of mandatory laws (with which I am not in sympathy) compelling the subject to be taught in the schools or compelling the teachers to pass examinations in it; it may be in the issuing of syllabi or course of study; it may be in the state adoption of a text-book; it may be in the official publishing of nature study leaflets, or inquiries looking to the status of these subjects in the schools. All this indicates

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that the demand for something real and vital in the schools is widespread and practically unanimous. However, this work is yet largely tentative and experimental in its character and the basis of it is chiefly text-book. It is very evident, however, that we are in the beginning of a great movement looking toward the fundamental correction of the inefficiency of the rural schools. I do not wish to be understood as saying that the rural schools are in a state of decadence, for they certainly are not. They are better than they were a generation ago. As compared with the city schools, however, they are no doubt in a state of arrested development; and it is perfectly apparent to any thoughtful observer that they are not meeting the real needs of the communities.

These various ideas are to express themselves in a new kind of laboratory work. This work is school-gardening. The movement in this country for school-gardening is now in its early experimental stage. It is a true laboratory method. Its purpose is not primarily to teach gardening or any other art, but to put the pupil into work with actual things, affairs and events. The school-garden laboratory will in time become an established part of every good school. The work in the school-garden will be pursued in the same spirit as work in the botanical laboratory or mechanical laboratory; but as it is a work for children more than for adults it will deal with actual and undissected objects.

The agricultural colleges stand for the need of better rural schools. I think it is a mistake to try to push technical agriculture into these schools very rapidly. The general pedagogical efficiency of the school must be elevated, the agricultural work coming gradually and naturally as the school develops. This raises at once the question as to whether our schools are so organized as to allow of the introduction of local subjects. There are several kinds of schools in which it is now attempted to introduce agriculture; and these kinds we may consider.

1. Naturally the first place in which to introduce agriculture is in the existing schools, because this would introduce the

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work on the basis of the public welfare and would prevent it becoming mere class education. Some kind of local work is essential for the best efficiency in every school; and in the rural districts this local work is necessarily largely agricultural. If the existing schools cannot handle these local subjects satisfactorily, it is an indictment against their efficiency as educational means. In that case, new types of schools will have to be organized, because this local work is bound to come unless our progress is stayed. It is for these reasons that I have opposed the organization of special schools in New York State for the teaching of agricultural subjects. The Education Department has now adopted syllabi for all the grades below the high-school and for one year in the high-school. Ideally, and even practically, these various schools should be able to meet the country life demands of the State. If they are not able, I shall be ready to stand for the organization of special schools to take up the work. The work itself, however, is not special, but general, and I hope that the public school system now organized can handle it. It is due to the public schools that we give them time to work out the methods.

In order to make much progress, we should have teachers who are trained in country life subjects. It is astonishing, when one comes to think of it, that these subjects are not the first to be put into schools. This simply illustrates again how exotic the schools are. The time should not be far distant, if it is not even now at hand, when the normal schools must take up the agricultural and country life subjects. The normal schools are naturally the institutions to render great aid in putting the subject into pedagogic form.

2. Agricultural work is being taught in various summer schools. These schools are very helpful to the teacher and they will aid to start the movement for good country life teaching; however, they must always remain supplementary institutions. The serious and fundamental work must be secured by a thorough training extending over a series of years. I am hoping to see agricultural work greatly extended in the summer schools,

as I am convinced that it would be one of the most effective means of demonstrating the need of fundamental training in these lines; but this cannot be sufficient.

3. There is now a rapidly growing movement for the consolidation of weak rural schools into larger and stronger units. In these consolidated schools there will be better facilities of all kinds, and there ought to be more than one teacher, each one of whom should be trained for some particular kind of teaching. In these schools it should be possible to teach elementary agriculture effectively. In parts of the west there is a township high-school system which enables the rural communities to have strong graded schools. In all these centralized high-schools it is possible to have the building large enough for the accommodation of laboratory work and the grounds sufficient for school-gardens. Every school building erected at the present day, whether in a one-teacher district or in a city, should provide for the comfort of the pupils in the way of heating, lighting and ventilating; and it should also afford facilities for manual-training work, nature-study and other local laboratory work.

4. If all the existing agencies are not sufficiently effective to reach the country life interests, then we shall be forced to organize special schools in which these subjects shall be taught. There is in fact a tendency to organize them in advance of the experiment in the general public schools. In Alabama, for example, there are nine schools devoted largely to agriculture and domestic science,—one in each congressional district. In Wisconsin two schools on a county basis have already been organized and have been very successful. Two more such schools have been provided for and other counties are awaiting an opportunity. If, as I say, the public school system cannot handle the work, we shall be obliged to establish a supplementary system; but even if this second system comes I hope it will not be a competing or duplicating system, but a part of the regular school work of the State. This school work in agriculture is really not a technical agricultural question, it is a broadly educational one and should not be handled apart from other educational systems.

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We may now inquire whether it is possible in the present state of development to introduce agriculture into the rural elementary and secondary schools. The tendency of the past few years has been to complicate the school courses. Every subject which seems to be good and useful is pushed to the front, in the hope that by some means it may be forced into the school work. I do not admit that merely because a subject is teachable and of great value to the pupil, it should therefore be introduced into the elementary schools. Of course, we all believe that every subject with which men engage in the making of a livelihood and the forwarding of civilization will be taught; but this does not mean that it will be taught everywhere or in the elementary schools. If the schools are to be really effective, the work must be simplified rather than complicated. I am sure it is possible to simplify the school course and at the same time introduce agriculture, and this even without the elimination of any of the fundamental subjects that are now in the course. The Committee of Five on Industrial Education in Rural Schools of the National Educational Association has given this phase of the subject much consideration and makes the following report:

HOW TO MAKE A PLACE FOR THE INDUSTRIAL PHASE OF EDUCATION IN RURAL SCHOOLS.

"Any proposition for the introduction of a new phase of educational effort into the work of the schools is met at the outset with objections. The poor results in the teaching of the common branches, too often apparent, are given as good and sufficient reasons why no other work should be attempted. It is assumed that the poor quality of these results is due to lack of time in the school and that, therefore, there is no time for anything else.

"The other objection is that the course of study is now overcrowded and that in the rural district schools especially, the variety and number of classes renders it impossible to organize and instruct additional classes in new subjects.

"As to the first objection, it may be said that the poor results in the teaching of the common branches is not due to lack of time on the part of pupils, so much as to poor teaching and lack of proper organization.

"The second objection is likewise not well founded, because the overcrowding of the course is not due to the number of subjects, but to the attempt to teach too many things in these subjects which are not worth the teaching.

"The subject matter in the common school course of study needs a critical revision, not so much with the idea of eliminating entire subjects as for the purpose of cutting out matter now found in most text-books in the treatment of these subjects, and upon which much time is spent in the school without profit to the pupils.

"Text-books are made to sell; most publishers recognize that certain detail of treatment of a subject is regarded as of vital importance by one superintendent while another regards it as utterly without value. The argument of the publisher from the commercial standpoint is that if this detail is supplied, it will meet the requirements of the one, and can be omitted by the other, and thus the book may be accepted by both.

"In the rural schools the supervision is necessarily lacking in effectiveness, and the teachers not feeling themselves competent to make proper eliminations, undertake to teach everything in the book, which was made to include everything which anybody might wish to teach.

"In determining what matter may be eliminated with a positive gain to pupils, the following tests should be applied.

"Has it a value as usable knowledge sufficient to warrant its retention?

"Is there other matter of greater value as usable knowledge not now taught, but which can be taught if substituted for that of less value?

"If its value as usable knowledge is not sufficient to warrant its retention on that ground, has it a value for training which will justify the expenditure of the time and effort essential for its mastery?

"Is there other matter, of equal or greater value as knowledge but with a greater value for training, which can be put in its place and for which there is no time unless it be put in that place?

"In no case is there any justification for the retention of any matter in the course of study, whatever its knowledge and training value, if its retention prevents the introduction of other matter having a greater knowledge value and an equal or greater training value."

The gist of this report of the Committee is that the present school subjects can be given a local application. Let us suppose that fundamental subjects are reading, number, geography, manual-training. It is easy to see that all of these subjects, unless perhaps number, can be given distinctly local and agricultural application. To my mind the best application of all could be given to the number work and the geography work. After the pupil has learned the principles of arithmetic, which really are few, the remaining drill can be given just as well by means of local and agricultural number work as by means of co-partnership, middlemen and theoretical problems which are now the chief part of our text-books. Many problems of soil fertility, soil moisture, the feeding of animals, handling and marketing

of produce, accounting in farm enterprises, are mathematical in their nature. I am convinced that one term's work in arithmetic could be given such an agricultural trend as in the course of a generation to revolutionize the agriculture of a state. Good geography teaching now begins with the local environment and goes out towards the universe. In former days it began with the universe and came in towards the earth, sometimes reaching the earth and sometimes not. The old methods reversed natural processes. Now, the local environment in the agricultural country is composed very largely of farms. The principles of geography can be taught in terms of the affairs of the community in such a way as to satisfy all the requirements of agriculture in the rural schools for the present time.

Manual-training may be very largely school-gardening work, with exercises in making and caring for tools, making labels, painting, building fences and doing a thousand and one other things that have direct application to the community life. In the present stage of our elementary schools I doubt very much whether we should begin this country life work with agriculture itself unless this may be thought to be the means of forcing the general elevation and development of the schools.

However much we may wish to develop the common schools along the line of the needs of the community, we must never forget that the agricultural college stands in a very important sense at the head of the effort, and that no stream can ever rise higher than its source. The agricultural college should receive first consideration. It will develop leadership. One of the efforts that the agricultural colleges are asked now to make is the development of some kind of brief winter-course instruction. This instruction may not be college work or university work, as measured by the old academic standards; but it is work that needs to be done and there is no other type of institution in existence that can do it. I think that we shall soon find the different states developing a new kind of an institution for the handling of winter-course and other extensional work, but this will neces-

sarily be in connection with the agricultural college. In many cases the development of good winter-courses will afford a stepping-stone towards further development of the agricultural college. It will connect the people with the college. If the public schools were what they ought to be, there might not be so great a demand on the agricultural colleges for the present kind of winter-course work; but that time is far in the future, and perhaps the necessity for the doing of winter-course work by colleges will never pass away. Even if the present type of winter-course work should in time be done by other institutions, the equipment that would be developed at the colleges would be more than needed for the giving of special instruction for brief periods to persons who had had the equivalent of winter-course work elsewhere. In the development of agricultural education we must not feel ourselves bound by academic traditions or old formulas. Whenever a college can serve the people effectively it should be glad of the opportunity to do so; in fact, it is its duty to do so. Therefore, I look upon the evolution of winter-courses as a distinct step towards the fulfillment of effective agricultural education.

The general burden of my plea, therefore, is that the States themselves must give aid liberally to the agricultural colleges and to experiment stations. The State should attack all those problems that the individual farmer himself is not able to attack. All such problems as can be worked out by the individual should of course be left to him, as he is responsible for his own development, and the State must never take away his initiative. However, the general and public policy questions are so great and so pressing that no state has yet given sufficient aid and developed sufficient men to work them out satisfactorily. The great institutions of the country are nearly all in the cities and towns. We are in the habit of measuring our progress by the growth of cities and by the institutions that are associated directly with them. It is high time that we began also to develop the open country. We need to conceive of large plans and to carry them out in a statesmanlike way. We are developing such plans for

our navy and our army; but the open country needs still larger plans and they are really more insistent and important if we are to develop a truly great nationality. In fact, all the efforts in the navy, postoffice and all other large governmental departments are only expressions of the development of the country at large. It is time that we cease to look at these rural problems in any small and narrow way. I can conceive of a state so forward and enlightened that its officers would take pains to find out what they should do to help the open country rather than merely to stand on the defensive when small appropriations are asked for.

There is another phase of this question which we as easterners need to consider. It is the fact that the West is developing away from us. In many ways the West is making more progress than we are. This is particularly true of some of the phases of education for country life. I am not now speaking to you as Jerseymen, but as easterners. I sometimes feel as if I should like to see a compact formed comprising New Jersey, Pennsylvania, New York and the New England states for the purpose of considering large measures for the development of the agricultural country. We have the lands and the markets. I presume that more plant-food value can be purchased for a hundred dollars in the old eastern states than in the western states. We have a great population near our doors to supply with food and the amenities of life. Agriculturally, these eastern States are less developed than some of the States of the prairies and the plain. I do not wish to be understood as saying that the development of agricultural education is the only means of improving our agricultural conditions, but I am perfectly sure that it is the chief and the primary means. All progress rests on the intellectual and spiritual development of citizenship. No agricultural state can afford to neglect its agricultural college. We of the East need to wake up.

PRESIDENT VOORHEES: I would like to say that it is not because we had not done anything that Dr. Bailey has not heard from us, but because of the negligence of some of our

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officers. I am sure he will hear that there was something done in New Jersey with reference to the matter which he has brought forward so eloquently and so well. I know that the State Board of Education in its last series of teachers' institutes in this State presented the matter of rural schools, and the teaching of matters pertaining to the farm, to all institutes, with the idea of getting teachers, particularly in the country districts well awake to the importance of the matter. That is a great step forward I think, and our State Board of Education is going further in this matter. Furthermore this State Board of Agriculture has also in the past taken a very active part in discussions of this sort, and has done more than that, and aroused interest in this work. We are very glad to have Dr. Bailey here and point out in his inimitable way the relief in the matter.

DR. BAILEY: I shall be glad to scratch New Jersey off the list now. (Applause.)

DR. THOMPSON: I desire to express my admiration at the address, and make the motion that is usually made in such cases. I wish we could do what they do in New York. I was in New York last summer and saw a bound volume of leaflets that they send out, and tried to get a copy, and wrote for a copy, and they said no they could not let anybody have a copy, they were only for teachers. I told them I had been a teacher for fifty years, and they sent them to me, which I loaned to the teacher in my district. I wish we could get something of the kind in New Jersey.

MR. JOHNSON: It seems to me if we are going to do something on the line suggested by Dr. Bailey, and we will have to sooner or later, it is the gentlemen who compose this body today who are to do the work. Dr. Bailey cannot come and talk to us all the time; Dr. Voorhees cannot stand alone at New Brunswick and work hard; the State Board of Education won't do very much unless it comes from you gentlemen; that is all you who live in rural districts and work and live there. It means that every one of us has got to get to work and do our share. We

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know how easy it is to listen to a good address and clap our hands and believe in it fully,—until tomorrow morning, and I, not a member of the State Board, not a delegate, get up and say please don't forget it tomorrow morning.

DR. THOMPSON: Talk to your teachers, you who elect the members of the School Board, who believe in real live practical education. Tell them it is not Asia Minor that we want to know about, but Vineland, Millville, and some of our own local places. Follow the suggestion of Dr. Bailey. Let us get down to little common every day things, and things that mean something, and let us know something about those things. There is not a child or man or woman in the world who wants anything more than to be happy, and the way to be happy is to know about the place where you live, and the place right next door to it.

MR. WHITEHEAD: I am a Jerseyman, and I claim that New Jersey instead of being behind is really in the front as an agricultural state; and in this matter of agricultural education it should not be forgotten that long before our national government made provision for our experiment station, New Jersey had a state experiment station sustained by the State, and was the third state in this Union to establish it. So we are pretty well in the front, and not so far behind.

A DELEGATE: It is very good to talk about public education, but I think we had better begin with the State Board of Education, when it formulates questions that are asked at the examinations in the public school. Sometimes they put questions about foreign countries that I could not answer. As long as the Board insists on such things in public schools we cannot have any relief, and we must attend to it. We must not begin reforming from below, but from above. They should ask sensible questions in the public schools, and not questions of things which in their lives they can never use, and I don't know that they ought ever to be used. (Applause.)

MR. FORT: I have been a member of the Board of Education in my township some twelve years, and about eight or ten

years I have been president, and I agree with the gentleman. You people listen to these addresses, which is very fine, and I wish you had the privilege of talking to my board of education in my township. They don't think of education, but of spending a lot of money. Don't care what kind of a teacher they employ and the people pay the taxes. You people should remember what he has said and attend the annual meeting in March, and elect the brightest men, the men who will sacrifice time for the benefit of the township. They need your services. Don't elect the men who won't attend the meeting, or the men who bring personal matters into the meeting. Elect men who will make a sacrifice and use their brain to bring forth the best efforts, and who will secure the best teachers they can, and make a judicious and economical expenditure of the moneys that are appropriated. It has gone forth that they must build palaces for school houses, one big school in every county or township, and let the little district schools go out of sight. What hope is there for a poor man's child. A rich man's child can be carried to school in a coach, but the little child of a poor man is to lose his education, because the little district school is to go down. Every man in moderate circumstances in the State of New Jersey ought to see to it that the little district school is maintained, and that the Board secures the best teachers they can for the money. The State of New Jersey will have brighter citizens, there will be a better manhood, but for goodness sake don't centralize those schools and rob those little children of an education after we have provided the money.

MR. RIDER: I have been very much interested in Dr. Bailey's address. I have spent a good many years of my life in teaching, and I can realize the truth when he says that we have been teaching too many things and too high things, and we don't teach enough in the fundamentals; better go back to the three R's. Concerning the speaker just on the floor, at the time Governor Stokes suggested the law which is now in effect, which takes his name the Stokes' Law, I said to Governor Stokes I

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think you made a mistake. I said the old system of each school district having the say whom they shall employ, and how much money they shall spend, came directly home to our people, and if an enterprising neighborhood wants a good teacher, and are willing to pay for it, they could have one. Now you put it into a committee where they have no say. The Township Committee sends whom they please and at the price they please. Besides that the old system of the school meeting in the locality, in each district, was an educational feature not only to the grown people, but to the children. It was their own business which they attended to, and the school district meeting which I remember in my boyhood was an event which was looked forward to almost as to a circus. We thought much of going to that school meeting and listen to our fathers and neighbors tell what they were going to do for us, and the very fact of hiring their own teacher and getting the best teacher had its results. You could see the results. Some enterprising farmers determined to have the best teachers no matter at what price, and the young men in that district became the judges and the legislators and the business men. In the neighboring district where they took no pride in hiring their teachers they remained where they were. I say we made a mistake in changing the school law and taking it away from the people. You get further away from them, and the further away you get the worse it is. I hope we will see the day when the school law will be changed and brought back to the people. (Applause.)

MR. REED: In view of the remarks made I would like to see something practical done here this afternoon. If we had Professor Bailey before our Board of Education to present the matter to them perhaps it would have some influence on them. As to our public schools educating our boys to become lawyers and legislators, that is the kind I don't want, I want them to stay on the farm. I hope something practical will be done this afternoon before it is dropped.

MR. RIDER: I wish to say all those young men in that neighborhood are not judges and lawyers and doctors, they are enterprising farmers, the men who raise the blooded stock, which brings ten times as much as the other farmers. They are good farmers as well as legislators. If they had been educated more on the line of farming they would be even better farmers than they are now.

A DELEGATE: As a member of the board of education of one of the lower counties, I should like to ask Professor Bailey where I can get a copy of the agricultural geography?

PROFESSOR BAILEY: J. S. Hazelwood, Jefferson, Wisconsin. I don't know whether this book in its original form is available or not. I think it is.

MR. REED: Can you tell us whether there are text books published by which those subjects can be taken up in the public school?

DR. VOORHEES: I think so, there are a number of books on those subjects.

MR. REED: I think the power should be in the State Board of Education. This matter I brought up myself personally in Manalapan Township and we went to our county superintendent and very soon learned that he was not in sympathy with the movement.

PRESIDENT VOORHEES: I think the State Board of Education is in sympathy with the movement. They are attempting to get the wedge in and I am satisfied they will cooperate loyally in every effort that is inaugurated by the farmers of the State. I am satisfied of that; they desire to do something.

DR. BAILEY: I should like to say something in regard to this last remark that certain persons who have official positions are in sympathy with the work. We find that everywhere. It is not by any means only in New Jersey, but I wish to make this

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remark, whether they are in sympathy with the work or not, the work is going on and these persons have got to make the plunge and the sooner they jump in the sooner it will be over with.

DR. THOMPSON: I don't like to have the discussions closed without a defender of the Stokes' Law having something to say about it. I think the township system is better than the district system, but there is no time to discuss it here.

MR. AGANS: The point that the Professor made in regard to the introduction of agriculture in our rural districts is very dear to my heart. I have talked of it in my township until they turned me down and out, and I guess I can't talk it there any more. But it is very dear to me and I hope to see it established throughout the State. There is one point that I wish to make and that is in regard to the parents investigating what their children are learning at school. I haven't a child in the world, but I feel that every child should be educated as much as possible, and receive all the education that it is possible for them to receive, because I realize what an advantage it is to them. I have been deprived of that to some extent myself, and for that reason I think that the parents of children should visit the public schools and ascertain what their children are studying and what they are learning. I know a few members of the Board of Education that visit some of the schools, that would be surprised to find how little some of the boys and girls at the age of fourteen know about practical things. If the parents of children would visit those schools and find out what their children are learning they would know what is going on in those public schools. If you take a child, say a boy seven or eight years old, and bring out a horse and tell him, now don't go near that horse, keep away from it, that child will become afraid of that horse, he won't have anything to do with it. In our public schools the children are taught everything except a love for things on the farm. They are taught to be clerks and stenographers and those sort of things, which are not on the farm. In order to make it practical things relating to the farm should be taught in the public schools and in

that way our children would love the farms and stay upon the farms.

MR. APPLEGET: I would like to call the attention of the Board to that most admirable work adapted for use in our public schools which is almost unknown so far as my observation has extended. "First Principles of Agriculture," by Dr. E. B. Voorhees.

A DELEGATE: In Piscataway Township, the Board of Education have requested the professors to use that book. That is in Middlesex County, and I think there are other townships in the same county where they give instructions in that line.

PROFESSOR SURFACE: Dr. Bailey has presented to us what we need in an educational way, and now we are to ask, "How are we to get those things?" Perhaps legislation is necessary to obtain what pertains to the farm and to the farmer's children. You, who are interested in those subjects, should for the time not be prohibitionists, nor democrats, nor republicans, but be agriculturalists. (Applause.) Get together as agriculturalists and agree among yourselves so far that you will not be at sword's points as to what you want, and then make yourselves manifest, and you will get it; but you must agree first.

The Farmer As a Citizen.

BY PROF. JESSE H. HOLMES, SWARTHMORE, PA.

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The Farmer As a Citizen.

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Gentlemen of the State Board of Agriculture:

I have felt it a great honor to be invited to address your session of this afternoon; and I esteem it a privilege as well. The man of books sometimes feels himself apart from the men of practical affairs, and hesitates to intrude upon their province. But on the plane of citizenship we meet shoulder to shoulder and hand to hand.

What I have to say is under this head: (1) The importance of the farmer-citizen; (2) the historical importance of the form of land-tenure, and (3) the vital need of loyal citizenship in America in meeting the problem of land monopoly and other allied problems.

When I speak of the importance of the farmer-citizen I mean no word of flattery. Importance may be for evil as well as for good. Responsibility goes as far as power, and if the farmer plays a large part he must play it well or the whole play goes ill. But the farmer-citizen has had certain special advantages over very many of his fellows in that he is of a class constantly called to deal with actual things. He breaks animals to his will, trains them to his service, uses them for his own purposes. He meets the flood and the drought, he wars with the insect enemy, deals effectively with the thousand and one crises into which he is forced by natural conditions. In a practical way, if not technically, he must be meteorologist, geologist, botanist, zoologist and sociologist, as well as citizen.

And the things he does are of wide and vital importance. Every breakfast table smokes with his products—if indeed he will acknowledge the modern crop of breakfast foods;—every citizen wears them, walks upon them, sleeps on and under them.

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A million middlemen open the way from his fields to a score of millions of homes. The navies of peace wait in the harbors to carry his stuffs to the cold and hungry of foreign lands and the navies of war hunt out foolishly satisfied people to inform them that they also are cold and hungry—and to insist upon it if necessary. The railroads of America grow rich, and powerful, and dangerous, because the farmer has prospered, the packer with the aid of the railroads, is a partial parasite upon his successes, and the stock gambler makes millions of business on the mere names of the things he raises. His is the primary trade of the many trades which feed, and clothe and keep the world.

The farm does not merely feed the professionals, and the merchants, and the other craftsmen, but it feeds the professions, and warehouses and crafts as well. As I look back to my college days I remember a tall, lank, loose hung, freckled fellow, who came up from a neighboring farm. His biography lies before me now. His short active life saw him successively winning a high place and degree in one of our great universities, successfully organizing the charities of two great cities and occupying with honor the chair of economics, first in his alma mater and not long after in a great university of the West. He left books that are still standards in their line, after ten years of rapid development of his science, and he left on all who knew him an indelible impress making for honor, and truth, and courage. Of the small group surrounding him during my college generation there are now three college professors, two leading lawyers and a great surgeon, all from the farm. I have no doubt that my experience is typical. The professions have all drawn largely on the farm-bred boys, and on those families where conditions of life resemble those of the farm—where the young people are early given duty and responsibility.

It has long been believed that city life leads to degeneration; that the city, unless constantly strengthened by new blood from the farm would decay and die. Hausen, a German sociologist, asserts "that the native population of a city is completely re-

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placed in two generations by the influx of outsiders," and again that the city "takes the crude vigor and vitality of the agricultural population, develops and appropriates to itself their highest intellectual abilities, and then casts them aside."

These statements may well be questioned in so far as they apply to the modern city under the sanitary conditions of the modern time. The city has advanced in these matters faster than the farm. But even under present conditions the debt of town to country cannot be denied; and the debt is increased by the increasing migration of the city to the farm in the summer season.

When Hercules wrestled with the giant Antaeus he found that each time he threw him the giant arose with strength re-doubled. Only by holding aloft and away from contact with the earth was the hero finally able to conquer his enemy. The modern man like Antaeus must get back to the earth. If separated from it for long he grows pale and anemic, and his line dies out.

Secondly now, as to land ownership; for not only does the farm feed the nation and the professions, and the cities, but questions of vast import center about the farm homestead and the tenure of it. This land question goes back to remotest antiquity. In the Babylonian law code of Hammurabi, a contemporary, probably of Abraham, over 2000 B. C., many pages are given to the difficult relations of owner, tenant, and laborer. There were inalienable lands; there were rents paid in kind and in cash; there were fixed rents and rents on shares. If a flood destroyed a crop after the rent was paid the farmer lost it; if before, recognizing the difficulty of collecting under such circumstances, owner and tenant divided what was left. There was public pasture land, which possibly, like a western timber claim, could become private property by cultivation. Further laws as to boundary stones, measurement and encroachment on highways show that the whole matter was a complex and difficult one. The prophet Isaiah, over 700 B. C., pronounces "Woe upon those who add house to house and field to field until there is no more room." It

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is in commenting on this situation that George Adam Smith says, "Every civilized community develops sooner or later its land question and its liquor questions. 'Questions,' they are called * * * yet problems through which there cries for remedy so vast a proportion of the poverty, crime and madness, are something worse than 'questions.'" From other sources we know that the "adding of field to field" in Isaiah's time "was carried out with the most cruel eviction and disinheritance," and that its results were depopulation and barrenness. The code of Leviticus three hundred years later shows that the same difficulties continue. An awkward attempt is made to remedy them by a jubilee year—a return after fifty years of all land to the family or heirs of the original owner. It is hardly probable that this scheme was ever carried out, but its incorporation in the law shows that the pressure of centralized ownership was being felt.

Rome met a similar problem of land monopoly in the second century before Christ. Under the earlier Licinian law the amount of public land which could be occupied by one citizen was limited to 500 acres. But some wealthy and powerful Romans by registering lands in the names of others, hired for the purpose, were able so to take possession of the public lands that the soldiers returning from foreign wars could find no homes at all—for openings in other lines of labor than agriculture were few indeed. Tiberius Gracchus, a noble Roman, undertook to force restitution. He made a brave struggle for the public rights, but was assassinated by a purchased mob of the Senatorial party. How modern all this sounds—false names, false entries, public lands, and senators!

Further instances from ancient history would not be difficult to quote; but I spare you the pedantry of completed lists. It is enough to note that our modern times face the same problems presumably not yet settled right since they refuse to be settled. The present rebellion in Russia is a maze of many problems of government—a universal conflict between the forces of advance and those of oppression, complicated by race hatreds, by the

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hopes of subject nations, and by universal graft. But one of the fundamental difficulties is the land question. Down to 1863 the Russian peasants were serfs, attached to the soil. When they were emancipated an arrangement was made by which they were to purchase portions of the land by a system of yearly payments. But in 1882 there were still a million and a half who had not redeemed their claims. The nobles had set too high a value on the land sold to the peasants and had made too low an estimate of the allotments needed by them. One-third of the whole number held less than eight acres each; and from these they were expected by the primitive methods of Russian farming to support their families and to pay for the farms. The present system of holding is communal. The mir, or community of peasants, owns the ground and division is made each year. But the amount of land available is insufficient. Originally 100,000 nobles held nine-tenths of the arable land of the kingdom; and when they were forced to divide with the peasantry even at a high figure, they kept a lion's share. Present conditions are intolerable, involving unspeakable suffering. Tolstoi believes this to be the most vital, and deep seated of Russia's many diseases.

In the England of today ten-elevenths of the land is owned by one two-hundredth part of the population, leaving one-eleventh for one hundred and ninety-nine two-hundredths. The Hon. George Broderick says that farmers, trades people and day laborers alike are as absolutely at the mercy of their landlord, the large landholder on whose estates they are settled, as the subjects of the Saxon or Norman lord in the fulness of his power. He adds "a great land owner exercises despotic power over individuals such as we are accustomed to look upon with horror when occurring in the Turkish or Russian Empires." He instances cases of dictation even in matters of religion, while Mr. Froude tells of the eviction, by a "noble" duke, of a whole village from the home of their forefathers because of some needed expense in repairs. The land monopolies of England have been made the means of demanding enormous sums for sites for pub-

lic improvements and for other extortions resulting in very heavy taxation—a taxation which the landholder has skillfully shifted in the main to the shoulders of the landless. Conditions in Scotland and Ireland are even worse than in England, and though some feeble movements have been made to remedy the general injustice there is still a great oppression to be lifted. The connection is a close one between these conditions and those of English poverty which are now threatening the life of that nation. Sir Henry Campbell Bannerman, the Liberal prime minister, in a recent address asserted that about 30 per cent. of the population of England is living in the grip of perpetual poverty. And General Booth estimates that a tenth of the population of London is not merely poor, but reduced to pauperism. It is only a few weeks since thousands of women, wives of men unemployed but seeking work, demanded of the prime minister some improvement of condition. It was not a group of mere tramps that met the large offers of charity with the response, "Curse your charity! we want work!" No nation is safe in which opportunity is locked and a few masters hold the key. Liberty is not safe when an oligarchy commands the chance to labor; and the prime necessity for labor is ready access to land. Even now a great English philanthropist is planning a great transportation to Australia,—“to take the landless man to the manless land.” And it will be found as with the transported convicts and inefficients of a few generations ago that the opportunities of the new land will make men of many of them.

“History is past politics.” It is only incapables that refuse to learn in any schools other than that of experience. The time to avoid the rock on which other nations have split is while there is steering room. The time to deal with the American land problem is before we reach its crisis. And already it begins to press upon us in spite of our broad expanse of territory, and in spite also of our genial certainty that all must be well in this alleged land of the free. The land grabber seizes the forests and sells the timber belonging to all of us in the far west. He

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fences in thousands of our acres for his cattle herds on our western plains, driving out the settler at the rifle point. And when he is convicted he so buys judge and court officers that his penalty is a few days comfortably spent at the sheriff's home. He seizes our anthracite lands, paying ordinary farm taxes on such as he doesn't want to use, but wishes to keep others from using and then puts his tax at will on every man's winter warmth. He seizes the oil fields, where the Lord of us all put away stores of light and comfort, and he doles it out at his own price as if the Lord gave it all to him. And to do this he corrupts men, councils, legislatures and wrecks mercilessly those who would make these necessities of life easier of access. He controls railroad rights of way and by the power of his monopoly he degrades public officers of every grade, not even excepting the judiciary. He pays taxes at about such figures as he chooses and he chooses low figures. He acquires city streets by shady methods and levies a toll on all citizens, which is as truly robbery as was that levied by the medieval barons at the fords and cross roads. Yet he is not personally guilty of the whole, or even the largest part of the evil. A social and legal system which allows and fosters land monopoly has no right to blame the individuals who take advantage of the opportunities offered. It is for society to see that no offer of special privilege or opportunity shall be made that does not at the same time require for the public good the full value of the special opportunity so given. Every dollar of value created by the energy, ability and knowledge of the individual should be his own; but every dollar yielded him by special privilege given by the public should be returned to the public treasury. To accomplish this seems to me to be one of the problems immediately before the American people. It may be postponed as a similar question was postponed in Rome, or in England, and as the slavery question was postponed in America; but as in those cases it grows more difficult as it is postponed and may yet, as in the agrarian question of the

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Gracchi, or the slavery question of America, call for a bloody cutting of its intricate convolutions.

Nor is the threat of land monopoly confined to the corporate holdings of great combinations. Even in farm lands the type of farmer who farms farmers instead of farms is coming more and more in evidence. It is perhaps a dangerous expedition for one not an expert to wander into the pages of the U. S. census report. Yet some things seem reasonably plain from the tables there presented. The number of those holding full title to their farms has fallen from 1890 to 1900 from 47.3 per cent. to 44.4 per cent. Mortgaged farms increased in number from 18.6 per cent. to 20 per cent. and hired farms from 34.1 per cent. to 35.6 per cent in the same period, and this in spite of the large number of farms almost given to settlers from the public lands of the west. In N. J. in 1900 33.1 per cent. of the farm families owned their lands, 35.8 per cent. were mortgaged and 31.1 were hired. Such figures are not conclusive and may represent only a temporary movement. It is possible even that some changes in the basis of census figures may explain them. Yet my own observation indicates that renters increase in number on the farms and owners increase in the towns and cities. If so, it represents a tendency of danger, and the more so if large tracts or many farms tend to accumulate in few hands. Rent invariably tends to demand all but a living, and the quality of living in times of stress cannot but tend downward. The intelligence and independence of our country population is immediately and vitally involved.

It needs not to say that the whole question of taxation is intimately involved in the land question. Under present conditions a large proportion of the corporations, especially the railroad corporations, escape their fair share of taxation. It is true that under the New Jersey law almost every predatory trust in the country pays tribute to your State. But if New Jersey escapes taxation by a miscellaneous incorporation tax, she does it at the expense of the rest of the nation. I am not an expert in such

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matters; but I know, as you know, that New Jersey has been pilloried from the Atlantic to the Pacific as "a traitor state" which is selling out the rest of us. I do not know whether there is a libel law for states or not, but I have heard no denial of the widely published assertion that your state "not only licensed companies to do in other states what those states would not license"; but has also "licensed them to do in other states what she would not let them do in New Jersey." Also "that she has sold us out for money" and lives as a state on corporation revenues. A recent paragraph in an independent paper outlining conditions in various states remarks, as if it were a matter of course, "The railroad corporations own New Jersey." Now Pennsylvania cannot say much to her neighbors about being owned by railroads; though I have always thought the pot justified in calling the kettle black if the kettle was black. And I realize that there is much wild partisan talk abroad which ought not to be taken too seriously. But if New Jersey makes money from corporations by giving them letters of marque to prey upon other states, then she makes money by the sale of honor? And if she is owned by railroads, then she is owned, like Pennsylvania, because she has given them an exclusive privilege to use land for transportation which is necessary for her life. Will the New Jersey farmer citizen think on these things, and having thought will he determine to be a citizen of the United States, or a citizen of a single state?

And this leads me to my third and last topic—the need of a larger, a deeper, a more firmly founded citizenship. The primal question for the New Jersey citizen, be he farmer or townsman, as for the Pennsylvania, Iowa or California citizen, is the honesty question; not the commonplace, easy honesty which keeps men out of jail, but the larger, more fundamental honesty which alone can make for good government; the honesty which demands no less than universal fair play; the honesty which in person and in community, will refuse to profit by another's loss. It may be that your State has been maligned—that is your ques-

tion, and you are not good citizens unless you determine it to the best of your ability and then act as a free, independent, honest man to make all right. It is true there are many phases of the honesty question. Our system of local taxation which tends to prevent improvement, encourages the obstructionist and upholds the liquor traffic; our system of tariff taxation which, according to Professor Ely, is one of a class which violates the principles of equality, encourages pauperism, obstructs trade, produces monopoly, and is "congenial to despotism and aristocracy"; our conflicting marriage laws, our liquor laws, our railroad rebate laws and a host of others. All these questions involve difficulties, but they can be faced with serenity if they are faced honestly.

Honest citizenship demands many qualities of mind beyond a mere respect for the property of our neighbors. The good citizen needs intelligence to understand, earnestness to drive his intelligence into the intricacies of our complex social relations, courage to act when action is called for, and the loyalty which sinks self interest in the general good. If America fails, if our great western experiment in democracy prove unsuccessful, as have many others before it, it will not be lack of intelligence, nor lack of intense interest that will cast us down. Beyond intelligence and application which we have or can have, we need courage and devotion—courage of mind and soul, and devotion to national ideas. We need the courage to try new and untrodden ways, to experiment in social forms and institutions, the courage of the pioneer. Dr. Ely of Wisconsin says: "There is at present among us an un-American fear of new ideas; whereas our greatest danger is in the dearth of them." And another sociologist predicts that in our national advance "we shall continually be obliged to go forward into dark forests, to cross unbridged rivers, to lose ourselves in tortuous valleys. Science will often be found misleading. It will often be safer to ignore the guide posts and to watch the stars."

But I do not fear for our lack of courage. Like intelligence and application, I believe that it is to be found and will

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be found. The one deadly danger which stares us in the face and which, unless destroyed, insures the deterioration and decay of the republic, is the grasping, self-seeking tendency which displays itself in political and business "graft," in sweat shop labor, in police licensed vice, in city slums, in the labor of children, in the trading of votes, in the pliant executive, in the subservient judiciary—all of which are to be seen in our country, and many of them in every part of it. Our nation can stand bad institutions, but it will die of bad citizenship. These many forms of evil are the external breaking out, the cutaneous sore, which indicates disease throughout the whole system. Our form of government by no means insures our permanent national life. Indeed, as Dr. Warner, late of Leland Stanford University, says: "A republic is a preliminary day of judgment." "One merit of democracy is this, that it is impossible so to organize a lot of self-seeking and vindictive rascals as they shall form a stable republic. If those who live under a republican government insist upon going to the bad, they can go in a hurry. If evil triumphs in their individual hearts, it will speedily triumph nationally and socially, and 'darkness be the burier of their dead.'" Those who attempt to rise by treading down other men are in fact treading down democracy.

