

STATE OF NEW JERSEY

Thirty-Fifth Annual Report

OF THE

State Board of Agriculture

1907

NEW JERSEY STATE LIBRARY

Printed by Order of the Legislature

TRENTON, N. J. :
THE JOHN L. MURPHY PUBLISHING CO., PRINTERS.
1908.

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

SIR—IN accordance with the act creating the State Board of Agriculture, adopted April 22d, 1884, and with the provisions of the law approved June 15th, 1895, I have the honor to present the report of said board for the year 1907.

FRANKLIN DYE,

Secretary.

Dated Trenton, November 11th, 1907.

(3)

State Board of Agriculture.



OFFICERS AND EXECUTIVE COMMITTEE FOR 1908.

PRESIDENT.

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

VICE PRESIDENT.

JOHN T. COX.....White House.

TREASURER.

WALTER HERITAGE.....Swedesboro.

SECRETARY.

FRANKLIN DYE.....Trenton.

GEORGE E. DeCAMP.....Roseland.

JOHN M. LIPPINCOTT.....Moorestown.

A. J. RIDER.....Hammonton.

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.

Term of office, one year dating from January 1st, 1908, to December 31st, 1908,
for all except County Board Directors.

CLASS A.

- EMMOR ROBERTSGeological Survey.
- D. D. DENISE } Board of Visitors, Agricultural College.
- CYRUS B. CRANE }
- EDWARD B. VOORHEESProfessor of Agriculture.

CLASS B.

- GEORGE W. F. GAUNTMaster of State Grange, P. of H.
- HENRY F. BODINESecretary of State Grange, P. of H.

CLASS C.

- ALBERT REPP } State Horticultural Society.
- LESTER COLLINS }
- C. C. BASLEYBergen County Pomona Grange.
- J. B. WARRICKBurlington County Pomona Grange.
- JOHN S. JAGGARDCamden County Pomona Grange.
- J. A. GANDYCumberland County Pomona Grange.
- CARRIE E. DOBBINSCentre District Pomona Grange.
- ALBERTUS ORRGloucester County Pomona Grange.
- J. W. OPIEHunterdon County Pomona Grange.
- JOEL WAINWRIGHTMercer County Pomona Grange.
- DAVID J. PERRINEMiddlesex and Somerset Pomona Grange.
- ROBERT THOMPSONMonmouth County Pomona Grange.
- J. GILBERT BORTONSalem County Pomona Grange.
- GEORGE E. HURSHSussex County Pomona Grange.
- SAMUEL T. BOWMANWarren County Pomona Grange.

BOARD OF DIRECTORS.

BOARD OF DIRECTORS.

NAME.	ADDRESS.	TERM.	COUNTY.
JACOB E. HOLMAN	..... Hammonton	..... 2 years	..... Atlantic.
JOSEPH BUTTERHOF	..... Egg Harbor City	..... 1 year "
FRED. V. STROHSAHL	..... Park Ridge	..... 2 years	..... Bergen.
JOHN F. BOMM	..... Westwood	..... 1 year "
HARRY ALBERTSON	..... Wrightstown	..... 2 years	..... Burlington.
HOWARD G. TAYLOR	..... Riverton	..... 1 year "
SAMUEL R. COLES	..... Merchantville	..... 2 years	..... Camden.
DANIEL W. HORNER	..... Merchantville	..... 1 year "
JOSEPH W. PINCUS	..... Woodbine	..... 2 years	..... Cape May.
RALPH SCHELLENGER	..... Green Creek	..... 1 year "
ROBERT PEACOCK	..... Deerfield	..... 2 years	..... Cumberland.
W. S. BONHAM	..... Shiloh	..... 1 year "
A. E. HEDDEN	..... Verona	..... 2 years	..... Essex.
WM. DEICKS, SR.	..... Chatham	..... 1 year "
E. T. RIDGEWAY	..... Mullica Hill	..... 2 years	..... Gloucester.
MASON CARTER	..... Clarksboro	..... 1 year "
		..... 2 years	..... Hunterdon.
H. E. DEATS	..... Flemington	..... 1 year "
JOHN V. GREEN	..... Trenton	..... 2 years	..... Mercer.
JOHN M. DALRYMPLE	..... Hopewell	..... 1 year "
B. DEWITT GILES	..... New Market	..... 2 years	..... Middlesex.
GEO. W. MOUNT	..... Monmouth Junction	..... 1 year "
H. W. BUCK	..... Freehold	..... 2 years	..... Monmouth.
D. HOWARD JONES	..... Freehold	..... 1 year "
EDGAR C. HOPPING	..... Florham Park	..... 2 years	..... Morris.
S. E. YOUNG	..... Rockaway	..... 1 year "
C. MILTON HORER	..... Cassville	..... 2 years	..... Ocean.
ROBERT C. GRAHAM	..... Holmeson	..... 1 year "
JOHN ACKERMAN	..... Paterson	..... 2 years	..... Passaic.
LEONARD PIKAART	..... Paterson	..... 1 year "
L. F. PRICKEIT	..... Woodstown	..... 2 years	..... Salem.
COOPER COLES	..... Woodstown	..... 1 year "
CHARLES F. DEBELE	..... Plainfield	..... 2 years	..... Somerset.
JOHN GROENDYKE	..... Finderne	..... 1 year "
JACOB N. VANAUKEN	..... Beemerville	..... 2 years	..... Sussex.
ROBERT O. BALE	..... Augusta	..... 1 year "
E. R. COLLINS	..... Westfield	..... 2 years	..... Union.
J. L. HEADLEY	..... Union	..... 1 year "
FRANK HOUSEL	..... Asbury	..... 2 years	..... Warren.
JAMES I. COOK	..... Mt. Hermon	..... 1 year "

OTHER ASSOCIATIONS.

F. W. STOUT	..... Monmouth Junction	} Princeton Farmers' Club.
W. B. MCFARLANE	..... Rocky Hill	
EZRA E. DARNELL	..... Mount Laurel	Mt. Laurel Farmers' Club.
A. J. RIDER	..... Hammonton	American Cranberry Growers' Association.
J. H. M. COOK	..... Caldwell	New Jersey Bee Keepers' Association.

PROCEEDINGS OF THE
THIRTY-FIFTH ANNUAL MEETING
OF THE
New Jersey State Board of Agriculture
HELD AT THE
STATE HOUSE, TRENTON, NEW JERSEY,
Wednesday, Thursday and Friday, January 15, 16 and 17,
1908.

STATE BOARD OF AGRICULTURE.

Thirty-fifth Annual Meeting.

FIRST DAY—MORNING SESSION.

WEDNESDAY, January 15th, 1908.

The president, Dr. E. B. Voorhees, called the meeting to order at 10:30 o'clock, and prayer was offered by Rev. Dr. W. Strother Jones, of Trenton.

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

The President—The next thing is the presentation of the order of business. If there are any changes Mr. Dye will explain them; if not, we will follow the order presented here if it is adopted by you.

Mr. Dye—I will say that, instead of Professor Bevier speaking first to-morrow afternoon, the postmaster-general will speak first, and he will be followed by Professor Bevier. That is all the change that I have to suggest.

The programme was then adopted as outlined.

ORDER OF BUSINESS.

WEDNESDAY.

First Session.

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.

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11:30 A. M.

Reading of 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 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.

"Money in Sheep for New Jersey Farmers," by F. C. MINKLER, Professor of Animal Husbandry, State Agricultural College, New Brunswick, N. J.

3:30 P. M.

Annual Address of President of the Board, DR. EDWARD B. VOORHEES.

4:30 P. M.

Report of Commission on Tuberculosis in Animals.

Third Session.

7:15 P. M.

"A paying Crop for Poor Lands," by ALFRED GASKILL, State Forester. Illustrated with colored lantern slides.

8:15 P. M.

"The Parasite Question Practically Considered," by DR. JOHN B. SMITH, State Entomologist. Illustrated with stereopticon.

THURSDAY.

Fourth Session.

9:30 A. M.-12:30 P. M.

Prayer.
Unfinished and New Business.

10:00 A. M.

"The Soil Fertility Problem," by ALVA AGEE, Professor of Agricultural Extension, Pennsylvania State College.

11:00 A. M.

"Corn Improvement," by PROF. M. L. BOWMAN, Head Department Farm Crops, &c., Iowa State College, Ames, Iowa.

NOTE.—Sample ears of corn from the different counties of the State will be shown for comparison.

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Fifth Session.

2:00-5:00 P. M.

Unfinished and New Business.

2:30 P. M.

"Improvement of the Rural Schools," by PROF. LOUIS BEVIER, JR., High School Inspector, Rutgers' College, New Brunswick, N. J.

3:15 P. M.

"Extension of the Present Parcel Post, the Establishment of a Local Parcel Post on Rural Delivery Routes and the Inauguration of a System of Postal Savings Banks," by HON. G. VD MEYER, Postmaster-General of the United States.

Sixth Session.

7:45 P. M.

"Servia and Bulgaria, the Battleground of Europe," introducing many colored pictures and a number of life motion scenes—a superbly illustrated stereopticon lecture, by COL. GEORGE NOX MCCAIN.

By arrangement with J. M. Green, Principal, this lecture will be delivered in the Auditorium of the State Normal School.

Music will be furnished by the Orchestra and the Philomela Club, of the State Schools.

FRIDAY.

Seventh Session.

9:30 A. M.—12:30 P. M.

Unfinished Business.

10:00 A. M.

"Essential Principles in the Practice of Market Gardening," by PROF. R. L. WATTS, Scalp Level, Pa.

11:00 A. M.

"A Campaign for Rural Progress," by KENYON L. BUTTERFIELD, Dean of Massachusetts Agricultural College, Amherst, Mass.

12:00 M.

Closing the Business of the Board.

On motion the reading of the minutes of the last meeting was dispensed with and the printed copy was adopted as the minutes.

The president then appointed the following committees:

On Credentials—Tylee B. Engle, E. T. Ridgeway and H. E. Deats.

On Resolutions—A. J. Rider, S. H. Fort and A. E. Hedden.

On Treasurer's Accounts—W. S. Bonham, John Ackerman and B. DeWitt Giles.

The report of the executive committee was then read by John T. Cox, and is as follows:

REPORT OF THE EXECUTIVE COMMITTEE.

To the New Jersey State Board of Agriculture, January 15th, 1908:

GENTLEMEN—It is a pleasure to again meet the farmers of New Jersey—the members of this board—in annual meeting, the thirty-fifth since its organization.

Since our meeting a year ago the farmers of the State have taken up and completed a year's work on their farms. While the weather conditions were somewhat unusual, yet, from reports received, we believe their labors have been rewarded with a good degree of success.

The business of this board has gone forward under the efficient direction of our president, and few meetings of the committee have been necessary. The report of the board covering the proceedings of the last annual meeting was published and distributed early in the season—much more so than was the report of 1905-06. These reports are highly valuable and the officers of the board and of our various farmers' organizations should endeavor to have them placed in the hands of farmers who may not know their value nor be able to attend this meeting.

Your committee during the year has had before it the question of the drainage of the salt marsh or salt meadow area bordering or near our sea and Delaware bay coast.

The United States Department of Agriculture has signified its desire to co-operate with this State in this work, and the executive committee have passed the following resolution concerning it:

“It is the sense of the executive committee of this board that we realize the importance of this proposition, and that we desire to extend what co-operation we may to further the work proposed for this State.”

On November 25th, 26th, 27th, 1907, the National Drainage Association met in Baltimore. Dr. E. B. Voorhees was appointed a delegate to said meeting to represent this board. Other delegates were recommended by us to be appointed by the Governor.

At the June meeting of the committee the secretary was appointed to arrange for the farmers' institutes for the coming fall and winter, to engage speakers, select subjects and conduct the same.

The crop report, issued monthly by the secretary, was approved,

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and the dates for this annual meeting selected. The secretary was authorized to hold one or more dairy meetings last of August and first of September as the funds at our disposal might warrant.

At the October meeting the annual appropriation to each of the county boards was made and to the State Horticultural Society, as required by law. Secretary reported he had planned for twenty-six farmers' institute meetings, which was seventeen less than was held last fall and winter, owing to a reduction in our appropriation of \$1,000 by the appropriation committee of the Legislature of 1907.

As to the reduction in our appropriation of \$1,000 from what it was the year before, the appropriation committee did not give us any reason for its action. The secretary appeared before it and explained the nature of work, its usefulness to the agriculture of the State, and respectfully asked for the usual amount—\$8,000—a very small sum for all the work and expenses of the board.

Furthermore, the president, Dr. E. B. Voorhees, wrote a letter to the chairman, Hon. Mr. Bradley, explaining in detail what this money was used for and how it was expended, earnestly urging the usual appropriation. But this was not acknowledged, but we were turned away with \$7,000 appropriation.

Secretary also reported correspondence with the Department of Commerce and Labor, Bureau of Immigration and Naturalization, Washington, D. C., with reference to securing farm help through that agency, and that he had called the attention of our farmers to this fact in the Crop Bulletin and through the press. This action of the Secretary was commended and approved by the committee.

Secretary reported the attendance and interest at the summer dairy institutes as very encouraging. The lectures of Mr. H. E. Cook, Denmark, New York, and of Prof. F. C. Minkler, of the Agricultural College, New Brunswick, were sound and instructive, and the studious attention of the farmers showed they were being benefited.

Not receiving a guarantee from the Jamestown Exposition Commission of New Jersey that they could furnish us enough money to make a comprehensive exhibit of our agricultural industry at Jamestown, that was abandoned. Our president and secretary, however, prepared articles descriptive of our State agriculture, our agricultural college work and our State agricultural organizations, which were published by the commission and distributed at the exposition.

In doing so it was stipulated that a proportion of the copies printed should be turned over to this board for its use. This has been done and the book will be used as was the Pan-American Hand-Book of New Jersey to inform inquiring persons, who desire to settle in New Jersey, as to our resources and opportunities.

At the meeting held December 30th the committee renewed their action of September, 1903, with reference to increasing the efficiency of our agricultural organizations.

In September, 1903, the executive committee issued a circular letter to the directors of the State board and to officers of county boards and granges, from which the following extract is made, viz. :

“The county boards of agriculture were organized according to law and are auxiliary to the State board, hence they are a part of the general system of organized agriculture in New Jersey. That they are capable of doing much practical good to the counties where they exist, when well supported and efficiently managed, is abundantly proved by the past record of most of them. That they are not more so in some cases is due, we believe, chiefly to the lack of co-operation by the farmers in general and the indifference of others who could, if they would, arouse an interest and increase the membership in them.

“The granges also are recognized by the State law. These have rendered valuable assistance in the institute movement by their co-operation in suggesting topics for consideration, in engaging halls for meetings, and especially in securing a much larger attendance than would have been possible without their assistance.

“Therefore the executive committee of the New Jersey State Board of Agriculture designate the directors (delegates) of the State board, the president and secretary of the Pomona (county) grange (or of the sub-grange, if there is no county grange) in each county, an advisory committee to act in conjunction with the executive committee of the State board and with the secretary as directors of institutes, in matters pertaining to the increase of membership and active usefulness of our agricultural organizations, thereby elevating and improving the agricultural thought and practice of the farmers of New Jersey, in order that a larger profit may be secured by them from this industry, and that it may become more popular and the farms more valuable.”

The executive committee, in reiterating the above action, would say that with the secretary they earnestly desire a stronger local co-operation in the institute work. Hitherto and even yet, in some

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localities, the work has been experimental, and the farmers were not acquainted with its methods, its purposes nor its possibilities of helping them in their business. That period is now passed.

The institute is not now a stranger needing introduction. This being so, the farmers, in any locality, desiring an institute should with earnest purpose and co-operation take up the local work of securing a place of meeting, advertising it and securing a large attendance.

For the future the executive committee will, according to the funds at its disposal, determine how many institutes or days of institute work can be allowed to each county, after which the secretary of the State board will notify *the secretary of the committee of co-operation in each county* as the general committee on institute and county board work, hence these officials *should meet and organize* as soon as possible after this meeting.

This committee will suggest such topics connected with local agricultural, horticultural, stock matters, &c., as, in their judgment, would be profitable to have discussed at the institute for the consideration of the executive committee. If this is done early a better programme can be arranged and wider publicity given to the meeting. Furthermore, there are some localities so favored by railroad and trolley lines, to say nothing of our good roads, that instead of holding, say, two or three one-day meetings within a few miles of each other, these meetings should be consolidated, and a two or three-day institute be held. The advantages from this course are many.

In the one-day meetings the interest, when aroused, is not deepened as it should be, and the subjects are not so fully discussed and understood as they would be if a longer time were given to each, and the institute become a *school* of agriculture where the pupils and the instructors become acquainted with each other.

We earnestly hope that the neighborhoods having such transportation facilities as have been indicated will earnestly co-operate in this plan of work when requested to do so; we believe it will be an *important forward movement*.

The order of business for this annual meeting is before you. We believe the subjects presented will be both interesting and profitable, and we trust this meeting will not, in any particular, fall below the high standard heretofore set and maintained.

Respectfully submitted,

EXECUTIVE COMMITTEE

The President—You have heard the report of the executive committee, and, I might say, that the committee did not appoint a committee on officers' reports, believing that a discussion of the reports in open session, without previous going over by a committee, would be quite as valuable, hence this report is now before you for discussion, previous to any action that you may take concerning it.