In its yearly and hourly day of judgment America turns to her farmer citizens. They are not her only hope, but they are her strongest hope. They make up over a third of her active working citizens. They are more than double the noble engaged in any other line of activity. Their conditions of life tend to strength, intelligence and courage. The history of our nation teaches us to look to them for independent patriotism and for sterling honesty.

In responding to your country's call the dangers that especially beset you are lack of self confidence, partizanship, and above all that insidious evil which includes most others, the degrading of your public duty to a private aim. Allow me a closing word as to each of these dangers. There is a wholesome

self distrust which drives men to deeper study of doubtful matters and results in increased efficiency. But there are no reliable specialists in the duties of citizenship. After using his best endeavors to understand each situation as it arises, the citizen should trust himself and stand by his instincts. There is no guide less to be depended on than the professional sociologist. By training and habit of mind he is a conservative. If he is not a conservative he is never accepted as a sociologist, but is labelled crank and set aside. He deals with the mapped territory of experience and is an excellent guide over well trodden highways. But the citizen is meeting new situations and facing new duties, which make "ancient good uncouth." A direct and straightforward dealing on the basis of his deepest patriotism may lead into difficulty, but it will surely find the safe way out. Let us be as wise as we may, but in the face of doubt and hesitancy let us be strong and of good courage.

Partizanship is especially the vice of the "good citizen," and under its influence he easily becomes the worst of citizens. The law breaker, the grafter, the political boss, the corrupt corporation is no partizan. Such vote and influence follows its selfish interests unerringly and regardless of party names. But every public officer tends to cater to the mobile vote. The fixed vote, whether for him or against him, needs no attention. How vitally important then that the ballot of the good citizen should show an independence equal to that of the bad citizen. Yet how many times have we heard the so-called good citizen claim credit that in a long life he had never voted any other than his own straight party ticket. Such a statement covering a long series of years is a claim of incompetency and uselessness. Such a citizen is a part of the dead load of inertia that the really live citizenship of the country has to carry. Parties are necessary, of course, and their officers, who may be presumed to believe in them, must in a sense belong to them. But no citizen who belongs to a party except in the immediate temporary sense, is or can be a good citizen.

Independence is a part of that loyal honesty which alone can

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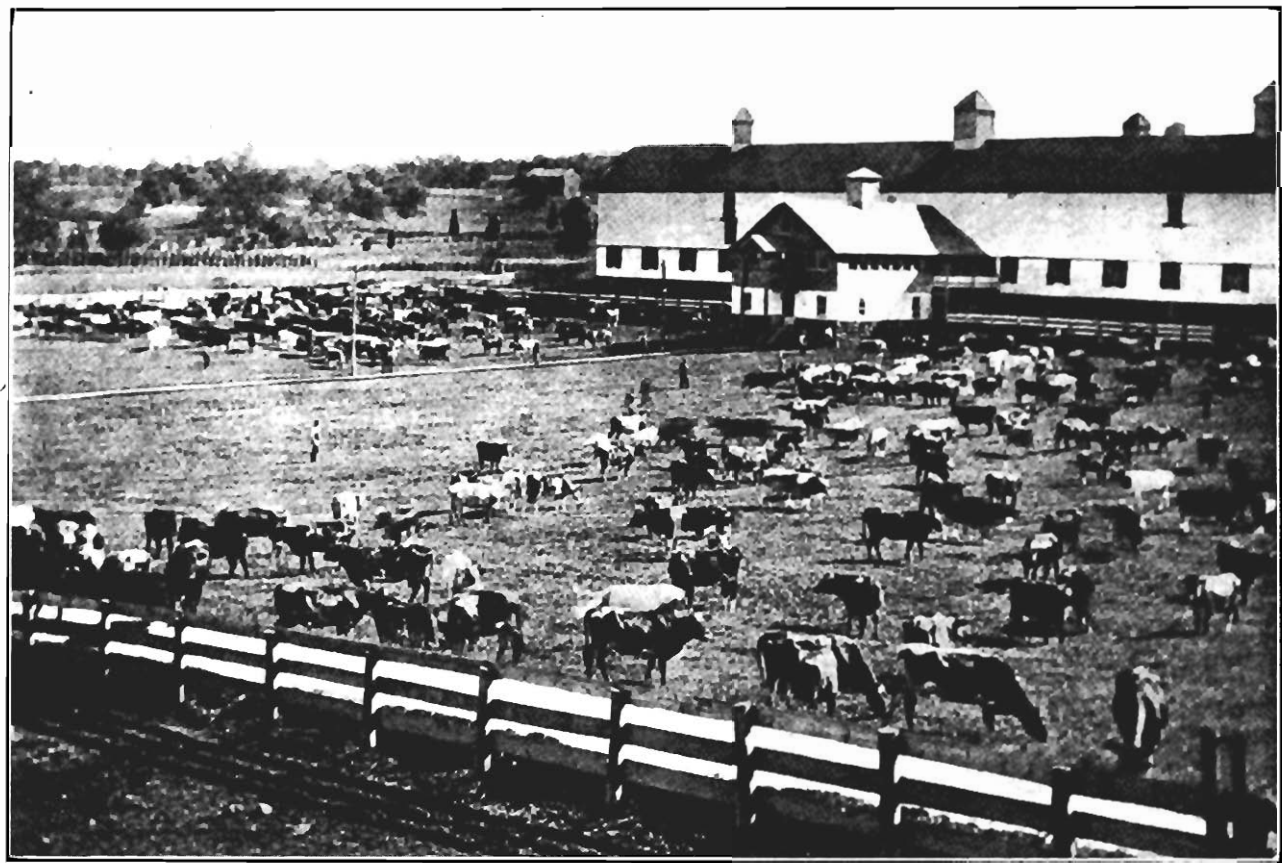
preserve a democracy. Yet it is only a part. For the royal democrat must wrench himself free from party only to become the servant of principle. He must guide his course by no private and by no class interest, but by the common weal of all his kind. The man who is a free trader because he wants free hides in the shoe business is a political grafter. The man who wants Dingley protection because he wants to keep up the price of sugar is another political grafter. The good of the whole people is the only honest basis for a decision. Driven by this principle, the citizen will often find himself in the small minority, condemned as a kicker and a pessimist. Either title may be borne with calm. For minorities do all the work of the world. It is their business to work on the inertia, the stupid slowness of the masses and gradually to convert them in understanding and to righteousness. Then the thing is done, and the live man looks about for another minority with a righteous cause to serve and joins himself therewith. Not all minorities are right, but the right that needs a man's help is always with some minority—and the pessimist—the name is generally applied to the real optimist. The genuine pessimist is the man who claims that the present is the end and climax of human progress—that there are no evils worth mentioning, and that the chief end of the good citizen is to fly the eagle and to gloat over the glories of his native land. He is a pessimist because he can see no possibility of advance. The genuine optimist is he who has such faith in man and in his country, that he believes a thousand improvements can be made, and these he joyfully and emphatically demands. We are the engineers of this great machine, our country. The so-called optimist engineer listens with enthusiastic joy to the throb of his engines. His heart rises in exultation with each swing of the great wheels. He does not allow his ecstasy of admiration to be interfered with by an occasional shriek of tortured friction here or the rattle of loose screws there. Let the pessimist busy himself with false notes; he will revel in the grand symphony of his rhythmic power maker. Do you want

to ride with that engineer? Or do you not prefer that so-called pessimist who, while he rests in solid satisfaction in the "true beat, full power" of his monster servant, recognizes in their orchestration their splendid structure and their enormous power, is nevertheless most keenly alive to every doubtful sound, to every uncertain motion. The citizen-engineer shows his loyalty not by open mouthed and mawkish admiration, but in constant criticism and repair—the constant vigilance and courageous taking on of responsibility, which is and must be the very life of the republic.

For these needed qualities, my fellow citizens, we turn hopefully to you—for courage and intelligence, for independence and earnestness, for loyalty and honesty. For these qualities your country has turned hopefully to you in more than one national crisis in the past and has not been disappointed. In the battle of public against private interest, of honesty against graft, of principle against partizanship, the nation may hope to find in you a strong tower for all righteousness.

The Cow as a Country Home Maker.

BY G. M. GOWELL, PROFESSOR OF ANIMAL INDUSTRY,
UNIVERSITY OF MAINE.



A 500 Cow Dairy, Essex County, N. J.

The Cow as a Country Home Maker.

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UNIVERSITY OF MAINE.

MR. PRESIDENT AND GENTLEMEN:—I don't suppose for an instant I can tell you anything that you don't know regarding any question that relates to the dairy. The cow, as I am aware, all over our country has had consideration at almost every public gathering of farmers, and the subject has been pretty well worn out,—if it is possible to wear it out.

Without entering into any specific direction as to method of work, I want to tell you something about what we have done, or tried to do, in our own State, as I think your conditions are somewhat similar to our conditions in New England. I suppose you had forests here at one time, and they were cleaned away, and that the rich lands disappeared by improper methods of tillage and husbandry, and after awhile you found yourselves with a worn soil that was yielding insufficient crops for the needs of the farmer and his family, and that those conditions resulted in a depleted population, the going away of the boys and the girls; and with the then known methods of agriculture there seemed to be nothing else for them to do. Then there was not enough to be gotten from the land so that the farmer could support himself and his family, and educate his children and give them an equal place in life with the sons and daughters of mechanics, tradesmen and professional men, seemed to them to be true.

That is the reason why our boys and girls went away from the State of Maine. It was not because we didn't have a strong soil. We do have a strong soil, much of it granite drift, that had been all covered with forest, but the vegetation had been burned out, and our lands had been lying long in grass—because that

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was the method of farming at that time. I presume that it is true with you, as it is with us in New England. When the West developed and sent its great grain crops to the East, it lowered the prices so that our eastern farmers had less profit than ever, and they had to turn their attention to some other line of agriculture, and naturally they turned toward dairying. It was in that way that we became interested in dairying, and gradually learned some of the conditions that pertain to the business.

Our people had been engaged in beef raising, sheep husbandry and general farming, and had gotten their money chiefly from the sales of beef, mutton and wool. Corn, wheat, oats and potatoes were grown on every acre that the manure secured from the stock would fertilize sufficiently. At the meetings of our Board of Agriculture and at our Farmers' Clubs, the subjects we discussed and planned for, more than all others, were making, saving and best measures of using manures. We built tight cellars with walls of solid masonry under our barns, so as to keep the manure from leaching and loss. Our land was rich, our agriculture prosperous, and our people happy. But western beef and mutton followed western grain to New England markets and depressed the prices of everything eastern farmers had to sell. Wooden ship building all along our coast, and mills and manufactories at the waterfalls on every stream were calling for men who could soon become skilled enough to earn more in a week than the farm could pay them in a month, and so our boys went—and our girls went too, of course—and there were lots of sore-hearted old fathers and mothers left in the country homes on the hills, and all up and down the valleys of our beautiful State.

Our people went from the farms to cities from necessity, not from choice. They would far sooner have remained in the country could they have found use for their brawn and brains at prices at all comparative with the city's payments. Then came long years of depression, for reaction was inevitable. Prosperous, well-cared-for farms were poorly worked and neglected be-

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cause of the lack of help to do the work. Less crops were cultivated, less stock kept, and much land was allowed to lie long in grass, until the crop yielded was worth but little more than the cost of harvestry. And these were some of the results of the exodus.

But not all of our people went; some remained because they could not, and others because they would not go. Some had an abiding belief in the soil, and that better conditions were to come to the farms and farmers, and they stayed to work out their convictions. In conjunction with our Board of Agriculture and our Agricultural College—before the days of Experiment Stations—they carried steadily forward a campaign for a system of agriculture that should meet the changed conditions and demands. When we took the matter to our people, through public meetings and the agricultural papers, and urged the more frequent plowing and re-seeding of grass lands, and the feeding of the hay to dairy cows instead of selling it from the farms, we had the best arguments that could be devised for such purposes, for we had some practical examples of success—a few dairymen—who had taken up the cow when they had abandoned her son, the beef steer, years before. These men were prosperous—more so than they had been under the old system when beef, mutton and wool had been their goal.

We took these men as examples, for the first lessons, and showed them to the farmers; showed how the cow could come in and consume the crops on the farm and give more money for them than any markets to which they might be sent; how she could improve the soil; and how more cattle might be kept on the farm than ever before—even when her son was king. We began to breed the cows of beef type over into the dairy type, and to improve and fix in them the functions of milk-making; we argued the cause of the cow with the farmers' boys—how she was something more than a machine, and if she were to do her best work for us she must be treated as gently as though she were a human and not a brute.

These innovations were well received by a greater or less

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number of people in almost every section of our State, but it was slow work; it was before the days of the silo for preserving corn; it was before the economical and practical uses of commercial fertilizers were known—and before the prices of them were reduced so they could be used in connection with general farming.

I said that the working out of this new system of farming, and securing its general adoption by our people was slow work. We had to depend on the resources of the farms, on better tillage, and on the making of manure from our stock; and you know that soil improvement under those conditions is slow work. I doubt if we could ever have attained what we did if it hadn't been for the commercial fertilizers that were brought in and used sparingly on the farms. Early we recognized the value of clover, and we raised lots of it, but we didn't recognize the value of corn as a forage crop. We knew how to raise yellow corn of those varieties that would ripen with us, and yield sixty or seventy bushels to the acre, but we could grow it only on such areas as could be manured from the resources of the farms. With the cheapening of the cost of commercial fertilizers and better knowledge of their use, came also the theory of growing coarser varieties of corn, for storing in silos, for a part of the winter food of our cows.

At our College Farm we raised silage corn, on old mowing land, with good tillage and commercial fertilizers alone, sufficient to feed a cow a year from every acre. On another part of that farm, on land made rich by cattle manure and chemicals combined, we grew corn enough on three acres to feed six cows a full year if they were not pastured a single day. Of course I mean that these fields yielded only the coarse fodder, the grain feed being purchased. And we carried these statements of what we had done at the College to our people.

For twenty-five years we have been talking about growing corn, and clover, and grass, and peas, and oats, and keeping cows, until Maine has become a great dairy state.

We grow potatoes, you know that, because at least a dozen

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men have asked me about buying seed potatoes in Maine since I came here last night. Potatoes are the special money crop in the northern section of our State, and there they are grown chiefly by aid of commercial fertilizers and the clover sod.

But we are also growing great quantities of potatoes on what were formerly regarded as worn out farms, in our central and southern counties—three, four, five hundred bushels to the acre, and we are able to grow them only because of the help the cow has given us to do so. Now what is the condition of our State and our farmers?

Those farms that were abandoned, and they were abandoned as far as work upon them was concerned, have been taken up and worked, and well worked, and instead of having a few cows and animals, we have many cows and animals all through the central and southern sections, and it has changed the conditions and brought back to the farms many of the people who went away.

It is keeping our boys at home, too, and they are earning as much for their work out there in the country, in the open air, on the land they own, as are their other brothers in their offices and business places on the hard, hot, crowded city streets.

The most successful way of teaching this newer agriculture has been by teaching by example. When one man in a neighborhood or town would take up the work and plow three or four acres of old mowing land, till it thoroughly, fertilize it with half a ton of chemicals, costing ten or twelve dollars per acre, plant to Sanford or Leaming corn; at harvest time he would find himself with cattle food enough stored in his home-made silo to feed three or four more cows through the year than he had ever been able to feed before. He would buy the cows, feed and milk them through the year on hay and the silage, and after paying for the grain and hay eaten by them and the fertilizer bill, would have something like a hundred and fifty dollars left. And do I hear you say, "Only a hundred and fifty dollars to pay for all that work and worry?" Yes, but that was

a hundred and fifty dollars more than he had the year before; but he had gained something else; he had gained courage, and faith in the land, and faith in himself. He knew now that the brown soil of that old farm had within it the materials from which money is made; and he knew, also, that he had it within himself to make that soil richer and more productive through all the coming years. Thoroughly aroused now, he put the plow into the old sod on other acres, and ten, fifteen, twenty and more cows were fed and milked where there were few before; the land was green with its heavy crop of corn, clover, grain and grass, and the hearts of the farmer's family were glad.

Do not suppose for an instant that the knowledge of what was taking place on that farm was confined within its own borders. Other men came and leaned over the fence—saw, and believed.

The revenues of these farms are not confined to the direct products of the cow. She enriched the land and made possible the great money crops of Maine—potatoes, sweet corn and apples.

And our people are happy. Many of the old farms are divided, and other homes are being built on them. The boys of one family are marrying the girls of another, and they are raising up children of the best blood of any people on earth, because their breeding is based on that old native stock that cleared away the forests and made living possible in the wilderness of New England.

I must tell you something of the cows that are our co-workers. They, too, are of New England origin through their dams, but they are foreigners through their sires—mostly grade Jerseys—but many grades from the Holsteins, Ayrshires and Guernseys. It is the stock we bred and moulded to the needs of the newer agriculture. They have the constitution and hardihood of the old native stock, combined with the milk-yielding functions of the special dairy breeds.

We taught them to work, for we accepted as our creed the

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cry: "There must be no boarders in the dairy herd." So we milked them nearly the year around, letting them barely get dry before giving birth to calf again. We bred the heifers young, so that they came to take their places in the milking herd when they were under two years of age. The early breeding tended to develop the instincts of motherhood and the functions of milk making. It diminished them in size, but strengthened them in function. But the function was already strong within them, and we could not afford to have them dwarfed in size and capacity. The trend of practice now is to have the heifers give birth to their first calves when they are about two and a half years of age, and to dry them off when they are not nearer than eight to ten weeks of coming in again, thus providing periods of eight to ten weeks yearly rest through all their year to come.

I am sure that the cow that goes dry eight to ten weeks before the production of her calf will give more milk through her lifetime of twelve or fifteen years than she will if she is milked to within four weeks of calving. She will be rested, fleshy, and filled with energy, and when she takes up her work again, she will give full measure of milk, and more, to pay for the rest she has had. If you don't believe it, just think back to the time when, by some mistake in your reckoning, you didn't get the cow dry at all, or only for a few days. Did she freshen as she had always done before, or did she give a small mess through all the following year? Another decided advantage is that the cow that has a good rest will yield a better calf than though she had been milked close up, and the young calf she was carrying starved before it was born. Constitution in man or animal is the vitality that is present at time of birth, and it cannot be fed into an animal that is born without it. We must have well-born heifers if we are to breed good dairy cows.

MR. FITHIAN: How do you get your cows to go dry so long? I can't get them dry as many days as you.

PROF. GOWELL: It is the simplest thing in the world if a man really wants to dry them up. We milk them once a

day—in the morning, and then, after four or five days, we milk them every other day, and milk them clean. Don't leave anything in the udder to rot and cause trouble. In this way we have but little trouble to dry them off, if we begin early enough.

MR. FITHIAN: I can't get Jersey or Guernsey cattle dry.

MR. RIDER: Suppose you had Guernsey or Jersey cattle, and had them dry for three or four weeks, do you not have milk fever then?

PROF. GOWELL: I never had an animal with milk fever.

MR. FORT: Is the milk that is not used for butter-making shipped in cans to the cities?

PROF. GOWELL: Our cities and villages are supplied with new milk from the farms; some of it is sent by teams and some by rail.

MR. FORT: I suppose a large percentage is taken to the creameries?

PROF. GOWELL: Yes. The cream is sent to the creamery, and but little milk is sent; the skimming is generally done at home.

MR. FORT: What do you receive for that?

PROF. GOWELL: We sell the fat in the milk, and are now receiving about 29 cents a pound for it.

MR. FORT: Then there is a very small percentage of your milk that leaves the farms and goes into the dealers' hands, and is sold by the quart?

PROF. GOWELL: Very little comparatively.

MR. FORT: What is the farmer receiving for that milk that goes into the city?

PROF. GOWELL: From three to four cents per quart.

MR. FORT: I understand you to say that your cows net nearly \$100.00; you must get pretty good prices.

PROF. GOWELL: Well, I don't know that you would call

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them good here. We sell a good deal of sweet cream that is sent to the cities outside of the State, and for that we think we get good prices.

A DELEGATE: How long do you milk your cows before service?

PROF. GOWELL: Ordinarily about three months.

A DELEGATE: Do you find that to the best advantage?

PROF. GOWELL: With the cows to raise and keep continuously, yes; but where cows are bought and fed heavily for what milk they will make, they are generally not served at all, but sold when the milk yield becomes too low for profit.

A DELEGATE: What is the average income per cow per year?

PROF. GOWELL: It varies in different herds; from sixty to a hundred dollars.

A DELEGATE: What is the cost of the feed outside of what is produced on the farm?

PROF. GOWELL: We feed ordinarily from 1800 to 2500 pounds of grain per cow. On some farms a part of this is grown, on others it is all purchased.

MR. CHARLES HOWELL COOK: You brought up a question that is very interesting to me, and that is the question of breeding a heifer. Did I understand you to say that you bred your heifers so that they would not have their first calf before they were thirty months old, instead of two years, as has been considered the custom?

PROF. GOWELL: Yes.

MR. COOK: I want to know what you find is the result of that breeding; is it a benefit, or against the two year system?

PROF. GOWELL: I regard it as decidedly better. Most heifers which come in at twenty months to two years old are little old cows during their heiferhood. They lack in growth,

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and seldom make it up, or, if they do, they milk lighter while they are making up the size, for they have to divide their energies between the growth and milk-making. When dairy bred heifers come in at thirty months old, they are larger and stronger, and yet the function of milk making is so well established that they readily take up the work, and soon develop into good dairy cows.

MR. COOK: You emphasize that because it is for dairy bred cattle, for dairy purposes?

PROF. GOWELL: Yes.

MR. COOK: If you were to take up the Short Horn cross and allow them to go to that period, would you not endanger the condition of fat-making as against milk-making?

PROF. GOWELL: Yes, that is right.

MR. COOK: The distinction you make is,—where you breed dairy bred cattle, it is more profitable to have them come in at thirty months, but where they are Short Horns, it would be wiser to have them come in earlier?

PROF. GOWELL: I should certainly say so, because the function of your beef bred animal is the production of beef, and in some way you have got to change and twist it to get her to do this other unnatural thing that you want her to do.

MR. FITHIAN: Would you not prefer these cattle not to get too fat?

PROF. GOWELL: The Short Horns?

MR. FITHIAN: No, the dairy breeds.

PROF. GOWELL: We don't want them fat; we want them growthy and moderately fat.

MR. FITHIAN: You let them go to pasture?

PROF. GOWELL: Yes, but we don't feed them grain when they have a good pasture, and our dairy-bred heifers do not overload with fat, so, but when they come to work at the pail the fat

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disappears, and we have a big, strong heifer to make a decent dairy cow of, all because we allow them to be free for the first thirty months of their lives. Were they beef animals that I wanted to make dairy animals out of, I suppose I would have to treat them differently. Our people are not trying to do their dairying with beef animals.

MR. FITHIAN: If she is thrifty, she will get fat at our place.

THE PRESIDENT: Do you find that those animals that you allow to get fat, these dairy bred animals, do you find that is detrimental?

MR. FITHIAN: I do; I keep them thin.

MR. COOK: I don't; I like to have them in good, fair shape.

THE PRESIDENT: I do too.

MR. A. S. APPLEGET: You spoke of the very great desirability of providing first for a good strong constitution. Now, after that has been provided for, is not there a method by which you can determine whether that calf so dropped is liable to possess a good constitution? In other words, I have obtained from two sources, information upon this point. Surgeons tell me that they have attended the birth of children of the same family, and that they could distinguish at once, although the child seems to be fully developed and has fully as much weight as any one of the same family. He can say at once that that child will not live, but this other will stand any amount of hardship and endurance from now on during his life. That is to say, if the umbilical cord is large and stout and shows full and strong blood vessels, that it is going to be a hardy strong constitution and will endure any amount of hardship. My surgeon in the army in picking out men for exceptional service first conveyed that information to me. I had it later given to me in the matter of animals by a very distinguished gentleman, and I ask you, sir, if we are not able to judge somewhat as to what might be the future of that calf by looking at the umbilical, and later on the navel, and

seeing whether it is large and well developed; if that would not give a dairyman a good send-off in that matter?

PROF. GOWELL: That matter has been presented a great many times, and it is quite a popular idea. I think the idea comes from the practice of the English surgeons in examining their recruits; stripping a man, and if he has a large navel, it is an indication that the large scar was left there in the healing of the large umbilical cord. If the cord was small, it healed over and left a small scar.

MR. APPEGET: And they assert that the prize-fighter that didn't have it could not win.

PROF. GOWELL: I don't know about that, of course. It is a matter we have thought a great deal about, and, strange to say, I know of a great many that I think have strong constitutions that are pretty nearly smooth, with very little navel, and I don't know what to think about it. Theoretically, it is all right, but whether practically it is, I am unable to say. I have seen some abnormally large scars on animals with just ordinary constitutions; and I have seen others, perfectly smooth, that lived long lives and stood up under a great deal of hard work. I wish there was something in it, perhaps there is.

MR. APPEGET: I am assuming that the live dairyman will be around not a great while after the calf is dropped, anyway, and they might judge from that.

PROF. GOWELL: I question whether the live dairyman will do well to examine it for anything further than indications of strength, seeing first that it has four well developed teats, properly placed, and showing that it is strong enough in the neck and throat; looking it over and seeing that it is not whittled down too small by the tendencies to produce milk, that it has inherited from its mother. I think, taking the whole case, the dairyman will be able to form an opinion that will be much more valuable than the navel will indicate.

MR. PANCOAST: The gentleman spoke of these very

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cheap silos; I think we have lots of men in New Jersey that would like to build a cheap silo if Prof. Gowell can describe them.

PROF. GOWELL: The farmer gets out his own material, preferably spruce, and has it sawed into scantlings two by four, or two by six inches in size, and has it dressed on the inside and on the two edges. The outside is not dressed. He takes it home and dries it. He builds it in the barn or on the outside. He cleans off a place on the earth and cements it, or rather prepares it for cement, and stands up his first standard, and then his second and third, and takes barrel staves and puts them around the outside and tacks them on with small nails for supports, until he has a cylinder 10 or 15 feet in diameter. Then he gets the blacksmith to fit some iron bands with lugs at each end. The first band is put around at the bottom, the next one two feet above it, and the spaces widen towards the top, where they are four or five feet apart. The door is in sections—one above the other from top to near the bottom. The bottom is cemented after the rest is done. Many of our people are buying silos of cypress at considerable expense. They are more durable, but I don't believe they keep fodder any better than these do. The home-made silo has to be looked after in summer to see that it does not fall apart when empty and dried out. I know some of those silos have been in use 12 or 14 years, and are doing good work now.

A DELEGATE: What is the use of the lug, do they continue this rod around?

PROF. GOWELL: The bands are in two sections—two sets of lugs to each band. When the silo is first filled, the staves swell, and the nuts on the rods have to be loosened, sometimes. If there are any cracks, the nuts are set up so as to make the silo air and water tight except on top.

MR. PANCOAST: Are the edges bevelled, or plain?

PROF. GOWELL: Plain,—at first we bevelled them, but

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it is not necessary, for the edges press into each other when the nuts are set up and staves swelled.

MR. EGE: Can you give the cost of a silo of that kind?

PROF. GOWELL: One of our boys built one; it was thirteen feet by twenty-six. He bought everything, and not reckoning his own labor in, he paid out seventy-three dollars.

MR. ROBERTS: How high was that silo?

PROF. GOWELL: Twenty-six feet.

MR. ROBERTS: What is the lumber worth a foot?

MR. GOWELL: About \$14 a thousand. Others that are more economical don't go to the saw mill, they go to the woods and cut it out.

MR. D. C. LEWIS: I want to say a word with reference to this interesting discussion. Forty years ago I established a home in the State of Maine, within a few miles of Orono, where the Professor comes from. At the time I went there it was a common remark that the Penobscot Valley was a splendid place for a man to be born, and unfortunately added to it that it was a splendid place to emigrate from. I am glad to learn from what the Professor has told us that improvements have been made, and those farms which I saw year after year deteriorate from three tons of fine hay to the acre to less than one ton before they gave them up and threw them away, are to-day worth a good deal of money, and the boys are staying at home.

MR. CRANE: I have been very much interested in these remarks of the gentlemen from Maine, and the thought occurs to me if the dairy interests have done so much for Maine, what could it not do for New Jersey. According to the report of our President, it nearly equals all other agricultural products. I think that taking into consideration the fertility along with the cows, it exceeds all other agricultural products in this state, and yet, to our shame be it said, that the dairy interests are not great enough to support and maintain a New Jersey Dairy Union.

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We had quite an enthusiastic time here some time ago when Senator McBride came here and aroused us, and we organized a Dairy Union, and for two or three years it went very well. I think that our State Board Executive Committee could lend some aid to resurrect that Dairy Union and put it on its feet. We have some money in the treasury, but I think the interest is lacking; it should not be so, this dairy union should stand guard over our dairy interests.

MR. LEWIS: I lived in Maine about 5 years of my life at about the period the Professor refers to. I want to say that the Jersey dairymen will not get along in the same economic line that a Maine man will. I know that from experience.

MR. FORT: I am very glad to hear what has been said by the Professor, because the idea prevails in my district that they do nothing in Maine but catch cod fish, cut lumber and vote the Republican ticket. (Laughter.)

MR. COOK: I respect our good friend's opinions and enjoyed what he said, but I will not let the New Jersey dairymen go down. I know dairymen in New Jersey that are making above the average of the Professor's figures of \$75 per cow, and doing it on the butter-fat basis.

A DELEGATE: I heard a gentleman say only a few days ago in my neighborhood that he had 14 cows, 2 were heifers, and he had sold \$1,500 worth of milk in less than 12 months.

Common Diseases of the Dairy Cow.

BY DR. C. D. SMEAD.

The Common Diseases of the Dairy Cow.

BY DR. C. D. SMEAD.

FELLOW FARMERS—We are all farmers to-day and we seem to be all interested in the cow. I have been very much interested in the address of Professor Gowell and in the discussion that his address has brought forth. It indicates to me that you as dairymen and farmers are intensely interested in the study of cows. I have been introduced to you as a veterinarian, and as a leading veterinarian,—I can't say as to that. I am what might be called a student of cows, and as a student of cows, I am fully convinced that you as farmers and dairymen need to study the cow more than you ever have studied her, not only in the State of New Jersey, but in the State of Maine and New York, and all over the country. She is really the foster-mother, as Henry Van Drezer has said, of all of us, and I anticipate if it hadn't been for the cow and the milk that she has yielded, that some of us at any rate, at one period of our existence, would not have lived very long. So I think that is right. Your Secretary, Mr. Dye, when he wrote to me asking me to address you at this meeting, especially requested that I place my remarks upon paper. He said that I would be able to say more in a limited time than I would, if I attempted to take up the diseases of the cow, and I believe that was wisdom on his part. Then he said he desired to incorporate my remarks in his annual report. I think if Mr. Dye were here and listened, he would abandon that part of it.

It places me in a rather difficult position. I am not in the habit of talking from manuscript, and I believe I have the reputation of being a wonderfully poor penman and a worse reader, so that I believe he will abandon the paper when it comes into his hands. I will do the best I can and try to comply as well as possible.

The physician who studies anatomy, physiology and therapeutics, and banks on the knowledge he has acquired, finds himself all at sea when he gets to the bed-side of his patient, without he has also acquired a knowledge of human nature and his patient's individuality. Therefore, the most successful physician is the one who has the greatest knowledge of human nature, to mingle with his knowledge of medicine. The first thing the *best* physician does, when called to the bed-side of the sick, is to study his patient, and as far as possible learn what his or her individual nature is. When this is learned, the dealing out of the remedy becomes a secondary consideration. If this be true in the successful practice of domestic medicine, it becomes doubly so in the successful practice of veterinary medicine. It is dumb mouths the veterinary has for his patients. The symptoms as they present themselves, together with the knowledge he may have of the anatomical structure and individuality of the animal, is the veterinarian's only guide in diagnosing the disease and prognosing the chance of a cure. Taking up the dairy cow and her diseases and studying her and her ancestry of an hundred or fifty years ago, and we find a far different animal from that of the race from which she sprang of a few centuries ago. Her mission on earth then was to reproduce her kind, and furnish milk for her offspring, until such time as it was able to care for itself, and live upon the class of food the mother subsisted upon. The natural cow as we study her history, we find producing milk about four months in the year, when she weaned her calf, which nature assisted her in doing, by so changing her milk that it became to an extent distasteful to her calf. The calf not relishing it, nursed less of it from her udder, and hence the cow was slowly dried off without injury to herself or her calf. Although this condition existed centuries ago, we still see marked evidences of it existing in the present up-to-date dairy cow. It is a known fact among dairymen that when cows have been in milk about four months, many cows will quite rapidly diminish in milk flow, and there will be sometimes a disagreeable

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taste to the milk; and many times an unpleasant odor. The cow may be apparently well, and be eating the best of food and plenty of it, yet the milk will be off in quantity and quality. Some cows will become nearly dry. This is not a disease, but an inherent tendency toward a reversion to the natural conditions of her ancestry. As a rule, a dose of physic given to clean out the bowels, and stimulate the glands of her system with a liberal supply of milk-producing food, will seemingly give her a freshening and restore the milk-producing functions to the normal flow again for the next four months, when the same conditions are again liable to occur. Some cows will dry up in spite of medication and food, her natural tendencies taking supremacy over medicine and food, but if again tided over the period, many cows will continue to produce milk for two or more months longer. I have referred to these facts to illustrate conditions which must be taken into consideration in successful cow management. Also to show to cow owners that the present dairy cow is a *very* abnormal creature when compared with her progenitors. She stands before us a creature of man's moulding. By a system of selection in breeding and feeding, she has been transformed into a beast capable of producing not only milk enough for one calf for a period of four months, but capable of caring for two calves for four months. Then go on and well feed two more calves for four months, and perhaps another calf for two months longer. When she can't do this she loses her reputation as a dairy cow, and soon goes to the butcher's block. Hence, we have in a first-class dairy cow of to-day, a cow of five times the milk capacity of the one of a few centuries ago. Man has made of her a veritable milking-machine. Is it any wonder then that we find many a cow after becoming fresh, one, two or three times, failing to breed any more?

This is not due to disease, it is simply a case of where nature's laws have been so violated by man's greed that she rebels. The cow has been so bred and fed for milk production that her reproductive organs have been weakened under the strain, and her

breeding becomes an impossibility. The speculative dairyman who buys his cows, milks them as long as profitable, and then sells to the butcher, is not seriously harmed. But the dairyman who is raising the calves from his best cows to replenish the herd, or the breeder of pure-bred dairy cattle, finds his business crippled when his best producing cows fail to breed. The remedy for this condition lies not in drugs nor vaccines, but in feeding less for milk production and more for constitutional vigor. He who would raise calves from cows with an excessive milk-producing function, must be content with less than the cow's full ability to produce milk. In short, less milk in the pail and greater vitality of the cow must of necessity be his motto, or he will soon be put out of business. It must be more oats and wheat bran and less cotton-seed meal. Gluten, malt sprouts and brewer's grains his cows must have to remedy the evil. In many cases it is more out-of-door exercise the cow needs. The scientist, the breeder and the dairyman in some cases have been going a little wild over milk production. The warm barn with the water so provided that the cow can eat, drink, lie down or stand up in her stall from November until May, has been preached, and practiced a little too strongly for the general good of the cow family and profit to her owner. The concentrated protein foods, also, good as they are when fed with judgment, can with the lack of it be made the ruination of the herd, by not alone rendering the cow impotent, but make her a fit subject for germ and inflammatory disease. This brings me to the point of speaking of some of her diseases. Luckily for the dairyman, great advancement has been made along lines of treatment of the most fatal diseases the dairy cow is subject to. Scientific research has discovered the cause of the more fatal ones. With the cause learned, the remedy becomes easy to find. The true cause of so-called milk fever was unknown ten years ago—the treatment of it was a haphazard proceeding. Some veterinarians, when the cow was able to swallow, gave physic; others bled them, and gave aconite or opium. Some dairymen bored

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the horns, split the tail, and poured turpentine or vinegar in her ears. Others buried her in the horse manure pile to steam her. As far as success was concerned, one line of treatment was about as successful as the other. Fully 75 per cent. of the cows died, whether it was the veterinarian or the farmer that treated them. But thanks to some scientific work done by a Dane named Smidt, and later by others, the cause was found to be a poison that developed in the udder of the cow when supposed to be dry, which, by the way, a really first-class milch cow never is entirely. No cow that will produce a fair flow of milk for ten months in the year, have I ever found so dry when called dry, but what I could milk a few streams of milk out of her udder. It is this class of cows that are the ones that always have this disease; never the shy milker, who will go dry at about six or eight months. Hence the dairyman now knowing that his cows which are bred to produce milk for a long period and never is absolutely dry, and has further learned that the poison, which, when she becomes a mother, would likely kill her calf if not her, should from time to time examine his dry cows and endeavor to milk out any cheesy or stringy deposit he may find in the little milk which has accumulated in the milk cistern of her udder. As it has been satisfactorily proven that the true cause of parturient apoplexy or milk fever is due to the rapid absorption of this poison into the blood of the cow, producing an intoxication not unlike alcoholic poisoning. Knowing this much of the cause, we do not hesitate to say if dairymen or individual cow owners would simply milk out the deposit named from time to time, milking no more than just enough to rid the udder of the stringy deposit named, and keep the cow on half-full rations of milk-producing food, and give her a three-quarter pound dose of epsom salts, with a half ounce of powdered gentian added, the cow in most cases would be immune from that dread disease. But, thanks again to scientific research, it is now no longer the disease to be dreaded it once was. While there are several agents that can be injected into the udder through the

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teat that will neutralize the poison, sterilized air takes the preference, and is capable of saving fully 90 per cent. of cases if taken in time. There are many devices for doing this. The bicycle pump has been successfully used, but its use is always attended with more or less danger. An air injector made especially for the purpose should be in the hands of every progressive dairyman. A boy ten years of age can be taught to use it as safely and well as the veterinarian, and as time in a case of parturient apoplexy (milk fever) is money, the veterinarian miles away, perhaps, he cannot be relied upon to get to the cow soon enough to save her life. Therefore, I advise every dairyman to be prepared and have the device on hand ready for immediate use. The cost is trifling—the price of one good cow would buy twenty or more air-pumps, and insure the lives of all the cows in a township if properly distributed. Hence cow owners, if they will, can cease to lose cows by this dread disease, and fully keep it under control without veterinary aid.

The next in line of the fatal diseases comes so-called "Lump Jaw," or more properly speaking Actinomycosis. But little was known concerning the true nature of this disease until about twelve years ago, but to-day not only the true nature of it has been discovered, thanks to our Bureau of Animal Industry at Washington for that. The iodide of potash, given in one drachm doses, twice per day, to a mature animal (less to younger animals), will practically cure 75 per cent. of the cases if taken in time. In fact, when the disease is confined to the glands of the head and throat, it is safe to say 90 per cent. of cases can be saved if the remedy is given or commenced within six weeks of its first appearance. The most convenient way to give the remedy, is to have the druggist finely powder about six ounces of the iodide and mix with a pound each of sugar and common salt. Then divide into 48 powders, each one of which will then contain a one drachm dose, which, when mixed in a feed of wheat bran, will be readily eaten by the animal. This treatment will not always reduce the enlargement, but it will in 75

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per cent. of cases stop the further progress of the disease, and thus save the animal. The question is frequently asked: Is the milk from a lump jawed cow suitable for human food? Is the carcass safe for food? The answer to these is, yes. The milk or carcass is not impaired by reason of the presence of the disease until such time as the spores of it have so broken down the tissues in which they have located, as to cause an ulceration, and even then not until the general health of the animal is affected, can the milk become of an unhealthy nature. The disease is one of spores or organisms which find a lodgment usually in the glands of the head or soft tissues of the jaw bones. They take root in these tissues and feed upon them, thus tearing them to pieces, until at last the gland or jaw becomes a mass of disease. The general health then soon becomes involved, when of course neither milk nor carcass is fit for human food. Again the question is asked: Is the disease contagious? Is it safe to allow a lump jawed animal to run in the herd? To this I will say, until such time as there is an ulceration of the affected parts or a driveling from the mouth, there can be no infecting of other animals. When that stage of the disease is reached, then most *certainly* there is danger, as the spores may alight on food which if eaten is liable to infect the animal that eats it; or, if a cow, nursing her calf, should lick it with her tongue, or get some of the matter where the calf would lick it, there would be danger of infection. It is therefore unsafe to allow calves to run with lump jaw cows, after such time as ulceration has commenced. The milk, however, can be drawn from the cow and safely fed to the calf at any stage of the disease, if it is pasturized before feeding. But why dwell longer on this? The thing for the cow owner to do, is to give the remedy as soon as he discovers the disease. This brings forth another question. How he is to know whether the enlargement he may find on his cow's or other bovine's jaw or neck, is lump jaw or not? He can't know, neither can the best veterinarian always tell, unless the cow owner knows for a certainty that the enlargement is caused

by a bruise. The only safe thing to do is to begin at once giving the remedy, and at the same time paint the enlargement with the tincture of iodine once daily for three days, then skip a week, and use again. There is no need of veterinary aid in a case of lump jaw, much less need for the owner to invest large sums of money in some fellow's lump jaw cure. None of them can do more than what has been advised. A very common though not fatal disease prevails at this season of the year, known by various names among cattle owners. By some it is called winter itch, others barn itch. By the veterinarian it is called "Linea Lonturans" (when the veterinarian desires to appear wise and scare the owner a little). The more simple name for it is "Ring Worm," its cause being a tiny spore which abounds in the air of the stable. It alights on the animal, and where the hair is thin and the skin moist it has an opportunity to take root in the scurf skin. It causes great itchiness of the skin and loosens the hair, which the animal rubs off in trying to relieve the itching, leaving a bare spot on the skin. As the skin around the eyes is generally always moist, this is the part most frequently attacked, yet, when cattle are kept in warm stables and lie close together, the heat of their bodies so moistens the skin and hair that the disease is liable to start anywhere on the body. When nothing is done to prevent it, the disease has been known to denude the whole back and sides of hair, and sometimes it destroys the hair follicles, then as a result the animal remains a bald animal. When treatment is commenced in time, there is little trouble in heading it off. With some strong soap suds and a stiff brush thoroughly wash the parts, and when that part is not around the eyes, add to every quart of the soap suds a dessert spoonful of liquid carbolic acid. If about the eyes, wash with the suds and where the parts are dry use a little of a mixture of carbolic acid, one ounce; glycerine, four ounces; olive oil, six ounces. Use the same also as an after treatment on other parts of the body that is denuded of hair, and the disease can be effectually cured. The next disease in the line, although not generally

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fatal, is a serious one. It is *Mammiltis*, commonly called Garget. This is a disease not as readily controlled as those that I have named, as many times it is produced from an inherited predisposition. By which I mean the cow has been bred with an udder so formed and with a body so wedge-shaped, and she is so narrow in the knuckle that she can't well walk with a full udder without bruising it with her hocks. Please bear in mind that Mammiltis is simply an inflammation of the udder. Anything that will inflame that gland and we have a case of Garget on hand. Cows of a wedge-shape and narrow hocks, if they are unfortunate enough to have an elongated or pendant udder, are constantly bruising it with their legs in walking. Also when lying down it comes in contact with the cold ground or stable floor, and is liable to both injury or being chilled. Such cows should be weeded out of the herd, or bred out by the breeder. But even cows with well-formed udders are liable to this disease. In our study of this we must keep in mind that when a cow is in full flow of milk, her udder is the weak organ in her body. If she is allowed to contract a cold or become chilled in a rain storm, the chances are that within forty-eight hours we will find her yielding gargety milk, even if one or more quarters of her udder be not inflamed. As a preventive of this, first stable the cow from cold storms, and on chilly nights, if perchance a cow gets chilled, lose no time in getting her in the barn, placing an all-wool blanket upon her, not some old fly-sheet that has been worn half out on the family driving horse, but a good horse-blanket, and give her as a home remedy a pint of ginger tea. This line of treatment would prevent many a case of Garget. But if the cow's udder inflames, then go for the tea kettle, and with hot water and a cloth, bathe that inflamed udder, and then make dry with another cloth. Then, if near the drug store, get some fluid extract of poke root, and give her a forty-drop dose every six hours. Also get some antiphlogistin or thermafuge, and plaster it on the udder. Then plaster some cotton batting over that, and to make the job perfect, have the good wife make

an udder bag out of an old grain sack. Sew some cloth straps on the corners, which tie over the back. In twelve hours remove and bathe again, and again apply the antiphlogistin or thermafuge, and the chances are in favor of a recovery. But one can't wait a day or two considering whether he had better do anything or not. All such cases require prompt treatment, or no cure will be made. Women as a rule make the best nurses in such cases. Men are too confounded lazy to half bathe the udder. To all such I will say, better give the wife a five dollar bill and let her attend to it and succeed. It will be far cheaper than to give the veterinarian ten dollars, and not succeed only in having a dry cow to sell for beef. There is another cause for Garget, or rather an infectious germ cause, which I have deemed best to leave until the last. By some it has been called cow pox, by others, infectious Garget. As I have observed it, I find it far different from either cow pox or from the infectious Garget we read of in other countries. It is true that in some cases it much resembles cow pox, which will run its course in from nine days to two weeks, when all scabs will come off, leaving a clean healthy skin. This disease will first appear as a tiny blister, then a little pustule will sometimes appear as a lump like a fly bite or bee sting. The pustule will soon break, and a watery effusion take place, then a scab will form, but instead of a healing there will be a spreading ulcer, which will never as a rule heal of its own accord. This is what we may term the observable form of the disease. But there is a more dangerous form yet. There is an unseen form in which it may appear. The first noticeable thing may be when the milker sits down to milk, grasps the teat and attempts to start the milk, the cow will cringe and may kick. The milker may think the cow does this for meanness, and proceed to curry her down with the milk stool and get up a racket in the cow stable. The cow did not kick for meanness, she kicked by reason of pain. If the milker would at that time make a close examination of the end of the teat, he would have discovered a tiny little blister no larger perhaps than the head of a small pin, but not knowing what to look

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for the disease was allowed to progress and in one, two or three days, as the case may be, the teat will be found hot and tense, and a difficulty experienced in drawing the milk. If the udder is also inflamed, I know of no cure, as the germ has then gotten where medicine can't reach it. But if cow owners will stop and look for the tiny blister spoken of, or even upon the first appearance of tenseness of the teat, then a remedy will be found in a mixture of carbolic acid, one part; pure olive oil, twelve parts. Use this freely on all blisters and sores on the cow's udder or teats, and when the germ attacks the end of the teat use it there, and after she is milked, with a small glass syringe, inject a tea spoonful up the teat. The disease can be headed off and the udder saved. As before stated, it is a germ disease, and when one cow in the herd is affected with it, without precautionary measures are used, it will spread through the herd. There is no more rapid way of spreading it than by the carelessness of the milker; on his hands the disease can be carried from cow to cow, until all will become affected, when if common-sense methods are put in practice there never need be more than one cow in the herd that will have it. Simply never milk an infected cow and then milk another until the hands have been thoroughly washed.

2. No one knows just how the first cow in the herd became infected, there may be the same germs in the cow stable, or even on every cow's udder only waiting for the right conditions to take place when they will begin business. Hence as a preventive measure, once per day as long as the one cow is affected with it, use a little of the carbolized oil on the teats of every well cow in the herd, and they will be immune from this disease. The same remedy will also kill the germ of cow pox and prevent its spread through the herd, if used in the manner advised. In fact carbolized olive or pure raw linseed oil is unsurpassed as a remedy for chapped teats and many other sores on both cattle and horses. There are only two more diseases prevailing among cattle in this country worthy of consideration. I refer to Black-leg and Anthrax, but having already wearied you I will forego speaking of them.

MR. BUTTERHOFF: I am not from a dairy section, but I think you might give us a little information upon a matter, and to illustrate I will start from the beginning: Some of our people have a cow or two for family use, but have no pasture simply because we have too many flies or mosquitoes, so we stable those cows because they would not give any milk. They will bite the cows and in some cases the cow will die. We would like to know what that is. It is only very seldom that a cow gets over it.

DR. SMEAD: They stable the cows?

MR. BUTTERHOFF: Yes, sir.

DR. SMEAD: It is very difficult for a long period of time to keep a cow in a stable. It is really a case of indigestion from long feeding on dry feed.

MR. BUTTERHOFF: During the summer they get green food.

DR. SMEAD. But the rough food is always dry food?

MR. BUTTERHOFF: Yes, sir.

DR. SMEAD: I would endeavor under those circumstances to get the cow some succulent food. You may be able to buy some of the root crops or something like that. But to obviate that as much as possible discover if you can if the voidings of the cow is becoming a little hard; if so, I would give her some epsom salts that I have already mentioned. Give her about a heaping tablespoonful. You will always in that case discover that in the voidings before the cow loses her appetite.

MR. COOK: There are one or two diseases that I think are prevalent in New Jersey that you did not touch upon. One is abortion and the other is tuberculosis. I have read some of your articles on both, and I would like to hear a little from you upon abortion and how you cure it.

DR. SMEAD: Abortion is rather a difficult problem to discuss in a mixed audience. I intimated a little of that in the paper

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that I have read. I can safely say that as it exists in the herd of cows in this country, at least 80 per cent. comes from uterine weakness and 20 per cent. comes from a germ. There is no question about that. In our modern dairying we have produced an abnormal dairy cow. We have created a cow with a capacity of yielding milk about five times as great as her ancestors had. Now here is a law of breeding, that whatever we do by breeding, abnormally developing one organ of the body, we always do it at the expense of weakening some other organ or organs that are in co-relation with it. Hence with that abnormal development of the udder of the cow to produce four to five times the quantity of milk that her ancestors did, we are doing it at the expense of weakening the reproductive organs. Those things must be taken into consideration. You were speaking of reading my writing. You will notice that I have advised feeding oats more to those animals, those large producing animals and be content with a little less milk. It is by reason of their enervation. It is really a nerve tonic, and if you will feed more oats and not try to crowd the cow too hard, that will largely overcome it. Feed this about 4 or 5 or 6 months before parturition.

I believe it is a question sometimes in the case of abortion whether it is a matter of sympathy or weakness, or whether it comes from a germ. Close observation will show to you whether it is a germ. In the germ abortion there is a slimy condition of the placenta, and there will always be a little inflammation. The placenta will soon follow in that case, while in the case of sympathy it will not so closely. By close observation a man can distinguish whether he has an epidemic or not. Here is another question: The object is to head it off in the herd, no matter whether it be sympathetic or a germ, whenever that cow drops her calf prematurely, take that cow away from the herd. There is a sympathetic nerve organization in a cow just as in a man. If a man at this moment were brought in here and laid on that table who had been run over by the cars, what would be the effect upon this audience. Some would be affected one way and some

another. Some would get out of the door, some would faint, and a few might assist the surgeon in caring for the man. Why is it so many could not? The car didn't strike them. It was simply through the eyes, the sense of seeing a fellow human being that was suffering. Now that cow that you have got has a sympathetic organization that is just as liable to affect her as it does your mind, from what she may see. Sickening odors will have the same effect. You who have had experiences with it will recognize this: That let a little calf be prematurely born, dropped in the field or stable or out in the yard, and every cow in that herd will sooner or later have its nose on that calf; every cow will be right around that calf, and the cows will be seemingly, in a dumb way, sympathizing with that cow. Hence the necessity of taking that cow right away from the herd.

Now how will you treat that? If it is a germ or not, there will be an ulceration and perhaps retention of the placenta. In that case carbolic acid can be used in one per cent. solution daily, as long as what we call the Leoclia flow comes from her. Stamp it out in the herd as you would if a match fell on the floor and began to blaze. If you don't, you will want a fire company to stop it. It is a good deal so there. It needs action on the part of the man when it does occur. It needs, as we have been told by Professor Gowell a little better knowledge of the cow, and we must understand that she is more than a milk-machine; she is an animated being, and I am not going to say but a thinking-machine, subject to all the ills that we as human beings are.

MR. PANCOAST: Do you believe that feeding bone meal has any tendency to lessen abortion?

DR. SMEAD: I don't think it does, any more than this, there may be a lack of phosphatic matter in the feed, and wheat bran will furnish all that is needed if fed liberally.

MR. SMITH: In our section of the country the farmers generally have more or less trouble to get their cows to conceive.

DR. SMEAD: That is right on the line of the discussion this morning,—milking-machines. We find that the uterine

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organs are closely associated and they will be benefitted by stimulating food. We see most of that where they are fed with gluten and where they are fed very largely on brewer's grains, and that is one of the reasons.

MR. COOK: What about linseed meal. I notice several vessels that sailed for Europe; I saw that linseed meal was being sent to Holland, and it is thirty some dollars per ton.

DR. SMEAD: Linseed meal I think one of the very best feeds, and I think thousands of tons have gone abroad that should have been fed here.

MR. COOK: Has it the same effect as oats?

DR. SMEAD: Not quite. Of the concentrated protein feeds, I believe linseed meal stands at the head, as the safest concentrated feed in the market. I consider linseed meal stands at the head. I am sure that oats and wheat bran and linseed meal, all balanced up to a proper ration, make in my judgment the safest feed that you can feed the dairy cow to get best results.

A DELEGATE: How much meal would you feed a day?

DR. SMEAD: That is owing to the capacity of the cow.

A DELEGATE: A cow weighing ten hundred that is giving sixteen pounds of milk per day?

DR. SMEAD: I would feed about one-half oats and about three-fifths of bran and balance with linseed meal, and feeding for a cow,—owing to her individuality,—feeding about eight to ten pounds per day. Individuality has to be taken into consideration and the judgment of the feeder must be used.

MR. APPEGET: I think I would like to say on behalf of our dairymen of this State,—perhaps the distinguished gentlemen from Maine and New York may not take into consideration enough the influence of climate and locality. That has a great deal to do with what they may think are our crude methods. To illustrate, I was down in the pine woods of Alabama, and was criticizing their razor-back hog, and they said to me, "Mister, we ain't got no use for your short-legged fat hogs down here; we have got to have a hog that will outrun a nigger." (Laughter.)

Work of the Commission on Tuberculosis in Animals.

Work of the Commission on Tuberculosis in Animals.

In examining the dairy herds of the State for the existence and removal of tubercular animals, the Commission has responded to every call made for its services. In these examinations, cattle were found to be affected to the number of 487, all which were appraised and slaughtered according to the provisions of the law.

On all the above number of cattle autopsy or post-mortem examination was made, and all showed the existence of tuberculosis from its incipient stages to its most aggravated forms.

The total number of cows examined was 2733. The average sum paid for cows condemned was \$21.59. The table furnished herewith shows the details of the work. The discrepancy in the total number examined in the several counties is due altogether to the applications made. The Commission goes when and where it is called. The law does not allow the Commission, on its own volition, to examine any herd, even though the Commission may know of herds in different localities that should be inspected.

On the other hand, it should be said to the credit of our more progressive dairymen, that they are asking for the services of the State in this respect more than they have heretofore done, believing that it will be to their pecuniary advantage to do so, from the fact that when the disease becomes firmly established in a herd, the health of every member is imperiled, and, if allowed to run unchecked, heavy loss may result.

To guard against this possibility, good dairymen are having their herds periodically examined and tested. To mention one case only, illustrating this point: A gentleman in Burlington County, whose stables and management in all respects are number one, and who had, at his own expense, tested his herd about a year ago, was fearful, because of certain indications, that there

were some new victims, and he requested a test, which was made. But this test of sixty animals condemned but one.

On the other hand, dairy farmers have unwittingly introduced the disease into their herds by the purchase of one or more that were diseased. Their herds before that had been healthy. But within two, three or four years, one or more members of the herd became badly diseased. Then an examination was requested, with the result that three-fourths of the herd, in some cases, were condemned.

The conditions most favorable to the lodgment and spread of this disease are dark, damp, dirty and poorly ventilated stables. Conversely, having the animals free of disease, give them clean, dry, light stables, closely constructed—no cracks—so as to retain the animal heat, which, if the stables were not ventilated, would make them too warm; but, having them light, clean, dry and tight, put in ventilating shafts by which the temperature can be regulated to cow comfort in the coldest weather.

Such a system of ventilation is that which is known as the "King System," not costly to construct nor difficult to manage.

The profits from dairying will be increased by following the suggestions made. Further, keep a close watch on every member of the herd and inspect regularly, so that any diseased member may be detected and removed at once, for a diseased animal left in a herd any considerable time is, according to our experience, a fruitful source of infection.

Will we ever stamp out tuberculosis? Not entirely and forever, perhaps. For, unfortunately, the instigator of this disease is itself a living organism, rapidly multiplying where conditions favor, waiting, almost anywhere, for suitable conditions and a victim in which to begin its destructive work.

But we can improve conditions, following the suggestions of our best scientists and progressive dairymen who have made this subject a study, and thus greatly reduce the possibility of its unlimited spread, as well as the number of diseased dairy animals throughout the State from year to year, which are themselves sources of contamination.

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There are 180,000 milch cows in the State, besides our 80,000 other cattle. Considering this large number of animals, in the light of what has been said, it will appear that the State is pursuing just about the wisest course in dealing with it; viz., continuous, conservative surveillance and removal of diseased animals, coupled with kindly suggestions to cow owners as to needed improvements in stable construction, cow care and general conditions surrounding.

Bovine tuberculosis has, in recent years, insidiously spread over a much larger area of country than formerly; without multiplying instances, one only, and that from Wisconsin, is here given. Bulletin No. 126, of the Wisconsin Experiment Station, states that during the past two or three years, seventy dairy herds in that State were examined by the State Live Stock Sanitary Board.

The cows examined and tested numbered 933, and out of that number 518, or about 55 per cent. proved to be tuberculous.

The herds examined were in all parts of the State and the result was both surprising and startling.

If, in this northern dairy State such conditions have been found, the fact should serve as a warning to others, and all reasonable efforts should be inaugurated in all dairy sections by studying the breeds and methods of breeding, feeds and methods of feeding, stables and stable life of cows in their relation to and bearings on this important question of healthy animals.

Scientific men are now seeking for some specific that, when administered, will make the animal immune to this disease, but no panacea will be found capable of keeping dairy animals forever free of disease, when they are kept in dark, damp, improperly ventilated stables, saturated with years of filth and polluted air.

Ex-Governor Hoard, of Wisconsin, who is well and favorably known to New Jersey dairymen, in answering a letter from a captious and incredulous correspondent in the "Dairyman" of June 16, 1905, says:

“Slowly, sometimes by accident and sometimes by patient investigation, one by one, facts are discovered, and it is not one whit wiser or less excusable for us to ignore these facts, because they were not known to our fathers, than it would be for the captain or pilot of a ship to ignore the newly charted rocks or reefs, because forsooth the charts of twenty years ago did not indicate them.

“Just so, in relation to the queries submitted by Mr. L——. It is comparatively immaterial whether tuberculosis and consumption are identical diseases, or whether either was known two or three hundred years ago. The pressing inquiry of the moment is, whether there is such a disease among cattle at the present time, and if so, whether it is communicable from one animal to another, and to what degree.

Let us not forget that facts are indisputable. If dozens of herds, not to say, as we truthfully might say, hundreds and thousands of herds, have been decimated, or entirely wiped out by the ravages of some peculiar and insidious disease; if careful inquiry and investigation show that this disease is contagious, that is, communicable from one animal to other animals; if there is at the present time no remedy known to us for curing this disease, what should be our attitude towards such revelations?

“Manifestly it is no more than common prudence that we should do whatever lies in our power to prevent the spread of that disease. This is a duty we owe both to ourselves and to the public. It is never safe to trust in ignorance, or to assume that what we do not know or have not personally experienced or seen does not exist.

“There is such a disease as bovine tuberculosis. It has been definitely ascertained that it is communicable from animal to animal. Let us govern ourselves accordingly:

“The tuberculin test may not be infallible. It sometimes fails to detect the presence of the disease, but properly applied it does not condemn the healthy animal, but the animal it does condemn is always a menace to every other animal it comes in contact with. Under proper sanitary conditions this menace is re-

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duced to its lowest terms, that is, the resisting power of the exposed animals is increased. Light, pure air and clean surroundings, anything and everything that promotes physical vigor reduces the danger of infection, but does not eliminate that danger. This can only be accomplished by isolating or killing the diseased animals, and thoroughly disinfecting the premises."

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

County.	Total No. Examined	Total No. Condemned.	Total Sum paid.
Bergen	7	1	\$ 9.00
Burlington.....	440	74	1,548.75
Camden.....	12	4	42.00
Cape May.....	30	3	30.00
Cumberland.....	99	23	429.00
Essex.....	1	..	.....
Gloucester.....	71	7	104.25
Hunterdon.....	231	59	1,453.50
Mercer.....	295	42	792.00
Middlesex.....	90	27	618.75
Monmouth.....	77	30	668.25
Morris.....	117	24	432.00
Ocean.....	16	5	129.00
Passaic.....	1	1	18.00
Salem.....	275	26	393.75
Somerset.....	282	72	1,679.25
Sussex.....	562	45	1,078.50
Warren.....	127	44	1,092.00
Total appropriation			\$15,500.00
Total sum paid for cows.....			\$10,518.00
Expenses of inspection.....			1,341.03
Expenses of commission.....			373.39
Secretary, assistant and stenographer.....			2,316.00
Stationery and blanks.....			80.07
Postage.....			100.00
Tuberculin.....			318.75
Ear tags.....			57.50
			\$15,104.74

IMPORTANT LAW.

Under Chapter 181, Laws of 1899, the Commission have examined 7,789 animals imported into this State by cattle dealers and farmers for the year ending October 31st, 1905.

There can be no doubt as to the wisdom of such a law. States bordering New Jersey have their full proportion of cattle affected with tuberculosis, and owners of such animals naturally desire to get for them all that can be secured and, if this can be obtained by selling them to go to some other State, New Jersey say, they will be disposed of in that way.

When such animals are introduced into our established dairies, they are a fraud on the purchaser, a menace to the health of the herd and to the healthfulness of their product. They are a fraud against the State also. For, most, if not all, such animals will in due time be reported to the Commission and, if they are condemned, the State will be required to reimburse the owner in some amount for his loss.

Honor and good citizenship should induce cattle dealers and all others purchasing cows in other States to bring into New Jersey, to be scrupulously careful in this matter. The requirements of the law are not unreasonable, but there is a growing tendency on the part of some to evade its provisions. This is not just to honest dealers, and, as was said in our last report: "If honest men obey the law without compulsion, others should be forced to do so."

Possibly some amendments to the law might help the Commission in making it more effective. The Commission have this under advisement.

To the State Board of Agriculture, Trenton, N. J.

GENTLEMEN:—Compared with previous years but few cases of communicable diseases among animals occurred, only two cases of anthrax and sixty-nine cases of glanders having been reported. The outbreak of anthrax appeared on the farm of

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Isaac Justice, in Gloucester County. As soon as the disease was reported the infected carcasses were cremated and eighty-five cattle and fifty-seven horses in the infected locality were immunized by inoculation with anti-anthrax serum. Before the nature of the disease was recognized by the owner of the two animals which died, the skin was removed from the carcasses by a son of Isaac Justice, and the young man contracted the disease. He was removed to a hospital in Philadelphia, and made a slow recovery. The distribution of glanders was as follows: Atlantic County, 1; Bergen County, 5; Burlington County, 1; Essex County, 21; Gloucester County, 1; Hudson County, 16; Morris County, 1; Passaic County, 23.

Name of sanitary district.	Date and number of cases reported.	Name of person making report.	Disposal of each case.
Jersey City.....	Nov. 15, 1904 2	Henry Smellie, H. O.,	Animal destroyed
" "	" 16, 1904, 2	" " "	" "
Harrison.....	" 16, 1904, 1	John T. McClure "	" "
Newark.....	" 17, 1904, 1	W. H. Lowe, D. V. S.,	" "
Orange.....	" 25, 1904, 1	William Schuler, H. O.,	" "
Jersey City.....	" 28, 1904, 1	Henry Smellie, "	" "
Moorestown.....	Dec. 3, 1904, 1	Benjamin M. Haines, Sec.,	" "
Hasbrouck Heights.....	" 5, 1904, 2	John G. Martin, Sec.,	" "
Passaic City.....	" 9, 1904, 2	J. P. Lowe, D. V. S.,	" "
" "	" 20, 1904, 1	" " "	" "
Woodcliff	Jan. 14, 1905, 2	G. J. Wortendyke Sec.,	" "
Jersey City.....	" 18, 1905, 3	E. Mathews, V. S.	" "
Newark.....	" 19, 1905, 6	D. D. Chandler, H. O.,	" "
"	" 20, 1905, 1	" " "	" "
"	" 22, 1905, 1	" " "	" "
"	" 28, 1905, 1	" " "	" "
Jersey City.....	Feb. 10, 1905, 3	Henry Smellie "	" "
Newark.....	" 10, 1905, 2	D. D. Chandler, "	" "
"	" 12, 1905, 1	" " "	" "
"	" 20, 1905, 1	" " "	" "
Orange.....	Mar. 7, 1905, 2	William Schluer, "	" "
Hackensack.....	" 15, 1905, 1	C. T. Demarest, Sec.,	" "
Bayonne.....	Apr. 12, 1905, 1	D. E. Mathews, D. V. S.,	" "
Newark.....	" 13, 1905, 1	D. D. Chandler, H. O.,	" "
Great Notch.....	July 16, 1905, 7	R. B. Smith, D. V. S.,	" "
" "	" 22, 1905, 7	" " "	" "
" "	" 28, 1905, 3	" " "	" "
Paterson.....	Aug. 8, 1905, 1	A. Machan, "	" "

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East Orange.	Aug. 9, 1905, 2	W. F. Harrison, D. V. S.,	Animal destroyed
Gloucester City,	" 12, 1905, 1	Carlos B. Allen, Sec.,	" "
Paterson.	" 17, 1905, 1	A. Machan, D. V. S.	" "
Whippany.	" 17, 1905, 1	W. F. Harrison, D. V. S.,	" "
Harrison.	Sept. 8, 1905, 1	John T. McClure, H. O.,	" "
Union Hill	" 27, 1905, 1	R. J. Meiners, D. V. S.,	" "
Atlantic City.	" 28 1905, 1	Edward Guion, M. D., H. O.,	" "
Passaic City.	Oct. 6, 1905, 1	J. P. Lowe, D. V. S.,	" "
East Orange.	" 13, 1905, 1	W. F. Harrison, D. V. S.,	" "
Jersey City.	" 17, 1905, 1	R. J. Halliday, " "	" "
" "	" 18, 1905, 1	D. E. Mathews, " "	" "

Very respectfully,

HENRY MITCHELL,

Secretary.

Some Poultry Questions.

G. M. GOWELL, PROFESSOR OF ANIMAL INDUSTRY, UNIVERSITY
MAINE.

Some Poultry Questions.

G. M. GOWELL, PROFESSOR OF ANIMAL INDUSTRY, UNIVERSITY
MAINE.

MR. PRESIDENT AND GENTLEMEN:—I came here to talk about the poultry industry. I don't come to give you instructions on the processes, but simply to tell something about the work that we have done that relates to that industry. We undertook poultry experimentation at the Maine Station because the poultry problems seemed to be interesting questions to the little country homes. Poultry keeping seemed to be one of the small country industries that might be developed, and so we took up the question, knowing at the beginning that the amount of food that will produce a pound of dressed pork or beef will come pretty near producing a pound of chicken, and while pork and beef may sell for five to eight cents a pound, a pound of chicken or fowl will sell for fifteen to thirty cents, and that the great difference between the selling prices of a pound of pork, or beef, and a pound of poultry represent higher prices for the labor and skill devoted to the poultry industry.

It was to find a market for that skill and labor that we took up the study of poultry problems, and one of the first things we undertook was to see if we could improve the egg-laying capacities of the hens.

Recognizing that all of the hens now in the world came originally from a common stock, that laid only a clutch of eggs and brought out a single brood of chicks in a year, and had been improved until many flocks and breeds were averaging over a hundred eggs a year; the question of their further improvement seemed reasonable.

So we undertook the work in the same way that the improvement of the dairy cow has been undertaken—by selecting those birds that were producers, and breeding from them alone, just as in the breeding of the dairy cow those were selected for breeders only that were large producers, rejecting the small producers, as weeds are rejected in plant growing.

In order to do that, we constructed our first house and furnished it with trap nests, so that every hen should have a book record of her daily performances throughout the year. Every bird that we put in there, was subjected to this process. At the end of the year, if she was a small producer, she was rejected. If she was a large producer, she was retained.

The 260 pullets tested the first year averaged laying 120 eggs each. Among them were found one that laid 200 eggs, one that laid 204, and another that laid 208. Some of the other birds laid less than 100 eggs each, even down to 36, 33 and 8 eggs per bird, although they were in the same pens with the others, and all were treated and fed alike.

Male birds were raised from the hens that had laid 200 eggs or over, during the first year, and the following year were bred only to hens that had given 160 and over eggs in a year, and this plan of work has been continued every year since then—breeding only the sons of hens that had laid from 200 to 251 eggs in the year, with hens that had themselves laid at least 160 eggs per year.

This work was undertaken in 1898 when the stock had been averaging 120 eggs per year for several years. Last year we carried 550 pullets, and they averaged 144 eggs each; among them were sixty-one birds that laid 200 or over eggs each during their first year of laying. The changes in methods of housing and feeding probably have had something to do with the average increase of two dozen eggs per bird per year, for the entire stock kept, but it is reasonable to suppose that part of the increase is the result of rejecting the poor and breeding to the best birds in the flocks. The selected birds have themselves

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demonstrated by actual performance that they are the better ones of the flocks, and fit foundation stock on which to build better creatures of their kind.

The eighty-odd hens now in our breeding pens, that have laid 200 or over eggs each in a year, vary from each other materially in shape, size and appearance, and show plainly the futility of trying to judge of the egg-producing abilities of hens by any external markings, so far as we are able to judge.

We have given some attention to buildings and methods of housing, and from our observations are led to believe that the old idea that laying hens, like tender plants in winter, must be kept in warm houses day and night, if they are to do the best they are capable of, is not correct.

A WARMED HOUSE FOR LAYING HENS.

Eight years ago we built a good house, 16x150 feet in size. It was well built—double walls with dead air spaces—a reasonable amount of double glass windows on the south side, and it was warmed by a water heater, with two lines of pipes running the length of the building. By the use of the heater, the building was always kept above the freezing point, and there was not much trouble from moisture except when extremely cold weather necessitated the closing of the windows in the winter nights.

The birds in this house have always laid well, never having shrunk in their egg yield from cold weather except one season when the coal strike was on, and the fire had to go out.

I regard this as the best warm, or warmed house I ever saw, but while the birds kept in it have laid well, and losses have been small, yet they have not had the color of comb and wattles that so surely indicates vigor and health. In spite of the best ventilation we could give in this building, the straw bedding would absorb moisture in dark weather, and damp bedding is the one condition in bird life they abhor above all others.

SMALL COLONY HOUSES.

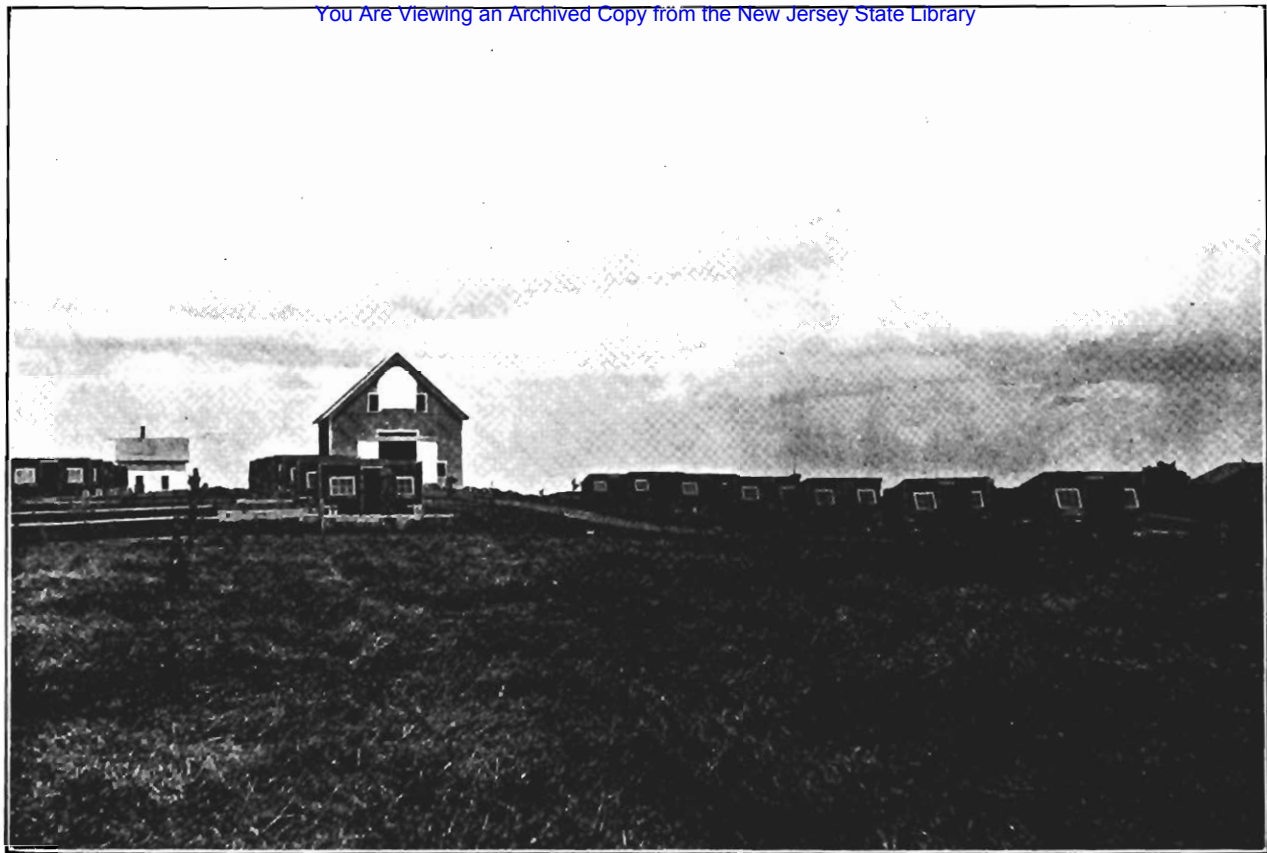
For many years it was believed that laying hens should be kept in flocks not exceeding fifteen in number, and each bird given a floor space of ten surface feet.

We accordingly built half a dozen houses, each ten feet square, and kept from ten to twenty pullets in each house, with free summer range. They were well built, and warm, but were apt to be damp and lined with white frost in very cold weather, when the windows had to be kept shut to save the birds from suffering at night. Another feature against them was their size. A person cannot care for hens in so small a pen without keeping them in a constant state of unrest, for they fear being cornered in so small a room.

AN EXPERIMENTAL OPEN-AIR HOUSE.

Being convinced that dampness in the houses was the worst obstacle in the way of the health of the birds, and winter egg production, we built a little house ten feet wide and twenty-five feet long. The walls were about $5\frac{1}{2}$ feet high in the clear, inside of the building. The whole of the front wall was not filled in, but a space 3 feet wide and 15 feet long was left just under the plate. This space had a frame, covered with white drilling, hinged at the top on the inside, so it could be let down and buttoned during driving storms and winter nights, but hung up out of the way at all other times. The roost platform extended the whole length of the back of the room. It was 3 feet 4 inches wide and 3 feet above the floor. The back wall and up the roof for 4 feet was lined and packed hard with fine hay. The packing also extended part way across the ends of the room.

Two roosts were used, but they did not take the whole length of the platform, a space of 4 feet at one end being reserved for a cage where broody hens could be confined, until the desire for sitting should be overcome. The space, from the front edge of the platform up to the roof, was covered by frame curtains



Forty Brooder Houses, 7x12 feet.
Barn and Poultryman's Home at Go-well Farm.

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of drilling, similar to the one on the front wall. They were hinged at the top edge and kept turned up out of the way during day time, but from the commencement of cold weather until spring they were closed down every night after the hens went to roost. The hens were shut in to this close roosting closet and kept there nights, and released as early in the morning as they could see to scratch for the grain which was sprinkled in the 8 inch deep straw on the floor.

The roosting closet was closely observed and has never been damp, or its odors offensive when opened in the mornings. There was very little freezing in the closets in the coldest weather. The birds seemed to enjoy coming out of the warm sleeping closet down into the cold straw, which was never damp, but always dry, because the whole house was open to the outside air and sun every day. There were no shut off corners of floor or closet that were damp. We used this building through five winters, with 50 hens in it, and have not had a case of sickness in it yet. Not a case of cold or snuffles has developed from sleeping in the closet with its cloth front, and then going directly down into the cold room and spending the day in the open air.