Mr. Dye presented a copy of the hand-book that was gotten up by the Jamestown Exposition committee, stating that in it is the matter spoken of in ex-committees' report, prepared by Dr. Voorhees, Mr. Ketcham and myself. It is of advantage to the State generally and to the people who desire information about the State. It is also a very valuable book to have in the home, because I believe nowhere else is there such a concise history of the counties as there is here. We have had very many applications from the school teachers and principals for our Pan-American book for use in their schools.

I might emphasize another matter, the suggestion as to institute work. I don't know who will take the initiative, whether it will be the secretary of the Pomona grange or the secretary of the county board of agriculture; it won't make much difference, but if you can get together the secretaries of the county board and Pomona grange and the delegates from each county and organize and appoint a secretary, we will then have somebody in each county to whom we can write about institute work as suggested.

On motion the report was received to be incorporated in the annual report.

The report of the State grange was then presented by George W. F. Gaunt, W. M. (See report.)

Mr. Gaunt—I notice in the report of the executive committee that there has been a decrease in the appropriation for the State board. The State grange at its recent session at Atlantic City went on record as being opposed to that kind of legislation. They believe that instead of reducing the appropriation from eight to seven thousand it should have been increased from eight to ten thousand, and I think before this session is over there will be a resolution introduced asking our lawmakers, who have so suddenly become economical, that our appropriation be increased to an amount commensurate with the agricultural dignity of the State.

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There are other matters that the State grange has taken a lively interest in during the past year, and for the benefit of our members here I will say that the National grange has gone on record as favoring national aid to the improvement of the highway. We have gone on record as favoring the parcel post; we have gone on record as favoring the establishment of a postal saving bank, and these three separate measures will be presented to Congress during the coming session, and the National grange and the members of the grange throughout the United States will take a lively interest in seeing to it that these measures are incorporated into a law. We believe they are just and should have been laws long before this. I will not attempt to discuss the two last named, because the post-master-general will be here to-morrow and deliver his address. I think it will be for us to have resolutions presented and have the State board endorse the same resolutions that were passed by the State and National grange, thereby aiding the National grange in the work they are doing at Washington at the present time.

The President—In reference to the appropriation to the State Board of Agriculture, I will state that it is a curious thing that the appropriation committee began to economize with the agricultural industry, and they economized in such a small way there so that they could enlarge their appropriations on matters that have no influence on the public welfare. It is well to take that into consideration.

It is for us to present our claims in such a way as to impress them with the importance of the industry we represent and the justice of our demands. This report is now before you; what is your pleasure?

The report was adopted.

Mr. Dye—I think we are very fortunate in that the master of our State grange is also lecturer of the National grange. New Jersey is honored. You will notice by the sweeping report of Brother Gaunt that he has touched on the progress of this great organization throughout the United States, and I thought as he was reading, if my memory is right, just prior to the American revolution there were three farmers' organizations in this country—little feeble organizations. One, I believe, was near Philadelphia, and one in North Carolina, and the other was, perhaps, in Massachusetts or New York, and they met, as it were, by stealth. It was a penal offense then to import blooded animals, to improve the

native stock; but what farmers' organizations we have to-day, and how the thoughts of the farmers now turn to organization. Fellow-farmers and brother-grangers, what a power is here at our command; we need but to direct it wisely as has been done in the main, in the past and make these organizations influential along the lines suggested, thereby improving not only agriculture and the agricultural population but those in other callings as well.

The report was then adopted.

Mr. Dye—In submitting the order of business I forgot to make a place on the programme for Dr. Smith's report, but he will present it, and I move that his report be printed in the proceedings as usual.

Motion adopted.

The treasurer's report was submitted by Walter Heritage, treasurer, and is as follows:

REPORT OF WALTER HERITAGE, TREASURER, FOR THE FISCAL YEAR ENDING
OCTOBER 31ST, 1907.

Dr.

Total amount received from Comptroller during the year \$6,192 13

Cr.

1907.		
Jan. 18. By Delegates' expenses at Annual Meeting.....	\$383	29
Speakers and expenses.....	402	23
Stenographer's bill at Annual Meeting.....	86	70
Janitor and lantern service.....	20	00
Appropriations to county boards of agriculture	845	00
Appropriations to State Horticultural Society	300	00
Express company's bills.....	276	12
Packing annual reports	10	00
Postage stamps and postal cards	435	07
Executive Committee's expenses	224	45
Expenses of Farmers' Institutes	3,209	27
		<hr/>
		\$6,192 13

The report was received and referred to the committee on treasurer's account.

Secretary Dye then read his report, which see.

Mr. Dye—You will pardon me for calling attention to defects in our work; that is what we are here for, to try to create a friendly rivalry, to obtain better results. I hope that within the next twenty years our farms will produce twice as much as they do to-day.

The President—The report is now open for discussion.

Mr. Butterhof—I think it is a good and wise suggestion to create a standing committee in relation to the defects in the game laws. I move that a standing committee be appointed to confer with the fish and game commissioners in reference to interviewing the Legislature, or in relation to any action that may be taken by the fish and game commission.

The motion was adopted.

Moved and seconded that the committee be appointed by the president. Carried.

Mr. Collins (of Union)—I think that the appointment of a committee to take up the question of transportation is about as important as the question of fish and game laws, and I move that a committee on transportation be appointed to confer with the State railroad commission, and that the committee be appointed by the president.

Motion seconded and carried.

Secretary Dye—I want to take up the question of crop yields, and particularly with reference to corn. The reports came to me during latter part of September and there has been some bad weather since. The average of the reports make it 36.5 bushels per acre for the State. Now, is that too high or too low?

A very interesting discussion followed this question as to the yield of corn, which was participated in by delegates from twenty counties. Some advocated a higher figure than 36.5 average, a few of them thought it should be a little lower, when a motion was made to substitute forty-five bushels per acre instead of 36.5. This was opposed, and a motion was made by Joseph Fitzga to amend the former motion to let the figures stand as the secretary has them.

On this motion Vice President Cox spoke, in part, as follows:

“I hope before this resolution is adopted our members will take into consideration that when you are figuring the average for the State you are figuring upon the average of the poorest farms as well as the good farms. I have traveled some over the State during the year, and I can assure you, gentlemen, that from some of

these counties where they are reporting yields from fifty to seventy-five bushels, I have seen corn growing that would not yield twenty-five bushels. Let us be careful; if we fix the average at forty-five we are fixing an average above any State in this Union, an average above any production that has ever been recorded. Let us bear in mind while we are holding up the reputation of the State, and it stands very high in the production of all crops that we produce, let us remember that when we go on record with an average for the State that we must average the poor farms with the good ones. Then, also, they are not all progressive agriculturists that are growing corn; they are not all model farmers, and not all produce high crops and a high average. The tendency of these progressive farmers is to increase the average of the State; there is no question about that, and as we increase the number of progressive farmers we increase the average production of the State, but we have these others, and we have to take them into consideration when we fix the average for the State. I hope that this State board will consider this well before it changes these figures which have been so carefully gathered by our secretary and from so many sources before they try to increase it. (Applause.)

Mr. Dye—My thought was that I might be too high, and hence I wished to bring the question before the board. As I stated, the storm came in after some of these reports were made and the crop was injured; we are not considering the quality, however, but the yield—that is what we want to get at, and we don't want to publish a report that is too low nor go too high and seem to brag about that which we haven't got. The figures now stand at 36.5.

The motion made by Mr. Fitzga was then put to a vote and the figures fixed at 36.5.

A recess was then taken until two o'clock.

FIRST DAY—AFTERNOON SESSION.

After the roll was called by the secretary, Mr. Deats, of the committee on credentials, said: We have a certificate from the New Jersey State Bee Keepers' Association appointing a delegate.

The President—The question is, shall this person serve as a delegate from the Bee Keepers' Association at this meeting?

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Mr. Denise moved that the representative be admitted as a delegate. Carried.

Mr. Deats then submitted the report of the committee on credentials. (See list preceding these minutes.)

APPOINTMENT OF NOMINATING COMMITTEE.

The President—The next order of business is the 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 member of this committee). The committee will report when ready. The secretary will call the roll of counties, and as the roll is called one member should be nominated by each county to serve as a member of this committee.

The secretary called the roll and the following nominations were submitted:

Atlantic county—Joseph E. Butterhof.
 Bergen county—John F. Bomm.
 Burlington county—Charles Collins.
 Camden county—Daniel W. Hornor.
 Cape May county—J. W. Pincus.
 Cumberland county—W. S. Bonham.
 Essex county—Cyrus B. Crane.
 Gloucester county—Mason Carter.
 Hunterdon county—John W. Opie.
 Mercer county—Wallace Lanning.
 Middlesex county—George W. Mount.
 Monmouth county—D. Howard Jones.
 Morris county—S. E. Young.
 Ocean county—R. C. Graham.
 Passaic county—Leonard Pikaart.
 Salem county—Cooper Coles.
 Somerset county—John Groendyke.
 Sussex county—Jacob N. Van Auken.
 Union county—E. R. Collins.
 Warren county—James I. Cook.

The President—The next order of business on the programme is a paper on

“MONEY IN SHEEP FOR NEW JERSEY FARMERS,”

By F. C. Minkler, Professor of Animal Husbandry, State Agricultural College at New Brunswick.

I take great pleasure in introducing him. He comes to us from the State of Iowa, and is our instructor of Animal Husbandry at the State College.

Mr. Minkler then read a paper on the subject named, which see.

Secretary Dye—We have come to the point in our programme where it becomes necessary to introduce the next speaker, and it gives me great pleasure, in the absence of the vice president, to introduce our professor of agriculture, director of the State and College Experiment Stations and president of the State Board of Agriculture, Dr. Edward B. Voorhees.

Dr. Voorhees then delivered his annual address. (See address.)

A motion was made that the address of the president be received and made a part of the record. This motion was seconded and discussed in relation to having the address immediately printed and distributed, particularly that part that relates to dairy matters, if the Comptroller would allow the expense.

Mr. Gillingham proposed that the balance in the treasury of the State Dairy Union be used for this purpose if necessary.

This was moved by Mr. Crane and adopted.

After a somewhat extended discussion, a motion prevailed that the whole matter be referred to the executive committee with power to issue a pamphlet if the way be clear.

The report of the commission on tuberculosis in animals was then submitted and read by Secretary Dye. (See report.)

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

Vice President Cox—We have now reached the end of the programme, and this is the opportunity for the members of the board to present any new business if they so desire. Are there any resolutions?

Mr. Horner read a resolution on automobile matters and it was referred to the committee on resolutions.

A Member—In reference to the report of the tuberculosis commission, could we have a law enacted to enforce tuberculin tests before any animals were exposed for sale in this State; I think it would tend to prevent the spread of tuberculosis among our animals.

Secretary Dye—You mean, if any persons wished to have a vendue in the spring, he should have his herd tested?

A Member—Any time any dairy animal exposed for sale shall be tested.

Mr. Wainwright—I want to bring up a matter. I have a letter from my milk dealer stating that milk after the 15th of this month would be four cents a quart. Brother Samuel Fort is here, he is one of the members of the Milk Shippers' Union and a member of its executive committee, and I want him to tell us whether or not we are forced to take four cents, or whether we can do better if we stop shipping for a few days.

Mr. Fort—Our committee fixed the price in Philadelphia at five and one-half cents per quart for the month of November. We did that expecting the dealers to raise the retail price to nine or ten cents per quart, and we thought giving the farmer five cents and he paying one-half cent for freight was asking too much of the producer, while the dealer was getting five cents for handling it. We based our price, five and one-half cents, upon the cost of production and then notified the Milk Exchange of Philadelphia and left it for them to raise the retail price. They had been anxious for an opportunity and had told some of the members they only wished they could raise the retail price to nine or ten cents. There was nothing for the producer nor the retailer at eight cents when divided between the two. It has been said, and truthfully, by the best men in Philadelphia who are in the retail business, the men who have all modern facilities for taking care of milk, and they can prove it costs in the neighborhood of three and one-half cents to deliver it in accordance with the requirements of the board of health in a sanitary condition. That being the case, there is not much margin when the dealers sell for three and one-half cents. Of course, some of those dealers believe in cheap milk, but they don't represent 5,000 quarts of milk. But the consumers of milk in Philadelphia are beginning to see light. They are satisfied that the farmers are not getting enough for milk at wholesale.

The Milk Exchange and Milk Shippers' Union made it four and one-half cents for the month of January. But recently a few of the leaders of the Milk Exchange passed a resolution reducing the price to four cents. Now, are the farmers going to take it? My worthy friend has asked for information. The farmers have the power in their own hands if they will use it, if they believe enough in organization. If the farmers would put their milk in the hands of the executive committee of the Milk Shippers' Union of Philadelphia and abide their decision, in case of a crash they would get five cents a quart.

That would be business, but now you stand alone single-handed. A dozen men rule the Milk Exchange and tell you what they will give for milk, and you are not a party to the contract. Now, look at your feed bills. If the farmers were organized, as they should be, and would stand as one man, they could buy their feed through a co-operative purchasing committee, as that of the State grange, and they could save \$10 a ton on feed. Those 200,000 cows at a half a ton each and \$10 saving per ton means \$1,000,000. It is an immense sum. But the trusts bleed you for it.

Dr. Voorhees—I am glad to hear the remarks on this, one of the most important questions before the farmers to-day, the question of getting a paying price for a product, something at least above what it costs. We have been going along without due consideration of this question, and it does seem to me that this meeting, and such meetings as are now being organized, should be fully attended by the farmers and these matters discussed and put properly before the public. Let us get together and be united.

It is just as I pointed out to-day, we haven't got the courage of our convictions; we won't make a few dollars' sacrifice in order that we might make larger sums; you can't make good milk and meet the requirements which are fair unless you get paid for it, and the consuming public should know this. We are not selfish in moving this matter along, we are only protecting our business and demanding a fair return for our labor. We hire labor to help make this milk and pay it union wages, and they would not work for us if they could get only the return that we get for our milk. That is an important question from an economic standpoint; it is one that touches the bottom and the heart of the whole question. We ought to rise up and say we will do this thing; it may mean a temporary loss, but in the long run it is going to be a gain to us

financially, and it is going to be for the good of the entire people as soon as they see it.

I believe the time is coming when we have got to take up in some practical way the education of the consumers of home-grown products, and educate them as to the right way to use them and the usefulness of them, and their value when considered from the standpoint of the value of other products. Let us not stop with simply making resolutions, let us meet the situation squarely.

Mr. Deicks—We used to be in the dairy business, but we had to give it up because there was more hard work than profit in it. Under the present price and circumstances I don't see how you dairymen can make anything. We are handicapped in our part of the State by outside milk concerns, also we cannot produce the milk and make a living.

Another thing, the board of health in our part of the State is getting very particular. It is right in some respects, but yet they are too strict. In Montclair they fixed regulations that are so strict that it is almost impossible for a common farmer to raise milk.

At this point a recess was taken until 7:15 in the evening.

WEDNESDAY—EVENING SESSION.

Vice President Cox—The first question that we will consider is "A Paying Crop for Poor Lands," which will be presented by Mr. Alfred Gaskill, State Forester. It gives me a great deal of pleasure to introduce to this State Board of Agriculture Professor Gaskill.

Mr. Gaskill then read a paper which he followed with stereopticon views on the subject. (See paper.)

Vice President Cox—We will now have a lecture by Dr. J. B. Smith, the State Entomologist, on the subject, "The Parasite Question Practically Considered." I take pleasure in presenting Dr. Smith.

Dr. Smith then read a paper on the subject named, which was followed by stereopticon illustrations. (See address and discussion following.)

The meeting then adjourned to Thursday morning.

THURSDAY, JANUARY 16TH, 9:30 A. M.

The meeting was called to order by Vice President Cox and was opened with prayer by the Rev. Dr. Walter A. Brooks, of Trenton.

Mr. Cox—This is the proper time for resolutions to be introduced.

Mr. Pikaart, on behalf of the committee on nominations, submitted the following report:

Your committee on nominations asks the pleasure of reporting on the officers for the ensuing year:

For president, E. B. Voorhees, New Brunswick, Middlesex county.

For vice president, John T. Cox, Hunterdon county.

For treasurer, Walter Heritage, Gloucester county.

Executive committee—George E. DeCamp Essex county; John M. Lippincott, Burlington county; A. J. Rider, Atlantic county.

The office of secretary not being vacant.

Moved and seconded that the report be received and the recommendations of the committee adopted and the officers declared elected.

Motion carried.

Vice President Cox—I declare the officers reported by this committee elected as the officers of this board for the coming year. I would ask Dr. Smith if he had time last night to finish all he had to say; if not, we will gladly offer him an opportunity now.

(See further discussion by Dr. Smith following his paper.)

Mr. Lanning—Those who were here yesterday listened with a great deal of interest to the address delivered by Professor Voorhees, and on that part of the address upon the production and sale of milk I offer a resolution.

The resolution was referred to the committee on resolutions. (See their report.)

Vice President Cox—The next paper on the programme is by Alva Agee, professor of Agricultural Extension, Pennsylvania State College, on "The Soil Fertility Problem," and I take pleasure in presenting him.