The birds have laid as well as their mates in the large warmed house have done; averaging last year above 150 eggs each. Their combs have been red and their plumage bright, and they have given every evidence of perfect health and vigor. While they are on the roosts, in bed, they are warm. They come down to their breakfasts and spend the day in the open air. Such treatment gives vigor and snap to the human, and it seems to work equally well with the hen.

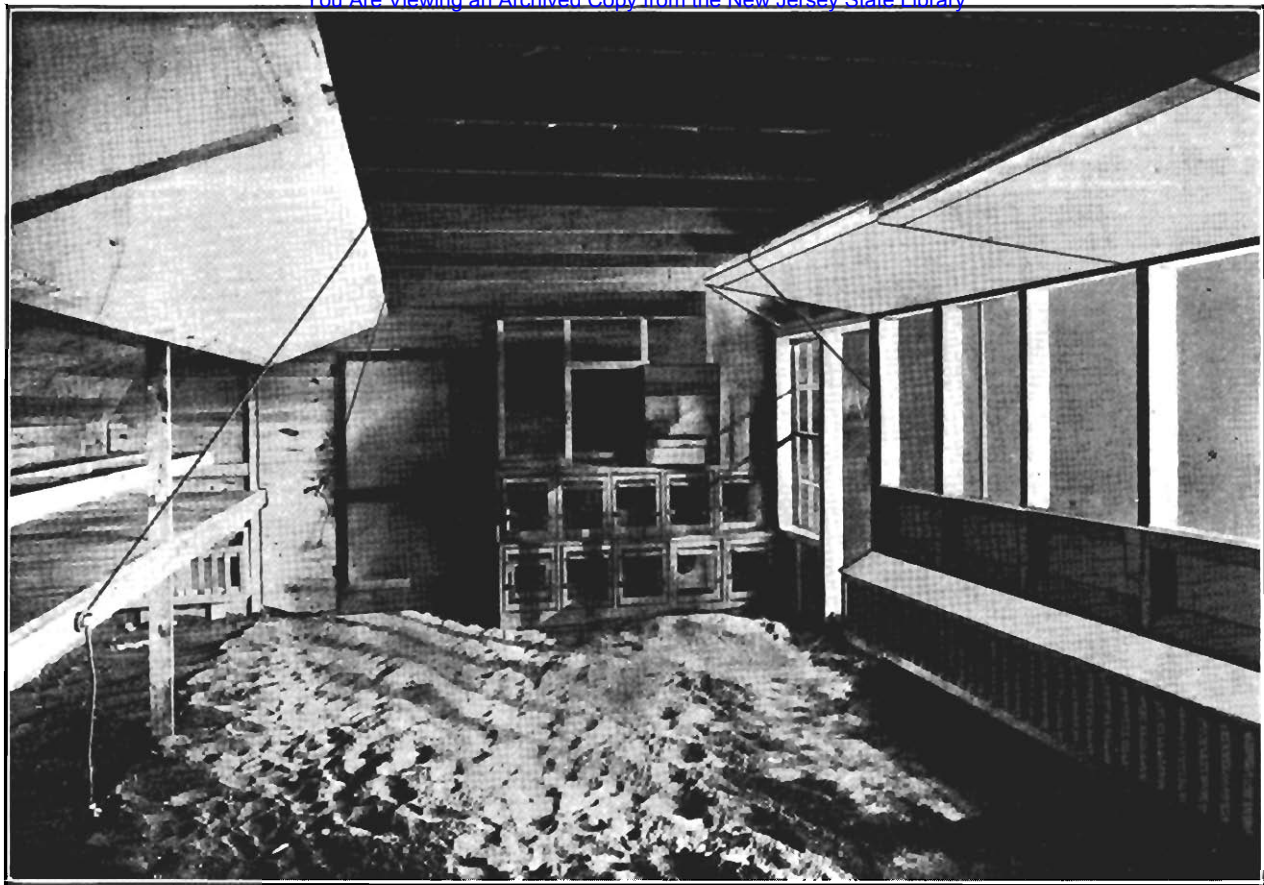
The results of the use of this house were such that we felt very sure that this was one of the right systems of treatment and housing of hens, and decided to build several houses on the same plan and join them together under one roof, as one house.

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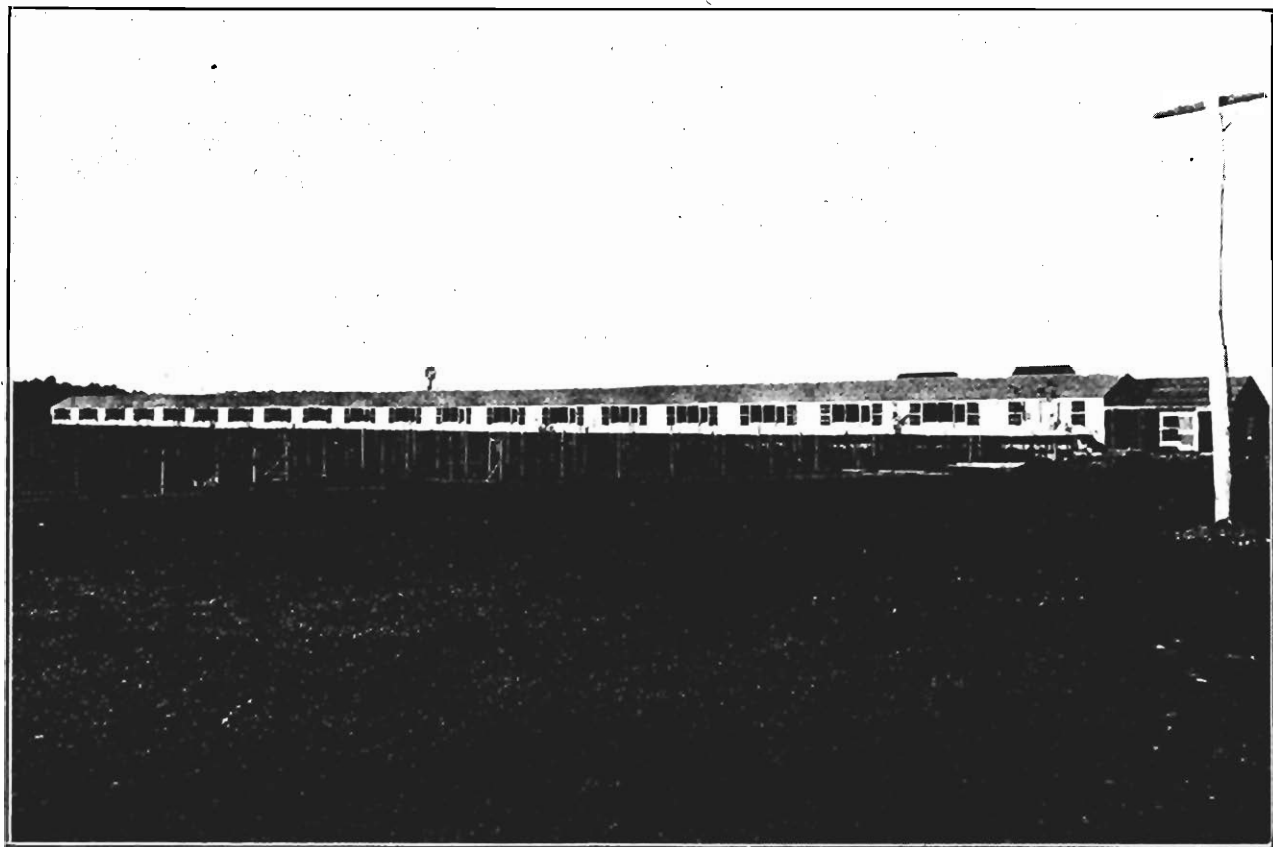
AN OPEN-AIR HOUSE FOR ONE HUNDRED HENS.

The building is twenty feet square on the ground. The back wall is $5\frac{1}{2}$ feet high from the floor to the top of the plate, inside, and the front wall is 7 feet high. The roof is of unequal span, the ridge being 8 feet in from the front wall. The height of the ridge above the floor is 12 feet. The sills are of hemlock six inches square, and rest on a rough stone wall laid on the surface of the ground. A central sill gives support to the floor. The floor timbers are 2x6 inches in size, placed two feet apart, and they rest on the sills. The floor is two thicknesses of hemlock boards. All of the rest of the frame is of 2x4 inch stuff. The building is boarded, papered and shingled on roof and walls. The rear wall, and four feet of the lower part of the rear roof, are ceiled on the inside of the studding and plates, and packed very hard with dry planer shavings. In order to make the shavings packing continuous between the wall and roof, the wall ceiling is carried up to within 6 inches of the plate, then follows up inching pieces of studding which are nailed to the studding and rafters. By this arrangement there are no slack spaces around the plate to admit currents of air.

The only openings in this room are in the front, which is to the south. Two comon outside windows of 10x12 glass, twelve lights each, are screwed on to openings in the front wall. The windows are upright and placed three feet from each end of the room. The space between the windows is about eight feet long. The upper part of this section of the wall is left open, which gives an opening eight feet long and three feet wide. This opening comes close up to the plate and leaves a solid wall three and a half feet high above the floor, which keeps the winds from blowing directly in on to the birds when they are on the floor. A light frame made of 1x3 inch stuff is covered by ten-ounce duck and hinged at the top at the plate so as to swing in, and up to the roof, where it is kept fastened throughout the summer and nearly all winter days. A door two and a half feet wide and six feet high is arranged in this section of the front wall.



One 20x20 ft. Section of Homes at Go-well Farm, Containing 100 Hens.



House for Hens at Go-well Farm, Orono, Me.
This house is 20x400 feet in size and contains 2000 laying hens.

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An elevated roosting closet is arranged at the back of the room. It extends along the entire back wall, and its floor is three feet above the floor of the house, which leaves the entire twenty feet square floor of the house open to the light and air at all times, with no dark, shut-off corners. Three roosts made of 2x3 inch spruce are framed together and hinged so as to turn up at the back to facilitate cleaning off the platform. The back roost is eleven inches in from the wall, and the spaces between the next ones is each sixteen inches, which leaves the front one fifteen inches away from the curtain when it is shut down, which is sufficient to prevent the curtain from being soiled by the birds when they are on the roosts.

The curtains to the front of the closet are similar to the one in the front of the house; they are each ten feet long and two and a half feet wide, hinged at the top, opening out into the room and are fastened up when not in use. Great care is exercised in constructing the closet to get it very tight so there may be no currents of air, except what may pass through the cloth and the small cracks around the close-fitting curtain. Two openings are made above the curtain for ventilating the bedroom. They are each six inches wide, and three feet long, with adjustable slides so they may be opened to suit the temperatures. We aim to keep the temperature of the closets so that it shall never quite reach the freezing point. With a hundred hens in this room the floor space is four square feet to each one. They have a large area to roam over, and do not seem to mind meeting so many of their mates. We like the large rooms with their large flocks better than the small ones with small flocks, as far as we have used them, as the birds seem to have greater liberties, and the work of caring for them is certainly reduced.

This house is practicable for the person who only cares to keep a hundred hens, or, several of them can be used as colony houses, located about the farm, where it is desired to extend the business. We have twenty of them connected together as one house, and are wintering two thousand pullets in it. Tight

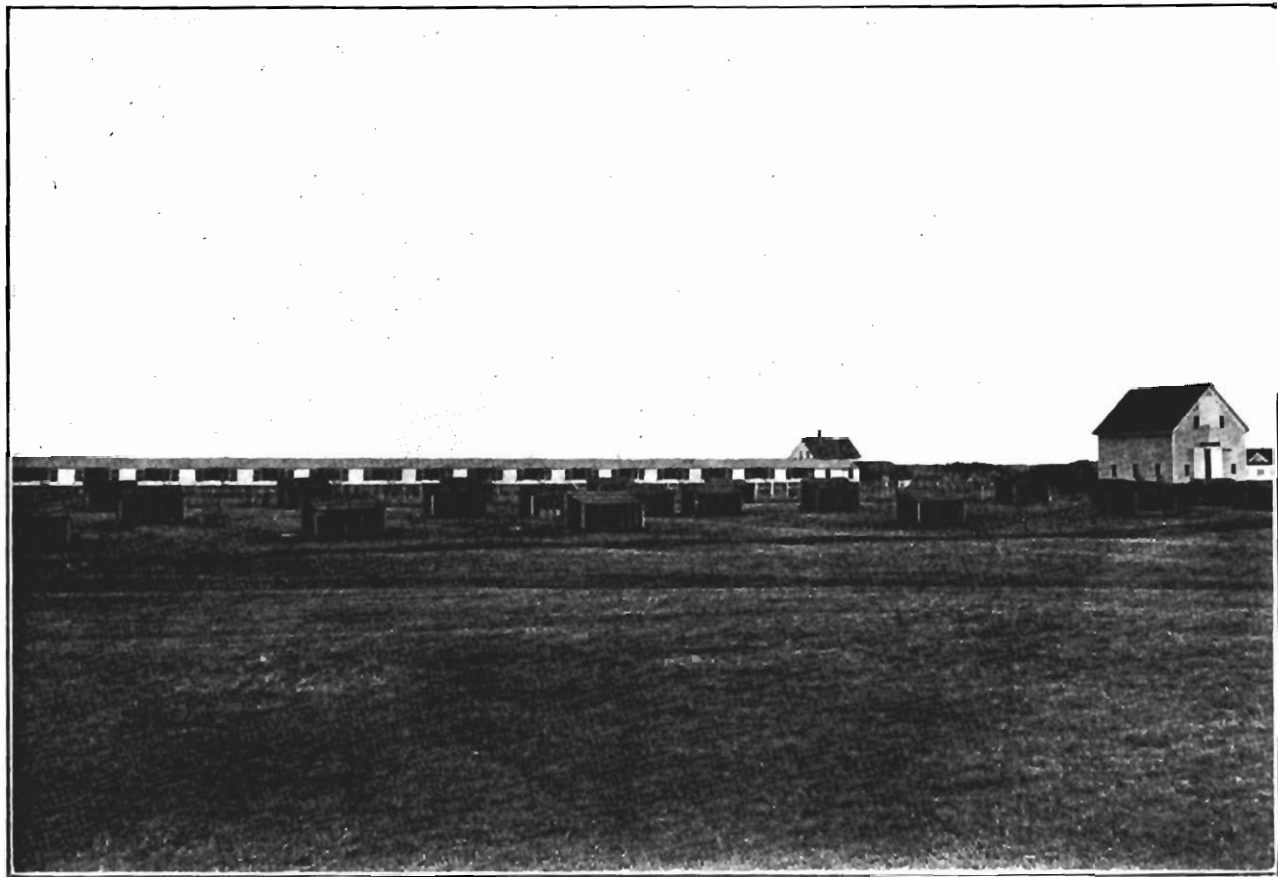
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board partitions separate the flocks, so as to prevent drafts of air from one section to another, which would be very strong at times, were wire partitions used. Doors three feet wide, which are hung with spring hinges that allow them to swing both ways, are continuous in every partition. An elevated track allows the easy pushing of a low-down carrier from one end of the four-hundred-foot building to the other, with its load of feed, water, or roost cleanings, and the automatic opening and closing of the doors as it passes. One man has cared for the two thousand birds this winter, except on Saturdays, when he has help to clean out the bedding and renew it.

These open front houses have solved the question of letting the hens go out of doors into the open air at all seasons, for whether it is wet or cold, and mud or snowdrifts outside, they have a tight roof overhead, a dry floor underfoot, and are sheltered from the raking winds by tight walls, except to the south, which is open to all out of doors.

You know how in our boyhood days when the hens had the liberty of farm, yards, and barn, we would swing open the great barn doors on the cold, windy, winter mornings and let the sun shine in on to the chaff on the floor, how the hens would come down from their roosts on the great beams and scratch in the hay and pick out the seeds and broken leaves, and sprawl in abandon in the open sunshine that was not strained through glass windows. But you remember we didn't get many eggs in those old winter days. Although the days were all right, roosting in the top of the barn on winter nights was like a berth in a refrigerator, and the self-defense the hen had to practice in order to preserve life, left little time or material from which to make eggs.

The confinement of a hundred birds in so small and close-made a place, seemed at first exceedingly radical, and I approached the matter with a great deal of care because I feared their health might suffer. We have used these houses now five years, gradually increasing the sizes of rooms and flocks, and



Buildings at Go-well Farm.

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we have had the best of health among the birds all of the time. Last year we started with five hundred and fifty pullets, and at the end of the year found we had lost seventeen, or one in thirty-three. I don't know whether that is very large, or not. I suppose everybody loses some birds, we do, anyhow.

The birds are vigorous, they show it; every movement indicates that they have good health, their plumage is smooth, their eyes are bright, and they have averaged laying a hundred and forty-four eggs to each bird.

Now as to the influence on the stock from the birds kept in these open houses. We used to have a good deal of trouble to get eggs that would hatch from our hens when kept in close-made hen houses. They were fertile and strong enough to develop half to three-fourths the way through the incubating period, and then would stop. An average for the season would show that over three eggs were required to each chick hatched. Since using the open-front houses we have done much better. Six thousand chicks were raised last year from twelve thousand eggs incubated.

FEEDING.

We keep Plymouth Rock hens. We do not know that they are the best. Every person should select the breed he likes, and keep that and nothing else, and try to make his breed better as the years go on.

The Plymouth Rocks never do things by halves; they have great appetites; if you give them a good breakfast, they will beg for more, and when stuffed full, will sit down and change that breakfast over into flesh and fat, and not into eggs. They may lay some eggs, but they are liable to be soft-shelled and thin. They easily learn the pernicious habit of egg-eating, and if there is anything more discouraging in a business way than to have hens eat their eggs when they are forty or fifty cents a dozen, I don't know what it is!

So we gave up the morning mash years ago, and fed it at night, with grand results. They went to bed with full stomachs,

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and rested, and that was what we wanted them to do. But we kept them at work during the day, hunting the litter over for something to eat; they had good health and laid well, and that was all that was wanted.

We have now given up the wet, or moist mash altogether, and give no regular supper or breakfast. For one hundred hens we scatter four quarts of cracked corn on the litter, all over the floor the first thing when we go to them in the morning; at ten to eleven o'clock we give them two quarts of wheat and two quarts of oats on the litter. This is all of the feeding we do at stated hours.

We keep a mixture of dry ground foods before the birds all of the time, in a trough with a slatted front, which is hung to the walls so they cannot waste or foul it. This dry mash mixture consists of 200 lbs. wheat bran, 100 lbs. corn meal, 100 lbs. linseed meal, 100 lbs. Ajax Flakes or gluten meal, 100 lbs. middlings, and 100 lbs. beef scraps. This mixture is not fed at any stated time, only care is exercised that the supply is never exhausted. Grit, dry cracked poultry bone, oyster shell, and granulated charcoal are kept in elevated slatted troughs, always. A few mangold beets are fed daily in winter, by sticking them on to large nails driven a short distance into the wall, and rye, grass, clover, rape or green grass runs are provided in summer.

I hesitated considerably before putting the food in the troughs and keeping a supply there constantly, for I feared the birds would gorge themselves with it and not exercise sufficiently, but would get fat and give us the same old troubles we used to have. But such is not the case. They do not like the dry, ground grain mixture well enough to eat it simply for the fun of it. They like the cracked corn, wheat and oats, and they scratch and pick for every last piece of it in the litter, and then turn to the trough of meals and help themselves to it—a mouthful or two at a time, turning away when satisfied and coming back again when in need of food. While they do not like this fine,

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dry food well enough to eat of it to repletion, we have never found a hen that has gone to bed with an empty crop.

I do not know that this mixture of ground grains is the best that can be made; all I can say is that it is the best we know now. The proportion of dry ground beef scrap, which is one-seventh of the meal mixture, we found to be just about the proportionate part that our hens would eat when they were kept constantly supplied with troughs of different grains and meals and a separate trough of the scrap.

I believe the linseed meal is one of the most essential parts of the ration, and I would not leave it if possible to procure it. We feed a little of it every day to every animal on our farm—cows, calves, pigs, sheep and hens. We use it because it is a health promoter and a nutrient.

I do not want to lay down rigid rules for any one to follow. I have tried to tell you about a few things relating to this great industry that we have found to be true in our work. There are no mysteries in connection with the poultry business. Any person of average natural ability and willingness to work can learn the business and engage in it with as much assurance of success as he would be entitled to in any other line of animal breeding and handling. But no one should invest much money in it until he has served a good apprenticeship and learned the trade. When a young man has done this and has earned two or three thousand, he can with it establish himself on a little farm almost anywhere, not too far from a railroad station, and have a business of his own, that he can manage for himself and his family, and be as free from the world's strife as any man has a right to be.

MR. COOK: I want to ask the gentleman to explain the method by which he keeps a record of the laying qualities of the hens, how he manages with the eggs.

PROF. GOWELL: On the last day of October, each year, we clean out the old stock and put in a new lot, and every bird

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wears a leg band. We put on two for fear they may lose **one**. Where there are 50 hens we have 10 nests. The hen goes **into** the trap nest, and as she rubs her back against the wire it **trips** the latch, and the little door comes down and she is closed **in**, and there she is. We will send you a description of the nest **if** you will write to the Maine Station for it. Once in 20 minutes, or once in 40 minutes, according to how much the birds are **lay-**ing, the boy goes along and if he sees a hen there, he looks **at** her band, and takes her off, and the egg out, and marks her **a** credit on the sheet that hangs handy by. Any egg laid on **the** floor is not recorded. It is only when the hen is found with **an** egg that she gets credit. At the end of the year comes the **day** of reckoning, when the monthly accounts are brought together and footed.

A DELEGATE: Do you feed the grain dry or wet?

PROF. GOWELL: All dry.

MR. OWENS: What whole grain do you feed with **the** mash?

PROF. GOWELL: For 100 birds,—I don't know that **this** is right—early in the morning we give them four quarts **of** cracked corn spread around on the floor, and about half past **10** two quarts of oats and two quarts of wheat.

MR. AGENS: When do you feed your ground grain?

PROF. GOWELL: Any time during the day, being **sure** that the trough never gets empty.

MR. AGENS: What do you feed in the evening?

PROF. GOWELL: Nothing; they simply go to the trough and help themselves whenever they want to, and they never **go** to bed with empty crops. Catch them as you will, you will **find** they have something in their crops.

MR. AGENS: That is the only whole grain you feed?

PROF. GOWELL: Yes, sir.

A DELEGATE: How are those troughs constructed **to be** cleaned?

PROF. GOWELL: The bottom boards are ten feet **long**

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and seven inches wide. A three-inch strip is nailed along the front. The back and ends are boards. Laths are nailed up and down the front side, just two inches apart. The cover is on top, and it extends the whole length of the trough, and slopes so the hens cannot get upon it.

MR. AGENS: Do you feed this mixture the year around?

PROF. GOWELL: Yes, sir. They don't eat as much of it during the summer time, when they lay less eggs, as they will when they are laying heavier. They will eat more in the winter when they are laying heavier than at any other time. They help themselves to what they want. They know they can always get enough, and there is no inducement to overload.

I have a friend who has had quite a little business, keeping some 600 or 800, and he is keeping them on the second floor of his poultry building, which was an old shed. Those on the ground floor go out in the yard, those on the second floor never go out, and his egg record looks as well from those up stairs as from those down stairs, but he puts a great deal of labor in it.

MR. PANCOAST: Did you state what was the yield of your best hen?

PROF. GOWELL: Two hundred and fifty-one eggs.

MR. PANCOAST: What is the average?

PROF. GOWELL: Our average was a fraction over 144 this last year.

A DELEGATE: Don't you provide anything more than ground bone?

PROF. GOWELL: Yes, I forgot that; oyster shell, grit, and the ground bone, and charcoal always. They help themselves to it.

A DELEGATE: Have these buildings a large amount of windows in the front?

PROF. GOWELL: Only two, 10x14 glass, twelve lights each; but you must remember we have the large opening in the front, as I described it awhile ago.

DR. THOMPSON: That is very interesting, but it would

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be more useful to us small farmers who have about 100 hens, to learn how to get along with them.

PROF. GOWELL: I endeavored to tell you that.

DR. THOMPSON: Do we need one house for day and another for night?

PROF. GOWELL: No.

DR. THOMPSON: You described a house with windows in front, and with the boards under the roosts, and all that—are the nests in the same room?

PROF. GOWELL: They are.

DR. THOMPSON: Whereabouts?

PROF. GOWELL: Across the ends of the house.

DR. THOMPSON: Do the hens go in the same nests all the time, or do they find their own nests?

PROF. GOWELL: There are 20 nests in the room, and they go into any unoccupied nest. If they find one closed, they go into the next one. I suppose they have preferences, but they are not very particular.

DR. THOMPSON: Are the nests all open, or do they appear to be hiding?

PROF. GOWELL: They appear to be hiding away. The nest is about 34 inches long, 12 inches wide, and 15 inches high. It is a box-like affair with a hinged cover, and the front end left open. It has a partition across the centre, and the laying is done in the back end. The door at the front, is a light frame, covered with poultry netting, and it is hinged at the top, and turns up into the nest box, and is held there by contact with one end of a trip wire; the other end of the wire comes down across the nest box in such a way that the hen must push it aside when she goes into the nest, and so unlock the door and let it down, where it locks itself.

The hen never breaks her eggs in these nests, for after laying, she comes to the front, to the light, and waits, or tries to get out. Were the boxes shorter, she would stand, or tramp on her egg, and probably ruin it.

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DR. THOMPSON: How high are they?

PROF. GOWELL: The bottoms of the lower ones are about 10 inches above the floor, and a second tier are placed above these, about six inches back, so as to give room for a threshold for the hens when they fly up to enter them.

DR. THOMPSON: It would take a good deal off the size of the room.

PROF. GOWELL: Yes, two spaces of the floor, each about 3x5 feet in size—about the same space as would be required by common nests.

Lightning.

BY PROF. WEST DODD.

Lightning.

BY PROF. WEST DODD.

GENTLEMEN:—1. My subject is lightning and how to civilize it, so it will be in harmony with the agricultural interests of New Jersey.

2. Before I bring lightning into this convention I wish to talk to you a short time on natural physics, so you will better understand the subject of electricity and lightning when we come to it.

3. The whole universe and all of its varied phenomena can be included in exactly three compartments, viz: Matter, Ether, Energy, and outside of these there is nothing.

4. I want to talk to you a few minutes on Matter, then some minutes on Ether and a little while on Energy, then mix them up for you and out of the mixture bring you some lightning flashes.

This will help you to understand what is taking place in nature's great laboratory during a thunderstorm, and the more you know of this the more you will appreciate the true methods of lightning protection, and you will be better guardians of your State's interests.

5. The Science of Chemistry teaches us that all matter, solids, gasses, liquids, are made up of minute grains called atoms, and these are so small, there are about 48,000,000,000,000,000,000,000 of them in a cubic inch of water.

6. However much we may neglect to think of these little atoms, they are the bricks of the Universe out of which we and the Solar System and the Milky Way are made. And whatever concerns them concerns us.

7. Locked up in these atoms is the cause of the heat of the sun, the nature of electricity and evolution of a universe.

8. These little bricks are not all alike. There are about seventy different kinds of them.

There are oxygen bricks and hydrogen bricks.

There are autimony and arsenic bricks.

Bismuth, carbon and copper bricks.

Sulphur and sodium, and gold bricks.

9. The Spectroscope reveals to us that the sun and stars are made up of the same kind of materials as the earth, and it seems the whole universe of suns and worlds is made up of only about seventy independent kinds of stuff, and each has its own special kind of atom, but these atoms make combinations with each other, making about 250,000 well-defined different substances, and innumerable others.

10. Now there is one well-defined, iron-clad, fundamental truth governing these atoms and that is, "You can neither destroy any of them, nor can you create any more."

11. We may take a hair from an infant's head, dissolve it in acid, burn it in the electric furnace, and use every annihilating agency, and while the hair vanishes the atoms of that hair persist in being, and if refused an existence in the hair they will exist in something else. Some perhaps in mice. Some in elephants.

12. A swarm of atoms under some guiding power combines, stands six feet erect, vibrating, proud, martial. We call it a soldier. On a distant Manchurian field that swarm dissolves because it met another little swarm called lead. Some of its very atoms passing into the fever germs that hurried the dissolution.

What an eternal change is ever taking place, for mark you, these same atoms, or others like them, come together again, combining, quivering, interlocking and there results other swarms; a woman, a rose, a rattlesnake, to dissolve again and perhaps reappear in the very grass that lines their graves.

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13. Now whether we call these atoms God's servants or the Devil's agents, this much is sure:

That every phenomenon in this universe, electrical or otherwise, that every action of every thing, living or dead, within this bourne of time and space, is the action of one swarm of atoms on another, for without them there is nothing.

14. Thus far we have been speaking of atoms and you are wondering what that has to do with electricity, but when you learn that electricity and all of its phenomena is due to motion among these atoms you will see it was necessary to speak of the atoms first. And now you want to know what makes the atoms quiver.

15. And now we will introduce another mystery, and that is the Ether. This is something we can neither see, hear, taste, smell, weigh or measure.

It is the one universal substance without limit.

Space and eternity are in its grasp.

It fills all of space not occupied by matter.

A thousand million millions miles away in space and it is there.

The galaxy is steeped in it, and without its existence there could be no light, and sun, and stars would be invisible.

16. In the olden days it was supposed that all space between the sun and earth and stars was empty, but we now know it is not empty but brim full of ether. And there is no such thing as emptiness.

As far as we now know the ether is not made up of atoms like ordinary matter but is continuous.

17. If our eyes could see the atoms of matter we would observe they do not touch each other, but that there are spaces between them. You can compress 800 cubic feet of air into 1 cubic foot. That shows you can crowd its atoms closer together. So there must be space between them.

Gold is one of the densest substances, but if you roll it into a sheet, you can see through it with the X-Rays. That shows it is porous.

The quicksilver in your thermometer will occupy a smaller space in a cold night than in a warm night.

That shows its atoms are apart.

18. Now the Ether is so thin and elastic that it fills all of the spaces between the atoms of matter and it is important we grasp this thought, for the whole explanation of light and heat and electricity hinges here.

19. As an illustration of this conception.

Suppose I had a pail of bird shot here. If we should call each shot an atom, they are then relatively much closer together than the atoms of matter, but even as they are, I could pour water among the shot and there would be room for a good quantity of water.

Well the ether mixes with the atoms of matter just as the water mixes with the shot.

So elastic is this ether that it will pass through ordinary matter as easily as water will through a coarse sieve.

And its resistance to planetary motion is too minute to calculate. Yet resistance it must have.

20. The main feature about this ether to which I wish to call your attention, is the property of transmitting wave motion, the same as water or air, for it is by ether waves among the atoms of matter that we are able to explain the nature of light, heat and electricity.

21. Light and heat and electricity are so closely related that they are interchangeable, that is, we can change one into the other.

Light, heat and electricity are almost alike, they are all due to ether waves. The only difference being the size of the waves.

22. If you were standing by a quiet pond of water and should throw in a hand full of pebbles, you would notice a multitude of little concentric waves chasing each other and ever widening out from the centre of disturbance.

These little pebbles disturb the whole pond and swell it a little bigger and make it seek a new level, but if you should

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throw in bigger stones, you would have bigger waves and a bigger disturbance.

23. This principle of disturbance or motion is exceedingly interesting to the physicist, for the whole universe is in a perpetual quiver and every phenomenon is due to motion.

24. Light and heat and electricity and sound are all produced by vibration; light and heat and electricity by Ether vibration. Sound by atmospheric vibrations.

If atmospheric vibrations are very slow there is no sound.

When these vibrations are 16 per second you begin to hear a bass note, and 32 per second will give you an octave higher, and if the vibrations are very rapid the sound is that of a mosquito's wing, and when the vibrations reach 40,000 per second, hearing ceases. So the whole range of the human ear is from 16 vibrations to 40,000 per second, and when you speak a word the vibration of your vocal cords shake the air for miles and send sound waves in every direction at the rate of 1,142 feet per second.

25. These waves are faster than water waves, because the air is lighter than water.

But Ether Waves travel 186,000 miles a second which shows its extreme tenuity.

The velocity of these waves was first discovered by Roemer—a Danish astronomer—in taking observations on the eclipses of Jupiter's moons from opposite points of the earth's orbit, by which he proved it took light $8\frac{1}{2}$ minutes to come from the sun, 91,500,000 miles away.

26. The determination of the cause of light being due to motion of the Ether and that coming at the rate of 186,000 miles a second at once took the attention of the great Newton, who paved the way for our present knowledge.

One of the unique discoveries his experiments led up to was, that if Ether waves that made light were all alike in size, every thing would be the same color, or else be black.

He let a beam of light that came through a hole in his window shutter pass through a piece of beveled glass, and on a screen behind the glass it made all the colors of the rainbow.

27. That showed the beam of light could be analyzed, for on the screen he had, red, orange-red, orange, yellow-green, blue-green, indigo and violet.

Now just as different kinds of sound is due to different sized vibrations in the air, so are different kinds of color due to different sized vibrations in Ether. The red corresponding to the bass in music and the violet to the soprano.

The lengths of these Ether waves has ben determined by a nice mathematical process and the figures are simply staggering.

What a phantasmagoric chase these waves are having, and what a task for the master of ceremonies.

And that is the whole range of the human vision, and waves larger than the red or smaller than the violet are in darkness.

The length of the ether waves that make red is .000002996 of an inch.

The length of the ether waves that make orange-red is .000002706 of an inch.

The length of the ether waves that make orange is .000002585 of an inch.

The length of the ether waves that make yellow is .000002323 of an inch.

The length of the ether waves that make green is .000002076 of an inch.

The length of the ether waves that make blue-green is .000001915 of an inch.

The length of the ether waves that make indigo is .000001697 of an inch.

The length of the ether waves that make violet is .000001563 of an inch.

28. When Ether waves lagrer than the red are pasing among the atoms of matter, the atoms partake of a larger motion and the sensation to us is heat.

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The heat waves vary from .000002996 of an inch to 300 yards and when the ether waves are larger than this the motion of the atoms is increased and instead of heat the effect is known as electricity.

The electric waves vary in size from 300 yards to 1,200 miles and these pursue each other at the rate of 186,000 miles per second.

29. The thought I wish to impress is: "There is no such thing as rest."

That the whole universe, all of its ether and atoms are in an eternal quiver and that energy phenomena of every kind is due to this motion and its conservation, and outside of the earth and its atmosphere in space there is neither light or electricity, for there are no atoms to move, except where they are bunched up in worlds.

30. And now we will enter our third department: The Mystery of Energy—the product of ether vibrations.

When one asks the question, "What is Electricity?" he only asks one ninth of the main question.

When he asks, "What is energy?" he asks it all and echo answers, "What is energy?"

This much we do know. It was here before we came. By it we live, move and think, and when we are gone it will still be here.

We also know we can neither destroy any of it nor can we create any more.

31. Energy has nine different forms in which it can exist and light is one of these forms, and heat is one, and electrical energy is another, but they are all different forms of the same energy and they are all alike mysterious, and all are interchangeable, that is, we can change heat into electricity and electricity back into heat.

We can change heat or electricity into mechanical power and we can change mechanical energy back into heat or electricity.

This changing of energy from one form into another is called its transmutation and a knowledge of this is what has made the civilization and wealth and happiness of the world possible.

32. Now while we can change energy from one form to another, yet like the atoms of matter if it cannot stay in one form, it persists in staying and will appear in another form and is absolutely indestructible.

It can be stored up for millions of years and then be taken out in any of its nine forms.

If you wind up a clock spring the energy you expend is stored up in the spring and a little ratchet wheel and trigger holds it, leaving a constant strain on the spring and a little energy is released at every tick.

33. Now all of nature has energy stored up in it just like the clock spring. The ether vibrations locks the atoms together and they are held by chemical affinity and cohesion under a strain. And whenever a little of that energy escapes there is a tick, no difference whether that tick is a lightning flash or a swing of the pendulum.

A storage battery merely has a strain upon its atoms and is like a wound-up spring and capable of doing work as it runs down.

A piece of coal is a store of energy, its atoms and molecules being held together by chemical affinity and cohesion which are like millions of wound-up springs. And the energy thus locked up is so tremendous that when released it drives our railroad trains and our steamboats.

34. Millions of years ago the agitation of the atoms of the sun sent ether waves to earth.

These waves caused commotion of the atoms in the air and the earth known as heat.

These heat waves stored up their energy in locking atoms together (winding up springs) and some of these came together as vegetation.

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For ages this energy that was stored up by the ancient ether waves in the ancient vegetation has been hid away in our coal beds.

And now we take a piece of the coal and release its energy beneath a steam engine in the form of heat and when the water in the boiler changes into steam, the energy changes into pressure in the cylinder of the engine, and we have mechanical power.

Then we belt the engine to a dynamo and again the energy changes into electricity and in this form it is transferred for miles through a wire, and a little trolley wheel and a wire leads it to a motor beneath a street car where it changes back to mechanical power and drives the car, or part of it may be used as heat and light.

35. Now at the instant when energy changes from one form into another there is a tremendous strain thrown on the atoms of matter, and if this strain is confined too much there will be an explosion.

No difference whether it is an explosion of a steam engine or an explosion of lightning, the energy in either case originating in the strain on the atoms.

36. Now there is a way by which we can determine the mechanical or explosive measure of different forms of energy.

For instance, if you had 1 pound of water and should raise its temperature 1° , the amount of energy in that 1° of heat in 1 pound of water is equal to the energy developed by 1 pound of lead falling over a precipice 722 feet. And 100° raise in temperature in 1 pound of water develops the same energy as 100 pounds of lead falling 722 feet. And if you brought your 1 pound of water to the boiling point and had it confined you would develop energy enough to have an explosion, and the same principle holds true in a lightning explosion.

37. Before I tell you how electricity gets into a cloud and how the explosion occurs, I want to tell you how much energy is given off in producing 9 pounds of ice.

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I shall quote you from that great scientist, Prof. John Tyndall:

"Water is made up of two gasses—oxygen and hydrogen—and the amount of energy locked up in the molecules of these gasses is simply amazing.

"If you take 8 pounds of oxygen and 1 pound of hydrogen and combine them properly you will have 9 pounds of water vapor.

"It seems the strain on the atoms is released as soon as they combine to form water and the amount of energy released in making this 9 pounds of vapor is enough to lift 48,000,000 pounds 1 foot high, or if conserved for explosion would blow a ton of lead $4\frac{1}{2}$ miles high.

"But when this 9 pounds of vapor is condensed into water, more energy is released and this time enough to lift a ton $\frac{1}{2}$ mile high.

"But there is still some energy left in the water, and when we reduce it to 9 pounds of ice, out comes the balance of the energy and this time there is enough to lift 1 ton 433 feet high.

"You are all familiar with the energy given off when water freezes, especially if you have ever let your water pipes freeze solid, and had to pay the plumber to replace the burst pipes."

So if Prof. Tyndall is correct our 9 pounds of oxygen and hydrogen in changing to vapor, water and ice gives up enough energy to equal that of a ton weight falling 5 miles.

39. I have stood at the base of Niagara Falls and have seen a mighty river falling over a precipice 160 feet with a vehemence that shook the very earth.

I have also seen snow flakes descending so gently as not to hurt the delicate spangles of which they are composed.

Yet to produce from its constituent gasses a quantity which a child could carry of this delicate material demands an exertion of energy competent to lift the whole of that mighty river back up over the precipice and drive it back into Lake Erie.

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40. Before I make you any lightning let me first tell you how electricity first gets into a cloud and where it comes from.

The idea that a cloud gathers its electricity out of the air is not sound.

The sunbeam is the prime cause.

The energy of the heat of the sunbeam is absorbed in the globules of vapor during the evaporation of water, for at the point of evaporation heat ceases and becomes stored energy in the vapor. Now when these vapor globules reach the upper atmosphere it is so cold there that it condenses the vapor into clouds and then this stored energy is released and appears in the form of electricity and ready to give the energy of the sunbeam condensed into a lightning flash.

41. And now we will discuss the lightning flash and why life and property are endangered by it, and what to do to secure safety in our homes, through electric conductors.

It is nice when we reach that point in thinking where we acknowledge all things are obedient to some law of nature and that "Chance" is not known in the operation of nature's forces.

The fact that lightning will not strike some things at all should convince us that there is some reason for it.

Do you know lightning will not strike a railroad train or buildings that are all covered with metal, or buildings with iron frame work from top to bottom, or steel wind-mill towers, or modern steel battleships, or buildings in the business streets of our large cities?

Now there is a reason for this and I want to make the reason plain to you.

And do you know the things lightning will strike are our country homes and barns, our city suburban homes, our churches and school houses, and trees, and our cattle and horses, especially if near wire fences?

And the law that prevents lightning from striking some houses and leaves other houses in danger I want to unfold to you.

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42. There are two general errors well fixed in the public mind which I wish to correct. One of these is that metal attracts lightning. If any of you have that notion, unload it here and now.

Remember, a steam engine on a railway weighs about 100 tons and is all metal, and the trucks of an ordinary train weigh 200 tons more. Now you would reason, and rightly too, if metal attracts lightning, surely one car or one engine out of five hundred thousand ought to be struck at least once in fifty years.

But I know, you know I tell you the truth when I say no one here ever read of or knew of anyone being killed by lightning in a railroad train or in a metallic building, or even while sleeping in a metal bed. So if I forget you must make me clear up anything that looks cloudy to you on this statement.

The other error I wish to refer to is the crude notion that lightning is electricity.

We can have plenty of electricity without lightning, but we can never have lightning without electricity. So we are more intelligent if we regard lightning as the product of electricity, and that the electricity was there first and ready to change into lightning and smash things if we let it.

There is nothing known which is so responsive to law as electricity. Indeed, it is the only thing you can send round the world in the twinkling of an eye. It is the most obedient servant, or the most cruel master, according as we are intelligent with it.

43. Note this law: "Through some things electricity passes easily, through some things it does not." When electricity passes through an easy road the effect is very different from what it is in passing through a hard road.

If electricity passes through metal, that is an easy road, a good conductor, and there is no heat or lightning on the conductor.

If electricity passes through the air, that is a poor conductor, and because it resists the electricity, heat is generated and you

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see lightning, or anything that resists electricity will either get hot or fly to pieces, or both.

As an example: We have here the electric lights in this room. Now if I should ask any of you if these electric lights came through the electric wires, you would promptly answer, "No, the light does not come through the wire." If it did the wires would be covered with fire, but the electricity comes through the wire and there is light only in the lamps.

Now the reason is this: The wires are good conductors of electricity and offer so little resistance that very little heat is generated in the wires; but in the lamps the wire is cut and a little filament of cellulose is inserted in the break—a little loop, it looks like a black thread, you know what I mean—now when the electricity comes to this loop, it meets with great resistance and has now a hard road to pass through, and on account of this resistance or friction, the loop in the lamp gets white hot, and you say, "Electric Light." So you see if the filament in the lamp was as good a conductor as the wire outside the lamp, there would be no electric light.

I think you see what I mean when I tell you, electricity has a different effect when it passes through a good conductor, from what it has in passing through a poor one, and when I tell you that lightning no more goes through a lightning rod than the electric light goes through the electric wires, it begins to look intelligent to you. And just what a lightning rod does do is the main lesson I want to teach you.

44. Let us first see how a flash of lightning is made, for there is always something at work ahead of the lightning flash and getting things ready.

Your philosophies tell you, "Before a house is struck with lightning, the house is first charged by induction." Now that word induction is too big.

I think you observe I am not using such words as Ohms and Amperes and Watts and Farads and differences of Potention, etc., for I do not understand big words very well and this word

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"induction" is too big a word, but that is the word the philosophies use.

Now "induction" is taken from the word "induce" and induce means, "to coax or pull your way."

So your philosophies try to teach you this, "Before a house is struck by lightning an electric strain is placed upon it." That is, a condition has been coaxed into it and it is this condition we have to deal with if we would prevent it from bursting into a lightning explosion.

But if a fog extended from the cloud to the earth this condition would not exist, as the electricity easily reaches earth through the fog and makes no lightning.

You will remember you never saw lightning on a foggy day, but when the air is dry, the earth directly beneath the charged cloud is electrified in sympathy with the cloud and tries to discharge to the cloud the same as the cloud tries to discharge to it, and a great electrical strain is between the cloud and earth.

Now the air is a poor conductor of electricity and anything that sticks up from the earth into the air, like houses and barns, become discharging points for the earth's electricity and in this way the house gets ready to be struck.

So the lesson we wish to impress here is this, "Lightning is due to causes." Electricity first gets in its work and loads up a cloud. Then this cloud fixes up things on the earth and induces an opposite electrical condition and the two electrified surfaces strain and pull on each other, and when the strain gets great enough so that the air cannot resist any longer, off she goes with an explosion through the house, and the undertaker has a job on his hands.

44. There is absolutely no necessity for life to be lost in this way, and insurance losses can surely be cut down more than one-half, and the day is now due when thoughtful men are weighing this subject, and that is why you have me here.

You want to know how to prevent losses by lightning, if it can be done, and you want to know the correct system, and I

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feel good to think you do me the honor of telling you a studious experience.

It is apparent to you all, that lightning is in harmony with some law or else railroad trains and metallic buildings would be struck as readily as anything else, and the question you want answered is, "Why are they not?"

Now if you will remember I told you, "There is no lightning till nature has things all ready." That electricity is, so to speak, bunched up in the cloud and also in the house, by induction.

Now a railroad train being largely made up of metal, telegraphs all of the electricity induced into it to one place and that is the highest point on the engine, which is the top of the funnel and here it is forced off as it were, and received by the molecules and atoms of air, and used up in the formation of ozone and thus destroys the conditions that otherwise would cause lightning to the train, but if the tracks and engine were made of other material than metal, the induced electricity would not pass so easily through it and the silent discharge could not occur, and conditions would be very different and the train be damaged by lightning.

45. You will understand this better if I make you some lightning and show you the whole process; and at the conclusion of this lecture if any of you want to inspect or investigate a little closer, I shall take special delight in meeting and showing you.

I have here a miniature cloud suspended in the air. I shall charge this cloud with electricity. I have here some miniature buildings which we shall place under the cloud and note the effect of lightning on the different buildings.

The first house I shall strike will be this one, in which you see the stove and the stove pipe. Here you see the chimney is struck and the stove pipe and stove show you the directions of the discharge and the lightning playing around the stove.

The lesson you get here is that in a house of this style, where there are no tin valleys on the roof and no water pipes on the

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house, the stove is a very dangerous place during a thunder storm.

But here is a building more modern in construction. Notice the tin valleys in the angles of the roof of this building and see the arrangement of the screen doors and water pipes and observe the tin-roofed porch. This building is an exceedingly dangerous one. The danger places being near the screen doors or under the tin-roof porch.

Notice when lightning strikes this house, you see its course from the chimney through the tin valleys and the screen door and if I place this little lady under the tin-roof porch, you will see she is killed by lightning, or if I place her near the water pipes, a flash of lightning reaches her there. The reasons for this I shall show you presently and how to rod these buildings so as to prevent this.

Here I show you how lightning burns a barn. The hay-fork track becomes an easy means of finding the easiest way through the barn, and the discharge in combustible matter such as hay easily takes fire and the result is such as your experience has to deal with.

And now notice, when I place this metallic house under the cloud, lightning will not strike it at all.

When you remember what I told you about induction and what I told you of this induced electricity discharging from the top of the steam engine, you will more fully appreciate this beautiful demonstration, for you can easily see the electricity discharging silently from the top of the metal house through the metallic cresting, and if this electricity did not escape it would accumulate and soon the conditions for a lightning stroke would be on and you will see when I hold this paper over the house, the electricity does not escape and the metal house is struck like the others.

We will now return to the house with the stove and you see lightning strikes the chimney and appears on the stove as before. Now when I put on this copper lightning rod without points, see how the chimney is struck but the stove is not now struck.

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as the lightning rod offers a better way and the electric discharge comes through the rod instead of through the stove pipe, but notice what a change takes place when I put the sharp points on the rod. You see the lightning has almost ceased and if you look at the sharp points you can see the reason, for the electricity is plainly visible in the dark escaping from the sharp points and making the building as safe as a railroad train.

So you learn from this lesson that sharp points are put on lightning rods, not to draw lightning, but the very opposite, to quietly discharge the electricity and prevent lightning and if they fail to discharge quick enough a flash occurs at the points where the electricity is and they are melted, but even then there is no flash below the point unless you have one of the old joint lightning rods, and in each joint there is a flash if there is a little rust, or anywhere where there is a break in the rod.

Here is a little wheel with sharp points. If I hang it on one of the lightning rod points, see how it whirls around driven by the electricity escaping quietly from the building through the points of the lightning rod.

And now next time you read your philosophies on this subject you will remember the lesson that big, fat, Scotchman gave you in Trenton.

46. I have now something of great interest to show you and which will be made compulsory in a few years among the patrons of insurance, and that is the value of putting ground wires on pasture fences, and when you do this you will work a revolution in insurance.

Years ago the Western Union Telegraph Company learned the necessity of ground-wiring their telegraph poles, so they could do business, as lightning was ever splitting their poles and letting down their wires.

At first they put ground wires on every tenth pole, but experience showed that this was not enough, and some of the poles were split; but later they put ground wires on every fifth pole, and now lightning has practically abandoned the Western Union

system, while many telephone companies who have not yet used ground wires are having a sad experience with lightning.

Now a large per cent. of your losses is for cattle and horses killed by lightning near wire fences, and it seems quite strange that thousands of dollars should be wasted this way when for twenty-five cents and a half a day's time it can be stopped on any pasture fence.

I have here a wire fence and you will notice when lightning strikes, this animal standing near the wire fence, is struck by lightning from the fence, but see how nicely this ground wire on the fence protects the animal, and now the animal can stand quite close to the fence with comparative safety.

These ground wires to fences should be put in more frequently than they are on telegraph lines and my judgment would be about every two hundred feet or so.

The most convenient way to do this is to take the rod out of the end gate of your wagon box and punch a hole down full length by the side of a post and put in a piece of fence wire and let it be stapled tight to the fence posts and come in contact with the wires, and the man who does this is justly entitled to a different class of insurance from the man who does not.

47. And now a few words on the proper way to rod a house, and I am through.

Since 1848 the lightning rod business fell rapidly into disgrace. A cut-throat and generally ignorant class of men had sprung up and had been fostered by two large manufacturing concerns which furnish the contracts and literature and in the period of one generation the great discovery of Franklin had become a stench in the public nostrils.

And when I took up the business in a small way in 1887, I became the laughing stock of my neighbors and friends.

But the necessities of misfortune and a sick family are a great stimulant to effort. And when I produced the "Dodd & Struthers Lightning Rod" and invented the Artificial Thunderstorm to demonstrate what was the correct and what was not

correct in the general system of rodding buildings, the old gang of lightning rod sharks said "ya-Ha." And the Insurance Men and Agricultural Association said, "Dodd, come in; we want to talk to you."

And now the old gang don't know whether they are a-foot or horseback. But a new class have sprung up that properly should be in work less scientific. This class have been copying the Dodd & Struthers system as much as they can, and the Dodd & Struthers literature and putting their names to it and copying the Dodd & Struthers Thunderstorm and going out into the world as charlatans.

With the highest regards for the honest efforts of every man, it is hard for me to even condemn plagiarism.

But there is one thing of far more vital importance to you as agricultural men and to the world in general than any make of any lightning rod, and that is the system of putting on the rod, for a system of common fence wire is much better if properly put on, than the best rod on earth improperly put on. But a good rod put on is very much better than any system of fence wires.

A lightning rod should be made of copper and should be as nearly as possible without joints.

The size of a lightning rod is of far less importance than its arrangement, in fact it is better to be small and use more of it.

The general rule is, the more disconnected tin valleys and water pipes on a house, the greater the danger if it is without rods, and the greater the safety if properly rodded. But to be properly rodded the rods should not be put through glass insulators, but nailed tightly to the building and connected with the tin valleys on top of the house, and with the eave troughs or rain pipes on the way down and if so arranged the tin valleys and rain pipes are very helpful in assisting the rod to do its work and if so arranged and well grounded at two or more places in different parts of the house, and well pointed with good copper points, the building is proof against lightning, and

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in an experience of fifteen years, I have never known of any danger from lightning where this rule is observed.

But if a lightning rod is made in joints and disconnected and put through glass insulators and put on by a man who is not qualified for his work, some mischief can occur and prejudice fails to make the distinction.

Gentlemen, I thank you.

The Needs of the Farmer.

BY PROF. H. A. SURFACE.

The Needs of the Farmer.

BY PROFESSOR H. A. SURFACE.

Mr. President, Ladies and Gentlemen: After the inspiring words to which you have listened, and in the presence of this body, it seems to me to be indeed a very difficult task for me to say anything that would interest or instruct you in any way whatever. It was a pleasure to me to hear your excellent Governor, who evidently is intensely interested in your welfare. I have read and re-read his message to your Legislature, and I hope that every person in this room has read it at least twice to comprehend the meaning of his statements concerning taxation, to comprehend the meaning of his statement concerning the uplifting of the tiller of the soil, the man who is responsible after all, for the permanent welfare of our country. We have been very much amused at times by the attitude of what we choose to call the politician, toward the agriculturalist, and that was exemplified in our Legislature and in many State Legislatures where the force and power of the agriculturalists were not made known, were kept latent, but were brought out at the right time. We know when there is no evidence of danger, no cause of fear, men and women are likely to be given up to diversion and frivolities. We see that every day; but when the day of danger draws near then they seek the source of their salvation. When the wave of popular reform comes, see the man who has formerly ignored the farmer come to him for his support and his help.

I was impressed with an illustration of this when a few years ago you remember, men, women and children were gathered

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in that great theatre in Chicago and then came that awful holocaust. When the flames had cleared away, no longer were they looking upon the giddy footlights, but the charred bodies of men, women, and children were found in the attitude of prayer. Why was that? Because, as I say, when the day of danger comes then the day of frivolity is passed and men and women draw near to the possibility of their salvation.

Now let us see the attitude of the world toward the American farmer. While everything is going well you see very little concerning the farmer in the quotations from Wall Street; but let us go back two years ago last Fall, I believe it was on the 11th day of August, that Wall Street financiers saw their foundations were threatened with panic. The outlook was alarming, and they sent out a Committee to investigate the conditions upon which their resources and their permanency was resting. To what places and to what persons did they send that Committee? Was it to the oil fields in Ohio, Virginia, or Texas, or to the great gas regions, or yet to the gold mines of Colorado or Alaska, or to the diamond mines of South America or Africa. No! Where did it go to study the resources of our country? Out to the fertile prairies and the fields of the West, and to the farmers of the East, and when the Committee came back it made a report that there was a good wheat crop; they reported there was a prospect of a good corn crop,—and upon their report the stocks and bonds were sustained in Wall Street and prices went up in five and ten per cent. jumps, and the day was saved by the man who tills the soil. (Applause).

Is that all? Read the report of the United States Secretary of Agriculture for the years 1904-1905 and you will find that when the balance of trade during the past fifteen years is cast between America and Europe, if we take not into consideration in the balance the produce from the American farms, we are owing Europe nearly one thousand millions. When the balance of trade is taken into consideration the farmer is saving the day, and Europe is owing us more than four times that amount. I say the day was saved, and the interest on the American

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bonds in Europe was paid by the tiller of the soil, as his crops saved the balance of trade. Unfortunately I am not able to give you the exact figures, but the principle I lay down,—the facts I enumerate without detailed figures,—are absolutely true, and anyone may look them up and prove for himself that the American farmer furnishes the resources that keep the balance of trade across the great Atlantic in favor of the United States instead of in favor of Europe.

That is not all. The railroads at times have felt some of the evidences of impending panics or troubles. What have they done- Not long ago one of the great companies of the West sent a man through the East to make personal investigation of the harvests in this part of the country and the variety of grain grown. That man established a depot at Harrisburg, Pennsylvania, for the purpose of gathering in there the best kinds of grain to be obtained and to send it out through the broad fields of the west and the great southwest, to teach the farmer not only how to cultivate the soil but what variety of grain to grow to get the best returns. In the State of Iowa they have established an educational car in which there are teachers showing how to till the soil and how to handle the produce of the soil, the fruits and grain. Men from the State College and State Experimental Stations travel in that car, pass along from station to station, bringing the farmers into the cars and giving them lectures. That is being done by the railroad company. Why? Because they realize that their resources depend upon the development of the soil. What is the application? If the great corporations like the railroads that have an eye for business see that the farmers have essential relation to the development of our country,—if the great financiers in Wall Street see that they must come to the American farmer in order to study their own safety,—the American farmer should see that he is the man that controls the situation.

It seems to me that the man who tills the soil, especially the man who makes two blades of grass grow where formerly

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there was but one, is like a young giant with immense strength, but does not know his strength. If he did but know it! A merchant who said to me, "I see there is a great tendency to combination among farmers." I said, "Why not. You have your Grocers' Association, and combinations and organizations, even the coffin makers have an organization, why not the farmers' organization?" He said, "God save the day when the farmers get together in the way that the business men have gotten together," but why not? Just because the business men feel that they will no longer be able to control, not only finances, but to some extent also the Legislatures.

What then does the farmer need if he is able to control the foundation upon which Wall Street rests; to control the foundation upon which the success of our great railway corporations rest? Why is he not able to get what he needs? Why should it be necessary for your Chief Executive to come to you today saying to you that you need proper legislation for the equalization of taxes in this state? Because his hands have not been properly upheld, that is all. Let the men in this state say, "We will have a proper law for the taxation of property," and if they will band together for that, they will have it!

I am for any organization that will further the welfare of the agricultural people, because I firmly and fully believe that they need help more than any others. There is no profession to which men can turn today that demands so much knowledge of science, of business methods, of practical affairs of mankind, than the profession of the man who gets his living from the soil. (Applause).

Had I time I could go into details of some of the things a farmer must know. The business man needs only to make a study of certain markets and financial conditions, buying and selling. He studies quotations. That is only a small feature of the necessities that come before you who are engaged in farming, whether it be in dairying or fruit growing, or truck-

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ing or general farming. I say the buying of what you need and the selling of your produce becomes only a small feature of what you must know. You must study electricity, as was shown yesterday; you must study the principles of chemistry to be able out of that barren soil to bring forth the plants you want, and to make it bloom and grow a fertile field. You must study the principles of biology, as Doctor Smead has just told you,—the very principles of biology, as taught in the best universities in our country. Certain points that he brought out could not even have been comprehended by a man who didn't understand those elements of biology. It is true, as was recently published in one of our agricultural papers, that a man who is to be a farmer's institute lecturer, to be successful, must be far in advance of a few years ago. Ten years ago a man who would have been counted a successful institute lecturer before an audience of farmers, would not today be tolerated upon the platform. Why not? Because you are growing, because you have grown, and because you will continue to grow. Thanks to the intelligent efforts of your state experiment station, your State College, the Agricultural Press, such men as those on your Board of Agriculture, the daily newspapers that recognize your needs and publish articles for your welfare,—I say thanks to such things the American farmer has grown and is growing.

Now that it appears to me that it is only necessary for him to recognize his strength; for him to get together, not to crowd the other men out, but hold his own and grow and continue to grow. That is why I stand for anything that will help the farmer, and from what I have seen I have found that organization is a fundamental necessity. What organization? I care not what. Call it a farmer's club if you choose, call it a union if you choose, call it anything; but that association which stands for the financial, intellectual and moral uplifting of the farmer is the society or organization with which I wish to join hands and work. The one that has undoubtedly done

the most and is doing the most is the one that is known today as the Order of the Patrons of Husbandry or the Grange. And I would that everyone in this room, without exception, could wear the button that shows his colors in that regard. (Applause).

You understand my attitude. I am not making a talk in behalf of the Grange as such, but I am talking for any organization that has for its fundamental principle the uplifting of agriculture and humanity, and the Grange is one of the organizations that I find, as I go up and down the land, and through the different states, that is doing this.

Fortunately it has for its purpose not only the co-operative features of buying and selling for the benefit of its members, but what is more and far beyond that, the moral feature, the study of the home and how to help the home, and how to make the home protect the state and the school; how to improve the schools and the state. My friends, I find where the Grange is the strongest, there is where the schools are the best. From those counties where we have the most members in the Grange do I receive the greatest support; from those counties do I receive a greater number of inquiries concerning the advance in scientific farming; from those counties do I see that there are most efforts made on the part of our agricultural citizens for their success and the welfare of their fellow laborers. By their fruits we shall know them, and since that is true, is it any wonder that in my few brief words I say that I believe in such organizations because I have seen what they have done, and I believe in what they are doing and will do in the future. (Applause).

State Grange of New Jersey.

REPORT BY GEO. W. F. GAUNT, MASTER.

State Grange of New Jersey.

REPORT BY GEO. W. F. GAUNT, MASTER.

Officers and Members of the State Board of Agriculture: Another year has been recorded on the pages of time, and the representatives of the various agricultural societies have assembled here to deliberate upon and devise plans for the future prosperity of the agricultural interests of our state. The past season has been a fruitful one for the farmers of New Jersey; we have no unfavorable climatic conditions to contend with, for all of which we as tillers of the soil should be ever mindful of him who doeth all things well. In reviewing the work accomplished by the Grange, the past year we see reasons for rejoicing. Our organization has steadily advanced, increasing in membership and in good works, until it occupies an enviable position among the fraternal societies of the world. Since the last meeting of the State Board, there has been eighteen subordinate Granges organized. It is with pleasure I report twenty counties of the state with Granges firmly planted within their borders, and members of the Order living in the remaining one. This is the best of evidence that the Order of Patrons of Husbandry is being looked upon by the farmers of the State with favor, recognizing the underlying principals of the Order, as the means by which the agricultural interest may be advanced. The regular meetings furnish its members the opportunity to come together to discuss the various lines of work they are interested in which in a great measure is developing and widening the minds of all those who make use of the opportunities such gathering afford. Not only along

the lines of social and educational improvement but in a co-operative capacity as well which is a very interesting feature of the Order, in those Granges where co-operation is being practiced saving annually thousands of dollars in the purchase of farm supplies, and in fire insurance. The fire insurance feature of the Order has demonstrated what farmers can accomplish when they co-operate together for business. There is at the present time about \$10,000,000 worth of property insured in the Grange insurance company which has cost the insured less than one half of what it would in the old line companies. This feature of the Order alone should be argument enough for any up-to-date farmer, and it is only one of the interesting features of the Order.

Education is one of the basic stones upon which our Order stands and, in the language of our declaration of purposes, we shall advance the cause of education among ourselves, and for our children, by just means within our power. We especially advocate for our agricultural and industrial colleges, that practical agriculture, domestic science, and all the arts which adorn the home be taught in their course of study. Since it has been our privilege to attend the Sessions of the National Grange we have had an opportunity to learn what other states are doing towards giving the boys and girls an agricultural education. We found in all the States we visited they were far in advance of New Jersey. We long to see the time in the near future when our boys and girls can get a practical agricultural education in New Jersey, so that parents will not be compelled to send them to Wisconsin or elsewhere.

The Grange is the medium through which our farmers can remind those in authority to provide commodious institutions with up-to-date apparatus and supplies, and that those who enter into an agricultural pursuit for a living will so educate the boys and girls to stay on the farm. I make mention of the girls for there certainly is no excuse for their being "anxious and aimless," for the daughter furnishes the life and bright-

ness of many farm homes; the farmer's daughter who makes herself familiar with the business and work of the farm is gaining an education in practical, useful experience that would enable her to support herself if she were thrown upon her own resources. In days gone by, many men who were content to work and study the soil and nothing else, living a mere animal existence achieved success. This success created the impression among all classes, that a general education for farmers was unnecessary. But the progress of the age has changed the environments of the agricultural world. New conditions demand newer and more approved methods. While the knowledge of the soil and plants cultivated is indispensable, the situation requires a man thoroughly equipped for the duty of conducting farming operations to meet the wants and requirements of an age of progress. The age demands the thorough adaptation of the man, by knowledge and experience to his work, and especially of a knowledge of how to so apply his energy so as to produce the greatest profit with the least loss.

Practice is simply theory applied, for, while many are willing to admit it, every man has a theory. With a mind alive to the condition of agriculture, the farmer educates himself by devoting constant thought to every detail of farm work, and avails himself of the thoughts and experience of all other agriculturists.

Hence, he reads the best agricultural journal, digests its information, and subjects its teachings to the test of his judgment.

Education is a practical benefit to the farmer if properly directed and used.

New Jersey State Grange with its 10,000 members starts in with the year 1906 with a determination to do all in its power to advance the interest of agriculture, working hand in hand with the State Board and all other agricultural societies that seek to promote the welfare of our country and of mankind.

The new administration of the National Grange has asked for 500 new subordinate Granges and 100,000 new members.

New Jersey is expected to contribute its quota toward reaching these results.

The 39th annual session of the National Grange was held in Atlantic City. The meeting was largely attended and New Jersey did herself credit.

The entertainment of our visiting Patrons, the decorations of the hall where the meetings were held and the exhibits of farm products were of such character they have been the means of placing our State in a different light before the people of the twenty-six States represented. Not only was this noticeable among the representatives of the agricultural interests but among the visitors and residents of this wonderful and far-famed resort. The exhibit of farm products at Atlantic City would do credit to a State Fair in season and every one knows that the middle of November is out of season for an agricultural exhibit.

I present to you for your consideration some of the important matters of legislation that the National Grange unanimously placed itself on record as favoring, and its action was unanimously indorsed by the New Jersey State Grange in annual session, Dec. 6, 7, 8, 1905.

1. The removal of the international revenue tax on domestic alcohol made unfit for beverage purposes.

2. Enlarge the powers and duties of the interstate commerce commission, giving it authority to determine what changes shall be made or what practices are discriminative or unreasonable, and their findings to be immediately operative and so to continue until over-ruled by courts.

3. Establishment of Parcels Posts.

4. Provide for the election of United States Senators by direct vote of the people.

5. Provide for National aid to improve the public highways.

6. Provide for postal savings banks.

7. Enact pure food laws.

Officers of the State Grange of New Jersey, P. of H., 1906

Master, GEORGE W. F. GAUNT.....Millica Hill, Gloucester county
Overseer, CHARLES CHALMERS.....Vineland, Cumberland county
Lecturer, DAVID H. AGANS.....Three Bridges, Hunterdon county
Steward, JOHN M. WOOLMAN.....Elmer, Salem county
Assistant Steward, HENRY M. LOVELAND.....Cohansey, Salem county
Chaplain, ROBERT L. TORBET.....Paterson, Passaic county
Treasurer, CHARLES COLLINS.....Moorestown, Burlington county
Secretary, H. F. BODINE.....Locktown, Hunterdon county
Gate Keeper, RICHARD M. HOLLEY.....Lafayette, Sussex county
Ceres, MATILDA DeCAMP.....Roseland, Essex county
Pomona, PHOEBE E. HUTCHINSON.....Robbinsville, Mercer county
Flora, ETHEL LAWLIN.....Wyckoff, Bergen county
Lady Assistant Steward, LAURA E. STRONG.....Ringoes, Hunterdon county

EXECUTIVE COMMITTEE.

GEO. W. F. GAUNT.....Mullica Hill, Gloucester county
ALBERT HERITAGE.....Mickleton, Gloucester county
NICODEMUS WARNE.....Broadway, Warren county
EDWARD M. LYMAN.....Park Ridge, Bergen county
JOHN T. COX.....Readington, Hunterdon county
H. F. BODINE.....Locktown, Hunterdon county
State Grange meets first Wednesday in December, 1906.

POMONA GRANGES.

MASTERS AND SECRETARIES, WITH ADDRESSES.

1. Burlington—Master, TYLEE B. ENGLE....Rancocas, Burlington county
Secretary, GEORGE L. GILLINGHAM—Moorestown, Burlington county
2. Sussex—Master, J. L. QUICK.....Sussex, Sussex county
Secretary, GEORGE E. HURSH.....Layton, Sussex county
3. Hunterdon—Master, WM. Y. HOLT....Flemington, Hunterdon county
Secretary, PERCY W. BUSCH.....Stockton, Hunterdon county
4. Cumberland—Master, WALTON E. DAVIS....Shiloh, Cumberland county
Secretary—L. F. Glaspey,.....Shiloh, Cumberland county
5. Mercer—Master, E. K. COLE.....Windsor, Mercer county
Secretary, JAMES F. MEEKER.....Windsor, Mercer county

STATE BOARD OF AGRICULTURE.

6. Salem—Master, CLARENCE M. WILEY.....Woodstown, Salem county
Secretary, CARRIE R. ATKINSON.....Woodstown, Salem county
7. Camden—Master, R. LEVIS SHIVERS.....Camden, Camden county
Secretary, HARRY E. HORNER.....Merchantville, Camden county
8. Gloucester—Master, T. WOOD WYNE..Thoroughfare, Gloucester county
Secretary, CADDIE J. GILL.....Swedesboro, Gloucester county
9. Centre District—Master, J. W. DOBBINS.....Vernon, Essex county
Secretary, HENRY F. HARRISON,.....Caldwell, Essex county
10. Warren—Master, NICODEMUS WARNE.....Broadway, Warren county
Secretary, NELLIE S. ALBERTSON.....Deleware, Warren county
11. Bergen—Master, GEORGE B. FOX.....Wyckoff, Bergen county
Secretary, EDWARD M. LYMAN.....Park Ridge, Bergen county

COUNTY DEPUTIES.

Bergen and Passaic—E. M. PELL.....Ridgewood, Bergen county
Burlington—JOS. ENGLE.....Rancocas, Burlington county
DAVID BALLINGER.....Moorestown, Burlington county
Cumberland—ROBERT PEACOCK.....Deerfield, Cumberland county
Camden—JOHN M. GARWOOD.....Haddonfield, Camden county
Cape May—A. T. D. HOWELL.....Dias Creek, Cape May county
Essex—GEORGE E. DECAMP.....Roseland, Essex county
Gloucester—AARON B. SOMERS.....Mullica Hill, Gloucester county
SAMUEL L. HOMAN.....Swedesboro, Gloucester county
Hunterdon—JOHN T. COX.....Readington, Hunterdon county
BURRIS SNYDER.....Pittstown R. F. D., Hunterdon county
Mercer—C. NEWTON HUTCHINSON.....Hamilton Square, Mercer county
Morris—A. M. WEBB.....Hanover, Morris county
Monmouth—C. C. HULSART.....Matarvan, Monmouth county
FRANK W. POTTER.....Imlaystown, Monmouth county
Middlesex—ARTHUR E. PERRINE.....Cranberry, Middlesex county
Ocean—THOMAS Q. TAYLOR.....Robbinsville, Mercer county
Salem—SAMUEL H. MOORE.....Woodstown, Salem county
Sussex—RICHARD M. HOLLEY.....Lafayette, Sussex county
Somerset—H. W. KLINE..New Brunswick, R. D. No. 6—Somerset county
Union—DR. J. B. WARD.....Lyons Farms, Union county
Warren—NICODEMUS WARNE.....Broadway, Warren county

Number.	GRANGES.	MASTERS AND ADDRESSES.	SECRETARIES AND ADDRESSES.	LECTURERES AND ADDRESSES.
1	Pioneer.	John E. Stults, Cranberry R. D. 3, Middlesex co.	H. J. Butcher, Cranberry R. D. 3, Middlesex co.	Miss Jennie Duncan, Prospect Plains, Middlesex co
2	Marl Ridge.	G. Ulmer Foulks, New Egypt, Ocean co.	Jos. H. Woodward, New Egypt, Ocean co.	Mrs. R. T. Ridgeway, Cream Ridge, Ocean co.
3	Hammonton.	A. J. Rider, Hammonton, Atlantic co.	A. J. King, Hammonton, Atlantic co.	Mrs. Josie M. Baine, Hammonton, Atlantic co.
5	Swedesboro.	Howard Crispin Bassett, Gloucester co.	Caddie J. Gill, Swedesboro, Gloucester co.	Miss Minnie Young, Swedesboro, Gloucester co.
7	Somerset.	James McCracken, New Brunswick, R. D. 6, Somerset co.	H. W. Kline, New Brunswick, R. D. 6, Somerset co.	Jacob Wyckoff, Middlebush, Somerset co.
8	Moorestown.	Aaron L. Collins, Moorestown, Burlington co.	Caroline B. Zellely, Moorestown, R. D., Burlington, co.	Lucy Satterthwaite, Moorestown, Burlington co.
9	Woodstown.	John D. Coles, Woodstown, Salem co.	Carrie R. Atkinson, Woodstown, Salem co.	Maxwell W. Buzby, Woodstown, Salem co.
11	Vineland.	Charles Chalmers, Vineland, R. D. 2, Cumberland co.	Ann Chalmers, Vineland, R. D. 2, Cumberland co.	C. M. Burge, Vineland, Cumberland co.
12	Ringoes.	George B. Hartpence, Ringoes, Hunterdon co.	John Q. Holcombe, Ringoes, Hunterdon co.	E. W. Strong, Ringoes, Hunterdon co.
16	Hopewell.	Charles F. Tomlinson, Bridgeton, R. D. 1, Cumberland Co.	Winfield S. Bonham, Shiloh, Cumberland co.	L. F. Glaspey, Shiloh, Cumberland co.
18	Cumberland.	Wm. H. Glaspey, Greenwich, Cumberland co.	Morris Goodwin, Greenwich, Cumberland co.	Anna T. Goodwin, Greenwich, Cumberland co.
20	Fenwick.	John P. Ridgway, Hancock Bridge, Salem co.	Anna E. Harris, Harmersville, Salem co.	Mollie E. Finlaw, Harmersville, Salem co.
25	Mannington.	Frank Crispin, Salem R. D. 1, Salem Co.	Miss Almata Patrick, Salem, R. D. 1, Salem co.	Mrs. Lena Waddington, Salem R. D. 1, Salem co.
26	Harrisonville.	Henry Edwards, Woodstown, Salem co.	Lizzie B. Kirby, Mullica Hill, Gloucester co.	Bell Kirby, Harrisonville, Gloucester co.
29	Elmer.	John M. Woolman, Elmer, Salem co.	Wm. B. Newkirk, Elmer, Salem co.	Anna S. Wentz, Elmer, Salem co.
32	Bridgeport.	F. Holdcraft, Swedesboro, Gloucester co.	S. Lewis Kille, Swedesboro, Gloucester co.	James W. Haines, Medford, Burlington co.
36	Medford.	Wm. D. Cowperthwaite, Medford, R. D. 1, Burlington co.	Lorena M. Brick, Medford, R. D. 2, Burlington co.	Amelia Bates, Haddonfield, Camden co.
38	Haddon.	Joseph Sharp, Marlton, Camden co.	Daniel W. Homer, Merchantville, Camden co.	Debbie Kirkbride, Sewell, Gloucester co.
39	Mantua.	Virgil Eachus, Mantua, Gloucester co.	Hiram S. Leap, Wenonah, Gloucester co.	Mrs. John M. Rogers, Windsor, Mercer co.
40	Windsor.	Wm. J. Tindall, Trenton, R. D., Mercer co.	James P. Meeker, Windsor, Mercer co.	

SUBORDINATE GRANGES.—CONTINUED.