Mr. Agee then read a paper on the subject which was fully discussed. (See paper and discussion following.)

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Vice President Cox—Are there any other questions now on the soil problems? If not, I will proceed to take up another matter.

Dr. Voorhees, during your absence this morning the committee on nominations selected yesterday to nominate officers for the ensuing year have made their report. I desire at this time to congratulate you upon your re-election as president of this State Board of Agriculture, and on behalf of your associates officially connected with you, you are expected on their behalf to extend your thanks to this board for yourself and your associates.

Dr. Voorhees—This is so sudden that it takes away my power to express how much I do feel the appreciation of my services on the part of this board. I have made addresses something along this line for the past several years. When I have been chosen to do any line of work I always feel honored, because I feel that somebody knows I am trying to do something, and that is a great deal in this world to have people understand that you are trying to do, and when you express your confidence in me, as you have in the past, I feel I am doing something for the interests of agriculture in this State, and as I have stated before on many an occasion, there is no line of work which I have done in this State that has had so great an interest in its broader sense as the work that I have done in this board, because it gives me an opportunity to come in such close touch and intimate relationship with the farmers individually, to know them as I know members of my own family, and feel that I have friends, and those will stand up and support, not me, but the movement which I represent. I call upon everyone to stand firm for those things which make for the uplifting of agriculture and for the benefit of the whole people not only of this State but everywhere. (Applause.)

Mr. Dye—Mr. Vice President, it seems to me that the thanks of this whole board are due to Dr. Voorhees for his efficient and faithful services in the past, and also that he has consented to accept this position for another year, and I move a vote of thanks.

The motion was seconded, and the vote of thanks was unanimously given.

Secretary Dye—Having had two professors to discuss the question presented by our friend Mr. Agee, we lost sight of the fact that he made the principal address and we didn't applaud him nor give him a vote of thanks, and we ought to give him one or the

other. Which will you have, Mr. Agee? (Laughter and applause.)

Mr. Denise—I have been connected with this board some twenty-six years, and I want to say to the gentleman who delivered the address to us this morning that it is the best address I have ever heard on that subject, and I move a vote of thanks. (Applause.)

Motion seconded and carried.

President Voorhees then took the chair.

The President—The next number on the programme is the subject of "Corn Improvement," and Secretary Dye has an announcement to make in reference to that subject.

Secretary Dye—We have usually been very successful in our efforts to get good speakers and very seldom have we had a failure. Last night we received a telegram like this: "Franklin Dye, Secretary State Board of Agriculture, Trenton, New Jersey. Serious attack of quincy, cannot be with you. Very sorry. M. L. Bowman." That is the gentleman we expected to lecture on "Corn Improvement." Some weeks ago I wrote to the county secretaries to have them send samples of corn for comparison and discussion at this meeting, and Dr. Bowman not being here I feel very much disappointed, but fortunately we have another young gentleman here from the West who I think the president will call out to conduct this discussion.

President Voorhees—As stated, we are unfortunate in not having Professor Bowman with us, but Professor Minkler has been giving lectures in corn judging and corn growing in the agricultural course this winter, and while he has not prepared a set address on this subject, we feel that he is able to give us very good information on it, and he has consented to do so, and I take great pleasure in introducing Professor Minkler, who will speak upon the subject of "Corn Improvement." (Applause.)

After the discussion of Mr. Minkler's address on "Corn Improvement," Mr. Gaunt presented a resolution recommending that more practical instruction concerning agriculture should be given in the rural schools.

The resolution was read and referred to the committee on resolutions.

Mr. Gaunt also submitted a resolution favoring better roads, which was read and referred to the committee on resolutions.

Also a resolution in regard to forestry, which was also read and

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Mr. Dye—I appreciate most highly the timely assistance of Professor Minkler in our emergency here this morning, and I believe the board does also, and I move a vote of thanks to him for his help in discussing this corn question so ably.

Motion seconded and carried.

Then adjourned to two o'clock to meet in Association Hall.

 THURSDAY—2 P. M.

Board met in Association Hall with a large attendance and was called to order by the president, who introduced the Hon. George von L. Meyer, Postmaster-General, who spoke on "Extension of the Present Parcel Post on Rural Delivery Routes and the Inauguration of a System of Postal Savings Banks." (See address and discussion following.)

At the close of the address George W. F. Gaunt, W. M., of the State grange, offered the following resolution, which was seconded and unanimously carried:

WHEREAS, It is a source of great satisfaction to the people of New Jersey that we have a Postmaster-General who is in sympathy with the establishment of parcels post and postal savings banks; therefore, be it

Resolved, That the State Board of Agriculture, in annual session, endorse the establishment of parcels post and postal savings banks, and offers its hearty support and co-operation to the Postmaster-General, to assist him in securing the enactment of such laws as will carry out this purpose.

Mr. Rider moved that a vote of thanks be tendered the Postmaster-General for his able and valuable address. Carried.

Mr. Cox then moved that the State board take a recess of twenty minutes that the members might have an opportunity to meet the Honorable Postmaster-General. Carried.

A recess was then taken and the members were personally presented to the Postmaster-General, after which Dr. Voorhees introduced Professor Louis Bevier, Jr., who spoke on "The Improvement of the Rural Schools." (See address and discussion following.)

After the address of Professor Bevier and the discussion following it a vote of thanks was tendered to him for his address. The meeting then adjourned.

THURSDAY—EVENING SESSION.

The evening session took place at the auditorium of the State Normal School, and after a few introductory remarks by Vice President Cox the members were entertained by Colonel George Nox McCain, who delivered a lecture on "Servia and Bulgaria, the Battleground of Europe," introducing many colored pictures and a number of life motion scenes, a superbly illustrated stereopticon lecture.

Music was furnished by the orchestra and the Philomea Club of the State Schools.

Then adjourned to Friday morning.

FRIDAY, JANUARY 17TH, 1908—MORNING SESSION.

The meeting was called to order by Dr. Voorhees and opened with prayer by the Rev. Dr. George B. Wight, of the commission of charities and corrections.

The president announced the appointment of the following committees:

On transportation and freight rates—E. R. Collins, of Union; A. J. Rider, of Atlantic, and Theodore Brown, of Gloucester.

On fish and game laws—Charles Collins, of Burlington; E. E. Cooper, of Somerset, and Theodore M. Roe, of Sussex.

COMMITTEE ON RESOLUTIONS.

Mr. Rider—The first resolution that was offered is rather in the shape of a memorial to the board. It is as follows:

PETITION AND RESOLUTION OF CAMDEN AND ATLANTIC COUNTIES' POMONA GRANGE.

WHEREAS, There has appeared in the public press a series of amendments to the Frelinghuysen Automobile Bill, suggested by the New Jersey Automobile Association, and

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WHEREAS, Believing that some of the proposed changes are contrary to the best interests of road travelers, by greatly increasing the danger to life and limb; therefore, be it

Resolved, That the Pomona Grange of Camden and Atlantic counties, in session assembled, respectfully petitions its legislative committee to protest to the Legislature of New Jersey, against the enactment of any amendments to the present law rescinding any of its registration features.

A. H. HURFF,
Master.

Attest:

HARRY E. HORNER,
Secretary.

The committee reports this favorably.

The report was adopted.

Mr. Rider—Resolution No. 2, offered by Wallace Lanning, and with his consent and approval the resolution has been modified somewhat in form, but in substance remains the same:

WHEREAS, The high cost of feeds and the requirements of the several boards of health are so exacting that it is impossible to produce sanitary milk at a cost of less than five cents per quart; and

WHEREAS, The consuming public has not appreciated these conditions, and are expecting milk to be supplied at former prices; therefore,

Resolved, That this State Board of Agriculture is of opinion that the demand of five cents per quart at railroad stations and points of delivery by milk producers is justifiable, and that the best interests of both producer and consumer will be advanced by acceding to this demand.

The committee reports favorably.

The report was concurred in.

RESOLUTION NO. 3.

WHEREAS, The National Grange, P. of H., at its annual session, held at Hartford, Connecticut, in November, 1907, adopted the following resolution, viz.:

WHEREAS, The improvement of the highways of the country is a matter of general public concern, and should properly receive the attention and assistance of the National government; and

WHEREAS, The revenue raised by taxes paid by the people of the country as a whole, should be devoted as far as possible to purposes which will benefit the greater number of the taxpayers in all sections of the country; and

WHEREAS, No argument can be advanced in favor of the annual appropriations by Congress, on behalf of river and harbor improvements, that does not apply even more strongly to the improvement of our public roads; therefore,

Resolved, That the National Grange favors a general policy of good roads construction by the various municipalities, counties and States; and

Resolved, That we favor the immediate enactment of legislation by Congress making liberal federal appropriations for the improvement of the public high-

ways of the country; these appropriations to be expended in such a manner as Congress may prescribe.

Resolved, That the State Board of Agriculture, now in session, endorse the foregoing resolutions, and that we urge our legislative committee to use its best efforts in carrying out the recommendations made in the above resolutions.

The committee reports favorably.

The report was received and concurred in.

RESOLUTION NO. 4.

WHEREAS, The National Grange, P. of H., at its annual session, held at Hartford, Connecticut, in November, 1907, adopted the following resolutions, viz.:

WHEREAS, We appreciate the great importance of forest wealth for best national development; and

WHEREAS, There is great need of education in forestry; and

WHEREAS, The income from the national forest reserves has now reached the sum of over \$1,500,000 per year, which is now paid into the national treasury and used for the general expenses of government; and

WHEREAS, The land grant, college and experiment stations have been a great uplifting force in American agriculture, and fully justified the expenditure of national funds for their support; and

WHEREAS, These colleges and experiment stations are admirably adapted to teaching forestry, and will do so if provided with means; and

WHEREAS, There is certain fitness in using the income from the national reserves for teaching forestry; therefore, be it

Resolved, By the National Grange, in convention assembled, that we recommend that the income from the national forest reserves be appropriated by Congress, at its forthcoming session, for instruction and experimentation in forestry by the agricultural colleges and experiment stations of the several States and Territories.

Resolved, That the State Board of Agriculture, now in session, endorse the foregoing resolution, and that we urge our legislative committee to use its best efforts to carrying out the recommendations therein made.

The committee reports favorably.

The report was received and concurred in.

RESOLUTION NO. 5.

Resolved, That it is the sense of the State Board of Agriculture that more practical instruction should be given to the pupils in the rural schools of our State; that their training may fit them more specifically for the work they must do in life, when they leave school. With that end in view, we endorse the resolution adopted by the State Board of Education, at its meeting, held in December, 1907, as follows:

"*Resolved*, That it is the sense of the State Board of Education, that a knowledge of manual training, home economics and elementary agriculture should become a part of the professional equipment of each teacher in the public schools of New Jersey."

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We also suggest that the State Board of Education consider the proposition of introducing elementary agriculture in the curriculum of our normal schools with a special instructor in charge of the department.

We would also give our hearty endorsement of the work of the summer schools, which have for their object the training of public school teachers in a knowledge of the industrial branches.

The committee reports favorably.

The report was received and concurred in.

RESOLUTION NO. 6.

WHEREAS, The State Board of Agriculture has, by its work in the county boards and farmers' institutes, contributed, in a large measure, to the present prosperity of the farmers; and

WHEREAS, The enlargement of their work in the past and the demands for a broader efficiency in the future, require a larger appropriation than has heretofore been made; therefore, be it

Resolved, That the farmers in the annual meeting of the State Board, here assembled, do deprecate the action of the appropriation committee of the last session of the Legislature, in reducing the annual appropriation, provided by law, without giving the representatives of the board an opportunity to present the matter to them; do endorse the work of the board and request that such legislation be effected as shall increase the annual appropriation to \$10,000.

The committee reports favorably.

The report was received and concurred in.

RESOLUTION NO. 7.

WHEREAS, In the establishment of short courses in agriculture, the farmers have an efficient means of acquiring education for themselves and their sons, at such times as will least interfere with their regular occupation; and

WHEREAS, The buildings and equipment now provided by the State are adequate to meet the present demands of the school, but which require a larger maintenance fund; therefore, be it

Resolved, That this board does request of the appropriation committee, that the annual sum for maintenance, now provided by law, namely, an addition of \$10,000 to be incorporated in the forthcoming appropriation bill.

The committee reports favorably.

The report was received and concurred in.

RESOLUTION NO. 8.

WHEREAS, The work of the commission on tuberculosis in animals has conserved the interests of the dairymen, and in like proportion, the interests of public health, in so far as the limitations of law warranted; and

WHEREAS, The present conditions demand that the restrictions in reference to importation of stock be enlarged, in order to make more effective the inspection now possible of native cattle; therefore, be it

Resolved, That this board does endorse the work already done, and requests that any enlargement thereof or changes therein shall recognize the rights of the dairymen, and that they or their representatives be strongly represented in the administration of this work.

The committee reports favorably.

The report was received and concurred in.

The committee on treasurer's accounts reported as follows:

The committee on treasurer's accounts report that the bills and vouchers of the treasurer have been examined and found correct.

Respectfully submitted,

WINFIELD S. BONHAM,
B. DEWITT GILES,
JOHN ACKERMAN.

Trenton, N. J., January 16th, 1908.

The report was adopted and made part of the record.

Carried.

Mr. Dye—There are about fifteen applications now in for more institutes. It is late to engage speakers, as they are usually engaged in the fall, but we will do what we can. If we can get a little help from the Experiment Station we may be able to meet some of these requests, and when correspondence is begun in any neighborhood I hope you who are interested will co-operate to make the institute stronger and better than ever before. (Applause.)

The committee on resolutions having completed its report, the president then introduced Professor R. L. Watts, who spoke on "Essential Principles in the Practice of Market Gardening." (See address and discussion following.)

Following Professor Watts' address, the president introduced Kenyon L. Butterfield, dean of Massachusetts Agricultural College. Professor Butterfield spoke on the question, "A Campaign for Rural Progress." (See address.)

Both these addresses were listened to with intense interest by the board.

On motion a vote of thanks was tendered the speakers for their excellent addresses.

The meeting then, on motion, adjourned *sine die*.

FRANKLIN DYE,
Secretary.

Annual Address of President.



Stock Judging Pavilion State Agricultural College Farm, New Brunswick, N. J.

Annual Address of President.

DR. EDWARD B. VOORHEES.

The present attitude toward agriculture of the public in general, and especially of men influential in public, financial and industrial affairs, confirms the old adage that "Rome was not built in a day."

It is only in recent years that the Presidents of the United States and the Governors of the various States in their inaugurals and messages have considered it necessary to give more than passing notice to the agricultural interests of the country and of the State. Nowadays it is the exception, rather than the rule, when these officials do not make extended reference to the farmer and his work, and recommend that such laws be enacted as will help to promote this basic industry. So, too, men of affairs, captains of industry and those who give careful study to economic conditions, recognize the importance to the country and State of a progressive agricultural practice, one that shall be conservative of the country's capital stock of fertility, and the influence of such practice upon the future prosperity and happiness of all the people. No less distinguished citizens than President Roosevelt and James J. Hill, president of the Great Northern railroad, representing as they do the nation and great industrial enterprises, have in recent public addresses given expression to their belief in the necessity of a more liberal policy by both State and nation toward both the elementary and higher agricultural education and towards agricultural experiment station work, and all other methods which have for their entire purpose the promotion of intelligence in the handling of soils, the production of crops and the reclaiming and proper use of waste lands. They recognize that the farmers of the country are a tremendous force, and if intelligent, educated and organized must

exert a powerful influence upon the economic and political affairs of the country.

In a recent lecture delivered by a prominent and influential citizen of this State, ex-Governor F. M. Voorhees, before the short course students at our college, on the subject of "The Farmer as a Citizen," the following tribute was paid to agriculture as an occupation:

"You should always realize and appreciate the proud position which merely as producers you occupy among the various people of your country. It will help you to better appreciate your responsibilities and the large share which you should take in the administration of public affairs. In your future calling there is nothing that will demand from you apology—nothing that should cause you shame—nothing that will justify you in assuming an humble or suppliant attitude towards others. It is the oldest occupation known to man. It is one that is clean—one that is honorable and one that ennobles him who follows it in the true spirit. And to the welfare and comfort of the nation it has and is now contributing in a degree truly amazing. During the year 1905 the farmers contributed to the wealth of the nation nearly two millions of dollars daily, and in the succeeding year \$7,412,000,000, or more than two millions daily. And this vast aggregate was won, not at the expense of others' sufferings, but in peaceful pursuits, where no man was wronged and no one was robbed of his own. It was won in the open field, beneath the skies of heaven, where the maker of all intended that man should labor. No life of idle ease produced it. To honorable labor was it due alone. The sweat of honest toil only created this vast contribution to a people's welfare and comfort.

"Why should you, who soon will join those who have so largely contributed to your country's good, stand abashed in the presence of other citizens of your country and yield to them the management of its affairs? Why, rather should you not claim the position to which you are entitled as contributors to your country's welfare in so large a degree and as citizens of the greatest and freest country on earth, take your part in securing that for which its founders destined it—the greatest good to the greatest number."