Number.	GRANGES.	MASTERS AND ADDRESSES.	SECRETARIES AND ADDRESSES.	LECTURERS AND ADDRESSES.
43	Hope	Wm. W. DuBois, Bridgeton, R. D. 4, Cumberland co.	Carrie E. Wheaton, Bridgeton, R. D. 4, Cumberland co.	Edward Perry, Bridgeton, R. D. 4, Cumberland co.
45	.....	Wm. H. Vennell, Marlton, Burlington co.	Geo. P. Lippincott, Marlton, Burlington, co	Mary A. Brick, Marlton, Burlington co.
50	Pemberton.	Geo. W. Lundy, Birmingham, Burlington co.	H. R. Lippincott, Pemberton, Burlington co. . . . .	.....
51	Mullica Hill.	Jona Iredell, Mullica Hill, Gloucester co.	W. H. Munyan, Mullica Hill, Gloucester co.	Maria Lloyd, Mullica Hill, Gloucester co.
52	Deerfield.	Leander S. Padgett, Bridgeton, R. D. 5, Cumberland co.	John Cole, Bridgeton R. D. 5, Cumberland co.	Robert Peacock, Deerfield St., Cumberland co.
57	Centre Grove.	Wm. H. Taylor, Millville, R. D. 1, Cumberland co.	John Taylor, Millville, Cumberland co.	Jacob Zimmerman, Millville, Cumberland co.
58	Columbus.	Amor J. Gaunt, Jobstown, Burlington co.	Rilla Kirby, Columbus, Burlington co.	Anna E. G. Haines, Columbus, Burlington co.
59	Thorofare.	Aaron L. Windish, Thorofare, Gloucester co.	Rodman W. Clement, Paulsboro, R. D. 2, Gloucester co.	Isabella Carter, Thorofare, Gloucester co.
60	Courses Landing. .	Lambert C. Richman, Sharptown, Salem co.	Helen D. W. Richman, Sharptown, Salem co.	Vinnie Weber, Sharptown, Salem co.
64	Pennington.	A. H. Burroughs, Pennington, Mercer co.	J. R. Burroughs, Pennington, Mercer co.	John Fleming, Pennington, Mercer co.
73	Ewing.	Hodoram M. Fine, Trenton, R. D. 1, Mercer co.	W. H. Cadwallader, Trenton, R. D. 1, Mercer co.	Mrs. Emma L. Cadwallader, Trenton, R. D. 1, Mercer co.
77	Mercer.	George E. Weart, Hopewell, Mercer co.	F. W. Cruser, Hopewell, Mercer co. . . . .	.....
78	Wantage.	Newman Hall, Sussex, Sussex co.	Mrs. Eri Vandruff, Sussex, Sussex co.	C. E. Stickney, Sussex, Sussex co.
79	Hamilton.	Geo. Hutchinson, Robbinsville, Mercer co.	Mrs. M. M. Nutt, Hamilton Square, Mercer co.	Mrs. Mary Rogers, Hamilton Square, Mercer co.
81	Friesburg.	E. Scott Hitchner, Cohansey, Salem co.	Joseph Perry, Elmer, R. D. 3, Salem co.	Charlotte Dare, Bridgeton, R. D., Cumberland co.
85	Williamstown. . .	James M. Tweed, Williamstown, Gloucester co.	Geo. E. Truener, Williamstown, Gloucester co.	Mrs. E. C. Ritchie, Williamstown, Gloucester co.
88	Locktown.	Henry H. Fisher, Sergeantsville, Hunterdon co.	Gardner J. Fisher, Sergeantsville, Hunterdon co.	Louisa Suydam, Locktown, Hunterdon co.

SUBORDINATE GRANGES.—CONTINUED.

Number.	GRANGERS.	MASTERS AND ADDRESSES.	SECRETARIES AND ADDRESSES.	LECTURERS AND ADDRESSES.
90	Blackwood.	Martin Shubert, Kirkwood, Camden co.	C. C. Stevenson, Blackwood, Camden co.	Maria Stetser, Blackwood, Camden co.
92	Monmouth.	D. H. Jones, Freehold, Monmouth co.	Watson A. Conover, Freehold, R. D. 5, Monmouth co.	Gertrude Davinson, Cranberry R. D. 4, Mercer co.
96	Hightstown.	Charles S. Lee, Hightstown, R. D. 1, Mercer co.	Harry Rogers, Cranberry, R. D. 3, Mercer co.	Lizzie Hunt, Davis Station, Monmouth co.
98	Allentown.	Frank W. Potter, Imlaystown, Monmouth co.	W. B. Burtis, Allentown, R. D., 1, Monmouth co.	Nettie Wells, Bradevelt, Monmouth co.
99	Liberty.	Willard Schenck, Bradvelt, Monmouth co.	Chas. E. Conover, Wickatunk, Monmouth co.	John W. Porte, Sergeantsville, Hunterdon co.
101	Sergeantsville.	T. Elwood Clark, Stockton, R. D. 1, Hunterdon co.	Wm. E. Rittenhouse, Stockton, R. D. 1, Hunterdon co.	H. H. Haren, Livingston, Essex co.
104	Livingston.	A. W. Fund, Livingston, Essex co.	Rev. W. R. Burrell, Livingston, Essex co.	Mrs. Robert Sanders, Hanover, Morris co.
105	Morris.	A. M. Webb, Hanover, Morris co.	Wm. A. Howell, Florham Park, Morris co.	Katie B. Thatcher, Frenchtown, R. D. 1, Hunterdon co.
106	Kingwood.	Wesley J. Thatcher, Frenchtown, R. D. 1, Hunterdon co.	Alvah L. Larson, Barbertown, Hunterdon co.	C. B. Crane, Caldwell, Essex co.
107	Caldwell.	A. E. Hedden, Verona, Essex co.	F. C. Goble, Verona, Essex co.	Mary J. Condit, Roseland, Essex co.
108	Roseland.	George D. DeCamp, Roseland, Essex co.	Hattie M. Condit, Roseland, Essex co.	Henry J. Beers, Stewartsville, Warren co.
110	Warren.	John S. Baylor, Broadway, Warren co.	Miss Mae Oberly, Broadway, Warren co.	Etta L. Carter, Mickleton, Gloucester co.
111	Mickleton.	Tullis R. L. Packer, Clarksboro, Gloucester co.	Walter Heritage, Swedesboro, Gloucester co.	John R. Seigle, Finesville, Warren co.
112	Lyons Farms.	Dr. J. B. Ward, Lyons Farm, Union co.	James L. Headley, Union, Union co.	Mrs. Mary A. Gardner, Sewell, R. D. 3, Gloucester co.
113	Pohatcong.	D. C. Donnelly, Springtown, Warren co.	Hattie A. Donnelly, Springtown, Warren co.	
115	Hurffville.	Chas. Turner, Sewell, R. D. 1 Gloucester co.	Walton H. Chew, Sewell, R. D. 1, Gloucester, co	

SUBORDINATE GRANGES.—CONTINUED.

Number.	GRANGES.	MASTERS AND ADDRESSES.	SECRETARIES AND ADDRESSES.	LECTURERS AND ADDRESSES.
116	Rocksburg.....	J. H. Young, Belvidere, R. D. 1, Warren co.....	Warren Herman, Phillipsburg, R. D. 2, Warren co.....	Irwin Miller, Belvidere, R. D. 1, Warren co.
117	Washington.....	Samuel T. Bowman, Washington, Warren co.....	Mrs. Joseph Bodine, Washington, Warren co.....	M. L. Rush, Washington, Warren co.
119	Oak Grove.....	Dr. H. M. B. Leaver, Pittstown, R. D., Hunterdon co.....	Andrew Allen, Pittstown, R. D., Hunterdon co.....	H. K. Wright Pittstown, R. D., Hunterdon co.
120	Spring Mills.....	M. W. Angell, Milford, Hunterdon co.....	Mary E. Woolfe, Milford, Hunterdon co.....	Mrs. L. L. McCullough, Bloomsbury, Hunterdon co.
121	Stewartsville.....	Harris A. Godfrey, Stewartsville, Warren co.....	J. C. Boyer, Stewartsville, Warren co.....	Mrs. Geo. Hagar, Stewartsville, Warren co.
122	Aura.....	N. Justice Black, Aura, Gloucester co.....	Phebe W. Guest, Monroeville, R. D., Gloucester co.....	Abbie Skinner, Clayton, Gloucester co.
123	Cross Keys.....	Jacob Harper, Cross Keys, Gloucester co.....	Edw. B. Gaunt, Cross Keys, Gloucester co.....	Stella Hurff, Cross Keys, Gloucester co.
124	Grand View.....	Thomas Hampton, Croton, Hunterdon co.....	Mrs. Augusta Higgins, Flemington, Hunterdon co.....	Wm. Y. Holt, Flemington, Hunterdon co.
125	Riverside.....	David H. Agans, Three Bridges, Hunterdon co.....	J. Spencer Dilts, Three Bridges, Hunterdon co.....	John T. Cox, Readington, Hunterdon co.
126	Delaware.....	Wm. C. Addis, Delaware, R. D. 2, Warren co.....	F. Russell Addis, Delaware, R. D. 2, Warren co.....	J. J. Hess, Mt. Bethel, Pa.
127	Iona.....	F. J. Van Valin, Porchtown, Gloucester co.....	Mrs. M. I. Marsh, Malaga, Gloucester co.....	Miss H. Butterick, Malaga, Gloucester co.
128	Cape May.....	Richard Lloyd, Dias Creek, Cape May co.....	A. D. T. Howell, Dias Creek, Cape May co.....	Truman Hickman, Green Creek, Cape May co.
129	Bergen.....	Arthur Lozier, Ridgewood, R. D., Bergen co.....	Mrs. C. C. Basley, Maywood, Bergen co.....	Miss Nellie Dariss, Maywood, Bergen co.
130	Franklin.....	John R. Van Houten, Midland Park, R. D., Bergen co.....	Mrs. A. A. Yoemans, Wyckoff, Bergen co.....	Frank A. Bates, Midland Park, R. D., Bergen co.
131	Rancocas.....	T. Sherman Borden, Beverly, Burlington co.....	Mrs. Nancy M. Leeds, Rancocas, Burlington co.....	Mrs. Emile B. Grant, Burlington, Burlington co.
132	Cold Spring.....	Frank E. Bate, Fishing Creek, Cape May co.....	R. E. Reeves, Eldredge, Cape May co.....	Jennie McPherson, Erma, Cape May co.
133	Hickory.....	Chas. Duckworth, Pattensburg, Hunterdon co.....	A. B. McCrea, Pattensburg, Hunterdon co.	Katurah Dougherty, Pattensburg Hunterdon co.
134	Vernon Valley.....	Thos. W. DeKay, New Milford, New York.....	Andrew S. Drew, Vernon, Sussex co., , , , ,	J. A. Dillenbeck, Vernon, Sussex co.,

SUBORDINATE GRANGES.—CONTINUED.

Number.	GRANGERS.	MASTERS AND ADDRESSES.	SECRETARIES AND ADDRESSES.	LECTURERS AND ADDRESSES.
135	Ramsey.	John H. Coe, Allendale, R. D. 1, Bergen co.	Eudora Coe Gunney, Allendale, R. D. 2, Bergen co.	Wm. J. Wilson, Allendale R. D. 2, Bergen co.
136	Lincoln.	Albert P. Knapp, Hillsdale, Bergen co.	F. J. Ludwig, Westwood, R. D. 2, Bergen co.	C. H. DeVoe, Westwood, R. D. 1, Bergen co.
137	Mt. View.	E. W. Clark, Beemerville, Sussex co.	Grace Clark, Beemerville, Sussex co.	Jennie Coddington, Beemerville, Sussex co.
138	Berlin.	A. H. Huff, Berlin, Camden co.	X. F. Ottiger, Berlin, Camden co.	A. S. Barton, Berlin, Camden co.
139	Upper Township. .	E. D. Berley, Tuckahoe, Cape May co.	Z. A. Townsend, Tuckahoe, Cape May co.	Lizzie Wallace, Tuckahoe, Cape May co.
140	Wayne.	H. E. Cortwright, Port Jervis, R. D. 1, New York.	Miss Zuba Carlow, Port Jervis, R. D. 1, N. Y.	George Hooker, Port Jervis, R. D. 1, N. Y.
141	Pascack.	Edward M. Lyman, Park Ridge, Bergen co.	John J. Brickell, Park Ridge, Bergen co.	Chas. O. Ellsworth, Park Ridge, Bergen co.
142	Olive Branch.	R. V. Crine, Morganville, Monmouth co.	J. S. Crawford, Matawan, Monmouth co.	C. C. Hulsart, Matawan, Monmouth co.
143	Delaware Valley. .	Ira Stoll, Layton, Sussex co.	George E. Hursh, Layton, Sussex co.	C. A. Dalrymple, Layton, Sussex co.
144	Saddle River.	A. Wode, Saddle River, Bergen co.	T. Nel. Woodruff, Saddle River, Bergen co.	S. J. DeBaum, Saddle River, Bergen co.
145	Mayner Township	R. M. Torbet, Paterson, R. D. 1, Passaic co.	H. M. Berdau, Paterson, R. D. 1, Passaic co.	Wm. C. Steele, Pompton, Passaic co.
146	Egg Harbor.	Henry Tapken, Egg Harbor City, R. D., Atlantic co. .	Clotilde Schimer, Egg Harbor City, Atlantic co.	L. P. Schmidt, Egg Harbor City, Atlantic co.
147	Wrightstown.	Rosha Thompson, Wrightstown, Burlington co.	Samuel S. Fort, Wrightstown, Burlington co.	Mrs. Emma Tilton, Wrightstown, Burlington co.
148	Stanton.	Josiah Cole, Roland's Mills, Hunterdon co.	J. B. Anderson, Lebanon, R. D. 1, Hunterdon co.	J. P. Smith, Stanton, Hunterdon co.
149	North Arlington. .	Wm. Brandenburg, N. Arlington, Bergen co.	Miss Effie G. Millar, N. Arlington, Bergen co.	Geo. P. F. Millar, N. Arlington, Bergen co.
150	Burlington.	Wm. Baggs, Beverly, Burlington co.	Mrs. Hannah Shedaker, Burlington, Burlington co.	Mrs. Samuel Creely, Burlington, Burlington co.
151	Millstown.	M. Elmer Denson, Milltown, Middlesex co.	Frank H. Smith, South River, Middlesex co. ....	.....

SUBORDINATE GRANGES.—CONTINUED.

Number.	GRANGES.	MASTERS AND ADDRESSES.	SECRETARIES AND ADDRESSES.	LECTURERS AND ADDRESSES.
152	New Market.....	Wm. Fitz Randolph, New Brunswick, R. D. 2, Middlesex co	F. N. Nelson, New Market, Middlesex co.	Mary E. Griscome, New Market, Middlesex co.
153	Raritan Valley... .	Fred Quick, South Branch, Somerset co.	Mrs. C. S. Phillips, South Branch, Somerset co.	Mrs. John Studdiford, South Branch, Somerset co.
154	Union.....	Jesse Smith, Leesburg, Cumberland co.	Wm. Newcombe, Leesburg, Cumberland co.	Mrs. Maud Smith, Leesburg, Cumberland co.
155	Fairlawn.....	Isaac A. Hopper, Fairlawn, Bergen co.	Walter E. Cocker, Fairlawn, Bergen co.	P. D. Henderson, Ridgewood, R. D. 2, Bergen co.
156	Raritan.....	John L. T. Webster, Hazlet, Monmouth co.	J. P. Brower, Keyport, Monmouth co.	James C. Hendrickson, Middletown, Monmouth co.
157	Farmingdale. . . .	Jos. L. Butcher, Farmingdale, Monmouth co.	Mrs. Clara Palmer, Farmingdale, Monmouth co.	Mrs. J. C. Winsor, Farmingdale, Monmouth co.
158	Lafayette.....	Rob't L. Everett, Lafayette, Sussex co.	Geo. C. Smith, Lafayette, Sussex co.	Anna M. Roe, Lafayette, Sussex co.
159	Whitehouse.	Grant Davis, Whitehouse, Hunterdon co.	Ethel M. Burdette, White House, Hunterdon co.	C. P. Oliver, White House, Hunterdon co.
160	Frankford.....	M. F. Lantz, Augusta, Sussex co.	Miss May Emmons, Halsey, Sussex 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.....	100	30	60									
Bergen.....	90	50		60	15		60	15		80	40	
Burlington.....	75	25	65	80	15	\$1.00	100	10	70	50	30	40
Camden.....												
Cape May.....	90	30	65							150		
Cumberland.....	100	40	55	120	20	1.00				110	40	45
Essex.....												
Gloucester.....	82	42	55	93	17	90	95	14	67	95	30	40
Hunterdon.....	117	35	68	100	12	1.05	93	13	65	125	35	32
Mercer.....		40	60		18	85		16	60		35	
Middlesex.....	110	30	56	110	18	85	100	13	56	100	28	35
Monmouth.....	100	56	56	100	25	85	100	18	62			
Morris.....	110	30	70	100		1.00	100		60	150		40
Ocean.....												
Salem.....	90	40	55	105	18	85						
Somerset.....	100	30	45	100	14	85	100	16	56	90	30	40
Sussex.....	100		65	90	16	1.00	95	18	70	100	40	40
Union.....	90	50	60	90	25	80	60	18	70	100	35	40
Warren.....	50	30	56	80	17	85	80	16	65	70	35	33

FARM CROPS.

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—bushels.	Average price per barrel.
Atlantic.				100	2	\$16.00	150	75	2.50	300	60	\$1.75
Bergen.	90	12		75	1		50	20				
Burlington.				60	1	14.00	55		2.00	85		1.50
Camden.												
Cape May.				100	1½	15.00	100	50	1.70	110	60	1.50
Cumberland.				115	¾	14.00	100	12	1.60	150	40	1.25
Essex.												
Gloucester.				84	1¾	16.00		50	1.60	110	62	1.45
Hunterdon.	100	20	60	60	¾	12.00	90					
Mercer.					1	14.00		40	1.65		50	1.50
Middlesex.				75	1	16.00		33	1.70	100	50	1.65
Monmouth.				75	1½	14.00	100	70	1.15	100	50	2.00
Morris.				50		16.00		25	1.75			
Ocean.												
Salem.				100	1½	18.00	110	30	1.25	110	45	1.60
Somerset.				110	½	12.00	90	25	2.55			
Sussex.	90	20	70	75		15.00	100		2.00			
Union.				100	1	20.00	40	20	2.50			
Warren.	80	30	60	75	¾	16.00	40	10	3.00			

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.	150	110	\$3.50	75	75	\$1.50	400	100	75	100	2,000	03
Bergen.	50			80			90			100	4,000	
Burlington.	80		2.50	50		1.50	20		1.25	40		04
Camden.												
Cape May.	75		2.00	100		1.50	25		60	50	1,000	02
Cumberland.	90	50	2.50	100	75	85	50	100	1.25			
Essex.												
Gloucester.	60	25	1.75	90	70		100	800	1.05	90		04
Hunterdon.	50		1.00									
Mercer.	75											
Middlesex.	70	75	1.75	70	80	1.75	200		1.00	100		
Monmouth.	60			50			75		70	100	8,000	
Morris.	25		60	100						125		
Ocean.												
Salem.	75		1.50									
Somerset.	100	10	1.75	100		1.50	75	150	60	100		02½
Sussex.												
Union.	90		4.00	50		1.00	75		1.00	100		03
Warren.	20	10	3.00	70		1.20	50	60	1.00	80		

Statistical Table of Farm Crops as Reported by Secretaries of the County Boards.

COUNTIES.	STRAWBERRIES.			RASPBERRIES.			BLACKBERRIES.			WATERMELONS.		
	Product compared with last year—per cent.	Average yield per acre—quarts.	Average price per quart.	Product compared with last year—per cent.	Average yield per acre—quarts.	Average price.	Product compared with last year—per cent.	Average yield per acre—quarts.	Average price.	Product compared with last year—per cent.	Average yield per acre	Average price per hundred.
Atlantic.	200	2,000	07	125	2,000	08	800	2,500	07	..	..	..
Bergen.	70	..	..	90	..	..	50	..	..	50	..	..
Burlington.	65	..	08	70	..	12	75	..	10	80	..	\$15.00
Camden.	..	..	..	..	..	..	..	..	..	..	..	..
Cape May.	75	..	05	75	..	07	150	..	05	50	..	..
Cumberland.	100	600	04½	..	..	..	..	..	..	..	..	..
Essex.	..	..	..	..	..	..	..	..	..	..	..	..
Gloucester.	100	..	05	80	..	10	45	..	07	95	800	12.50
Hunterdon.	..	..	..	..	..	..	..	..	..	..	..	..
Mercer.	..	..	..	..	..	..	..	..	..	..	..	..
Middlesex.	80	..	..	..	..	..	..	..	..	100	..	15.00
Monmouth.	75	..	..	75	..	..	75	..	..	90	..	..
Morris.	80	..	..	75	..	..	50	..	..	75	..	..
Ocean.	..	..	..	..	..	..	..	..	..	..	..	..
Salem.	..	..	..	..	..	..	..	..	..	..	..	..
Somerset.	100	..	08	100	..	10	50	..	08	..	..	..
Sussex.	..	..	..	..	..	..	..	..	..	..	..	..
Union.	100	..	08	25	..	12	20	..	15	..	..	..
Warren.	60	..	10	50	..	08	30	..	08	..	..	..

Statistical Table of Farm Crops as Reported by Secretaries of the County Boards.

COUNTIES.	CITRON MELONS.			CUCUMBERS.			CABBAGE.			TOMATOES.		
	Product compared with last year—per cent.	Average yield per acre—baskets.	Average price per basket.	Product compared with last year—per cent.	Average yield per acre	Average price per basket.	Product compared with last year—per cent.	Average yield per acre	Average price.	Product compared with last year—per cent.	Average yield per acre—tons.	Average price per basket.
Atlantic.							100	4,000		60	3	60
Bergen.	100			100			20			70		
Burlington.				50		25	50			75		
Camden.												
Cape May.				50			100		\$3.00	75		25
Cumberland.	100	85	30				110	1,500	4.00	175	7	
Essex.										4		
Gloucester.	100	275	40	65		50	75		3.00	95		45
Hunterdon.												
Mercer.												
Middlesex.							100	5,000	4.50	75		25
Monmouth.							75			100		
Morris.	90			25			110			40		
Ocean.	50											
Salem.										100	6	
Somerset.							100		4.00	100		
Sussex.												
Union.							100		4.50	50		40
Warren.				50			90		5.00	70		30

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.	100	\$200.00	100	\$200.00	100	\$50.00
Bergen.	100	100.00	100	100.00	100	40.00
Burlington.	100	175.00	100	225.00	100	45.00
Camden.	100	125.00	100	125.00	110	45.00
Cape May.	100	140.00	100	125.00	100	30.00
Cumberland.	100	150.00	100	175.00	100	45.00
Essex.	100	160.00	100	150.00	100	40.00
Gloucester.	100	150.00	100	125.00	100	30.00
Hunterdon.	100	165.00	100	180.00	100	40.00
Mercer.	100	100.00	100	100.00	100	80.00
Middlesex.	100	140.00	100	140.00	110	55.00
Monmouth.	100	125.00	100	155.00	110	50.00
Morris.	105	135.00	100	100.00	100	50.00
Ocean.	100	100.00	100	100.00	100	60.00
Salem.	50	140.00	40	130.00	50	45.00
Somerset.						
Sussex.						
Union.						
Warren.						

Statistical Table of Farm Stock as Reported by 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.....		07					75	08			125	14			100	100
Bergen.....	100						100		100		100		100	100	125	100
Burlington.....			\$5.00		\$6.00			06½		23			100	100	100	100
Camden.....																
Cape May.....		06					100	07½			125	16				
Cumberland.....	100	06½					100	07	100	14	125	16	100	125		
Essex.....																
Gloucester.....	100	07					90	07½	50	24	100	18	90	100	100	105
Hunterdon.....	100	07					105	07½	90	25	110	11	100	100	100	100
Mercer.....								06½		23		15				
Middlesex.....	100	06½	100			5.00	100	07	75	25	100	15	100	105	100	105
Monmouth.....	100	07	100	\$5.00	100	5.50	100	06½	100	25	100	14	100	100	100	100
Morris.....										20			100	100	110	100
Ocean.....																
Salem.....	100	07	100		1.00	5.00	100	06½	100	21	110	18	100	100		
Somerset.....		06	6.00		5.00			07		18		12	100	110	100	105
Sussex.....							110	08	90	20	105	10	95	100	90	100
Union.....	100						100	08	100	12	100	18				
Warren.....	80	06½	60	4.50	60	4.75	75	07	50	17	90	10	100	80	80	85

Reports of County Boards of Agriculture.

Atlantic County.

OFFICERS FOR 1906.

President, JOSEPH BUTTERHOF.	Egg Harbor City
Vice-President, L. H. PARKHURST.	Hammonton
Secretary, VALENTINE P. HOFMANN.	Egg Harbor City
Treasurer, WILLIAM KARRER,	Egg Harbor City

DELEGATES TO STATE BOARD OF AGRICULTURE.

V. P. HOFFMAN, for one year.	Egg Harbor City
L. H. PARKHURST, for two years.	Hammonton
CARL SCHIRMER, Alternate.	Egg Harbor City

DIRECTORS.

J. E. HOLMAN, Fruit Shippers' Union.	Hammonton
HENRY PFEIFFER, Germanina Fruit Growers' Union.	Cologne
JACOB MIESNER, Altantic County Agricultural and Horticultural Association.	Egg Harbor City
L. F. SCHIRMER, Egg Harbor Grange.	Egg Harbor City
L. H. PARKHURST, Hammonton Grange.	Hammonton
WM. LIEPE, Hamilton Township.	Cologne
J. L. PURZNER, Galloway Township.	Egg Harbor City
EMORY SCHULTZ, Mullica Township.	Egg Harbor City
CHARLES KRAUS, At-Large	Egg Harbor City

REPORT.

BY THE SECRETARY.

This County was favored with two Farmers' Institutes. The first combined with annual meeting was held at Singer Hall in Egg Harbor City, on November 20, 1905.

The following subjects were on the program:

"Thoughts for Cow Owners," by Edw. Van Alstyne.

"Practical Plant Feeding," by Prof. R. L. Watts.

"Growing and Marketing of Strawberries," by President Joseph Butterhof.

"How to Use Waste Products," by Henry Pfeiffer.

Hon. John J. Gardner, Member of Congress, spoke upon the subject of taxation and upon duties of farmers to their families and the public.

Prof. John B. Smith spoke upon "Insect Enemies and How to Combat Them."

This meeting had an attentive but not large attendance.

The second Institute was held at Hammonton, on February 1st, 1906, and was very well attended at all sessions.

The subjects treated there were:

"Soil Bacteria and Their Work," by Prof. J. G. Lipman.

"Poultry Management—Some of the Problems," by Prof. G. M. Gowell.

"Some of the Common Diseases of Farm Animals—How Can the Farmer Best Prevent Them," by Dr. C. D. Smead.

"Principles of Insect Warfare," by Prof. H. A. Surface.

"Spraying and How to Prepare the Mixtures," by Prof. G. F. Warren.

"Higher Education for Farmer's Boys and Girls," by Prof. H. A. Surface.

"Suggestions on the Renewal of the Peach Industry in This Section of Atlantic County," by Prof. G. F. Warren.

GENERAL REMARKS.

This was, with a very few exceptions, one of the most prosperous seasons the farmers in this section of the State have been favored with for many years. The prices realized from their products were higher than usual.

With the exception of Hay, White Potatoes, Pears and Tomatoes, all of the other crops showed a decided increase of yield. Grapes showed neither increase nor decrease. In many sections the Cane varieties of Blackberries are superseded

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by the Dewberry varieties, as they are not so apt to be winter-killed as the former.

The saw fly has in some strawberry fields showed considerable depredations and even destroyed entire fields.

This County having particular available lands suitable for Cranberry Culture this Board endeavored to obtain some information and statistics in relation thereto. In answer to a number of inquiries sent out, it has been ascertained that at present about 1000 acres are in cultivation. The average price of available uncultivated land suitable for this berry is about \$25.00 per acre; the cost of preparation is about \$300.00 per acre, and the price of a cultivated acre varies from \$300 to \$500. The average yield per acre is from 50 to 75 bushels; harvesting \$1.00 per bushel and prices realized for the season from \$1.50 to \$2.00 per bushel. The opinions on general experience are very varied. One grower writes: "Sometimes they pay good returns on the investment and quite as often not. I have acres that pay interest on \$1000 and others that do not pay expenses." Another one writes: "We have frosts, insects, rot and other enemies to combat, and no grower can feel certain of his crop until he has actually harvested it. I have found cranberry culture about as uncertain as any venture a person could engage in. Some have made a success of it, but many thousands of dollars have been lost in it also."

Owing to the negligence of various parties, this County was in early Spring marked by the spread of large forest fires, which burned and destroyed many valuable forest areas and threatened the homes of farmers.

This county has been quite immune from the various contagious diseases of animals during the past year.

GROWING AND MARKETING OF STRAWBERRIES.

Paper read before Atlantic County Board of Agriculture by President Joseph Butterhof.

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The growing of strawberries has become quite an important factor in the different agricultural pursuits of South Jersey, and that justly so, for where is there another fruit that finds such a ready market, is in such demand, is as relished by the public, by the rich as well as by the poor, yields such profits by a rational up-to-date scientific culture, as that delicious, fragrant fruit?

In order to induce more of our farmers to grow this fruit and to grow it right, to obtain the highest possible return for their labor and outlay, I will endeavor to give a few practical hints, both in growing as well as marketing, as far as my ability and experience in that branch of agriculture extends.

SELECTION OF SOIL.

When starting out to grow a certain crop, the wise, intelligent farmer, will first consider the soil at his disposal. For the soil is that element in which the plant must live and exist from the time the seed is sown or the plant set out, until the plant itself or the fruit of the plant, as the case may be, is mature. It is the element from which it gets its nourishment.

In Strawberry growing, the soil is the most important thing to consider. You do not want a real sandy nor a very heavy clay soil, although under favorable weather conditions, nice crops may be grown on such soil. Neither do you want fields that collect a miniature lake after every heavy shower and are flooded for days in winter and spring. Land underlaid with a so-called iron pan or crust is not suitable even if all other conditions are favorable, but such lands can be remedied by proper subsoiling.

The ideal soil is a nearly level, rich, deep sandy loam, with subsoil of same material or intermixed with a light clay.

Never take a sod field, for it is full of insect enemies.

Select a field that has been kept free of weeds for some years, and then you will still have enough trouble to keep it clean.

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PREPARATION OF LAND.

The preparation must be thorough. The land should be put in the best possible state, made as fine and firm as can be. After plowing, the land is harrowed and cross-harrowed until it is in the right shape. An Acme harrow is just the proper tool for this; next comes a drag, this breaks up all remaining clods, which may have skipped the harrow, and levels the fields off as smooth as the street. A roller can be used to advantage, but I believe a drag is better and cheaper.

SELECTION OF PLANTS.

Good judgment should be exercised in selecting plants. Many failures to obtain a good stand must be attributed to carelessness in this respect. Many plants look all right at the first glance, but on examining them we find the roots rotten, that is the skin of the roots peels off very easy; such plants will live for a while and sometimes make a fairly good stand, but it never makes a really good one and the fruit resulting is inferior in size and looks. Plants should be dug only from one year old patches, taking only the strongest and most vigorous well-rooted plants.

The practice of taking plants from between the rows, as is done to a great extent, is not encouraged as these are the least rooted and are consequently the weakest. Every few years a new strain should be procured, but by all means do not get them from any old "Cheap John." Do not deceive yourself in that way; at \$1.00 per 1000 plants, more often nets 20 to 50 per cent. more at harvest and even more. Get them from reliable grower or nursery. Remember, that the man having a good strain knows what he has, and will not sell for the same price as somebody else will sell trash.

VARIETIES.

There are a great many varieties of berries on the market, of all shapes and sizes, and in color ranging from pale red to

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crimson, some getting almost black after picking. Some ripen very early, others a little later and still others very late. Which shall we plant? This depends to a great extent upon your market and the condition of soil in reference to withstanding draught. If you have a local market and your soil is rather light, you will probably do better with the early varieties. But should you be so fortunate as to have land, which will withstand drought for a considerable length of time, the later varieties will invariably make better returns. And by the way, there is plenty of such land round about. Yes! thousands of acres of it lying undeveloped. I do not recommend any particular variety, that matter the grower must decide himself. One man makes a success with a certain variety, whilst his neighbor fails, and vice versa.

PLANTING.

When your land is prepared and in readiness, it is marked out in rows $3\frac{1}{2}$ to 4 feet apart. I prefer to plant $4\frac{1}{2}$ feet apart, the plants in the rows to be about 16 inches apart. I prefer the planting to be done by one person, that is, one man handles the trowel in one hand and the plant in the other. A man with a little experience will plant in this manner about 5000 to 8000 plants per day and do it right.

The crown of the plant should be set level with the surface of the ground. Most people set too deep, the first rain or cultivation covers them up. In planting press the soil around the plant firmly; this prevents drying up, giving them a chance to take a foothold.

CULTIVATION.

The cultivation begins almost right after planting and continues regularly every two weeks and oftener if necessary, until about first of September, or until the beds are full enough with runners and young plants. Hand-hoeing around the plants will

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have to be done three or four times and all weeds kept away; they do not belong in a berry patch.

BEDDING.

The strawberry plants have a curious habit, namely, throwing the runners out of the row, and never in where they belong or rather where we want them. This must be remedied and can best be accomplished by bedding, that is laying the runners in on the row, but not crowding them; put them in where they do belong in such a manner as to get a young plant every 4 to 6 inches. The sooner you get them in the right place, so that each joint strikes roots, the sooner and better beds you will have. In former years it was deemed wise to cut the first shoots or runners off, but I think this practice is wrong, especially for market farming. The strawberry plant to be at its best, should be almost a year old at bearing fruit. For that reason I always encourage my young beds to send out shoots very early. Another reason for early vining as I might term it, is this, the young plant formed at the first joint, gets nourishment from the soil at a different place than the old plant, it will soon grow strong and vigorous and instead of being a burden to the old plant and sucking away its strength, it will soon begin to support itself, then as it grows stronger and stronger always more and more and in this way assist its mother in producing new plants.

FERTILIZING.

Generally the land in this part of the state has not enough fertilizing elements available to make proper beds, therefore we must apply these in sufficient quantity. Ammonia or Nitrogen, in its different forms, just fills the bill. Soon after planting, if possible before rain, a little fertilizer high in nitrogen is drilled over and along the side of the row; this will be thoroughly mixed in the soil by the hoeing and cultivation following.

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The best results that I have obtained along this line was with hen manure.

The principal fertilizing, however, is done the following spring, before plant growth starts. Here we must take in consideration that the plant requires material for leaf growth as well as fruiting. For this purpose a fertilizer analyzing 4-8-10 will be the best thing obtainable.

Most brands on the market have too much Phosphoric Acid in comparsion to their Nitrogen and Potash. Rough-looking seedy berries result from using such brands.

MULCHING.

Mulching is beneficial in all cases and weather conditions. On some fields it is absolutely necessary to prevent freezing out in spring. One of the greatest advantages of mulching is, it keeps the plants back in early spring, thereby escaping disastrous spring frosts; next, it holds moisture better, and last but not least, keeps the berries nice and clean in rainy weather; no sandy berries where mulching is done. Any kind of course material answers the purpose,—such as straw, leaves, pine-browse, marsh-hay, etc. Fresh manure is excellent, as it not only covers but fertilizes at the same time. Now we have done almost everything possible to grow the crop, except spraying, but this is not always necessary, although at times it pays well to do so, for instance: for the rust, the leaf-roller, strawberry weevil, etc. Very light Bordeaux mixture is effective for the rust. Bordeaux with a little Paris-green added, certainly makes the leaf-roller move and look for other quarters. The weevil is not very particular about poison, he seems to like them all, at least nothing has been found yet, that can be recommended to help the fellow off into the spirit world with a certainty, without injuring the plant. We have used different sprays and experimented some along this line the last spring with partial success. I will continue this the next season and hope to know a little more about it in a year.

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Fruiting the beds but one year is the best after all. By this method very little spraying is necessary, as no insect enemy has time to develop in sufficient numbers in order to effect your crop materially; furthermore a great number of weeds are prevented going to seed, which if allowed, stocks the land with weed seeds for five or six years.

The fruit of an older patch never looks as fine, it has not the size, nor the shine and gloss as a young patch, and consequently does not command the same price.

MARKETING.

The marketing begins in the field, standard baskets and crates must be procured, and the nicer and neater these are the better will your fruit look, the prouder you will feel about it.

In picking each picker gets a certain number of baskets in a carrier, two pickers are put to a row, one on each side. Each one picking but his side or half of the row; this is done to prevent him or her as the case may be, from reaching over on the other side or stepping on the row, through this habit of some pickers a great many berries, green as well as ripe are destroyed; for this reason we put two pickers there. The boxes or baskets are well filled, seeing that the corners of them are full also, not high in the middle and corners empty. Fruit well ripe, not half-green or rotten. Topping off is not allowed. When the pickers have their boxes full, they bring them to the packing shed; there all defects are remedied; the boxes put in crates layer after layer. Of course the berries are laid and fixed to look their best and catch the eye. But the berries in the bottom or middle of the box must be good also, no trash, and the bottom layer look as nice as the top one. The buyer does not purchase these berries by looking at them, he empties them out, and if your berries are not as good in the bottom as the top made them to appear, you will get it in the neck eventually.

Here is the great secret of marketing successfully and that is packing, pack it right, pack it in such a manner as you would like to see it packed, were you buying it. Pack up an *honest*, neat, bright looking package and do not be afraid to affix your name and address, so the purchaser may know where they come from. Some may say here, "Oh well, it does not pay, that Commission man robs us, wherever he can," and I believe myself there is a great deal of truth in this robbing business, but I contend that it pays anyhow in spite of that, when a buyer gets your berries and finds them O. K. he naturally looks for the mark, as it is called on the market, when he goes to market next morning he buy the same and the following day wants more of such and such a mark, and so come others and want that; there may be plenty of other marks alongside looking just as nice, but they do not trust these. Now, the Commission man sees this, he is always alert to business; what does he do? Why he simply puts a premium on that mark, asks a higher price, and he gets it too. He will give you that premium, because he wants more of those berries, it helps his other business. In most cases he will treat you right, if you treat him right. Should you notice him taking the advantage of you, then cut him out; there are plenty of honest men in the business yet. Don't be afraid to tell him what is wrong and fight for your rights.

Bergen County.

OFFICERS FOR 1906.

President, JOHN F. BOMM.	Westwood
Vice-President, CHARLES C. BASLEY.	Maywood
Secretary, GEORGE P. F. MILLAR.	North Arlington
Treasurer, FREDERICK V. STROHSAHL.	Park Ridge

BOARD OF DIRECTORS.

FREDERICK M. CURTIS.	Harrington Park
ABRAM C. HOLDRUM.	Westwood
MALCOLM H. ANGELL.	Etna
JOHN C. VAN SAUN.	Maywood
ALBERT P. KNAPP.	Hillsdale
WM. BRANDENBURG, JR.	North Arlington
TEUNIS A. HARING.	Hackensack
JOHN BEAVER.	North Arlington

DELEGATES TO STATE BOARD.

A. G. SMITH, two years.	Wyckoff
MALCOLM H. ANGELL, one year.	Etna

REPORT.

BY THE SECRETARY.

The Board held four meetings during the past year.

An Institute was held at Westwood on November 29, 1905, when a number of excellent speakers were heard.

In addition to the regular speakers furnished by the State Board, Dr. Ward, of Lyons Farms, was present and spoke on raising and marketing small fruits. A roast pig dinner was furnished by the Board which was partaken of by every one attending the Institute.

Bergen County now has seven Granges, all in a prosperous condition.

Nearly all crops were below the average here during 1905.

No one seems to have had any success as yet in raising alfalfa in this County.

Burlington County.

OFFICERS FOR 1906.