He also referred to the influence which had been exerted by farmers in the development and government of our country, and which should continue to be exerted in an even greater degree. He

said: "The cities and towns cannot claim a superiority over the country in this regard. The history of our country proves the contrary. In its beginning our population was made up largely of farmers. Secretary Seward, eminent lawyer, distinguished Senator of the United States, and, in most trying and troublous times, its Secretary of State, once said: 'Farmers planted these colonies—all of them—and organized their governments. They were farmers who defied the British at Bunker Hill and drove them back from Lexington. They were farmers who reorganized the several States and the Federal government and established all on the principles of equality and affiliation. Our nation is rolling forward to a high career, exposed to shocks and dangers. It needs the bravest wisdom and virtue to guide it safely; it needs the steady and enlightened direction which of all others the farmers of the United States can best exercise, because, being freeholders and invested with equal rights of suffrage, they are at once the most liberal and conservative element of the country.'

"He spoke of his own times, but what was then true is equally true now. In general intelligence the farmer of to-day, is not one whit behind those to whom the secretary paid this deserved tribute. On the contrary, in all that goes to make up a better equipment for your life-calling, you are far in advance of those who laid the foundations of your country, and in its early days helped shape its destiny. You are better fitted to meet and solve for yourselves the problems of the hour than were they. You need give your intelligent consideration to those matters which affect the Commonwealth if you would act wisely and make your impress felt as well as did they in their day and generation. But no fancied wrongs or imaginary grievances should sway you. Rather as citizens you should calmly and without prejudice regard all things as did the patriots—not as they do who selfishly first regard their own. And then with deliberation you will do your own share, fully confident that more can be accomplished by calm persistency than by fitful or spasmodic effort."

These are good words, and a well-deserved tribute to the past and present farmers of our country, both from the standpoint of their position as producers and in reference to the influence that they may exert upon public affairs. This deserved recognition, thus given, but illustrates the position now being taken by close students of political economy and of democratic government.

Farmers themselves have been slow to realize and to exert their influence in matters which promote not only their own best interests but which are in the long run for the best interests of the whole people. I cannot help but believe, however, that this rather slow but sure recognition of themselves, and this slow building up of faith in themselves and their destiny has been wise. Their position must rest upon a sure foundation, for without it there would arise bodies of fanatics, image breakers, radicals and other pests, whose judgments are warped and whose viewpoints are obscure, and who would lead astray, because their foundations were based upon slipping sands of error, rather than buttressed by the rocks of eternal truth and principle. The farmers, as a whole, could not so firmly establish themselves in their chosen industry until they had opportunity to obtain such education and such technical knowledge of their calling as would make them sure of their position. This better realization of their true position has been largely brought about by the establishment and development of organizations which enable them to acquire knowledge of their true political, social and economic relations to the country. They now feel and realize more fully than ever that there are certain underlying principles upon which they can all agree, and which if followed by them as a unit must enable them to take their rightful place as citizens, claiming and securing their own without interference with the rights of others.

IMPROVEMENTS IN CONDITION OF FARMING.

This is very clearly shown by comparing conditions which exist to-day with those of but fifteen or twenty years ago, in reference to but one phase of their life, namely, their ability to secure a livelihood from the farm. I can probably make this point clear by referring to concrete examples in the experience of this board in its work with the farmers of the State.

In the beginning of our lecture and farmers' institute work, for example, much time was given to the discussion of the question of soils, fertilizers, manures, feeds and subjects of that sort, believing that these were fundamental subjects, and should be understood if our progress was to be made along right lines. Many criticisms were made of this line of work; these critics asked why do we



Shipping Scene at Elmer, N. J.



Shipping White Potatoes at Woodstown, N. J.

study methods of improving the soil, the use of fertilizers and of raising better crops, the reduction of the expenses in the production of milk, when we cannot sell at a profit what we already raise? Many, too, have followed in their practice that line of argument up to the present time, and are financially and socially where they were then. Others, in greater number, realized the importance of the instruction then given, and were ready, because they had studied the situation, to take advantage of the conditions when they improved, and knew what to do. These are now successful and are realizing greater financial profits than are realized in many lines of business. There are sections in this State, for example, where the farmers are making a specialty of the raising of potatoes and are making money, and in proportion to their prosperity they are becoming better citizens in every sense of the word. They are better able to support public improvements; they are increasing the values of their properties, and are making the localities in which they live comfortable, not only for themselves, but for others, in direct contrast with other sections equally as good so far as location and land and other conditions are concerned, but whose farmers are following old lines of practice and are in practically the same state now that they were twenty years ago.

It is quite possible that in the beginning the farmers engaged in this line of farming were not any more successful than were the others, but they realized that the arguments for a better knowledge of what to do, and how to do it, were sound, and must, if followed persistently, result in the improvement of their conditions; they have overcome the obstacles, and when good seasons and good prices for products have come, as in the past few years, they have been ready to take full advantage of them. The same is true in reference to the growing of other special crops, as, for example, early tomatoes, sweet potatoes, peppers, asparagus, apples, berries and other fruits, milk and live stock. Along with this increased prosperity has come the legitimate desire for the conveniences, and, in many cases, luxuries, which recent discoveries and the present development in mechanical lines and in transportation have made possible, which contribute so much to the farmer's comfort and self-respect. It has resulted in the improvement of communication by means of telephones, trolleys, good roads, all of which, besides making the farm a more attractive place to live, contribute to the wealth of the State. These things have been

accomplished, not because farmers have pursued their calling in a selfish spirit, but have recognized the importance of mutual cooperation, and have supported such organizations as this State board, the horticultural society, the patrons of husbandry, the experiment stations, the colleges, the schools and all institutions which are organized and established for the promotion of education and social improvement. That these beneficial influences have not extended to all in the same degree is largely due to the individual himself, for the opportunity is open to all. A more detailed discussion of these relations would be attractive, interesting and to many very helpful if time were permitted, but suffice it now to call attention to the fact that as soon as any proportion of those who represent any special industry begin to realize the advantages of their position, just in that proportion will they become unselfish in their desire for improvements which make for the general welfare of the people rather than for those of a particular class, for while the motives may be in their origin selfish, private and public good are in a way so closely associated that what affects the individual must in a greater or less degree affect the masses. I have in mind the support now given to various public improvements which have had their origin in the various institutions that have been established for the development of various phases of our public weal.

MOVEMENT INAUGURATED BY FARMERS' INSTITUTIONS.

Fifteen years ago this board inaugurated the movement of State support for stone roads, believing that such assistance would not only contribute to the comfort of the people but add to the wealth of the State. At that time the earnest supporters among the farmers were very few, as they did not realize that this partially unselfish movement would, in the long run, be of quite as great, if not greater, service to them than to other citizens, and yet through the intelligent and unwearied efforts of our late and honored president, Mr. Edward Burrough, the initiatory legislation was accomplished. A department of good roads of the State was established and was placed in his charge, and his most efficient administration continued until his death, since which time the sympathy and support of the movement has increased with all

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classes of citizens; so much so that now it is a prominent department of the State's institutions, although the farmers with whom the movement originated, and the work successfully established, are absolutely ignored in the present administration of the large funds appropriated.

The work thus initiated by the State Board of Agriculture has been of untold value. At the present time, because of the great increase in the use of the automobile, and notwithstanding the laws that have been enacted and which are helpful, many farming communities are debarred rights which they originally enjoyed. It is hoped that by the judicious co-operation of the farmer such further legislation will be enacted as will secure the rural districts their rights in this respect.

THE MOSQUITO PROBLEM.

For many decades the State was known by many only through its notoriety as a breeding-place for the largest and most vindictive variety of mosquitoes known; its superior advantages in other respects were ignored. A few years ago, when it was suggested by one of our institutions that the mosquito-breeding areas could be eradicated, and that it would be a great boon, not only to the residents in the infested districts, but contribute to the wealth of the State in many directions to have the mosquitoes removed, a howl of derision arose from the citizens. Laws were, however, passed providing for the investigation of the subject, followed by others which have appropriated funds for the eradication of this pest. To-day we know that it is possible to eradicate the mosquito from the State of New Jersey.

In the beginning the farmers, in common with other citizens, were not, and possibly all of them are not yet reconciled to this movement, though their support was given, both as individuals and as organizations, and the work that has already been done not only proves the correctness of the position taken by our Professor Smith, but shows that the drainage which has been done has not only resulted in the eradication of the mosquito, but has materially improved the lands thus drained, making them capable of producing valuable crops, where before they were practically worthless, and such a nuisance in many cases that the owners hesitated to acknowledge their ownership.

A bulletin just issued by our Experiment Station shows that the increase in value of crops has ranged from \$10 to \$40 per acre, because the drainage, which resulted directly in the eradication of mosquito-breeding areas, has indirectly induced marketable grasses to take the place of worthless weeds, besides making it possible to harvest the crops at such times as to enable them to obtain the entire growth of higher quality. This movement, therefore, which in its initiatory stage received but sneers from most of our citizens, is bound to result in very largely removing the odium from our State in the matter of mosquitoes; to increase directly the property values of our seashore resorts; to increase the yields of salt hay and possibly of other crops, all of which will add directly to the wealth of the State, without interfering with any other legitimate industry. In fact, the report of this work before the National Drainage Association Convention, in Baltimore recently, was of such a character as to appeal strongly to the New Jersey delegation, and has resulted in the formation of a New Jersey Land Reclamation Association, the object of which shall be to secure such information and data as will enable the State to take advantage of the co-operation now offered by the United States government in the drainage and other methods of reclaiming waste lands. Thus this movement, originating in a farmers' institution, supported mainly by the representatives of farmers, promises to add very largely to the wealth of the State, because, in addition to the immediate and direct gains made, it has crystallized sentiment in favor of government expenditures, which will in some degree at least help to balance those which have been made and to be made for the reclamation of the arid lands of the west, which movement was not strongly supported by eastern farmers.

FARMERS SUPPORT EDUCATION.

Another movement which has had the support of the farmers is the elementary and higher education of the people along lines which will be of greater practical service to them in their life-work. It has been an unselfish movement for the farmers or their representatives; they have not tried to tear down or take away, but to build up and add to, and on such foundations as would be of service to all. They have made possible the agricultural experiment sta-

tions of the country, which are such a power for good, they are responsible in a greater degree than any other body of citizens for the splendid State universities, particularly in the west, and indirectly responsible for the change in sentiment on the part of school boards for the introduction into the curriculum of the rural and high schools the study of agriculture and other industrial branches. The great University of Wisconsin, for example, with its many departments of literature, science and art, is due more than any other one to the splendid leadership and far-seeing wisdom of Professor W. A. Henry. The splendid buildings, the modern equipment and notable teaching force of the University of Illinois have been acquired only since the farmers or their representatives exerted their influence in its behalf. The same is true in Ohio, Iowa and other leading farming States. The farmers have been unselfish; they have not worked for agricultural education alone, but have supported the movement in its broadest aspects.

In our State a movement which had its origin in this board, and which after many days is receiving the support that was asked for it about sixteen years ago, is the question of agricultural education in rural districts. At the annual meeting of this board in 1891 the following in reference to this point was adopted:

“WHEREAS, It is the opinion of the State Board of Agriculture that the lack of facilities for the proper education of the farmers’ children is the chief difficulty in the solution of the problem of profitable agriculture; and

“WHEREAS, The curriculum now established in our public schools does not demand a knowledge of the principles of agriculture on the part of the teacher, thereby making it impossible for the pupil to secure training in those branches of knowledge so essential to his life-work; therefore, be it

“Resolved, That this board, through the executive committee, does hereby request the board of education and the superintendent of public schools in this State to introduce into the curriculum of the normal school such studies of science as shall enable the teachers to give instruction in the elementary principles of agriculture, and that certificates to teachers in the rural districts be granted *only* upon their passing careful examinations upon the above subjects, and that the teaching of the same be enforced by the trustees of said district schools.”

Under this resolution a committee presented the matter to the State Board of Education and to the Superintendent of Public Instruction; no definite action was taken. The committee was advised that the normal schools were not prepared to furnish teachers who were capable of giving instruction in this line, and that, in their judgment, the work could not be successfully accomplished. This board, however, has kept the matter before the public, and has constantly reiterated their demands for some change in this respect, and it is now a pleasure to report that after all these years the State Board of Education has adopted a resolution requiring that rural teachers shall pass an examination in the principles of agriculture before being assigned to schools in country districts.

It is now recognized that if we are to give the industrial classes that education that will best fit them for their future occupation we must begin at the bottom rather than at the top. For a long time the need for agricultural education seemed to demand that it come through colleges and not through schools. The principle was wrong, because it was impossible to build up a strong agricultural college without first having an agricultural school, and it was impossible to draw agricultural pupils from schools where the instruction was along lines without special reference to agriculture, although practically four-fifths of the pupils of the public schools do eventually engage in agricultural pursuits. This is a genuine advance, and it should be a matter of congratulation to this board that it has persistently insisted upon this change in our school system. They have also been a unit in demanding that the State should recognize our demands for special schools and special courses for the boys upon the farm, and the short courses in agriculture recently established at our college exemplifies in a marked degree the advantages that can be gained from a winter course when properly arranged to give both practical and scientific instruction, and I desire to urge upon the members here of the importance of such legislation as will provide a sufficient maintenance fund to carry on this work in a manner that shall be a credit, not only to the State, but shall be a benefit to the entire people. We have been handicapped in the past with parsimonious appropriations, and now need the additional sum (\$10,000) already provided for by law, but not appropriated, in order to enable us to properly develop the school.

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ANIMAL DISEASES.

Another matter which was initiated by the board and carried to a successful issue was the investigation of animal diseases, though the work is not yet organized in such a way as to meet the requirements that exist. The subject of tuberculosis is the only animal disease which is in charge of this State board. The work that has been done has been along conservative lines, and has been good so far as present limitations of law and of appropriations have made it possible. That a broader policy should be adopted is admitted, but it is believed that the policy that has guided the commission should remain, as in the past, a conservative one. The question of tuberculosis in dairy cattle is one which has to deal with vested rights, and any radical measures which would interfere with such rights, without adequate return from the State, and which would not appreciably contribute toward the health of the public, should not be adopted.

Furthermore, it is the opinion of the farmers of the State, as far as such can be gathered, that any measures that may be adopted, or any commissions that may be appointed or provided for, which shall have to do with the diseases of animals, should have a strong representation of the farmers, in order that their point of view may be taken into consideration. I am strongly of the opinion that any board made up exclusively of physicians or veterinarians, of leading citizens or of scientific bodies of any sort, who may be fully capable of carrying on their own profession, are not capable of managing a matter of this sort, because they have no practical knowledge of the situation as it appears to those more directly interested.

There is need of modification of our laws and enlargement of the powers that now exist, and I hope that those here, representing different parts of the State, and directly interested in these matters, shall express themselves fully on this question, and support such measures as shall be for the best interests of all. Surely the farmer himself has quite as much interest as anyone in public health, as he is quite as much a part of the public as those citizens who, because they reside in town, think themselves the public.

BUSINESS FARMING.

While, as already pointed out, the farmers of the State and nation are making rapid progress in their work—in fact, such wonderful progress as to make one wonder whether the old-time alchemist has not had his hand in their affairs—and are exerting a mighty influence in the affairs of State and nation, many of them have yet to learn a great deal about business methods. There is still among them a feeling that bookkeeping on the farm, or at least records, is not essential, that all that is necessary is to know whether at the end of the season they are ahead or behind in their financial affairs. This is poor business policy, and in many instances farmers are raising crops that do not pay; they are keeping cows that do not pay; they are doing a great many things that do not pay and they do not know it, because the gains in some of the crops are helping to cover the deficiencies in others. Those specialists to whom I referred in the beginning are keeping accounts. They know how much things cost; they know how much their labor costs; they know how much their fertilizer costs; they know how much the harvesting costs, and they know to a nicety, for example, how much a bushel of potatoes, or a ton of hay, or a pound of asparagus costs, and it is because they know these things that they are extending their areas for these crops year by year. Too many are losing money because they are not following the matter as closely as they should. This is particularly true in the dairy business, which up to within two or three years has been from a broad standpoint one of the most profitable lines of practice in which the farmers are engaged in this State. Feeds were cheap; the cost of labor reasonable; cattle were low-priced and prices for milk were as high as they are to-day. Whereas feeds are now high; cattle are high; labor is expensive and inefficient, and many restrictions are now placed around the sale of milk, and when all expenses are properly charged there are a large number of farmers who are not making money in selling milk. They partially realize this, and know that some other branch of their farming is helping to pay the deficiency. They hope, however, that times will change, and are still maintaining their dairies. Many, however, have gone out of the business, because they have a realization of the facts. This question is one of the most im-

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portant before us to-day, and I believe I can do no better than to call attention in some detail to the situation as it presents itself to me at this time.

MAKING AND SELLING GOOD MILK.

This condition is a result, in large part, of our own inertia. We do not have confidence in ourselves, or the courage of our convictions. We are too good natured, and are willing to put up with all sorts of conditions of affairs, both in city, State and nation; we sublet our rights for a nominal fee, preferring this to the effort necessary to maintain them. We prefer our ease and comfort, to the turmoil of a fight against those things which we know are wrong. We cheat ourselves and others constantly by allowing things to be done which are wrong, both in principle and in practice. We allow individuals and corporations to take privileges on our country roads and village streets, the result of the use of which not only does not contribute to our safety and ease of access for ourselves and our products to villages and cities, but which do add to our discomfort and cost of living. We are willing to give, or if not willing, at least we permit transportation and express companies the sole right to handle our goods in their own way, and at their own price, while goods from other countries may be sent to us at just the cost of transportation. The business of city, town and country is conducted by those who have no genuine interest in the work other than to increase their income, thus increasing our burdens of taxation; it is only when citizens are indifferent that taxation is burdensome.