President, FRANKLIN ZELLEY.	Mount Holly
Vice-President, LEON COLLINS.	Moorestown
Secretary, BENAJAH P. WILLS.	Mount Holly

DIRECTORS.

J. HARVEY DARNELL, Mt. Laurel Farmers' Club.	Masonville
T. SHERMAN BODINE, Cooperstown Farmers' Club.	Beverly
ARTHUR PRICKETT, Medford Grange.	Medford
EDWARD ENGLE, Columbus Grange.	Columbus
JOSEPH ENGLE, Rancocas Grange.	Mount Holly
CLIFFORD E. BUDD, Pemberton Grange.	Pemberton
AARON COLLINS, Moorestown Grange.	Moorestown
HORACE ROBERTS, Delegate -at-Large.	Fellowship

DELEGATES TO STATE BOARD.

JOSEPH C. DUDLEY, two years.	Moorestown
SAMUEL S. FORT, one year.	Wrightstown

REPORT.

BY THE SECRETARY.

CROPS, YIELDS AND CONDITIONS.

The condition for the growth and maturity of crops have varied from one extreme to the other, comparing very much in this respect to the year nineteen hundred and four. The spring was late and cold; the frost on the nineteenth of May destroyed many vegetables and retarded the growth of all young and growing plants.

The great amount of snow that fell during the winter and early spring was very favorable to a large crop of hay, wheat

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and rye, though the dry weather in the latter part of May and June greatly interfered with the proper growth and shortened the wheat and hay crop very materially.

Cold weather in the spring was very favorable to the growth of the grub worm, which destroyed the seed sprout and made double work and very much trouble for the farmers in replanting the same.

Exceptionally fine weather during the months of October and November enabled the farmers to gather their crops in fine condition, though the dry weather in November caused considerable trouble in providing water for the stock; many streams went dry, and several farmers were compelled to haul water for their stock.

The greatest difficulty the farmer has to contend with is the scarcity of farm help, and the class they are compelled to depend upon to assist them in their work is becoming more serious and troublesome each year; wages are higher and labor of an inferior quality. In my opinion, this is the cause of the price of farm land remaining as low as it is at the present time. Situated as we are between two large cities of Philadelphia and New York, our land should sell at very much more than fifty to seventy-five dollars per acre, as land in the West, many miles from the city, sells from fifty to one hundred dollars. The emigrant farmers go West in place of remaining in the East, which makes labor more plentiful there than it does here, and the Railroad Companies discriminate in favor of through transportation, which enables the western farmer several hundred miles away to compete with us in the East; consequently, their farms sell more readily and at a better price. If some movement could be had to remedy these evils, there is no doubt but what land in this vicinity would sell for its real value.

WHEAT.

On account of the late planting by many farmers in the fall of nineteen hundred and four and the early freezing in Novem-

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ber, many grains of wheat did not have the opportunity to sprout at the proper time, and the dry weather in the latter part of May and June shortened the crop very much.

RYE.

Rye was a good crop, as it is more hardy and capable of standing the winter than wheat.

HAY.

In the fore part of the season grass promised to make a good yield; the snow that fell in the winter moistened the ground and induced dormant seeds to sprout. In April the prospect was excellent, though the dry weather the latter part of May and June burned the old sod and destroyed, in many cases, the young clover that was sown in the spring, while the meadow land was damp, it withstood the dry weather better; consequently, there was not more than half a crop of hay.

The corn crop was promising in the early spring, but the continued dry weather in July and August shortened the crop. At one time it looked as though we would not have more than a quarter of a crop, but the rains in the latter part of the season revived it to some extent, and on a whole, we will have about two-thirds of a crop. The weather being fine in the months of October and November enabled the farmers to gather their fodder and corn in excellent condition.

PASTURE.

The dry weather in July and August completely destroyed the pasture; many farmers were compelled to feed both grain and hay to keep their stock in fair condition. The rains, which came later on, revived the grass and made good late pasture. Grass looks fine, growing nicely and promises a good crop for another year.

Oats are not much grown, and the crop is not very significant.

Growing winter grain, both rye and wheat, looks very well, and with favorable conditions, we should expect a good crop for another year.

MILK.

The production of milk is on the increase, and many farmers who formerly raised hogs and sheep have abandoned that branch of farming and devoted their entire attention to the production of milk, which, at an average of four cents per quart wholesale, is a very good business, especially as the producers and retailers of milk have come to an amicable understanding, and there does not exist at the present time the contention and unsettled condition of the milk market which has heretofore existed.

POTATOES.

The acreage of potatoes was about the same as last year, though the seed did not come up as well, and in many cases not more than one-half of the potatoes sprouted in the ground. The dry weather interfered very materially with them, and I would not think the crop was more than sixty per cent. of last year, though the prices were very good and profitable to those who were favored with a good crop.

Apples were an average crop; good prices received throughout the season; the quality was generally good. Kieffer pears were not more than fifty per cent. of last year's crop. Strawberries were not a large crop; the unfavorable weather interfered with them, though good prices prevailed. Currants, blackberries and raspberries were a fair crop. Grapes were a moderate crop and rotted badly in some sections.

The cranberry crop was not as great as last year, and that was not more than two-thirds of a crop in this neighborhood. The frost in May destroyed the fruit on many bogs, and the vine worm destroyed many others. The growing of cranberries has many obstacles and enemies to contend with; therefore, it

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is not all profit, though those who were fortunate in having a crop this year received very good prices for them.

The tomato crop was not more than sixty per cent. of last year. While the vines looked vigorous and healthy, they did not produce the fruit. Asparagus was a moderate crop, and sold at fair prices. Cabbage was a fair crop and sold at good prices. The worms interfered with them; consequently, made a short crop.

BOILING CORN.

About the same acreage in boiling corn as last year, while the prices at some times during the season were good, other times they were very low. As an average, it sold about as last year.

Citrons were nearly a failure. The climatic conditions were unfavorable to their growth and production. Watermelons were a moderate crop and sold at a fair price.

Lima beans were a good crop, but sold for low prices. Peas were an average crop and sold for a fair price.

The production of pork is not as great as in former years, and it appears to be on the decrease. Many farmers who fattened pork and steers now sell milk and truck.

Very few sheep and lambs are raised in this section, though those who do raise lambs have been very well paid for them.

It is a question in my mind if it wouldn't be profitable to farmers, who are nicely situated for the raising of lambs, to engage in that industry.

Turkeys are more plentiful than last year, although not very numerous, as they are a hard bird to raise; consequently, the price is very fair.

Eggs are scarce and high.

The squab industry is on the increase, and some people make a business of it, which has been profitable to them.

I have often wondered why young men who are reared on farms and understand the business should leave the farm and

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engage in other business. Barring the scarcity of help, it seems to me that a young man with good health, by practicing economy and industry, the business of farming could be as profitable, if not more so, than any other business at the present time with the same amount of money invested. To think, a good farm in a good neighborhood, with good buildings, fencing and properly underdrained, selling for fifty dollars per acre. Can you show me a business with \$10,000 invested where you can place your money in a safer place and more profitable when hay is selling for \$14 per ton, wheat 80 cents a bushel, rye 75 cents, corn 60 cents, potatoes 80 cents, apples \$2.50 to \$4 per barrel, straw \$10 per ton, chickens 18 to 20 cents, turkeys 20 to 22 cents, hogs \$7 per hundred, milk 4 cents per quart wholesale, all good paying prices. I venture to say that any enterprising young man could make a good living and pay for such a farm within ten years.

CLIMATIC HISTORY OF BURLINGTON COUNTY, N. J., IN RELATION
TO AGRICULTURE, FOR THE YEAR 1905.

Obs. Lat. 40 deg. Lat. 74 deg. 54 ft. Elevation. Above tide 71 ft.

	TEMPERATURE.			Rain and Melted snow.	Snow days.	No. of days 0.61 or more rain fell.	No. of clear days.	No. of partly cloudy days.	No. of cloudy days.
	Max.	Min.	Mean						
	deg.	deg.	deg.						
January.....	54	0	26.5	2.87in.	10.9in.	13	10	4	17
February.....	45	—1	24.1	2.79	8.8	9	13	5	10
March.....	81	9	40.	4.24	4.8	12	13	5	13
April.....	80	26	48.9	3.12	0.6	13	9	11	10
May.....	84	34	62.	1.31	.....	10	8	10	13
June.....	91	45	69.	2.93	.....	12	10	10	10
July.....	96	55	75.1	2.85	.....	12	9	14	8
August.....	90	50	70.9	5.66	.....	15	10	10	11
September.....	84	37	65.4	3.81	.....	8	13	7	10
October.....	87	29	54.1	3.84	.....	8	17	8	6
November.....	67	15	41.1	1.87	Trace.	7	12	7	11
December.....	61	15	35.6	3.59	2.6	7	11	10	10
Year.....	96	—1	51.1	38.88	27.7in.	124	135	101	129

The latest killing frost in Spring was on April 19th, (26°); the earliest in Autumn was on October 22nd, (32°), making 186 days for out-of-door growth of tender vegetation.

There were no abnormal extremes of temperature during the year. Of the past 41 years there has been but six with less

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rainfall than 1905. But twice did its rainfall in 24 hours exceed 2 inches, viz: Aug. 13th—2.07 inches, and Oct. 20th—2.27 inches, so that there was less than usual of loss of soluble plant food on light, sandy soils. The semi-drought of May lessened the yield of grass and potatoes in many fields. The balance of rainfall for the year was in amounts that rescued vegetation but did not fill springs, so that many streams and wells were low or dry in Autumn and many are still without normal supply. There were two narrow pathed violent wind-storms—on April 19th and on August 13th—shaking off much fruit and breaking trees.

The snows of January and February were so drifted that fields were left unsheltered. Fruit buds were kept dormant. Plowing could not be done until March 16th. On April 19th the ground froze to the depth of 2 inches when much early corn was sprouted and above ground, yet it survived and grew, to vigorous maturity. The season was very favorable for the planting and cultivation of all crops. Although there was so much less than average of precipitation, there was no long periods without some rain. The yield of summer crops was sufficient to abundantly supply the markets but there were no glutted periods like those in 1903 and 1904 that were so disastrous to producer's net profits. The cantaloupe and melon crops were of better quality than for several years. The rains of August and September were most opportune for the corn and sweet potato crops and for germination of grass seeds which has grown in best form to date. The conditon for gathering, marketing and storing of corn and sweet potatoes were very favorable and the yields satisfactory. The cabbage crop was the poorest in quality and yield that we have had for several years.

The individualizing climatic feature of the year 1905 was that from the month of September to the year's close, the weather was almost continuously pleasant, without rude winds, with few interjections of storm and frost, into its genial warmth and

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sunshine and with many days of such exceeding beauty, that they seemed in very truth,—“The bridal of the Earth and Sky,”—with much environment of quiet Indian Summer haze, and persistent, so on into many December days until the 29th with its bright sunshine and temperature of 56° , and ending with display of a dark storm cloud in the N.W.—thunder and lightning—a brilliant rainbow and closing with a sunset of indescribable splendor.

Camden County.

OFFICERS FOR 1906.

President, CHAS. BARTON. Marlton, N. J.
Vice-President, R. COOPER MORGAN. Blackwood
Secretary and Treasurer, DANIEL W. HORNER. Merchantville

DIRECTORS.

MR. AND MRS. S. S. BATTEN. Blackwood
MR. AND MRS. H. H. BELL. Mt. Ephraim
MR. AND MRS. M. SCHUBERT. Kirkwood
MR. AND MRS. M. C. BROWNING. Merchantville
MR. AND MRS. BENAJAH HORNER. Merchantville
MR. AND MRS. JOHN M. GARWOOD. Ashland
MR. AND MRS. R. COOPER MORGAN. Blackwood
MR. AND MRS. A. DEWEES. Collingswood
MR. AND MRS. XAVIER OTTINGER. Berlin
HERBERT WILLS. Mt. Ephraim
C. C. STEVENSON. Blackwood

DELEGATES TO STATE BOARD.

S. S. BATTEN, two years. Blackwood

The twenty-second annual meeting of the Camden County Board of Agriculture was held at Haddonfield, Desember 1st, 1905. A varied program was presented. I mention a few of the subjects that engaged our attention on that occasion. "Purity and Vitality of Seeds." This subject was treated by R. Cooper Morgan, a farmer and also a dealer in seeds. Mr. Morgan thought the loss experienced by farmers, who have been deceived by purchasing spurious seeds, of sufficient importance as to justify legislation on the subject. "Parcel Post," by Wesley R. Stafford, who related personal experiences, full of vexatious delays, expense, etc.. under the present method and thought

we had outgrown the primitive method now in vogue. "Potatoes—Varieties and Culture." On this subject valuable experiences were exchanged to the benefit of the entire meeting. After dinner the meeting listened to an address by Judge Carrow. The Judge strongly pressed upon the hearers the wisdom of not going to law to settle difficulties. He said that former decisions and precedents were not reliable. He also spoke of the importance of making searches when buying real estate, and of making a will by those possessed of property. "A wife's knowledge of her husband's business," was treated by Mrs. W. C. Raughley, in a manner that was vigorously applauded. Alfalfa was also upon the list, and seems to be a subject that our progressive farmers do not tire of talking about. These meetings of the County Board are well attended, an increased interest is noted. The ladies provided a meal at a small cost, and a general reunion and good time followed, a rounding up—we might say—to the profit and enjoyment of all. The Institute held at Blackwood under the management of Mr. Dye, furnished an opportunity for the residents of a different section of the county to exchange views and experiences. The San Jose Scale, as usual, got a good share of attention, and from what we listened to, it is fair to infer that it will continue to be a theme for the next generation.

It is a genuine Yellow peril that confronts us,—And—well—He's a plenty.

Taken on the whole, the season of 1905 was a good one. Crops were fairly good and prices above the average. It is evident that a little of that prosperity that the other fellow has been getting has come our way. 'New hope has sprung up and many of us have concluded that farming is not such a bad business after all. There is, however, one feature connected with it that we cannot pass by and that is isolation. It occasions all thoughtful farmers much concern to leave their homes unprotected when in the fields, and the remedy is hard to find.

Cape May County.

OFFICERS FOR 1905-1906.

President, DR. E. H. PHILLIPS.	Cape May City
Vice-President, J. D. LUDLAM.	South Dennis
Secretary, J. W. PINCUS.	Woodbine
Treasurer, VOLNEY VAN GILDER.	Ocean View

DIRECTORS.

HARRY LEAMING, Lower Township.	Cold Spring
HOWARD HOFFMAN, Lower Township.	Cold Spring
FRANCIS HARRIS, Middle Township.	Rio Grande
WINFIELD COOMBS, Middle Township.	Goshen
HON. F. L. LUDLAM, Dennis Township.	South Dennis
HON. J. D. LUDLAM, Dennis Township.	South Dennis
WASHINGTON VAN GILDER, Upper Township.	Petersburg
H. P. MICKLE, Upper Township.	Petersbur
J. SPEECE, West Cape May.	Eldredge
W. F. MCKEAN, Cold Spring Grange.	Cold Spring
RICHARD LLOYD, Dias Creek Grange.	Dias Creek
Z. A. TOWNSEND, Tuckahoe Grange.	Tuckahoe

DELEGATES TO STATE BOARD.

DR. E. H. PHILLIPS, two years.	Cape May City
RALPH SCHELLENGER, one year.	Green Creek

REPORT.

BY THE SECRETARY.

Work of the Board.—During the past year, two meetings, besides the Farmer's Institute held last Dec. 23rd, were held. The Spring Meeting was held in Cape May Court House on March 1st, 1905. At this meeting, the delegates to the State Horticultural Society and the State Board of Agriculture presented their reports. Mr. C. C. Hulsart of Mattawan, N. J.,

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spoke on "Growing of Melons, Tomatoes, and Strawberries," and Mr. M. F. Delano of Millville, N. J., spoke on "Poultry Keeping."

The Dias Creek Grange made this meeting very successful by bringing a large delegation.

The annual meeting was held at Cold Springs on October 26, 1905. Here we had the co-operation of the Cold Spring Grange. At this meeting the officers and delegates were elected. Mr. P. F. Staples, of the Hirsch Agricultural School, Woodbine, N. J., spoke on "Orchard Management," and Mr. J. W. Pincus of Woodbine, N. J., spoke on "Cow Peas and Leguminous Crops." The question of inoculating soils and nitro-cultures were also thoroughly discussed.

In closing my report, I desire to state that while the meetings of the Cape May County Board of Agriculture are not as well attended as they should be, I notice some improvements and that with the co-operation of the granges, we shall be able to make them more useful in reaching more farmers.

GENERAL STANDING OF AGRICULTURE.

The climatic conditions of the past seasons were quite favorable for most of the farm crops. Comparing the precipitation of the season of 1905 with that of previous years, we found that the rain fell was neither excessive nor deficient, but properly distributed through the growing months. During June and July there was a slight deficiency, but the greater amount of rain during August remedied this deficiency.

The late frosts in May injured peach and plum buds, so that there were a very few peaches and plums. Apples and pears did not yield very heavy with the exception of Kiefer pears which were plentiful, but were difficult to dispose of at a profitable price. Small fruits yielded fair crops. Strawberries brought good returns. Gooseberries yielded very heavily; at Woodbine on a 1-5 acre, the Agricultural School picked about

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25 crates which netted \$35.56; this makes at the rate of over \$175 per acre.

Currants also yielded well and the average price for them was \$.06. The latter two crops should be grown more as there is a good demand for them.

Grapes yielded a very poor crop, but there was a good demand for them. The grape juice factories offering \$38 per ton.

Corn crop was somewhat disappointing. While some of the corn came up well and made a fine growth, when it came to husking it did not turn out so well as last year. Corn for silage and for soiling purposes yielded very well.

Quite a number of farmers planted the pedigree corn this year. Two varieties were planted, namely, the Boone County White, and the Yellow Reid—both varieties imported from Illinois. The latter variety is with a high protein content. They were both disappointing and particularly the latter kind. The Yellow Reid is an excellent corn for Illinois, but it is undoubtedly not suited to the light soils of South Jersey.

The hay crop was fair, the crimson clover sown in the fall of 1904, owing to dry weather did not come up, so that no crimson clover was harvested during the past season. The clover sown in the fall of 1905, however, came up very well and promises a good crop next year. Peas and oats grown for hay yielded about three tons per acre at Woodbine. Cow-peas and soja beans yielded heavy crops. Some inoculation was tried with them, but no appreciable difference was recognized.

One farmer reports however very good results with inoculating lima beans.

Potatoes yielded a fair crop. The early ones, better than the later ones. Black Heart appeared in many of them, so that they kept very badly and had to be disposed of early.

Sweet potatoes yielded an excellent crop. Some farmers reporting as high as 100 barrels per acre. Several acres at Woodbine have yielded at the rate of 95 barrels per acre. The

prices for sweet potatoes were rather low, but fancy selected stock is in good demand at good prices.

Lima beans have yielded well and brought good returns. Lima beans and sweet potatoes are among the most profitable crops grown in South Jersey. Tomatoes yielded a fair crop, and the late ones brought very high prices.

There are four canning factories in this County and all reported good pack. One of the canning factories canned in addition to tomatoes, sweet potatoes, paying \$.70 per bushel for second size; another factory canned apples, and another peas. The canning industry is on the increase and better prices are expected next season.

Some of the poultry establishments in this County are doing very well. Eggs are in good demand at high prices.

Dairying is slightly on the increase, but still not enough milk is produced to supply the needs of the summer resorts.

Cumberland County.

OFFICERS FOR 1906.

President, E. L. BOLLES.	Bridgeton
Vice-President, WM. SHUTE.	Bridgeton
Secretary and Treasurer, CHAS. H. DUNSAFE.	Cedarville

DELEGATES TO STATE BOARD.

WINFIELD BONHAM,	Two years
ARTHUR SEABROOK.	One year

EXECUTIVE COMMITTEE.

CHAS. WALLACE.	Greenwich
JACOB ZIMMERMAN.	Millville
JOSEPH SHAEPSHIR.	Commercial
THEOPHILUS DICKENSON.	Stow Creek
WINFIELD S. BONHAM.	Hopewell
D. H. BURGE.	Landis
JERI CHAMBERS.	Maurice River
EDWARD DIAMENT.	Lawrence
ELI WARTON.	Downe
ARTHUR SEABROOK.	Deerfield
GEORGE FISHER.	Fairfield

REPORT.

BY THE SECRETARY.

The Board has held two meetings during the year. The first one February 8, when the officers were elected. The delegates of the State Board of Agriculture gave us a very interesting and instructive talk. The attendance was good and much interest was manifested by the farmers present. The second meeting was held February 23, which was an all day meeting, the subject discussed in the morning session was "Fighting the San Jose Scale,"

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by Mr. Chambers, of Vineland. The attendance was all right. The farmers were there to learn what they could about spraying. The afternoon session was better attended than the morning; the Court house was nearly full. The discussion was on the tomato question, and it commenced with considerable earnestness. The farmers were out in force and meant business. Tomatoes were a paying crop last year. The crop was above the average and the price realized for early tomatoes was all right; and for late grown tomatoes in Bridgeton, the price was never better. The past season has been very profitable for the farmers of Cumberland county, they have had good crops and good prices for all their crops except sweet potatoes and onions. The fruit industry in this county will soon be a thing of the past if the farmers do not take up spraying and fight the San Jose scale.

Essex County.

OFFICERS FOR 1906.

President, CYRUS B. CRANE.	Caldwell
Vice President, ISAAC S. CRANE,	Chatham
Treasurer, GEORGE E. DECAMP.	Roseland
Secretary, JUSTIS W. DOBBINS.	Verona

DIRECTORS.

A. E. HEDDEN,	F. C. GOBLE,	WM. DIECKS, SR.
J. B. WARD,	A. W. FUND.	

DELEGATES TO STATE BOARD.

DR. J. B. WARD.	Two years
MARCUS W. DECAMP.	One year

REPORT.

BY THE SECRETARY.

The board has held three regular meetings during the past year. The attendance and interest shown by the members was fully up to the average.

The first meeting was held February 25th. The first number on our program was "Potato Growing." The discussion on seed, soil, fertilizers and cultivation was taken up by the members and was very helpful to those interested in this crop.

Spraying for the blight, scab and its remedy, and the cause of hollow potatoes were also discussed. Our president gave a very interesting account of the early history of the potato.

"The Best Education for the Farm Boy" was the next topic.

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The bill introduced in the Legislature for an appropriation for a short course in agriculture was reported as progressing very favorably.

The opinion of the members was that it would be very helpful to many who could not spend the time for the longer course.

The opportunities of the young man on the farm and the hardships of the average young man in the cities, where rents and the necessities of life are expensive, and the moral effect of the apartment houses were discussed.

By taking advantage of the educational privileges now offered in agriculture it was the opinion that a young man would have a better chance for success on the farm than in the cities.

"Essentials to Success in Farming" was the last topic on the program. Two qualifications necessary to success are the love of country life and love of the occupation.

The second meeting was held April 6th. The special purpose of this meeting was the fertilizer question. Several price lists were read and a discussion followed on the merits of the different grades. A committee was appointed to purchase the fertilizers.

The third, or annual, meeting was held December 13th, when the officers made their report and the election of officers for the ensuing year was held.

A circular from the Highway Protective Association was read and discussed.

The topic of "Corn Culture," was next considered. The fine exhibit of corn at the National Grange at Atlantic City was spoken of and claimed to be the finest ever exhibited in the United States. The result of the discussion was that corn was one of the best paying crops a farmer could raise, not alone for the value of the grain, but the stalks, if properly handled, has a high feeding value.

The corn crop fits very nicely in a rotation as it does best on a sod following grass.

On the subject of small fruits Dr. Ward gave a very interesting talk.

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"Small fruits can be easily grown, no more trouble to raise than beans or peas."

"The currant is one of the healthiest fruits a person can eat, should be eaten every day during the season."

"Eating plenty of fruit will save doctor's bills."

"The peach is a money crop for the farmer."

"The scale has killed off large numbers of orchards, but it is a blessing and is here to stay."

"Spraying not only holds the scale in check, but the fruit is larger and finer and brings better prices."

"For our locality plant late varieties which ripen after September first."

Thinning the fruit makes the fruit larger and adds life to the tree.

Secretary Dye is to favor us with a Farmers Institute, but the date arranged will be too late for an account in this report. From the programs sent out we anticipate an institute of unusual interest.

The robin has not been as destructive fruits the past year as that preceding, which is probably due to the wild fruits being more abundant.

It is still the opinion of the fruit growers of Essex county that a similar law to that in our neighboring states should be passed, which allows the farmer to protect his fruit. This does not mean the extermination of the fruit-eating birds, as experience shows that a few shots will drive the birds away.

We feel the farmers need to know the habits of many of our common birds, which are his best friends.

Owls and hawks are not protected by law and are often shot when found. The principal feed of the owl is the mouse, with an occasional small bird, while we have only two species of hawks which feed principally upon birds. The sharp shinned and the red shouldered or hen hawk. As the owls and hawks disappear our fields are overrun with mice which destroy our grain and as winter approaches they are driven into our out buildings, doing great damage.

In the annual report of our president he said in part: "The season just closed has been a favorable one in most respects, although the drought has shortened the hay and potato crops, the later rains and absence of early frost were compensating agencies in their value to other crops. Prices have been such that farmers have been better satisfied with the results of their labor."

Appreciation of the work the state is doing in the interest of agriculture should be manifested by a more general attendance at the various institutes and conventions held."

Gloucester County.

OFFICERS FOR 1906.

President, ELMER E. CLEMENT.	Thorofare
Vice-President, LEWIS MORGAN.	Woodstown R. F. D.
Secretary, M. ELLA MORGAN.	Woodstown, R. F. D.
Treasurer, WILLIAM H. BORDEN.	Swederboro, R. F. D.

EXECUTIVE COMMITTEE.

ALEXANDER P. OWEN.	Mickleton
EMMA PARKER.	Mickleton
DEBBIE KIRBY.	Mullica Hill, R. F. D.
DAVID T. BROWN.	Swedesboro
BARCLAY D. KELLE.	Swedesboro

DELEGATES TO STATE BOARD.

JOHN WOLFERTH, two years.	Clarksboro, R. F. D.
ALEXANDER P. OWEN, one year.	Mickleton

REPORT.

BY THE SECRETARY.

In accordance with its usual custom, the board held four meetings during the year, at which questions relative to the farm or household were discussed with interest, and I trust with profit. A few of the subjects considered were: "The latest and best experience in destroying our insect enemies," "The Possibilities of Alalfa," "Which will produce the better crop, second-crop potatoes (for seed) or 'Eastern' seed?" "Does every acre of your farm earn something for you every year? If not, why not?" "Best species of Flowers for home adornment," "Is it advisable to plow sod in the Fall?"

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There were three Farmers' Institutes held in the county during the year. One at Clayton on November 25th, which was the second held there. It was well attended and there was a fine exhibit of farm products on the tables, to which allusion was made by most of the speakers, among whom were E. Van Alstyne of New York state, Prof. R. L. Watts of Pennsylvania, and Prof. Voorhees.

On the 27th and 28th of the month a very interesting and instructive institute was held at Swedesboro, at which a long and greatly varied programme was fully carried out. Among the subjects considered were: "The Life of a Tree—How it Lives and Grows," by Prof. G. F. Warren; "How to obtain the best results from Food," and "The Relation of Food to Life and Health," by Mrs. Sara Walroth Lyons; "Care of the Orchard," "Essentials to Success in Spraying," "The Production of Sweet Potatoes at a Profit," "The Proper Feeding of Farm Crops," "Experience in Growing and Marketing Cantaloupes," "What Our Agricultural Colleges of Today Teach, and How They Teach It," etc.

On the 7th of December another was held at Williamstown, which was a successful one. Prof. J. G. Lipman spoke upon "Soil Fertility." E. Van Alstyne talked on "Building Up and Maintaining a Successful Dairy."

These institutes are yearly growing more and more in favor, but it must be admitted that there is still a large number of our farmers who have never attended one, and consequently they are unaware of how much they miss that might be of value to them in their avocation. Wide-awake farmers, however, realize the advantages to be derived from these annual gatherings in which they may discuss various topics of pecuniary interest to them, and in which they may profit by the experience of others, or impart to those whose information on a particular subject may be less and therefore you invariably find such farmers in attendance, and accompanied by their wives and daughters.

The year has generally been a prosperous one for our farmers. The leading crops of sweet and white potatoes, cantaloupes and

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asparagus have been good and the prices remunerative. Corn was somewhat below last year's yield, when there was an unusually large crop, where it was not ruined by hail. Several weeks of dry weather shortened the hay crop. The set of fruit was sufficient for an abundant crop of apples, but where spraying was neglected they continued to drop badly, so that at gathering time there were few on the trees although no wind storm of importance occurred. Perhaps thorough sprayings might have prevented much of the dropping.

The San Jose scale is rapidly spreading, and its depredations are becoming more and more manifest, and while those who make a specialty of fruit-growing give close attention to spraying for the various insect pests, and fungus diseases, the majority of those who have only a small fruit orchard still wholly neglect to take any measures to keep in check either the scale or any of the other predatory insects or blights.

John Repp and sons, who keep at the head of the fruit-growing industry of our county, have, after thoroughly testing the sulphur, lime and salt mixture, returned to the crude petroleum remedy, with which they have successfully kept the scale in check during the last seven years. They have seen no ill effects from the oil on the trees during its use, and they are of the opinion that if it is judiciously used, no harm will be done them, as some have reported.

The Grangers' annual picnic was held as usual on two days in August and was very largely attended. The exhibits of almost every form of farm product, and of the household were very fine. Free telephone service was furnished, and a great display of farm machinery was in evidence. Many sales of the latter were effected, and in deference to the wishes of the machine men, it is probable the picnic will continue three days the coming year.

In last year's report allusion was made to the local telephone company which had recently commenced operations. Believing it might be a matter of interest to the farmers of other communities if a brief account of it were given in this connection. W. C.

Sloan, superintendent of the company, has kindly furnished the following:

"The remarkable growth of the People's Rural Telephone Company—independent—of Gloucester and Salem counties furnishes a striking illustration of the business energy of the farmers of those counties. The entire amount invested has been subscribed by local people.

"The company was incorporated in October, 1903, and on June 22, 1904, the first pole was erected. Since that date over two hundred miles of pole-line, equipped with one thousand miles of copper wire, have been erected.

"Exchanges installed in Swedesboro, Woodstown, Mullica Hill and Mantaua. The lines have been extended to reach twenty-five towns and villages in the two counties.

"Seven hundred telephones connected, with orders on file that will increase the list to over one thousand.

"The company has provided modern apparatus, using the 'Central Energy' system on all lines. The switchboards installed have a capacity for 1800 subscribers, and from present indications the company will reach this number inside of another year.

The company is strictly independent, and has connection with all other independent companies operating in New Jersey, Pennsylvania, Delaware, New York and Maryland, thus insuring to its patrons the advantage of both local and long distance service. As an illustration of the appreciation by farmers of the advantages of the telephone, we find that each farm house between Swedesboro and Mickleton is equipped with a telephone, and many other sections are similarly equipped."

"Swedesboro, Dec. 12th, 1905."

Hunterdon County.

OFFICERS FOR 1906.

President, E. M. HEATH.	Locktown
Vice-President, JOSIAH PRALL.	Flemington
Secretary, WM. W. CASE.	Baptisttown
Treasurer, F. J. TOMLINSON.	Pittstown

DIRECTORS.

H. F. BODINE, Hunterdon County Pomona Grange.
JOHN Q. HOLCOMBE, Ringoes Grange.
WM. B. HOCKENBURG, Locktown Grange.
NEWTON B. RITTENHOUSE, Sergeantsville Grange.
ELLIS B. HUFFMAN, Kingwood Grange.
WM. SCOTT, Oak Grove Grange.
M. W. ANGELL, Spring Mills Grange.
JOSIAH PRALL, Grand View Grange.
W. H. OPIE, Riverside Grange.
URIAH SUTTON, New Jersey Fruit Exchange.
A. B. ALLEN, Hunterdon County Peach Exchange.

COMMITTEE ON FRUIT STATISTICS AND REPORTER TO STATE BOARD.

WM. W. CASE. Baptisttown, N. J.

DELEGATES TO STATE BOARD.

E. M. HEATH, one year. Locktown
W. H. OPIE, two years. Readington

OTHER ORGANIZATIONS IN THE COUNTY

NEW JERSEY PEACH EXCHANGE.

President, JOHN T. COX. Readington
Secretary, MORRIS STOCKTON. Pattenburg

HUNTERDON COUNTY PEACH EXCHANGE.

President, A. B. ALLEN. Flemington

REPORT.

BY THE SECRETARY.

Two meetings have been held by the Board during the past year, in September and November. The September meeting was held at Oak Grove Grange Hall and was largely attended by local farmers and was devoted to Alfalfa and the San Jose Scale. Dr. E. B. Voorhees of New Brunswick, spoke very enthusiastically of the value of Alfalfa in farm economy and of the conditions necessary to its proper growth and development. "Alfalfa possessed the nitrogen storing element common to the pulse family and its successful growth and permanency depend upon a well drained, well limed, well fertilized soil, plowed early in spring and cultivated weekly till mid-August, when it should be seeded at the rate of not less than thirty pounds to the acre. If the land is deficient in the proper bacteria for development of Alfalfa root nodules sow the field with soil properly inoculated and if failure is met with, try again until successful. A ton of properly cured Alfalfa contains as much protein as a ton of best bran, and five tons of cured hay is the average yield of the trial acre at the experiment station. The less acid and more humus contained by the soil the more favorable are the chances for success. It should be cut before fully in bloom as seed setting is very exhausting and detrimental to its continuation as a permanent sod. A field properly cared for should yield profitably for from ten to twenty years.

Dr. G. F. Warren, State Horticulturist, spoke on "Problems that Confront the New Jersey Fruit Growers," as follows:

PROBLEMS THAT CONFRONT THE NEW JERSEY FRUIT GROWER.

While the New Jersey peach grower has many problems to contend with as regards diseases of the tree itself, cultivation, etc., the great problem that at the present confronts the grower is that of San Jose scale.

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The scale has come to stay, and in the future will have to be reckoned with as a serious problem, as there is very little prospect of its eradication by natural means, as while severe winters greatly lessens its number, yet its wonderful reproductive powers soon enable it to regain all the ground and more, lost by freezing and insects, and where it is, in a few instances, becoming extinct, it is only through starvation and not as the result of predaceous insects or fungi.

At the present time it is useless to try to isolate an orchard from the pest by getting trees from non-infested sections, as the scale is carried many miles on the feet of birds, and when once started, its spread from tree to tree by the same means is only a matter of a very few weeks, and yet if proper care is taken to spray at the right time in a properly thorough manner, not only can the pest be held in check but profitable crops of peaches grown, and, as at the present time, many growers have given up the business of peach growing in disgust on account of the scale, the present is the very best time in which to set an orchard with the prospect of winning large profits from the enterprise.

Unless the trees are known to be absolutely free from scale at time of planting, they should be dipped in the regular spraying mixture of lime, salt and sulphur, and spray regularly and thoroughly every Spring after the first appearance of the pest. Spraying, to be effective, must be made in at least two applications, one from each side of the row, so that every particle of bark from the ground to the uttermost tip of each twig is thoroughly coated. If done thoroughly, while it will not absolutely eradicate the scale, it will hold it so completely in subjection as not to interfere with the growth and production of the tree or fruit, and merely increases the cost of producing an orchard, at the present time, only to the extent of the absolute cost of spraying—a small item in the care of an orchard.

No other spray yet experimented with has given at all satisfactory results; the soda spray, while cleaning the bark and

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giving it a healthy appearance, does not have any effect on the scale, and the twenty-five per cent. oil spray kills at least ninety per cent. of the trees in far less time than is required by the scale; neither has the kerosene and lime spray been at all effective during the season of 1905.

The lime, salt and sulphur spray, to be effective, must be made as follows: Equal parts of lime, salt and sulphur, the lime being slacked and sulphur added and boiled at least one hour, when it should be of a rich amber color, add the salt and add one gallon of water to each pound of the mixture.

It should be understood that either lime, salt, or sulphur alone, are utterly innocuous, and that it is only the chemical combination formed by the lime and sulphur when boiled, a lime sulphide that does destroy the pest, and it is not equally effective if mixed in any other proportions.

The lime, salt, and sulphur mixture is usually efficacious for leaf curl also, although the bordeaux mixture is thoroughly effective sprayed before the trees come in leaf in Spring.

I have confined myself merely to the peach in my remarks, from the fact that for many years this county (Hunterdon) has been noted for both the quality and quantity of her peaches, and is not very extensively occupied in growing the other hard wood fruits, and I see no real reason why the county should not again reach and hold her former position as the queen of the peach growing section of the East.

The lime, salt and sulphur spray is not efficacious on the apple and pear, crude oil being much better, and I am very sorry to be unable to recommend a thoroughly reliable remedy as yet for the apple and pear, as the thoroughly reliable and satisfactory spray has not yet appeared. It should be borne in mind that unless pure sulphur is used in the lime, salt and sulphur mixture, it will not be effective on the peach.

CROP YIELD AND CONDITIONS.

Owing to a long drawn out season and, as a whole, generally favorable weather conditions most regular farm crops ranged

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from normal to extra drought in May and excessive wet in September were detrimental to hay and potatoes. Corn never produced more bountifully nor of better quality, and oats were the best in several years. Wheat and rye, while not equal to some seasons, exceeded the average yield for the whole United States. Corn and oats averaged in yield 35 bushels per acre for every acre planted; wheat twelve; rye and buckwheat twenty.

FRUIT.

Apples were not more than half a crop, and the luscious peach a product of but few sections.

Practically all fruit trees are disappearing under the frightful assaults of the San Jose scale, and, with the possible exception of peaches, no remedy has been found to stop its devastations. While the lime, salt and sulphur spray in some instances enables growers to produce a more or less (usually less) satisfactory crop of peaches, no spray has as yet appeared that amounts to anything on the apple and pear—the most of the oil sprays killing the trees in even shorter time than required by the scale.

The lime, salt, and sulphur spray does not, owing to conditions of apple, bark, etc., prove very detrimental to scale development, not a single square mile of our county but that is badly infested and if our orchards are to be saved, something effective must make its appearance soon. The small black insects referred to in the last report turned out to be the *Peutilia nusella*, a very diminutive, lady bird. The utter failure of the Chinese varieties and the indifference of the native sorts seem to render the fruit grower utterly helpless to stay the course of the plague.

The tomato pack was rather light. H. E. Scarborough of Lambertville, packing 75,000 No. 3 cans of extra fine fruit. The yield was greatly curtailed by drought in July. Prices paid per ton, \$8. Ringoes Canning Co. has packed no fruit in three years.