We have, in the past, given to strangers a large part of our public domain, which rightfully belonged to us as a heritage from our pioneer fathers, who, by their patriotic devotion to principle, won it for their children and children's children. We have permitted our forests to be wantonly destroyed, and are now suffering for lack of timber, and waste of our soil resources, because the conserving influences of wooded hills have been removed, and many other things that we are permitting, because of our good natured satisfaction with ourselves, are causing not only

a loss of money and opportunity, but impairment of health and life.

These general considerations apply specifically to the question of the price of milk that the farmer receives. We have studied the question of feeds, of the selection of cows, of the handling of the product, and know in a general way how to produce milk. We do not know as yet enough about rations, or the selection of animals, and we know scarcely anything about the cost of the product, and we know still less about how to sell it. From the consumer's standpoint, there is no food that is more important than milk, and because of the extraordinary qualities possessed by this, one of the chief of all human foods, it is liable to be both a source of nutrition, and also a source of danger, and many consumers, in their ignorance, call down maledictions of the severest sort on the head of the good old cow, the nurse of the human family in all civilized countries. It is recognized that in times gone by we drank milk, we ate butter and cheese and the other products of the dairy and survived. It was not until the discoveries of eminent bacteriologists developed the germ theory of disease, and showed us the danger in milk, that our interest was aroused to any degree. With this knowledge, though it is far from complete, together with the changes which civilization has wrought, which has encouraged the larger growth of cities, with their concomitant evils, has required that careful attention shall be given to the matter of the production and proper handling and delivery of this food-supply.

The farmer has not studied this situation as fully as he should have done, and he has not changed his methods, while the consumer, on the other hand, has had the support of boards of health, of pure food leagues, of national dairy divisions and institutions of that sort, who constantly keep before them the importance of this phase of the question, without giving due consideration in all cases to the farmers' end of the transaction. It must be admitted that milk differs from practically all other foods, in the sense that it is in many ways superior. It exists in such form as to make its various nutrients not only well adapted for the growth and development of babes and young children, but also a nourishing and wholesome food for adults, yet it is these very qualities that make milk one of the most susceptible medi-

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ums for the development of these germs which cause the most malignant types of disease.

Any methods or any restrictive measures which have for their purpose the improvement of conditions must take into consideration both the chief parties at interest, namely, the producer and the consumer. Any attempt to accomplish the purpose without the co-operation of the two will meet with at least partial, if not complete, failure.

CLASSIFICATION OF DAIRYMEN.

The producers (the farmers or dairymen, as you please) may be classified into three groups—first, the genuine dairyman, who makes it his sole business, and whose laudable ambition is to make a comfortable living and get ahead in the world; who is intelligent, and attempts to make an ideal product; one that can be derived only from healthy cows, fed healthy food, kept in clean barns and carefully handled after it is produced. He knows that milk varies in its composition and quality; the first due both to the kind of animal that produced it, the time of year that it is produced and the methods used in handling it; and the second, to the vigor and health of the cow and the care of both the cow and her product. He is, therefore, reasonably careful in all of the processes to make it healthful and nutritious and to prevent any injurious quality entering into it after it is drawn. He knows, too, that if he makes this kind of a product that it costs him more per quart than if he did not observe certain rules in its production and care.

Second, a farmer-dairyman who is strictly neither one nor the other; at one season neglects his farm to take care of the cows and at another he neglects his dairy to take care of the farm—he has a standard of milk, but it is not very definite. He does not know much about cows, nor the causes of variability in the composition and quality of milk, and has only an indefinite notion of what clean milk or impure milk is. He does not recognize a disease among his cattle until it has progressed so far as to become a menace to his entire herd, and the animal is finally removed because it is of no value to him. He is uncertain, also, as to the influence of breed of cows in fixing composition and quality of milk and as to the kind of cattle that should be used in order to

obtain a product of definite character. He has an idea that there is a distinction between what are called "butter breeds" and "milk breeds," and he also knows that any cow has to be well fed if it is to produce a good yield of milk, but he is not clear as to the influence of food-stuffs upon quantity and quality of milk.

The third group includes the man who is not a dairyman, but who keeps a few cows and sells milk in order to have ready money the year 'round. He may have an ideal, but it is not clearly defined in his own mind; to him "cows are cows and milk is milk," whether rich or poor, clean or unclean. He knows no distinctions in reference either to composition or quality, and he cares less. It is not a business with him, and he does not study it, but because in many localities this type of milk producer is in the majority, and because his ideals are low, the whole product must suffer because of this lower standard. In other words, the fact that this man is not careful in his selection of animals and their health, their stabling, their cleaning, or in reference to their feed, or the handling of the milk afterward, the milk is liable to be (though not necessarily) poor as a food product. His milk, however, goes to the same dealers as the milk of the good or average dairyman; the dealers make no distinctions unless the milk is absolutely bad, and hence it is mixed in and frequently contaminates the whole. Moreover, inspections conducted by intelligent men are apt to be influenced to a greater degree by this type of milk and its producer than by the type produced by the good dairyman.

Any attempts at improvement will be met more than half way by the producers included in the first group; they understand the reasons that may be advanced for greater care in all the operations involved, and appreciate the conditions that must be maintained if this important food shall serve its best purpose in human nutrition.

Among the producers of the second group there is a feeling that things might be better, but they are not impressed with the reasons advanced as to why their conditions should be changed, and are slow to accept any suggestions that shall make for their improvement. They think that there is a good deal of foolishness in the rules and regulations that may be adopted; they have been selling milk for years without disastrous results, and they think that their cows, their methods and their milk is as good as their neigh-

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bors', and besides they cannot afford to add any more to the cost of their product.

In the case of the producers of the third group suggestions for improvement are always resented; they feel that it is an infringement on their sacred rights to even suggest that they should be clean in their own habits, or should make any improvements in the stabling, feeding and handling of their animals, or should exercise greater cleanliness in the handling and sale of their product. They do not understand any of the reasons that are advanced in favor of a pure milk-supply, and are doggedly stubborn in their adherence to their present practice. There is need here, therefore, of great care and tact if we are to accomplish much. Precept alone is not sufficient, even though in the long run their education in the principles which underlie, together with the education of the parties who purchase their supplies, must be the main lever by which they shall be raised to a higher standard. This applies to all the groups, though not in the same degree, because those in the first and second groups are more susceptible to reason than the others. It is to their self-interest to consider the matter more carefully, provided they can feel assured that the extra cost involved will be returned to them.

On the other hand, it is my firm belief that the consumer must have some very practical lessons before the producers will receive that encouragement from the business standpoint that is necessary in order to enable him to make genuine progress in the elimination of the factors that do not make for improvement. The intelligent consumer, and, unfortunately, he belongs to the great minority, is reasonable; he knows that dirt is liable to be the chief contamination, and that this can be prevented, provided the barns and animals are kept clean and the milkers are clean and healthy. He also knows that to make milk clean and healthful it costs more than to produce it in a dairy where these conditions do not prevail, and is willing to pay a better price, knowing that even at twelve cents per quart it is manifestly the cheapest source of nutrients.

The majority of consumers are ignorant and indifferent, and they seem to glory in both these characteristics; they regard milk in its natural state as a standard product; they do not know of the possible dangers that may be lurking in it. It is used largely as a luxury, and not as a considerable source of food-supply. The methods of production do not interest them, and they

are satisfied, provided they are able to obtain it at a low price per quart. A lack of definite knowledge, or indifference, on the part of these two classes whose interests are so closely identified, must have an important bearing on any efforts that shall be made to improve the supply; they are the directly interested parties, and however much health officers, sanitarians and others may know concerning the real factors that make for purity, and the necessity for the adoption of improved methods, their work cannot be fully effective without their co-operation. There must, therefore, be a propaganda established, having for its purposes the direct education of the people, and members of organizations, such as this, may be powerful factors in such work; they can, by precept and example, by lecture, by pamphlet and by personal appeal, reach large numbers that could not be reached in ordinary educational channels. There is one thing, however, that it seems to me that more than any other, aside from those I have mentioned, will bring about a rapid improvement in the condition of our milk-supply, and that is more complete knowledge on the part of the consuming public, of the cost of producing milk under sanitary conditions. Farming at the present time is different, and must be different from the farming of the past. Farmers must do business on business principles, and must get an adequate return on their capital invested. The farmer has too long been making and selling milk at too low a price; he has not been able to make it pay as it should, even under the old requirements. With the newer requirements, the cost is still greater than under the old, and a clear knowledge of this must be had on the part of the public. Consumers of milk in cities, towns and villages are composed, in large part, of business men, who would not for a moment continue their business on the same basis that the farmer-dairyman is conducting his.

You may say that the facts disprove these statements; that there are hundreds of dairy farmers that are selling milk, that are not only making a living, but are paying their taxes, educating their children and getting along in the world. This may be true, too, but it is not a business proposition, as business men look at it.

At the present time, milk produced under the ordinary conditions that now prevail, and including the product of the three groups of producers here mentioned, sells for eight cents per

quart. A very careful estimate of the cost of production shows that under reasonable methods, as, for example, those adopted by the dairyman of the first group, milk costs at the farm nearly five cents per quart. Allowing in this, interest on investment, at five per cent., and laborers' wages for the farmer, who must assume all responsibility and direct all of the work. This assumes, too, that the cows are the very best, averaging 7,500 pounds of milk per year, and does not take into consideration the possibilities of infection by tuberculosis, which would result in very largely increasing his annual expenses. If it costs practically five cents a quart to produce milk at the farm, certainly it cannot be sold in cities at eight cents per quart, and allow either the farmer or the dealer genuine profit. If, in addition to the expenses that are involved in the production of milk under these conditions, are added the further expenses that would be required in safe-guarding all of the avenues of danger, the cost must be considerably greater, and calculations show that his cost would be increased very nearly three cents per quart. This does not include any extended fads or fancies, but simply what sanitarians regard as necessities in the way of clean barns, clean cows and careful handling. It does not include the possibility of tuberculosis, and thus the probable destruction of many of the animals in the herd. The fact that milk now produced under what are believed to be sanitary conditions has been raised in price, at retail, from twelve to fifteen cents per quart, is abundant evidence that these figures are well within bounds. The business side of this question is, therefore, a very important, if not the most important, factor involved in the adoption of such measures as shall protect this most useful source of food-supply. It is not enough to pass laws and ordinances and appoint inspectors; public opinion must be aroused and educated before real progress can be made.

The situation as I have outlined it in the discussion of these various branches of our work seems to me, however, to point to genuine progress. We are not lagging in the race, but are taking advantage in a large degree of the opportunities now open for us, which were not open a few years ago. If we lack the courage to take the step that will help us to solve the present problem of profitable milk production dissatisfaction and loss will continue. We should

face the situation squarely; we must study the cost more carefully; we must organize as those having a good cause and be a unit in the principles involved; we must co-operate and stand shoulder to shoulder for a proper recognition of the business as it appears to the business man. Let us then go forward hopeful of the future, equipping ourselves to withstand all possible changes, resting assured that we are engaged in a work which is second to none in dignity, in opportunity and in helpfulness to our fellow-men.

Annual Report of the Secretary.



Shipping Peppers at Bridgeton, N. J.

Annual Report of the Secretary

New Jersey State Board of Agriculture, for the Year 1907.

Though the year 1907 was very unusual as to its weather conditions which (adverse) conditions reduced the yield of a number of crops—wheat, potatoes and oats only exceeding the yield of the year 1906 by 299,951 bushels; white potatoes by 134,706 bushels and oats 250,048 bushels, yet the increased price for the crops has brought the total value of all crops above that of any seven preceding years.

Farmers were much disheartened at the beginning of their year's work owing to the very late spring, but nature did better as the season advanced, and the final ingathering, with the price realized for what was produced, has encouraged them to have greater faith in this old and essential industry.

The yield and value of the various crops produced in the State that are reported by the directors, crop correspondents and county secretaries are herewith given for information and reference with some other data:

NUMBER OF FARMS, ACREAGE AND VALUE—FOR REFERENCE.

Number of farms in New Jersey—twelfth census	34,650
Average acreage in each farm	82
Average value per acre—twelfth census	\$57 23
Thirteen per cent. increase since added	64 66
* Average value each farm at \$65.44 per acre	5,366 08
Total value farms, 1907	\$185,934,672
Buildings—census value	69,230,080
Implements and machinery	9,330,030
Total for the State	\$264,494,782

* U. S. Department of Agriculture, Bureau of Statistics, Bulletin No. 43, on Changes in Farm Values, 1900-1905, gives the value per acre of New Jersey farms, \$65.44.

STATE BOARD OF AGRICULTURE.

TABLE I.

NUMBER, AVERAGE PRICE AND TOTAL VALUE OF FARM ANIMALS IN NEW JERSEY, JANUARY 1ST, 1907.

	Number.	Average Price Per Head.	Total Value.
Horses	101,886	\$115 00	\$11,763,722
Mules	5,223	127 00	661,862
Milch cows	190,193	44 00	8,368,492
Other cattle	82,003	20 00	1,658,107
Sheep	44,198	4 81	212,592
Swine	156,952	11 00	1,726,472
			<hr/>
			\$24,391,247

TABLE II.

*ACREAGE OF CROPS, THEIR YIELD AND VALUE, 1907.

Crop.	Acreage.	Yield		Total Yield.	Price.	Total Value.
		Per Acre,	Bushels.			
Corn	277,749	36.5		10,137,838	\$0 73	\$7,400,621 74
Wheat	111,093	21.		2,332,953	97	2,252,964 41
Rye	78,363	17.		1,332,171	80	1,025,736 80
Oats	62,512	32.		2,000,384	60	1,200,230 40
Buckwheat	11,598	17.		197,166	75	147,874 50
Hay	424,525	1½ tons.		636,787	16 00	10,188,592 00
Potatoes, white	67,353	122.		8,217,066	75	6,162,799 50
Potatoes, sweet	20,588	110.		2,264,680	75	1,698,510 00
						<hr/>
						Total value of all corps raised
						\$30,077,329 35

* Computed on acreage basis of 1906.

TABLE III.

Miscellaneous vegetables and fruits	\$11,069,805	
Milk	13,052,480	
Poultry and eggs	2,204,120	
		<hr/>
		26,326,405 00
		<hr/>
Total for 1907		\$56,403,734 35
Total for 1906		52,460,262 00
		<hr/>
Excess for 1907 over 1906		\$3,943,472 35

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Statement of value of the various field crops and milk, and the estimated value of live stock for eight consecutive years from 1900:

Year.	Field Crops and Milk.	Live Stock.
1900	\$24,249,179	\$18,756,553
1901	38,545,095	17,612,620
1902	44,619,344	17,612,620
*1903	39,453,050	20,545,475
1904	48,222,505	20,545,475
1905	49,964,286	23,049,677
1906	52,460,262	24,391,247
†1907	56,403,734	24,391,247

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

† See government report herewith.

The acreage, yield and value of the following crops are published in the *United States Crop Reporter* for December, 1907, is herewith given for comparison. The government estimate of values is for the farm value. I believe our reporters estimate on the market value. The difference for the total is not great.

The government acreage is for wheat, 108,000 acres, or 3,093 less than last year. For corn, 278,000 acres, an increase of 251 acres. For oats, 60,000 acres, decrease of 2,512 acres. For rye, 78,363 acres, a decrease of 37 acres. For buckwheat, 12,000 acres, increase of 402 acres. For potatoes, 70,000 acres, an increase of 2,647 acres. For hay, 437,000 acres, increase of 12,475 acres.

Crop.	Yield	Total Farm	
	Per Acre.	Price.	Value.
Wheat	18.5	\$0 98	\$1,958,000
Corn	31.5	63	5,517,000
Oats	29.5	56	991,000
Rye	17.5	76	1,043,000
Buckwheat	16.5	75	149,000
Potatoes	120.	74	6,216,000
Hay	1.45 tons.	17 00	10,778,000

Total value of crops named	\$26,652,000
Add sweets	1,698,510
Add milk	13,052,480
Add poultry and eggs	2,204,120
Add miscellaneous vegetables and fruit	11,069,805

\$54,676,915

COUNTY BOARDS.

There are twenty county boards of agriculture now organized auxiliary to the State board according to law. These are encouraged and assisted by the State through this board both pecuniarily and in furnishing speakers for their meetings.

FARMERS' INSTITUTES.

The farmers' institutes have become a most important and useful division of the State board's work. Last fall and winter, ending with February 9th, 1907, there were forty-three such meetings held in the counties of the State. The value of this means of agricultural education is attested in connection with other helps by the steadily increasing yield and value of the crops produced on the farms of the State.

As it seems to be a general custom to tax improvements, it is very evident that this great increase in the products of the State must bring in a corresponding increase in taxes from agricultural property, an increase far in excess of the small sum (\$6,000 to \$7,000 annually) appropriated by the State to the work of this board.

THE FEEDING STUFFS LAW.

Chapter 29, Laws of 1900, concerning the regulation of the sale of concentrated commercial feeding stuffs, has proved its value in the protection of purchasers of fine feeds. Prior to the enactment of this law the doors were all open and the unscrupulous dealer could and did impose on the buyer, not being required to state the constituents contained in the package and material sold.

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

"In 1906, 528 samples of fine feeds were collected, of which 471 were selected for analysis; of these 304 belonged to the class that required a guarantee.

"In the first feed inspection in this State forty brands, or 28 per cent., which required guarantees under the law, were not guar-

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anted. In this inspection only four, or 2.5 per cent., showed this deficiency.

“From the standpoint of guarantee the feeds examined this year were more satisfactory than in any previous inspection. There was no direct evidence of adulteration in any of the samples analyzed, but there were several feeds of marked inferior quality which was due in the majority of cases to methods of manufacture, though in a few cases materials of inferior feeding value were unquestionably used. The sale of these inferior feeds would not be open to question were the selling prices correspondingly low, as this would warn the intending purchaser that he must not expect a high-grade article. Where feeders pay attention to the relation between guarantee and purchase price they are not liable to be injured by products of this sort. Special attention is called to these materials in the bulletins issued.

“Owing to the increased cost of feed products there is a greater tendency each year toward the making of special feeds, the primary object of which is to utilize refuse products, and thus to in part cheapen the cost per ton. In many instances these waste products could not be sold as such, though possessing useful characteristics as a feed.

“On the whole, the work demonstrates very clearly the value of such an inspection from the standpoint of protection to purchasers, and more especially from the standpoint of the education of the farmer as to the value of nutrients.”

MONTHLY CROP REPORTING.

The monthly crop and agricultural bulletin introduced last year has been continued during the past season, seven issues having been printed and distributed throughout the State, covering the months from April to October, inclusive. For these reports we are indebted to farmers in the different counties who kindly gave their assistance in this work.

For the final reports of the yield of the various crops the directors of the board and the county secretaries lend their aid. Thus we have a threefold volunteer corps, whose combined judgment furnishes the basis of the final report made by your secretary.

Furthermore, the two last named express their views as to the condition of agriculture as requested in our questions.

These questions are:

1. Has 1907 been as prosperous as was 1906 to the farmers?

(a) If not, why?

(b) If better, in what respects?

1. All say "yes," except Bergen, Essex and Morris. Because of cold and drought, fruit and vegetables not a full crop, and expenses are higher.

(a) (b) Burlington—Better because of home markets and favorable weather conditions.

Camden—Better prices.

Cape May—Hay crop better. Can-house tomatoes much better yield, some getting eleven tons.

Gloucester—Prices have been better on all farm products, except tomatoes.

Mercer—Prices are higher. Crops have yielded more per acre and farmers are doing their work better.

Middlesex—Better crops and prices.

Monmouth—Prices 20 per cent. higher than last year.

Passaic—Better prices.

Sussex—The poor corn crop made up by a good crop of hay.

Warren—Fair crops and better prices.

2. Are average good farms being run at a profit?

(a) If they are, what per cent. above cost of production?

2. All say "yes."

(a) The replies to this run from 2 per cent. to 35 per cent.

Perhaps an average of 17.5 per cent. on the average good farm with good crops at a valuation of \$70 per acre, or about \$12.25 per acre net. There are many farms, however, poor in soil, poorly farmed, with meager crops that earn but little more than a living to their owners. They should stand in a class by themselves.

3. Give price paid for farm laborers by month, with board.

(a) By month, without board.

(b) By day, without board.

(c) Is there a deficiency of farm help?

(d) If so, what per cent.?

3. Wages paid farm hands are higher than ever before. Wages per month, with board, average \$21.50.

(a) Wages per month, without board, average \$32.50

(b) By day, without board, average \$1.57.

(c) Seventeen counties say there is a scarcity of farm help. Three say "no."

(d) The deficiency, as reported, averages 30 per cent. It is suggested by one very reliable business farmer that much farm help is inferior in quality. Another suggests that, if farmers could procure good help, they would try to produce more.

FARM HANDS.

There is a very important suggestion in the last foregoing reply: "If the farmers could procure good (and sufficient) help they would try to raise more." There is no doubt as to the truth of this statement, and, in the hope of assisting our farmers to procure farm hands, your secretary has entered into an arrangement with the Hon. T. V. Powderly, Chief of Department of Commerce and Labor, Bureau of Immigration and Naturalization, Washington, D. C., whereby it is hoped it will be possible for farmers, from time to time, to obtain help in such numbers and of such efficiency as will, at least, justify the efforts made to procure them, and a notice was sent to the farmers with our September crop report accordingly. Up to November 1st about twenty letters were received from farmers besides others who visited the office seeking help. Their requests were forwarded to the department and correspondence begun with the parties interested.

It was not expected that many applications would be made at the close of the season, but, if farmers needing hands for the coming year, will make their requests known early, it is possible they may obtain such help as they need.

The department is also willing to procure purchasers or renters for farms for sale or rent, or to work on shares. Farmers having farms to dispose of in either of the ways named will be furnished a blank form on application to the secretary of this board, which, when filled out, will be sent to the department.

There is one phase of the labor question that, according to my view, should appeal to every patriotic American employing foreigners, and that is the improvement of these people in all those particulars which will help to make them good citizens. It is right to secure the best help for our purpose and to require good service for money paid, but an opportunity is afforded every employer to influence these people in the choice of that which is good—in companionship, in temperance, in Sabbath observance, in literature and patriotism, thus aiding them to become good citizens.

Help them to understand that liberty in this country does not mean license to do as one pleases, even though he pleases to do wrong, but that freedom in the United States of America is liberty within and regulated by the law. In some such way we may help to counteract the evil tendencies, in some so frequently manifested, and aid in making them better and our country better for their coming.

DAIRY DEMONSTRATION LECTURES.

During the institute season closing with December 21st, 1907, a number of lectures on "Cow Conformation," "The Dairy Type," "Stable Ventilation," "Breeding for Milk Production," &c., were given right at the cow stable where the living animals were used to illustrate the points the speaker desired to impress upon his hearers. Four such meetings were held last of August and first of September and twelve during November and December.

The value of the object lesson in teaching is more generally accepted now than formerly. While teaching *about* the thing have the *object itself before the class* if possible, and the teaching will be far *more interesting* to the pupil, and the impressions made will be more permanent, for the eye as well as the ear will be open to receive the intended instruction. This principle is capable of a broad application; it has a wide field of usefulness. We believe this is the first attempt by any State to give instruction on dairy matters in this way. Of course, it was experimental—most new work is. Judging from the interest manifested at most of these meetings, and the expressions of appreciation on the part of farmers and dairymen concerning them, they were a success.

The lectures thus given furnished special needed information in such a way that those who were interested could grasp it. And



Beginning at the right, front row, the names are:

10	9	8	7	6	5	4	3	2	1
Franklin Dye.	J. G. Curtis.	George Bellis.	Harry Bodine.	Hugh Murray.	Harry Johnson.	J. T. Eick.	H. E. Cook.	H. F. Bodine.	W. W. Bodine.

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it will be of exceptional value to them in this branch of their business. Lectures on feeds and feeding can be given as heretofore in lecture hall.

Mr. J. G. Curtis, of Rochester, New York, who attended most of these meetings, says concerning them :

“By holding these meetings in the stable or yard of a dairy farm and having the animals on hand, so that the speaker and also the listeners can get close to them and handle them, it is possible to bring out the differences that exist in the conformation of the dairy types and the beef types in a way that is not possible when speaking from the lecture platform, and I believe the lesson will be imprinted upon the mind of the interested observer for a long time.

“I am frank to admit that I have learned more concerning points of value in the selection of a good dairy cow through attending these meetings and studying the living animals than I could possibly have learned by reading or studying about the animals.

“The attendance at these meetings has been large, and the numerous questions asked the speaker at each session showed that the audience appreciated the opportunity to get some valuable help toward solving some of the dairy problems of their State and were anxious to make the most of it.

“In agriculture the trend at present is toward specializing or making a certain branch of farming or a certain line of animal husbandry the prominent feature on each farm, and to meet these conditions the instruction that counts for most is that which gives definite information about the thing, whether it be plant or animal, and it is plain that it adds greatly to the effectiveness of such teaching to have at hand a living specimen of the thing under discussion.

“It would seem that this method of doing institute work is worthy of a general trial in other States.”

INCREASING PRODUCTION.

It is possible to greatly increase the annual yield of our various farm crops—first, by a more thorough preparation of the seed bed and a more liberal supply of plant food ; second, by planting only

pure and perfect seed. If we cannot properly prepare and fully fertilize the present acreage devoted to our several crops, it will be far better to reduce the acreage for a time at least and produce maximum crops, than as, in so many cases now, secure but a minimum return.

Look at the *average* yields of our farm crops and consider how many there must be who are doing that poor work way below the average. The second best is always a foe to the best, whether it be the producer himself or his product.

Maximum returns will not crown his efforts who ignores the weak points in the management of his business. In the matter of *missing hills* and thinly-seeded grass and grain fields, resulting largely from defective seed and adulterated seed, there is a loss to our farmers that is simply enormous. Conversing with some good farmers on this matter the conclusion was that \$100 loss per farm annually from this cause would be a low estimate. If this is within bounds, the total loss to the 34,650 farms of New Jersey is \$3,465,000 annually! Can we afford it? If not, where is the remedy? Buy only clean seed guaranteed pure and free of adulteration and test its germinating power.

The extent of seed adulteration, both by mixing impure imitations into the genuine article and also intermixing therewith seed that has lost its germinating power, is very great. Such an imposition as this should be branded as a high crime and the perpetrators of it classed as criminals of the first grade. Let us combine to drive them out of business and out of good society. We need to put a premium on honesty rather than to encourage dishonesty.

This principle holds true in dairying also. If our dairy cows are not producing on an average more than 4,400 pounds each annually, how many farmers there must be who are receiving but little more than their board for all their investment and work. The remedy is at hand if cow owners and dairymen would apply it. Weigh the product and discard the profitless animals. Then, too, breed your dairy cows and breed for milk production. I believe it would be a wise and profitable thing to do if our dairy farmers would organize cow-testing associations, thus helping each other to detect profitless cows and creating a friendly spirit of rivalry. If this should be earnestly engaged in a very decided improvement would soon be manifest all along the line. Could not

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our dormant State Dairy Association be revived and take up this work?

Mr. H. E. Cook, who many of you heard during the institute work last November and December, referring to the triumph of our dairymen in securing the adoption of liquid measure instead of dry measure, says:

"I wonder if these same men will figure as carefully how much loss they have sustained from inferior cows—and let me say that New Jersey has its share with other States. I have no figures to offer, nor can anyone make estimates in figures, but it is safe to say that, if it were possible, they would so far distance all other losses as to frighten the cow owners. Probably not one dairyman out of one hundred whom I have met in the six weeks of institute work just closed knows anything whatever about the production of each cow. The dairy is the unit of measure instead of the individual cow.

"The mass of dairymen will never be able to put the business on a really permanent basis or be able to get the prices we should have until we know how to stop the tremendous losses right at our own doors and within our own reach—an old story from a different point of view."

Milk producers of New Jersey, do not allow this reproach to rest upon your management of the dairy business any longer. With the will to do the means will be found. If ye know these things, happy are ye if ye do them.

But what of the future in dairying? Many of our intelligent milk producers of the past are abandoning the business. Various reasons are given for this, chief of which are: Cost of production is greater, scarcity and high price of such laborers as are necessary in milk production and the small margin of actual profit after all expenses are met.

The truth is milk production as a business has not generally, hitherto, been conducted on strictly business principles. It has been largely a side issue to the general farm work. The farmer, his wife, his children, the hired men and the hired girls each and all took a turn at the business in various ways as occasion required, and their labor was not charged up against the business, hence the actual cost of the product was not known and consumers have not paid, at least producers have not received, such a price for the article as the actual cost demanded. That time is passing away.

Is the production of milk for the Eastern States in the near future to be put on a strictly commercial basis and carried on by associations owning a thousand or more cows in each dairy? The trend seems to be in that direction. The demand for milk will not decrease and this demand in our large eastern cities can be supplied only by widening the territory drawn upon for milk or by increasing facilities for its production nearer the market.

The changes now going on in the dairy business, owing in part to new demands for sanitary milk, will have a tendency to eliminate profitless cows from our dairy herds. This will be a great gain, for this is the greatest defect in many dairies.

Then, too, there should be more silos. In some sections of the State where dairying prevails, and is one of the chief branches of husbandry, we find the farmers pursuing the old methods of harvesting the corn crop—a method tedious, costly and calculated to greatly reduce the possible profit from this luxuriant crop as a dairy feed.

Another weak point, to which our president has frequently called attention, is not producing more protein crops, especially for summer use. If this were done the shrinkage so often occurring in dry weather would be overcome and the steady milk flow maintained. In this connection it is gratifying to know that the number who are trying, or are intending to try, alfalfa production is increasing. If failure has followed any attempts hitherto made it has been due to some error. But do not allow one failure to prevent further effort. It can be produced in this State, and, with abundance of alfalfa hay at command, it will be possible to somewhat reduce the cost of milk production.

We are to have an address on "Corn Improvement"—that means we are to select better seed and secure larger returns. If we should increase by any or every means in our power our yield of corn five bushels per acre, our wheat three bushels per acre, our hay one-half ton per acre, our potatoes twenty-eight bushels per acre and our dairy cows five hundred pounds per head per year, at present prices this increase would add to our total income \$7,705,458 per year, or \$222 per farm.

That would mean that we should produce of corn forty-one and one-half bushels per acre, wheat twenty-four bushels, hay two tons, Irish potatoes 130 bushels and our cows 5,000 pounds each per year.

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Let us put these items together—

Loss from poor seed and improper seeding	\$3,465,000
Loss from leaching and improper methods of caring for and applying home manures at \$50 per farm	1,732,500
Gain from increasing yields per acre	7,705,458
	\$12,902,958

Or a gain of \$375 per farm each year.

INSECT PESTS AND THE GAME LAWS.

Every farmer and fruit grower knows to some extent the value of insectivorous birds in the destruction of insects injurious to his various crops, but to what extent are our game laws framed with reference to the farmers' interests along this line? Furthermore, how often have the farmers, or any of them, been consulted in the framing of the fish and game laws? It seems to me it is high time they should have a part in this matter, and I suggest that a standing committee be appointed from this board to confer with the present fish and game commission concerning the farmers' interests in our birds and other game. I believe they would have a respectful hearing accorded them and good results might follow.

TRANSPORTATION FACILITIES AND FREIGHT RATES.

With the increase in railroad and trolley lines in this State, reaching every city and almost every town of fair size, there should be no lack of facilities for the shipment of produce from our farms at the proper time and with such dispatch and in such condition and at such rates as would be just to the producer, the shipper and the consumer, for all these are interested.

Some complaints have been brought to my attention. Here, again, in my judgment, it might be well to have a standing committee appointed who would receive such complaints and present them to the railroad officials either direct or through the newly-constituted railroad commission.



Shipping Scene at Swedesboro, N. J.



Sorting Grapes. Baron de Hirsch Agricultural School, Woodbine, N. J.

Parcel Post and Postal Savings Banks.

Parcel Post and Postal Savings Banks.

BY THE HON. G. VON L. MEYER, POSTMASTER-GENERAL.

Dr. Voorhees—We have the pleasure and the privilege of having with us this afternoon Postmaster-General Meyer, who will speak to us upon the subject of “The Extension of the General Parcel Post, the Establishment of a Special Local Parcel Post on Rural Delivery Routes, and the Inauguration of Postal Savings Banks.” I take great pleasure in introducing to you the Hon. George von L. Meyer, the Postmaster-General of the United States. (Applause.)

Postmaster-General Meyer—*Mr. President and Ladies and Gentlemen:* Last week I had the honor of being called upon by the president of the National Grange, Governor Bachelder, and a committee of seven, who visited me at my office in Washington, and assured me of their hearty support of the propositions I have recommended in my annual report to the President, which was in turn transmitted to Congress, namely, the extension of the general parcel post, the establishment of a special local parcel post on the rural routes, and the establishment of postal savings banks.

It is a privilege to be here to-day, and I am delighted to have this opportunity to explain the purposes of the recommendations the department has made, and which we hope Congress will consider at the present session.

I found upon entering the Post Office Department that we had a general parcel post, and that packages up to four pounds in weight could be sent to any part of the United States at the rate of sixteen cents a pound. I also found that we had conventions with more than thirty countries; that the rate to all of them was twelve cents a pound while the weight limit to a majority was eleven pounds. This appears to be a peculiar discrimination against our own people, which may be illustrated as follows: If

any one of you should go to the post office here in Trenton with a four-pound package and should ask that it be sent to New York it would cost sixteen cents a pound, but if you had another package of the same weight and desired to ship it to some one in a foreign country, it would cost only twelve cents per pound, although it would have to travel many thousands of miles.

Still another inconsistency and discrimination, if I may use the latter term, is that if the package should weigh four pounds and six ounces the postmaster would have to refuse the one intended for delivery in New York, while the one destined to the foreign country with which we have a convention would be dispatched if it should weigh as much as eleven pounds. In other words, it is necessary under existing law to pay four cents a pound more on parcels delivered at home than on those sent abroad.