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FARM VALUES, ETC.

Farm values show but little if any improvement, in a few instances farms have changed hands at higher figures than last year, others have been sold at the lowest prices on record. While there are conditions tending to a rise in farm values, there are also other conditions which tend to paralyze any movement in that direction. Rural free delivery now extends over a large part of our county to the general satisfaction of those served as far as it goes, but the hands of our postal authorities are tied by the representatives of the "Big Four," who seem to have power enough to deny to eighty million of people the accommodation of a parcels post system,—a condition tolerated in but few of the constitutional monarchies of Europe.

Owing to our excessively hilly territory and the arbitrary state road improvement law concerning grades and the more arbitrary interpretation of the same it is quite likely that Hunterdon's first experiment in modern road building will be the last for some time to come, as the people stand aghast at the contract price of our first five miles—practically ten thousand dollars per mile.

Perhaps it will be for the best to leave our roads in the present condition indefinitely, if it shall continue in the future as at present that all our best ones are to be taken possession of as racing tracks by the autoists, a large majority of whom have no more regard for the rights of others or of statutory law and law officers than did the pirates on the high seas one hundred and fifty years ago, and today they have practically driven our wives and children from the use of our own highways that we have been taxed more than a century to maintain.

Men who are now in declining years and who have paid taxes for maintaining our roads all their lives, now find it unsafe to venture upon them.

The idea that automobiles have any natural right on the public highways is absurd, being based on neither law, pre-

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cedent, nor custom as to vehicles propelled otherwise than by man or horse power.

Railroads and trolleys have their own tracks, but today machines not confined to certain tracks and which neither the locomotive nor the trolley can compete with in speed, are allowed to take possession of our highways to the danger of the pedestrian and practically to the exclusion of a majority of horse-drawn vehicles, and they show an utter disregard for the few laws we have and the officers who are appointed to enforce them.

POULTRY.

Poultry and egg production is rapidly on the increase and the large increase noted in my last report has been fully equaled this season. Prices of eggs remain, compared with last year, practically the same. Mr. S. O. Heath of Kingwood township, reports following results: From five hundred hens 3,744 dozen eggs were sold for \$720, averaging about twenty cents per dozen. The above makes no account of the large number of eggs used for hatching purposes.

Live poultry averaged 11 cents during fall, live turkeys ranging round the twenty cent mark.

The creameries at Cherryville and Oak Grove, owned by Mr. C. R. Peterman of Cherryville, report receipts of milk for year ending October 31, 1905, at the former of 1,192,786 pounds of milk against 1,188,663 pounds last year and at the latter 1,003,028, against 917,840 pounds last year, while the price of butter fat has risen from 24¼ cents per lb. to 26¾ cents, a substantial gain in both product and price.

Locktown creamery whose report is appended in full shows a gain in product from 1,741,917 pounds of milk and 85,118 pounds of butter to 1,790,429 pounds of milk and 87,996 pounds of butter and a raise in price from 25 1-3 cents for butter fat to 20¼ cents,—a splendid showing.

REPORT OF THE WORKING OF LOCKTOWN CREAMERY FOR THE YEAR ENDING
OCTOBER 31ST, 1905, AS TAKEN FROM THE BOOKS BY GEO. W. HOCKEN-
BURY, SECRETARY AND SUPERINTENDENT.

	Number of pounds of milk received.	Number of pounds of butter made.	Butter sold for.	Skim milk sold for.	Average test of all milk received.	Price paid per pound for butter fat.	Average price per cwt. for milk.
1904.							
November.....	122,097	6,022	\$1,674.43	\$63.09	4.44	\$0.28	\$1.24—
December.....	122,294	6,474	1,993.04	58.40	4.64	.32	1.48 +
1905.							
January.....	121,453	6,270	1,986.50	55.50	4.33	.34	1.47 +
February.....	113,410	5,860	2,000.57	52.20	4.40	.37	1.63—
March.....	135,124	6,873	2,085.75	63.70	4.24	.34	1.44 +
April.....	127,022	6,120	2,023.81	67.75	4.20	.35	1.47
May.....	173,073	8,415	2,101.84	84.55	4.18	.27	1.13—
June.....	186,351	8,883	1,949.45	94.95	4.09	.24	.98 +
July.....	166,246	7,654	1,754.32	91.85	3.93	.24	.94 +
August.....	166,711	7,898	1,788.54	94.70	3.91	.25	.98—
September.....	177,701	8,734	1,991.45	95.48	4.13	.25	1.03 +
October.....	178,947	8,793	2,078.63	89.67	4.16	.26	1.08 +
Total Average. ...	1,790,429	87,996	\$23,428.33	\$911.84	4.22 +	.29 1/4	1.23 1/2

HORSES, CATTLE, ETC.

Horses still continue high and many western horses find ready sales at fancy prices; native bred horses also, if good, sell well.

Good cows range from forty to fifty dollars per head, and much less is heard of tuberculosis than was heard a few years since.

Hog raising keeps steady pace with the increase in the creamery interest, while sheep raising has degenerated until there are more dogs than sheep.

SILOS.

Silos increase but slowly in number and somehow do not seem to increase in popularity as they should, rated at their true worth. But few if any have been erected the past year, and the use of some already built have been abandoned. With

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the increasing scarcity of farm help the silo should be used, if for no other reason than lessening the labor of, and time required in harvesting crops. Farm help gets scarce and higher priced all the time, the city or the west drawing and getting the best of our young manhood, the majority of whom would in the end be better off financially and morally on the farm.

Mercer County.

OFFICERS FOR 1906.

President, JOHN V. GREEN.	Trenton
Vice-President, THEODORE CUBBERLY.	Hamilton Square
Treasurer, LAURA BLACKWELL.	Titusville
Secretary, FRANKLIN DYE.	Trenton

DIRECTORS.

J. W. HENDRICKSON,	CHARLES BLACK,	W. N. CUNNINGHAM,
WM. D. HILL,	H. H. HUTCHINSON, JR.,	D. C. MCGALLIARD
J. F. ALLINSON,	FERDINAND BLACKWELL	

DELEGATES TO STATE BOARD.

SAMUEL B. KETCHAM, two years.	Pennington
J. M. DALRYMPLE, one year.	Hopewell

REPORT.

BY THE SECRETARY.

While agriculture in Mercer County has had some drawbacks, yet the condition of our farmers compares favorably with one year ago. At time for spring planting, excessive rains delayed preparations of the ground. This was followed by long, continuous drought, so that corn not planted early in season was extremely late; in some cases, not maturing, but, with seasonable planting and good cultivation, a very satisfactory yield was obtained. Seldom, if ever, has timely and thorough farming been better rewarded.

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A marked contrast between industry and intelligence on the one hand, with slow and easy going methods on the other, have afforded object lessons abundantly.

Oats quite generally grown in the northern and central part were better than for some years past. In the southern portion, on lighter soil, potatoes are largely planted succeeding corn. These are considered as a better paying crop and shows the importance of studying the adaptation of different grains, fruit or vegetables for the various soils.

Dairy interests continue to lead in the northern part as heretofore. Prices obtained for milk have been fairly satisfactory. The city of Trenton consumes most of the product within driving distance. The dairyman retailing his own milk secures the whole amount instead of less than half as when shipped to New York or Philadelphia.

Mercer County consumes far more than she produces and, while some products are shipped away, the larger proportion is required by a good home market, which is the best.

The annual meeting of the Board was held in Trenton, March 14, 1905. After the routine business, the following subjects were taken up and interesting and instructive addresses were made, viz: Hon. D. D. Denise on "Producing Potatoes," Lloyd V. S. Knover on "Poultry and Egg Production," Dr. E. B. Voorhees, President of the State Board, gave one of his timely and instructive addresses on dairy matters, urging, in particular, that to make dairying a success the farmer must grow more protein feeds, as the several clovers, beans, cow peas, etc. Each subject was followed by an interesting discussion, which added to the interest of the meeting.

President McGalliard, in his annual address, referring to many questions which confront the farmer at the present time, said:

The life and existence of our orchards depends on discovering some remedy that will keep the San Jose Scale under control, if we cannot entirely destroy it. I have taken a keen interest in the many remedies that have been recommended and tried,

but there is not, so far as I have been able to find, any remedy that is sure and certain in its effects on all varieties of trees in every condition.

We, last year, thoroughly sprayed our orchards, consisting of apples, pears, peaches and plums, with lime, salt and sulphur cooked and used as hot as we could handle. While it did not clean the trees entirely from scale, it kept it under control so the trees are being injured very little so far as I can see. The only thing that makes me hesitate to use the same mixture this spring is—we had such heavy crop of fruit that it was not profitable to handle; whether it was from the benefit derived from spraying or from natural causes, I do not know.

But perhaps another year it will have a different effect, probably the best thing to do will be to give it another trial as the reports that I have heard from the application of that mixture has given more general satisfaction than any other used in our section. It is evident that, if we expect to raise fruit and keep our orchards in condition so they will be profitable, we must keep the insect pests in subjection by using any remedies seeming to be successful.

We have had several new free delivery routes added to our county during the last year. Mercer county now has ten routes. These have proved very successful and satisfactory to a much larger portion of farmers who had heretofore not been able to receive their mail through the rural delivery, and it is hoped they may be extended so the country people may obtain their mail with the same facility they do in town.

The labor problem is still a serious question with us as farmers, as we can hardly tell how to plan for our season's crops, as, perhaps, just as we need our help the most, we are left without it.

Some have thought to have solved it, by having houses on the farm and getting men with families to occupy them, as such help is not so apt to want to change so often.

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The farmers have derived great benefit from the Experiment Station, as they can, by sending a sample of fertilizer, find out if the manufacturer is giving them value received. I know of a member who saved \$49.00 on a \$150.00 order. The manufacturer agreed to fill an order for a certain bill of goods for that amount. After the goods were received, he sent a sample to see if it were up to the standard agreed upon and, when he received the analysis, he sent it to the firm and they were glad to refund him \$49.00 rather than the matter should go any further. Sometimes we can use a cheaper fertilizer that will give us as good results on some soils as the high grade mixtures and we should experiment with them and find what is profitable to use on our farms.

There is increasing interest in the Grange; Mercer now having six sub-ordinate granges with membership ranging from fifty to hundred and seventy-five each and a Pomona Grange with a large number of members, and I could wish all the farmers in the county had the benefit of the organization. Our insurance covers over \$8,000,000 of property in the state and is carried in such a manner as to save hundreds of dollars annually to the policy holders, and then by co-operation in buying, we can save considerable in the purchase of the various supplies needed on the farm.

We have some very successful members—one in dairy business told me he had succeeded in making his cows produce milk, which, sold at wholesale, brought him \$105.00 per cow and several others could be named that have done well both at wholesale and retail. A member said that from one hundred and fifty-eight hens, he sold from January 1st to March 1st, 3,000 eggs bringing him \$90.00.

Another said from sixteen hens, from December 1st to March 1st, he had sold \$33.00 worth of eggs. Such statements as these are the exception. They show what can be done under favorable circumstances by some persons.

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I think a farmer with good care can take from three to five hundred hens and make profit of one dollar net per hen, if he is so situated that he can raise the most of his grain on the farm.

Our county has the convenience of trolley cars, which connect most of the small towns with Trenton and, having improved roads in all parts of the county, makes travelling much pleasanter. It seems that it should be a desirable place to make a home, as farms can be bought at moderate prices with good markets within convenient distance.

It was said of a prominent New Englander when asked what they raised on their barren, rock soil, answered—our soil is poor and stony, we cannot raise large farm crops so we build school houses and churches and raise men.

So let us see that our churches and schools are well supported and that our influence is for good and clean government and against all vice and immorality. That we teach our children by precept and example to be better farmers, better citizens and better men and women.

The second meeting was held at Pennington, December 9, 1905, in connection with the Farmers' Institute. Three sessions were held. Practical subjects of value to Mercer County farmers, including general husbandry, dairying and horticulture, were intelligently treated by able speakers and we can safely say these meetings are growing in favor and usefulness year by year.

CROP YIELDS AND VALUES.

Allowing the same acreage to each of the crops named in the table as was given last year, and using the figures decided upon by the Board as the average yield per acre, gives the following totals:

STATE BOARD OF AGRICULTURE.

Crop.	Acreage.	Bushels per acre.	Total Bu.	Price.	Total Value
Corn.	2,200	40	880,000	.60	\$528,000
Wheat.	1,200	18	216,000	.90	194,400
Rye.	4,000	16	24,000	.60	38,400
Oats.	10,000	35	250,000	.38	133,000
Hay.	23,000	1 $\frac{1}{4}$ tons.	30,666	\$14.00	429,324
White potatoes.	1,800	125	225,000	.65	146,250
Sweet potatoes.	200	125	25,000	.60	15,000
Miscellaneous vegetables.					\$1,484,374
Milk.					613,000
					\$2,567,374

This is an increase of last year's returns of nearly \$59,000 for the county.

Of the income from poultry, eggs, veal calves, pork, etc., we have no returns.

The value of horses, mules, milch cows and other cattle and swine will aggregate a total of at least \$1,030,000.

Middlesex County.

OFFICERS FOR 1906.

President, B. DE WITT GILES. New Market
Vice-President, SEWARD APPLGATE. Helmetta
Secretary and Treasurer, LEWIS D. WALKER, JR. New Brunswick, R. D. 1

DIRECTORS.

W. C. VOORHIES. Cranberry
J. E. BENNETT. Cranberry
C. S. BOICE. New Brunswick, R. F. D. No. 2
D. J. PERRINE. New Brunswick R. F. D. No. 2
DE HART VOORHIES. New Brunswick
FRANK HART. New Brunswick
I. S. BENNETT. Jamesburg
J. S. Robbins. Monmouth Junction
SEWARD APPLGATE. Helmetta
A. S. CONOVER. New Brunswick, R. D. No. 3
WALTER GREEN. Browertown
W. T. WORNER. New Brunswick, R. D. No. 1
N. D. RUNYON. Stelton
H. E. PERRINE. Prospect Plains
CHARLES EDWARDS. Prospect Plains

DELEGATES TO STATE BOARD.

B. DEWITT GILES, two years. New Market
R. F. VON MINDEN, one year. New Market

REPORT.

BY THE SECRETARY.

The Board has held four meetings during the year. At the meeting in February Prof. Voorhees, of the State Experiment

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Station, was present and gave a talk on fertilizer which was very instructive. He also drew the attention of the Board to a bill which he had prepared and which had been presented to the Legislature providing for a short course in Agriculture which he explained fully. The secretary prepared a resolution supporting the bill.

After the routine business at the meeting of May 27, the Board adjourned to the College Farm on invitation of Dr. E. B. Voorhees.

At the meeting held August 19th, the secretary stated that a movement had been started to form a "Road Protective Association." Remarks were made on this and other subjects. After adjournment the Board enjoyed a sail to Boynton Beach as the guests of Mr. George Smith.

The time was occupied at the Annual Meeting with the election of officers, and remarks relative to increasing the interest of members in the Board. A motion was carried to make the dues 25 cents per year.

The growing season was attended with long drought in some localities, causing shortage in hay crop and early corn.

Potatoes were a good crop in part of the county; in some sections badly affected with blight and rot.

Rye straw is lower in price than for a number of years

The grain crops were a pretty good average.

Dairymen are making use of knowledge gained and are producing green fodder and ensilage for their cattle, a few are trying alfalfa with varied success.

Gardens were injured by drought.

Poultry prices have been good throughout the year and eggs more plentiful in fall and winter than common owing to mild weather.

Monmouth County.

OFFICERS FOR 1906.

President, JOHN R. PARKER.	Freehold
Vice-President, JOHN H. DuBOIS.	Freehold
Secretary, D. AUG. VANDERVEER.	Freehold
Treasurer, WM. M. MOREAU.	Freehold

EXECUTIVE COMMITTEE.

JOHN H. DENISE.	Freehold
WM. H. REID.	Trenton
H. V. M. DENNIS.	Freehold
GEORGE L. DU BOIS.	Trenton
GEORGE S. JONES.	Freehold

DIRECTORS.

E. A. SEXSMITH.	Wall
WM. H. DuBOIS.	Freehold
GARRETT B. CONOVER.	Englishtown
JOHN L. ELY.	Holmdel
GEORGE W. PATTERSON, JR.	Ardena
JACOB B. CONOVER.	Englishtown
WM. M. CONOVER.	Clots Neck
C. C. HULSART.	Matawan

DELEGATES TO STATE BOARD.

DANIEL JONES, one year.	Freehold
WM. M. MOREAU, two years.	Freehold

REPORT.

BY THE SECRETARY.

Two meetings were held during the year. The first on February 25th, 1905, at the Court House, Freehold.

Reports of delegates to the State Board of Agriculture and State Horticultural Society were read.

C. C. Hulsart delivered an address on the "Farmer's Interest in Good Seed."

"Discussion on Asparagus and Tomatoes," by members.

"Scale and Blight," by J. R. Parker and others.

The Annual Meeting was held December 2d. The officers and delegates were elected for the ensuing year and several local topics discussed.

Three Institute meetings were held under the direction of the State Board, one at Freehold which was well attended and very instructive, and at Matawan and Key Port. Other meetings were held by the Fruit Growers Association and the Monmouth County Horticultural Society. A new Grange has been started here with a good membership and is doing well. It has been a very prosperous year and prices have been good. There has been a good demand for farms and several sales have been made. Fruit growers are trying to check the injury done by the San Jose Scale by spraying with the salt, sulphur and lime mixture and oil, and in most cases with good results.

Morris County.

OFFICERS FOR 1906.

President, GEORGE E. FELCH.	Florham Park
Secretary, W. F. ELY.	Madison
Treasurer, WESLEY D. HOPPING.	Hanover

BOARD OF DIRECTORS.

S. E. YOUNG.	Florham Park
WILLIAM JAMES.	Florham Park
EDGAR C. HOPPING.	Florham Park
Frank P. Cook,	Hanover
JAMES COOK.	Hanover
JOHN J. MITCHELL.	Whippany
JOHN OLIVER.	New Vernon
W. B. LINDSLEY.	New Vernon
N. D. GOBLE.	New Vernon

DELEGATES TO STATE BOARD.

W. B. LINDSLEY, one year.	New Vernon
GEORGE E. FELCH, two years.	Florham Park

The Board the past year has held two meetings.

The one held on February 11th, at Morristown, was the largest attendance the Board ever had to hear Prof. John B. Smith give his second address on the San Jose Scale, the interest at this time being such that the counties outside of Morris, Essex, Union and Somerset were represented by a number from each county. Many ladies being present and much interest shown the whole P. M.

Some of the largest and finest Baldwins and King Apples were shown the Professor had ever seen.

At the last meeting of the Board the correspondent of the *Newark News*, December 21st, gave the following account of the Boards doings the past 20 years and of its interest and purpose for the coming year. Special despatch to the *Evening News*, Morristown, Dec. 2.—During the last twenty years the Morris County Board of Agriculture has held many public meetings in this city at which the current topics of the day were discussed. These were not confined to subjects that interest the farmer and fruit grower alone, but any paramount question, as broad in its range as the politics of the day or the prevailing destructive insect that at the time claimed public attention, has been treated of by capable public speakers, and it is proposed to continue this feature of what the association understands to be one of its missions, but with a change of methods. Instead of calling a meeting and announcing the subject to be discussed, the association wishes the public, the individuals who take an active interest in public affairs, to send postal cards to William F. Ely, its secretary, at Madison, requesting that meetings of this character be held.

The association hopes by this method to increase the interest in these gatherings with the object of having Morris County join with other counties in the State in regard to controlling the speed vehicles upon the public highways, in discussions of the primary election law and that relating to the consolidation of spring and fall elections, and in other issues of the hour. Mr. Ely is also authorized to say that Prof. John B. Smith, the State entomologist, will again address the people of Morris County upon methods for the destruction of the San Jose Scale, if they will signify their wish to hear him, by postals sent to Mr. Ely. In fact speakers and meeting places will be provided by the association for the discussion of any important subject that may be desired, and these meetings will always be open to a general discussion of the subject after the close of the preliminary address.

Ocean County.

OFFICERS FOR 1906.

President, C. M. RORER.	Cassville
Vice-President, PATRICK DAVITT.	Toms River
Treasurer, H. R. WILLS.	Toms River
Secretary, ROBERT C. GRAHAM.	Holmeson

DELEGATES TO STATE BOARD.

C. M. RORER, two years.	Cassville
CHAS. R. GRAHAM, one year.	Red Valley

DIRECTORS.

ALFRED JENKINS.	Cassville
C. C. REED.	Cassville
JACOB C. CASLER.	Cassville
ENOCH H. LANNING.	Cassville
E. APPLEGATE.	Toms River
A. B. CLUTE.	Toms River
H. R. WOOD.	Lanoka

REPORT.

BY THE SECRETARY.

The season for 1905 has not been so encouraging as heretofore, but, taking the disadvantage into consideration, the crops have excelled all expectations. The dry weather prevented full crops, but realizing good prices for the products of the farm has partly made up for the short yield.

Corn, about sixty per cent. Rye, wheat and oats, seventy per cent. White and sweet potatoes only fifty per cent. of a crop.

Labor seems to be getting more difficult to obtain as the sea shore attracts all those that are not encumbered, as the wages are higher than the farmer can pay.

The rural free delivery is a step in the right direction, now for the parcel post and it will be complete, as it will save the farmer unnecessary driving to the city or paying enormous express charges.

Game is becoming scarcer every year with all the protection, as so many people gun for a living instead of sport, which will exterminate it entirely, if the open season is not made shorter for a few years and give it chance to replenish.

Stock has gone in winter quarters in fine condition and the weather is all that can be asked for. Winter grain has a good start and looks well for a full crop.

Cranberries, apples and potatoes are bringing good prices and poultry and eggs are high.

There is a boom in real estate, as the Jewish people find Ocean and Monmouth counties a desirable place to live. They have purchased several farms and want more, if they can buy at a low figure. They should be encouraged as there is lots of room on untenable land that needs clearing up as farms.

Salem County.

OFFICERS FOR 1906.

President.	JOHN G. BORTON
Vice-President.	SAMUEL H. MOORE
Secretary.	GEORGIE A. DUELL
Treasurer.	JOEL BORTON

EXECUTIVE COMMITTEE.

BENJAMIN F. STRAUGHN,	EDGAR C. MOORE,	JESSIE L. COLSON,
C. FRENCH MOORE,	S. JACKSON MORGAN,	M. D. DICKINSON,
	GEORGE H. KIRBY.	

REPORT.

BY THE SECRETARY.

The Salem County Board of Agriculture has held three meetings: January, April and October, during the past year, all in Woodstown. The meeting in July was omitted, as the farmers were so busy at that time.

Our subjects for the meetings have been of special interest. Our State Secretary, Franklin Dye, was with us two of the meetings, in April and October, and gave most excellent talks upon "Increasing the Profits of the Farm," and "Economy in Agricultural Pursuits." "Brighter Prospects for the Farmer," "Our Local Soils," "Pure Bred Poultry," "The Garden for the Farm and Home," "What Constitutes a Model Farmer," are subjects which have been most ably presented by those near home and have been very interesting. The year has been rather above the average in profit for the farmers. The poultry and

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dairy industry seems to be upon the increase and prices good. Farmers found a good market for potatoes, tomatoes and apples at the station.

The rural telephone has added another source of comfort and convenience in many farmers' homes and, if we could have the trolley carrying freight, we think Salem County would be an ideal home—now we have not a mile of trolley in the county.

Our Farmers' Institute, which was held January 26th and 27th, 1906, was well attended and exceedingly interesting.

Somerset County

OFFICERS FOR 1906.

President.	HON. LOUIS H. SCHENCH
Vice-President.	BERNARD MEYER
Secretary and Treasurer.	ARTHUR P. SUITHER

DIRECTORS.

Bedminster Township.	C. M. WYCKOFF
Bedminster Township.	WM. C. LANE
Bernards Township.	G. S. VOORHEES
Bernards Township.	FRED C. SUTRO
Branchburgh.	MINNA V. SAUMS
Branchburgh.	S. D. OPIE
Bridgewater.	WM. J. LOGAN
Bridgewater.	BERNARD MEYER
Franklin.	A. V. D. POLHEMUS
Franklin.	GEO. B. RANDOLPH
Hillsborough Township.	JOHN GROENDYKE
Hillsborough Township.	JOHN V. M. SUTPHEN
Montgomery Township.	CHARLES HOWELL COOK
Montgomery Township.	HEUSTON LABAW
North Plainfield Township.	CHARLES F. DEBELE
North Plainfield Township.	HUBERT P. PHILLIPS
Warren Township.	WM. H. ROGERS
Warren Township.	JOHN C. COOPER

REPRESENTATIVES TO STATE BOARD.

HUBERT P. PHILLIPS.	Two years
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REPORT.

BY THE SECRETARY.

During the year 1905, Somerset County has shared in the general prosperity of the country, and intelligence and industry

have been richly rewarded. The report will show an increase in products, and better prices. Farmers are encouraged. The former cry so frequently heard, "Farming doesn't pay," is now scarcely ever heard, and a more satisfied and contented feeling prevails. Our farmers are coming to realize that if they do their part in preparing the soil in an intelligent and intense manner in season, that a kind Providence will do the rest.

This county has materially improved in the last five years. We had 673 miles of public roads, of which 71 have been improved under the "State Aid Act," 26 in and by the Township of Warren, and 20 by individual enterprise; making 117 miles improved. These roads have been improved without bonding the County or materially increasing the County debt. With one sixth of the total mileage improved and the prospect of continued improvement, our prospects are very encouraging. That the improvements of roads have materially enhanced the property goes without saying. The assessed valuation of real estate increased from 1901 to 1904 about half a million dollars, and the valuation of 1905 was a half a million dollars higher than that of 1904. Less attention is given to fruit raising, especially apples, peaches, pears, and plums, the reason for this is manifestly because of the ravages of the scale. Unless our fruit growers and farmers generally adopt the remedy of spraying, these valuable and delicious fruits will have to be abandoned in this County. We therefore urge that they procure the best information from bulletins issued by the State Board, and those published and distributed by the Government at Washington, and use every endeavor to rid the County of this destructive pest.

This Board has held five meetings during the year. Much interest has been manifested, and the meetings have been well attended. We have more than 100 contributing members. The first meeting was held January 7. The annual report of the President, Hon. E. E. Cooper, was a comprehensive report of the past year, and contained valuable suggestions for the future.

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Then followed a discussion on the subject of "Winter Dairying," opened by Charles Howell Cook, in an interesting and forcible address upon the question, followed by the members, and resulting in an instructive and profitable meeting. The meeting of March 11th was addressed by Grant Davis, Esq., of White House, Hunterdon County, upon the subject of "Selection and Care of Poultry for Profit." The discussion was taken up by the members and much interest was developed and valuable information given. It is noted that increased attention is being given to this profitable industry. Herbert P. Phillips exhibited samples of seed potatoes, and gave an address upon "The Selection of Seed for Planting, Preparation of Soil, and Care," which was followed by a profitable discussion. At this meeting Joseph Fitzga, Esq., presented for distribution Government garden seeds.

The meeting of April 29th was largely attended. An interesting paper upon "Farming in Japan," written by Rev. William Johnson, was read by Major N. Y. Dungan, after which our honored member A. A. Cortelyou, Esq., of Neshanic Station, read an admirable paper prepared by him upon the subject of "Corn." The discussion was taken up by Secretary Dye of the State Board and several members of the County Board, which was entertaining, interesting and instructive. This admirable address was published in the County newspapers.

The next meeting, held June 10th, was largely attended, and we were favored by an address by Prof. E. B. Voorhees, President of the State Board, upon the subject of "Wheat Growing." Whatever the Professor says goes. He being a product of the County, is always heartily welcomed home. Our members are very free in questioning him, they assume that he knows it all by experience and his experience is an interesting and entertaining story. The last meeting held December 2nd, addressed by Dr. John B. Smith on "Up-to-date Knowledge Concerning Sprays," was truly a desirable subject at this time. And we have never listened to an address so full of practical experimental

knowledge upon the subject. If our people will adopt the suggestions of Dr. John B. Smith, we shall in a few years be enjoying bounteous crops of fruit. One of the most difficult and serious problems confronting our farmers today is the question of hired help. This must be met in some way.

We think our County Board has been a great benefit to all **who** have availed themselves of the privilege of membership and attendance at the meetings, and it will be the aim of the officers to increase the interest and membership during the coming year.

Sussex County.

OFFICERS FOR 1906.

President, THOMAS C. ROE.	Augusta
Vice-President, D. C. HOWELL.	Beemerville
Secretary, GEORGE A. DICKERSON.	Branchville
Treasurer, THEO. M. ROE.	Branchville

DELEGATES TO STATE BOARD.

GEO. P. MACDANOLDS, one year.	Branchville
ROBERT V. ARMSTRONG, two years.	Papakating

REPORT.

BY THE SECRETARY.

The officers named above were elected at the annual business meeting of the Sussex County Board of Agriculture, held at Branchville, December 14th, 1905. There is somewhat more interest manifested from year to year in our Board, which shows that our farmers are realizing the value of supporting the Board and we think the coming year will show new features in its work in the interests of agriculture in the county.

Although no marked changes occur in the farming industry as a whole throughout the county, there are some changes worthy of note in some localities. The past year has shown considerable variation in crops, especially of corn and hay, owing to the difference in the rainfall. The whole county suffered more or less from drought from spring till fall, but through the southern and middle parts of the county the crops were kept growing by occasional showers, while the northern portion was without any noticeable precipitation during the most critical part of the growing season. Hence we can report fair crops of hay, corn and other grains from the southern and middle parts of the county, while in the northern

portion all crops were cut short, so much so that many dairymen have been forced to sell some of their stock on account of shortage of fodder.

Among field crops receiving most attention, corn comes first on account of the large amount of fodder it produces per acre. Larger areas were planted this year than last owing to the threatened drought, and of this the greater part was planted thickly in rows for fodder only. The scarcity of help is another reason for raising less for husking.

Oats was a good crop, generally speaking, and some large yields are reported. Wheat and rye were about average. Potatoes were a fair crop, but rotted badly. It being the "off year" for apples, this crop was short. Peaches and other fruits about average.

The cultivation of clover increases every year and will continue to do so we believe, as we hear more praise for it every winter as a feed for dairy cows at that season. A few persist in trying to grow Alfalfa, but as yet there have been only a few successes. Grass culture in general is receiving more attention than in some years past.

Efforts are made to obtain better stands at seeding and to maintain the sod in good productiveness for a greater length of time. Lime is being used quite extensively and commercial fertilizers are also found very beneficial in supplementing the manures made at home, which we may say are more carefully handled than in former years.

But little change is to be noted in the live stock on our farms; there are probably a few more colts and swine than last year, but dairy stock, which constitutes by far the greater part of our stock, remains about the same.

Poultry is a little on the increase, several new buildings having been built during the past season for the accommodation of the farm flocks, which at least proves that the stock is receiving better care.

The question of farm help is at present one of the most perplexing problems before us, it being almost impossible at times to secure competent help.

Union County.

OFFICERS FOR 1906.

President, E P. BEEBE.....	Elizabeth
Vice-President, J. D. MAGIE.....	Elizabeth
Secretary, F. E. WOODRUFF.....	Cranford
Treasurer, OGDEN WOODRUFF.....	Elizabeth

EXECUTIVE COMMITTEE.

J. D. MAGIE	D. T. MAGIE	E. P. BEEBE
J, L. HEADLEY	F. E. WOODRUFF	

DELEGATES TO STATE BOARD.

F. E. WOODRUFF.....	One year
G. E. LUDLOW.....	Two years
E. P. BEEBE.....	Alternate

REPORT.

BY THE SECRETARY.

The Union County Board of Agriculture has held nine meetings during the year, with an average attendance of ten. Ten new members have been elected to membership. At the first meeting in January our delegate to the State Horticultural Society reported.

At the first meeting in February our two delegates to the State Board reported. "New Things about Spraying" was discussed at this meeting. At the second meeting in February the question was brought up as to the best way to advertise our Board. It was decided to try and make the meetings more interesting. Reports of the meetings were sent to several of the papers of the

county with invitations to the farmers to join. This decision was carried into effect with good results. The subject of this meeting was "Corn and Grass Growing." A great many good points and new things about both crops were brought out, one thing being that the comparatively new variety of field corn, the White Cap Dent, was a valuable addition to the field varieties.

March 2nd the subject of the meeting was "Potatoes and Spraying." One fact learned was that larger crops could be produced from second crop southern potatoes than from first crop seed.

Mr. Theo. Ball, of Mountainside, a nurseryman and an authority on spraying, gave an interesting and profitable talk on the subject. He said he did his first spraying eleven years ago, making a comparison of sprayed and unsprayed trees, and he decided that in every way it paid to keep trees free from insects.

The San Jose scale was spoken of especially. Mr. Ball said the scale hatches in June and locates and begins to feed in a day or two. After once locating it remains in one place until a new brood is hatched—which always means death to the parent. This scale is always sure death to trees, unless scale is killed by insecticide. Mr. Ball advocated both winter and summer spraying, but preferred the latter as the scale is more easily killed during the hatching period. The only objection to summer spraying being the danger of killing the leaves. As a safeguard against this he tried the solution on trees in the nursery row for which he cared nothing, making it just as strong as the trees would bear. Mr. Ball recommended the following solution: One cake brown soap, three gallons boiling water, three gallons kerosene. Mix well and dilute the whole with eighteen gallons of hot water. Apply while hot. For winter spraying the solution may be made much stronger.

Mr. Ball spoke encouragingly about fruit raising, notwithstanding the numerous pests. Peaches would be as cheap as potatoes were it not for the insect and scale enemies. It is so much more difficult to raise fruit than it formerly was; that the man who

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sprays his trees reaps the profit. As an illustration he told about a plum tree he sprayed, and which he gave the best of care, which yielded three bushels, whereas a tree which was neglected yielded only two quarts.

The subject of the meeting for March 16th was "Culture of Small Fruits." Three varieties of strawberries were mentioned as being especially good, viz., Wm. Belt, President and Senator Dunlap. The Ward blackberry and the Diamond black cap raspberry are considered to be the very best varieties. Red raspberries cannot be successfully grown in this locality on account of the rust. The following is a collection of the best grapes: Black, Campbell's Early, Concord and Moore's Early; red, Brighton; white, Niagara and Moore's early.

On April 13th we held our first meeting in the new Court House. Our county has just built a very fine and commodious edifice which does the county great credit. The Board of Freeholders kindly provided a large room in the new building for our use. "The Culture and Pruning of Fruit Trees" was discussed at this meeting.

On November 2nd the first fall meeting of the Board was held, the subject being "A Review of the Summer's Work." Every one agreed that the season had been a profitable one for most farmers, notwithstanding the partial failure of the potato crop, which was caused by the drought in July.

At the meeting held on November 16th the annual report on crops, prices, etc., was made out, to be sent to the State Board.

On December 7th occurred the annual meeting of the Board. The officers whose names head this report were unanimously elected. The following subjects were briefly discussed: "A Salaried Sheriff," "Equal Taxation," "Adulteration of Foods" and a "Sugar Beet Factory."

Assemblyman Perkins was expected to have been present at this meeting and address us, but he was unavoidably detained.

Mr. Thomas G. Earl, a native of Union county, but now from British Columbia, gave an interesting talk on fruit raising in that country. Mr. Earl said that the scale and insect pests were rather

generally kept in check there, consequently extra fine fruit is raised.

British Columbia took the prize of the world for apples at the St. Louis Exposition. The climate of British Columbia is especially well adapted for apple growing.

On December 21st the Board discussed the subject, "Is not Farming just as Attractive to Young Men as Any Other Line of Business?" E. R. Collins, editor of the N. J. Farmer, and others gave short talks on the subject.

Mr. Collins said that agriculture is a profession just as much as medicine or law, and that just as much study, if not more, is reequired in order to become a good farmer as a good physician or a good lawyer. Farming is as attractive from almost every standpoint.

Dr. J. B. Ward and other members of the Booard also spoke briefly. Every one seemed to think that if the farm and farm home was made attractive and pleasant, young men would be drawn to farming.

We think that our meetings have been more interesting and profitable than for some years past. We have made greater efforts to interest the farmers in our Board, for we think that the two most important essentials to successful farming are organization and education.

Warren County.

OFFICERS FOR 1906.

President, WILLIAM C. ADDIS.	Delaware
Vice-President, NICODEMUS WARNE.	Broadway
Secretary, WM. EUGENE OBERLY.	Asbury
Treasurer, John Albertson.	Deleware

DIRECTORS.

HENRY PURSEL.	Phillipsburg
WM. H. BOWERS.	Hope
SAMUEL REED.	Mount Vernon
A. D. ROSEBERRY.	Belvidere
AZARIAH FREY.	Stewartsville
R. B. MARTIN.	Blairstown
FRANK HOUSEL.	Broadway

DELEGATES TO STATE BOARD.

CHARLES M. OBERLY, two years.	Shimers P. O., Phillipsburg
JAMES I. COOK, one year.	Mount Hermon

REPORT.

BY THE SECRETARY.

The Warren County Board of Agriculture has held interesting meetings during the year. At our June meeting Franklin Dye, Secretary State Board, gave us a general, good talk, bringing out some important facts and points relating to our grievances. One of our greatest drawbacks is to get farm help. He spoke of the Carlisle School and the Woodbine, Jewish, Agricultural School as furnishing very good help, by treating them well.

He also spoke concerning the dairy, that it should be managed in a scientific way, that we could make dollars where we

only make cents. It seems very strange for people to make remarks that farming don't pay. There are different branches of farming and openings for every farmer.

There is demand for milk ready sale and, if the dairymen would combine, they could secure better prices. Raising stock is another branch. We do not raise stock to supply home demand. Drovers bring car loads of horses in our county and dispose of them at good prices. Cattle are also brought in by the carload and are sold at fair prices averaging from 45 to \$55 per head; look at the amount of money farmers are expending for stock every year.

Crops for the past year, wheat, rye and corn, being only medium crop at prices low. Wheat 80 cents, rye 60 cents, corn 50 cents, oats 32 cents. Hay, half crop, fair price, \$15.00 per ton.

Fruit: Apple crop being an entire failure in the county, just about one-fourth of fruit trees are killed by San Jose scale. The majority of the trees are affected with the scale. Some orchards where spraying has been followed every year, are free from scale. Potatoes, being a failure in some parts of the county, prices 50 cents and 80 cents, and are very scarce at that.

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