Therefore, it was deemed proper that the department should call the attention of Congress to these inconsistencies and should recommend that the price on parcels forwarded by mail to our own people should be the same as on those to people in foreign countries.

This proposition has been opposed and is being opposed by the express companies, certain wholesale houses and by mail order houses. You must remember that I have coupled with the proposition the establishment of a special local parcel post on rural routes for packages originating on a rural route. The rate is five cents for the first pound and two cents for each additional pound up to eleven pounds, or twenty-five cents for a package of the maximum weight.

You should bear two things in mind: That on the general parcel post, that is, on parcels outside the rural route service, the cost of transmitting an eleven-pound package would be \$1.32, but on the local parcel post on rural routes it would be twenty-five cents for a package of the same weight. That eleven-pound package for a farmer or other individual on the rural route, ordered by telephone or postal card, could be made up of numerous small packages tied together, and these smaller packages could be distributed by him, the total charge by the government being but twenty-five cents.

What are the arguments that have been made against this recommendation in connection with the rural parcel post? A great many of the retail merchants have been frightened by the cry which has gone out from certain hardware associations in Chicago and else-

where that this would be but an entering wedge, that the same rate would ultimately be adopted on the general parcel post proposition throughout the country, and that it was class legislation.

In answer to the first claim, that it would be the entering wedge for the adoption later of the same rate on the general parcel post, thereby giving greater facilities to the large mail order houses for shipping supplies all over the United States, I want to call to your attention that in the general parcel post railroad carriage is a tremendous factor in the cost of transporting a package from one point to another. The parcel must be hauled in a screened wagon from the post office where received to the railroad. Then, as I have said, comes the railroad transportation, and then the transportation in a screened wagon from the railroad to the post office of destination. If addressed to a patron on a rural route an additional haul by the rural carrier is necessary.

Now, as to the argument that it is class legislation. In post offices where there is no free deliverery a rate of one cent an ounce for letters which are to be called for is allowed, but if a letter is dropped into a post office having free delivery, the rate is two cents, even though delivery is effected at the general delivery window. That might as reasonably be called class legislation by the men who are making that argument.

We also know that any county paper has free transportation in that county, and that a publisher can send his paper at one cent a pound all over the United States, a rate which is not allowed the individual. If the latter wishes to send a paper he must enclose it in a one-cent wrapper. That also might be called class legislation, and there are other regulations similar to those mentioned. In the proposition concerning the rural routes the claim of class legislation could not logically be made, because there is no particular class that would have any special privileges. The special rate for the local parcel post is founded upon the ability of the government to render the service at a reasonable profit, and would be the same to anyone living or regularly doing business on a rural route.

I believe it is of the greatest importance to the farmer, and others occupied directly in the tillage of the soil, as well as of incalculable value to the local merchant, who should not be wiped out and driven to the wall. This is the first time the government has been in a position to aid, by special rates, the residents on these

rural routes and the rural communities of which they form so important a part.

I wish also to call your attention to the number of rural routes and the people they are accommodating at the present time. There are more than 38,000 rural routes, furnishing mailing facilities to more than fifteen millions of people.

The rural route delivery originated in 1896, and the first year's expenditures were about \$15,000. Ten years later, for the fiscal year ended June 30th, 1907, the expenditures were \$24,000,000. Yet with these largely increased expenditures for rural delivery the deficit this last year was smaller by about \$4,000,000 than the first year, when only \$15,000 were spent, showing conclusively that the rural delivery, while it costs a great deal, has not resulted in increasing the deficit. The rural routes serve in a way as feeders to the general service. An apt comparison is the service the branch railroads render the great trunk lines. The increased business is not necessarily shown in the receipts of the local post office, because a great deal of correspondence goes to the rural route rather than from it.

As we have this great machinery in existence, there is no reason why we should not avail ourselves of it. On the contrary, there is every reason why we should permit the people to enjoy the great benefit of the service which has been proposed.

If we adopt the parcel post on rural routes it would greatly increase receipts; in fact, it has been calculated that if each time a rural delivery carrier went out he took three eleven-pound packages (for which the charge would be seventy-five cents) the resulting revenue would be sufficient to wipe out the deficit of the postal service, which was this year over \$6,000,000.

Instead of being a burden upon the resources of the post office department the revenues would be increased, and at the same time the farmer would be benefited as he would have his goods delivered to him at a very nominal cost, often when it would not be convenient for him to hitch up and go to town for them. The increased consumption would increase local traffic and trade, and that would result in larger orders to shippers and wholesale dealers. Last, but not least, the increased cancellations would raise the salaries of the fourth-class postmasters.

These, in brief, are some of the advantages which would enure to the community and to the government by the establishment of a local parcel post on rural routes.

POSTAL SAVINGS BANKS.

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I believe further that we could make a reduction in the general parcel post rate. I fail to see by what reasoning we should charge our people for the transportation of mail to domestic points four cents a pound more than we do if sent to people living in foreign lands.

There is still another advantage which would come by the adoption of the parcel post on rural routes, and that is the movement which would follow for better roads. I think you would find that if the farmers, in certain parts of the country where roads were bad and bridges out of repair, knew they were going to receive the necessities of life over these roads, they would lend a helping hand in patching, filling, &c.. This would lead to concerted action for better roads, and better roads would mean an increase in the value of their property.

A congressman came into my office a short time ago and told me that since the establishment of rural delivery in the south the value of farms had increased because they had become more accessible, and people were better able to communicate with the outer world. In the same way that they now receive mail they could receive packages up to eleven pounds containing merchandise and whatever else was needed for every-day life, and this would make their farms still more habitable and attractive, and the people would be benefited in all directions. It should be borne in mind that this can be done without burdening the government.

Mail order houses are opposing this proposition for this reason: While to-day the rate—sixteen cents a pound—is higher than that I recommend, they can ship four-pound packages to any part of the United States for delivery by rural carrier. The small local merchant, who may be only a few miles away, pays the same rate. Therefore, they greatly object to any change.

I ask you people to give this matter serious thought, and it will be necessary to make your representatives realize that you have this matter at heart in order for it to receive consideration at this time, because there is a disposition in Congress to prevent the matter coming up.

I wish to speak to you, also, as to the establishment of postal savings banks. There are certain people in this country who are opposed to the government taking any more action in a business way for the reason that they fear it will reduce private enterprise.

Now, I thoroughly respect any sound and sincere argument in

that direction, but I want to call your attention to the fact that the object of the postal savings bank will not be to compete in any way with existing financial institutions, but rather to inculcate in our people habits of economy and thrift and to encourage the husbanding of their resources.

I find that savings deposits in the United States amount to \$3,500,000,000. Thirty-eight per cent. of these deposits is in New York State, about 31 per cent. in the New England States, and, if you include the States of Pennsylvania, Illinois, Iowa and California, eleven in all, you will have accounted for 92 per cent. of all the deposits in savings banks. New Jersey has a very good record for its size, and is to be praised for the savings banks that are in operation and for the work they have done; but when you take into consideration that thirty-five States of the Union have only 8 per cent. of the entire deposits, it is conclusive proof to my mind that sufficient attention has not been given to encouraging people to put by something for a rainy day. That comes about because of several reasons: one is, that in many of our large States the distances are so great that the opportunity is not given the people to take their money to any financial institution. Another is, that when the laborer finishes his day's work and returns home the banks are, in most instances, closed. A third is, that the great foreign population which has come to our country in the last fifteen years has preconceived and prejudiced ideas against private institutions, and these foreigners are sending vast sums of money out of this country, a practice which is having its effect upon our resources and to some extent upon our prosperity.

I find that for the last fiscal year the post office department sent out in money orders to Europe \$80,000,000. These orders averaged about \$40. This will illustrate the striking results which can be accomplished where a large mass of people are operating toward a common end.

About nineteen millions were sent to Italy, sixteen millions to Austro-Hungary, eleven millions to Great Britain and eight or nine millions to Russia. I want you to remember that this is merely the money that was sent out through the post office and does not include the large sums sent through bankers and express companies. This money sent out by the post office department, through money orders, in many instances has been put into the postal savings banks in the country to which it is sent.

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A steamship purser on one of the lines told me of the large sums taken by these people when they go home, as they have been doing in large numbers lately.

Large sums of money are going out of the country which would remain here if we had postal savings banks. We have on file in the post office department letters from all parts of the United States showing that foreigners have asked postmasters to take care of their money. This is especially true of the west and south, and when postmasters have refused the money has been taken away and kept in hiding. In other instances money orders have been bought payable to the purchasers. These orders are good for one year only and a fee is charged.

It is very evident that people put their money in financial institutions for two or three distinct reasons. If they put their money in a national bank or in a State bank they put it there primarily because they want it subject to check. They want the convenience of drawing on that money in paying their bills, of getting it at once when they want it, of sending it away by check, or of getting business accommodation in the way of having their notes or those of their clients discounted. If they go to a savings bank they do not expect to withdraw by check, but they do expect to get a larger return—sometimes only 3 per cent., but pretty generally 4 per cent.

The rate which the government offers is only 2 per cent., and the maximum deposit to which we propose to limit each individual is \$500. This I mention as an evidence of good faith that we are not desirous of competing with financial institutions as they exist to-day. One of our main objects is to bring into circulation the money which is not now in the channels of trade and has lost its function. We have every reason to believe, from careful study of the problem, that several hundred million dollars are idle because of ignorance or lack of confidence.

If we can get at this new money—I call it new because it is new so far as capital and labor are concerned—if we can get this new money into the channels of trade we will benefit the industries throughout the land. The proposition is a very simple one. I have profited by experience in making my recommendation, by experience in the department, by that of other countries and by studying a similar system as it has existed in Canada for the last forty years. The Canadian people have deposits in postal savings banks amounting to \$50,000,000, and if Canada can have \$50,000,000 we should have four or five times as much.

The method will allow any individual to go to the post office and make a deposit. Say he wants to deposit \$5. He receives a book with his name on it and a credit of \$5. On the back are instructions as regards the drawing of money, &c., and also a notice that if within so many days he does not receive word from headquarters, he must notify the Savings Bank Department at Washington that he has not received notice. We will then know that there is something wanting and will act accordingly. Under ordinary circumstances, barring accidents, he will, within twenty-four or forty-eight hours, according to the distance, receive note from Washington stating that so much has been placed to his credit. This method constitutes a check on the postmaster, and the depositor has the double assurance of his book and a notice from Washington.

Canada has, through her postal department, received and paid out in the last thirty-nine years \$450,000,000, with a loss of only \$25,000 in all that time. It has not increased the clerk hire in post offices, for at small post offices the depositors are not numerous, and in large cities the money order clerk makes the entries.

It would be necessary to have a postal savings division of the department at Washington, and the experience of Canada has been that to take care of their \$50,000,000 of deposits but \$60,000 per year are required. The cost in our case would be somewhat higher, and the bill as proposed carries an appropriation of \$100,000.

From that point we can go into a separate arrangement somewhat different from that Canada has adopted. There the money is put into the treasury. The principal opposition to postal savings banks in the past in our country has been because of the fear that they would result in a lot of money being tied up in the treasury. In order to overcome this objection and get the deposits back into the channels of trade at once, the intention is to place the money in the national banks in the counties of the State where the money is received at the post office. You see in that way each district will have the new money which belongs to it; there will be no favoritism practiced in sending it to any financial center. It is necessary to confine depositories to the national banks because they are semi-governmental institutions and under the supervision of the Comptroller of the Currency.

Now, as to the interest: I have consulted bankers in Boston and

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New York, Philadelphia, Chicago, Milwaukee and other cities, and the universal opinion seems to be that we can count on a 2 per cent. rate of interest from the national banks. Therefore, the money would practically board itself and we would pay the depositors the same rate.

I don't propose to ask for collateral on these deposits for this reason: that the government, that is, the post office department, is a preferred creditor. Another safeguard is that the stockholders of each national bank are liable for double the amount of their stock. Again, each bank would be carefully inspected by the Comptroller of the Currency before deposits were made, or at any other time the Postmaster-General might deem necessary.

Someone has said that our plan would not help the trust companies or the State banks. This is true to a certain extent, as the only people we could use as agents would be the national banks, they being under government supervision, but let me show you how it would benefit the other institutions. Take, for instance, the case of Providence, Rhode Island, where there was a run which closed one or two banking institutions that were not national banks. Such runs generally are started by the small depositor, who becomes nervous, or by the foreigner, who is even more frightened. Now, if they had made a run on these banking institutions in Providence and had taken their money immediately to the postal savings bank, and we had immediately placed it in the national banks and back into the channels of trade, the run would have ceased quickly, because it would have been like taking water out of a well and letting it run back. When the people saw that those banks could stand the run the run would have ceased, and the entire community would have been benefited.

The great benefit to the country at large will be to get and bring into the light of day money which for years has been hoarded and which we know amounts to a large sum. The money in circulation is about \$3,600,000,000, but we can trace only about two and one-half billions; that is, we know that two and one-half billions is in the treasury or in financial institutions of the country; the other billion we cannot locate. It is in the pockets of the people or in hiding-places, and it is that money which we want to get back into its proper place, and there seems to no simpler method than that I have suggested. The people know the government is good and has always met its obligations, and they have confidence in it such

as they do not repose in any private institution. I would like to read a few words from the speech that I am to make this evening in Newark:

“My object has been, in recommending in my annual report the establishment of a postal savings bank and the extension of the parcel post, to obtain results that would bring about the greatest good to the greatest number. The strength of France in the past forty years has been the thrift and economy of its people, a national trait which has brought about wonderful results. In a few years France, after the Franco-Prussian War, paid off that tremendous indemnity, the people drawing upon their husbanded resources. Again, in 1890, it was France that helped out in the panic that took place in England, and to-day the Bank of France is in a stronger position as regards its gold reserve than any other country in Europe. Could our people be taught to husband their resources and to acquire the habits of economy and thrift there would be no country in the world which could show such strength and which would promise such great developments for the future.”

I realize, as I see the great cities of our country growing with such rapidity, that one of the important features in the problems of the day is to add to the attractions of country life. The backbone of our people is the farmer. We should aid him in every legitimate way to acquire the necessities of life at the smallest possible expenditure. The free rural delivery has been a great benefit to the rural patrons and is keeping them in touch with the great questions before the country, besides raising the standard of living. Is it too much to ask that we should further utilize this great machinery of the rural delivery, which is accommodating 15,000,000 of people, for establishing a local parcel post in order that the man in the country may have the necessities of life delivered at his gate at an average cost of two cents a pound, which, besides being of great benefit to the people, would at the same time add materially to the income of the postal service from the rural routes, the expenditures for which last year amounted to \$24,000,000, and the present year probably will amount to \$34,000,000.

It remains for the people of the United States to say whether Congress shall be called upon to take up these questions and debate their merits, and after proper consideration to decide whether the people shall have this privilege.

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President Voorhees—The Postmaster-General is ready to answer any questions that you desire to ask upon this subject. Are there any questions?

Mr. Rider—I am a little concerned. If the government borrows the money at 2 per cent. and loans it at 2 per cent., where does the expense of handling the money come from to the government?

The Postmaster-General—The government is not going to borrow this money that is deposited with it, but it deposits it in a national bank, and the national banks have intimated that it is safe to figure on 2 per cent.

Mr. Rider—And that is what the government pays the depositor?

The Postmaster-General—Yes; the government is not going to make anything.

Mr. Rider—Where is the expense to come from?

The Postmaster-General—There will be no additional expense in the different post offices, except the establishment at the national center, which in Canada is Toronto, and in our case would be Washington, and to take care of that matter costs in Canada \$60,000 a year. The depositors will be paid not from the exact day on which the deposits are made. There will be four intervals at which the interest is computed, the first of the year and then at intervals of three months. There is something saved, a fractional saving to the government, because it will get interest from the bank and will get it from the date of the deposit. That small difference should cover the expense of the central establishment at Washington.

Mr. Rider—That is satisfactory; I only wanted to know whether there was any weak point in the proposition.

A Member—The great object of this law is to make safer the deposits of the people, and the government is responsible for this money besides the banks.

The Postmaster-General—The primary object is to give an absolutely safe place for the people's money throughout the United States. Of course, I realize, as all of you do, that the great majority—more than that—it is an exception when a financial institution is dishonestly managed, but there have been some, and that, unfortunately, has made a great many people nervous, especially the foreign element, and other elements that don't want to take any chances. If we can instill confidence into the people and

inculcate this habit of saving, so that they will have something to fall back on for a rainy day, there is no doubt when they see their friends getting 4 per cent. from some of our institutions, that they will take their money, after they have acquired several hundred dollars, and go to this first-class saving institution. We will not discourage that, because the object of the postal savings bank will merely be to encourage people to put their money in—those who have not yet done so, or those who are afraid of the institutions. It will be very useful to the financial institutions now existing when such nervous times come as have been here within the last few months. It has been figured out that \$200,000,000 have come out of hiding recently; whether that is so or not I don't know. But instead of going into hiding, in the first place, it would have gone into the postal savings bank and a good deal of the trouble would not have occurred. The object is to give an absolutely secure place and to get the people to put their money where it can be used and have its proper function.

A Member—I take it for granted that our President is heartily in favor of it.

The Postmaster-General—I refer to the President's message in which he says he is heartily in sympathy with it, and also that he would not endorse the parcel post measure if he did not feel sure that it would benefit the farmer and the small merchant.

Money in Sheep for New Jersey Farmers.

Money in Sheep for New Jersey Farmers.

BY F. C. MINKLER, PROFESSOR OF ANIMAL HUSBANDRY, STATE AGRICULTURAL COLLEGE, N. J.

I am very grateful, indeed, for this privilege of opening for general discussion a subject of so great importance to the farmers and land owners of this State as has been given me by the worthy secretary of this board. Truly, it is gratifying to note the genuine interest and intense enthusiasm that the eastern farmers are exhibiting in their united efforts to improve and promote the various agricultural enterprises, and the mere fact that success is surely and steadily crowning these extra efforts adds real inspiration to the work. It must be admitted at the outset that New Jersey is a State of varied industries; that it is possible to produce and find ready markets for a great variety of farm products; also, that conditions vary surprisingly as consideration is given to the different portions of the little State. However, we are safe in stating that no State in the Union offers more or better market centers so close at hand; that the nine millions of people who live within a radius of fifty miles from the center of the State are exacting in their demands for high-class food and meat products, and that the Jersey farmer should exert every possible effort to supply these known demands first handed.

Possibly you may think that my ideas as regards live stock production were formulated in the west and that eastern conditions are vastly different, but permit me to state, with all emphasis and earnestness, that after my first year's work in the east I am fully convinced that the brightest agricultural opportunities are here, rather than in the west, and that local conditions are, in many respects, far superior for the growing, marketing and successful management of certain classes of live stock, and in this regard the sheep or mutton industry is well worth careful consideration.

One of the first things demanded by a grower of live stock, or of any salable farm product, is a ready and dependable market for his surplus, and, without consideration of this item, failure is certain, and will bring ruin to the brightest of prospects. On the other hand, success is almost assured where there is a growing public demand made by a wealthy class of people for a certain commodity that can be readily produced, regularly and easily placed on a steady market where the prevailing prices insure reasonable profits. It is evident that there is an increased and popular demand for choice, and especially early marketed mutton among the upper classes of people in our larger cities, and of late it has been impossible to meet this want in season. People in general have been educated to appreciate choice meats, and only recently the common prejudice against the so-called "flavor" of mutton has subsided. Granting, then, that there is splendid market for the surplus meat, and knowing that wool is always salable, let us briefly consider the advisability of raising sheep in this State.

During the past summer and fall I visited several hundred farms located in five different counties of this State in an attempt to find out as far as possible the actual conditions affecting, chiefly, the live-stock farmer. It was possible in this way to meet with the farmer on his own farm and talk over matters of interest relative to the particular class of stock he was raising, and in this regard the information was first-handed. While comparatively few were found that could be termed large mutton producers, yet in every instance where sheep were found the owner frankly and willingly admitted that for the money invested and the food consumed his sheep and lambs yielded by far the largest profits and required the least care of any live stock on his farm. In support of these statements the chief reasons given were: First, their superior grazing qualities and ability to thrive and be content on pastures unsuitable to either cattle or horses; second, the fact that they willingly consumed all kinds of rough fodders not readily eaten by other animals without subjecting them to expensive methods of preparation; third, their superior weed-destroying habits and likings; fourth, added fertility to the soil and the equal distribution of same; fifth, that they required less labor during the busy season, less expensive winter quarters, yielded salable products always in demand at local markets at good prices. The

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greatest difficulties seemed to be: First, a lack of proper fences; second, destruction from stray dogs, and this was usually exaggerated; third, inability to purchase from the drover, store ewes with good mouths and ones that were sure and regular breeders; and fourth, a scarcity of experienced shearers in season. It is readily seen that the desirable features greatly outnumbered the objectionable ones; and furthermore, it was found that the more successful breeders have almost solved the stray difficulties mentioned.

Two systems of establishing foundation stock are quite generally practiced. On the one hand, the farmers depend entirely on the local or visiting drover for his breeding ewes, which means that he buys western or southern culls varying in age and condition. Usually they are very common, if not inferior in breeding, and very often the purchaser finds that they are old and will not breed nor even fatten under the changed conditions. It is not uncommon that such ewes are mated with a scrub ram of unknown breeding, regardless of their condition or vigor, and this mating is accomplished as early in the fall as possible. The ewes are not "flushed" nor conditioned in any way and no special feeds nor extra care or quarters furnished until weaning time when all hands are required to care for the flock. Some few prefer single drops, maintaining that they will grow and gain faster and that the buyer will pay higher prices for single lambs. This belief is entirely wrong, yet it is foolish to expect a ewe of low utility to suckle two hungry lambs on a ration equal to the one given the ewes with single drops. The lambs are sold as soon as possible, also the entire flock of ewes disposed of after being shorn and slightly "warmed up" by the use of a little grain and cheap roughage. The only representative of the flock that is kept over from year to year is the unsightly scrub ram, and he must make his way by working the tread power.

The other practice which is far more successful consists in selecting the choice twin-bearing ewes and keeping them in the flock during their usefulness, gradually culling them by rigid selection and reinforcing the flock each year by the addition of the choicest ewe lambs weaned from the most prolific and heaviest milking mothers. In this way it is possible to increase the number of lambs dropped, which, in turn, means more profits. Instead of the mongrel ram, used as first outlined, a pure-bred sire heads the

flock and the lambs are more growthy, mature earlier and show the results of their better breeding in many ways. The ewes are regularly flushed before breeding, either by the addition of grain to the ration or by changing them over to a fresh pasture. This insures a more uniform settling among the ewes. The ram mingles with the flock during the evenings only and is stabled during the day and fed a nutritious grain ration. Success follows this system in every case, as the following instance illustrates: A general farmer in Hunterdon county owns sixty grade Southdown and Shropshire ewes. Last year he was fortunate in inducing early mating by furnishing an abundance of second crop pasture clover, and succeeded in raising ninety-three lambs from the sixty ewes. A pure-bred ram was used, but allowed to run at all times with the flock. Excepting the few choicest ewe lambs maintained for breeders the balance were sold when about eight weeks old at an average price of \$7.85 per head, and weighed approximately forty pounds each. The ewes averaged seven pounds of wool worth thirty cents per pound, both lambs and wool being sold at his local station. The earliest lambs brought as high as \$10 each, while another instance was found where forty-pound lambs brought as high as \$14 each on an early market. These cases differ from the so-called "hot-house lamb" inasmuch as they were found on farms where the buildings and general management were only ordinary, if not common.

It is to be regretted that so few sheep raisers pretend to raise or grow their breeding ewes. They feel confident that an offer of \$5 or possibly \$10 for a youngster that can be easily carried under their arm is too good to miss, and are induced to part with them regardless of their future value. The dairyman has almost decided that the only way to procure profitable cows is to raise the choicest heifer calves from their best milking cows, sired by a pure-bred bull whose family record is a milk record and whose individuality and dairy breeding is high class. It is just so with the sheep business. The mere buying of culled or discarded ewes from the extreme south or west does not insure profits in lamb or mutton production; but the selecting and maintaining of the choicest twin ewe lambs from tried and known heavy milking mothers as foundation stock or breeders, is sure to result in more successful practice for the shepherd.

The New Jersey farmer is interested in that class of live stock

that can be cared for at the least expense, and it must be admitted on all sides that a flock of ewes require less attention than the dairy herd, and as a machine for converting feed-stuffs into salable products the ewe ranks even above the dairy cow, being able to put firm flesh on her back, loin and leg as cheaply as the cow makes milk, and besides, offers her fleece as additional evidence of her superior feeding qualities. It was further noticed that the farms on which the flocks were kept from year to year needed far less commercial fertilizer; that there were fewer noxious and troublesome weeds, and that the physical condition of the soil was superior both as regards tilth and productiveness. The question of hired help, which is a discouraging factor at present with the dairyman, is less serious with the farmer who resolves to keep fewer cows and more sheep, and from statements made by the farmers themselves I would conclude that the profits greatly increased where such resolves were put into practice and the size of the breeding flock increased.

I would not infer, however, that sheep growing or early lamb raising is profitable business for every farmer. It requires knowledge and experience as well as patience and perseverance. It is no business for anyone to engage in pell-mell or full-fledged at the start, for it has its drawbacks and discouragements. A successful shepherd must like his business and have confidence in the ability of his charges to grow and yield profits, and must know sooner or later the value of rigid selection and regular culling; also, the importance of using only pure-bred utility sires, regardless of the class of ewes on hand or their previous conditions. Mere keeping of sheep without caring for them is poor business, and the party who follows this practice ought to feel, for it is doubtful that any class of farm animals require more devoted attention than is demanded by the ewe during the lambing season, especially if it is during the winter, as few dead lambs killed by mere neglect often makes the difference between success and failure.

We have in this State ideal conditions for the raising of sheep and early lambs. The pastures for the most part are high and dry, thus free from parasites often troublesome in low marshy districts. There is an abundance of hilly grass land, too rough and stony to cultivate, that will grow luxuriant grass and forage for the flock while their browsing tendencies increase their value as animals to have about the farm. It is not necessary that warm

stables or quarters be furnished unless real lambs are produced, as a sheep can withstand an abundance of cold weather providing the quarters be dry and free from direct draughts. The "hot-house lamb," of course, being almost an artificial product, must be given special care, both as regards quarters and care. Coming as he does in midwinter, it is necessary that the barn be warm and well protected and an attendant must be on hand at all times. The youngster must be kept growing and gaining, which infers that the mother must have an abundance of choice feeds fed with caution and regularity. The extra prices received makes the extra efforts well worth while, for the rush for market comes at a time when the farmers' time is of least value, which is a very important consideration.

Finally, it is evident that the whole question of profits with sheep in this State rests with the individual farmer himself. We have the necessary markets, splendid grazing pastures and can produce any variety of feed and roughage desirable for their maintenance. Our depleted farms will welcome the added fertility the sheep furnish, while troublesome hired help can be more nearly dispensed with. If the farmer has a liking for sheep; if he will carefully select and properly feed, care and manage his breeding flock, be attentive at yearning time and watchful at all times, there is little doubt in my mind but that there is money in sheep raising in this State.

You notice I have omitted any discussion of the breeds of sheep, and I was in hopes this would be followed by a discussion along that line.

The President—You have heard this paper and the suggestion that the breed and other phases of the sheep question may be taken up in the discussion.

Mr. Fitzga—We have a sheep man here from Somerset county who can give us some information on this.

Mr. Cooper—Mr. Fitzga says that I have been successful. Possibly, on a small scale. I had a flock of twenty-four ewes a year ago last fall and I raised thirty-two lambs from the twenty-four ewes. I marketed the first lambs in January and the last lambs in March; I averaged my lambs well and they netted me \$10.03 per ewe after paying the commission, the killing and the shipping. I thought myself that was quite successful. Some years, possibly, I did better. I bought the ewes right in Professor Voor-

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hees' country, from the Mettler farm; they were half-bred Southdowns. The ram was a thoroughbred Dorset that was bred in Canada. That was the stock I raised from, and I think myself there is money in the growing of sheep, and the right way to get that out is to get early lambs. There is no use in taking \$5 for a lamb when you can just as well get \$10.

The general care of sheep is exaggerated. I think Mr. Minkler exaggerates it. In lambing time he is right. As far as dogs are concerned, that can be remedied. The way we do we have a Page wire fence and some others; they are cheaper than post and rail, and that does away with the dog question; you can make them dog-tight. I think he is right when he speaks of rough ground, because that is practically going to waste, and it will yield a good crop to people who raise sheep. (Applause.)

Mr. Gillingham—I want to ask Mr. Minkler what breed of sheep he would recommend?

Mr. Minkler—I would say that it is individuality in the ewe you look for rather than her being a representative of any particular breed. With the Dorset you can control the time of breeding more fully than with any other breed, and this is often very desirable. In many sections farmers use the Dorset ram on the native ewes, these being in most cases grade Southdown, Shropshire or Hampshire crosses. By using the Dorset ram on the average ewe for two or three generations it is possible to modify their breeding tendencies almost to the same extent as with the pure-bred Dorset. It is possible to take any of the breeds mentioned, either the Southdown, the Hampshire, the Shropshire or the Dorset, and raise right good lambs if you give them the proper kind of care.

A Member—What do you feed those ewes that have lambs in winter?

Mr. Minkler—The case I cited in Hunterdon, the chief element of that man's success seemed to be that he fed an abundance of second crop clover hay, also a little alfalfa, reinforced with a grain mixture consisting of three parts bran, two parts ground oats and three parts corn meal, and sprinkled in a handful of oil meal to keep them in good condition. The use of clover hay and alfalfa seems to be very successful.

A Member—Has anybody had any experience in feeding silage to sheep? I would like to use silage as food for sheep.

Mr. Minkler—I know of no complaint having been made as the result of feeding ensilage to sheep, but it is hardly necessary if they are supplied with abundance of clean clover hay reinforced by a fat-producing grain ration.

Mr. McCracken—I have tried ensilage for a few ewes, sometimes as many as 200 head, without any bad results whatever. I have been able in feeding ensilage to hold up the pasture weight of sheep better than I was able to do it with dry feed. I remember selling in February a bunch of about eighty wethers and dry ewes to a butcher, and the average weight was up almost to what we would expect selling out of a pasture field, which I was never able to do in feeding dry feed.

A Member—Did you ever feed silage to ewes at lambing time?

Mr. McCracken—Yes; and as far as I know I never lost a lamb in feeding silage. I would not hesitate to feed them if they were worth \$100 apiece. It is not theory with me, what I know about feeding sheep from ensilage I know. I lived on the top of the Allegheny mountains where we have to scratch for a living.

Mr. Dye—I think Mr. Minkler has touched a very important point in his communication, and that is the breeding of early lambs. Years ago, when it was more common to have sheep and lambs all over the State of New Jersey on almost every farm, the rule was to raise lambs in early summer, which made it necessary to turn both mother and lamb on the pasture, and, of course, the farm was pretty closely used up so far as grass was concerned; that was the complaint against the sheep business. But now, in the winter, if we are not dairying, and when we are not so busy, we have plenty of time to take care of those little fellows, and if they are bred early and the lambs can be fattened on clover hay and alfalfa, which is coming, it seems to me we have the true key to success. Experience proves that winter or early lambs can be raised at a good profit, and I suppose the whole thing will turn on that last word. If we can make more growing potatoes we will do that; if we can make more money by truck farming we will do that, but there are regions where we cannot do much trucking or raise potatoes but where we can raise sheep and lambs, and, it seems to me, there we want to turn our attention to this business. I don't know, but I have thought it might be a good scheme for

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some of our farmers to unite together, not in a farmers' trust, and buy up 1,200 or 1,400 acres, say in the northern counties, and get their sheep herders and make this business go.

Mr. Fitzga—There is an important point in that; it is that the farmer received money at a time of the year when there is nothing else to sell on the farm. Instead of going into the bank and borrowing it, they can borrow it as well through the lambs. Years ago we had a hundred ewes, and there was nearly as large an income from these hundred ewes as there was from the whole farm. On that hundred ewes we generally figured about \$800 to \$900; that was the income from them, and it came at a time of the year when there was not much to sell. Most farmers don't carry a large bank account during the year, and it comes in very handy. (Applause.)

A Member—While I produce some mutton, I find the most difficult matter is to get the proper ewes for the raising of lambs. Last fall, for instance, we went through a flock to get out about forty head, and we found it almost impossible to get our order out of a few hundred ewes. So I agree that if we want to make a success we should grow our own ewes and cross with a thoroughbred sire, the same as we do with our dairy cows.

Mr. McCracken—I was going to suggest that anyone who gets the idea of keeping a hundred sheep for the purpose of getting \$800 or \$900 out of them is liable to go up against a serious proposition in another direction. I admit the income of \$800 or \$900 per year, but you take a hundred-acre farm in New Jersey and put a hundred sheep on that and you had better look out for breakers ahead. They will eat all the grass on the farm and the farm too if you don't look out; they are small animals, but they are good eaters. I have tried that; I have raised as many as 200 brood ewes and have pastured them during the summer with their lambs, and I know what it means to do it. It was not done on a hundred-acre farm.

There is another practice that has been carried on quite successfully by quite a number of Pennsylvania German farmers, particularly in the eastern part. A good many of them buy a lot of sheep in the fall and put them on the farm after the meadows have made their after-growth, and the sheep were allowed to run over them in the winter and run through the sheds and yards and were fed on the surface roughage, were kept in good condition

and dropped their lambs in the early spring and were kept for early market, and they were sold, lambs and ewes, before the real pasture season. They had the advantage of feeding on everything that grew on the farm, and, as Mr. Minkler suggested, the fertilizer was more evenly distributed than by any other manner, and when the time came that there was danger that they would eat up everything they were sent off, and in the fall they buy new stock and stock up for the winter. Look out when you attempt to pasture 100 sheep on an ordinary-sized farm; they will eat up everything in sight.

Mr. Fitzga—I am glad the speaker came from Pennsylvania; if he had heard the discussion before noon about the average farm raising forty bushels of shelled corn I think he would talk differently. The farm I spoke of contains 240 acres, and we raise sheep and produce with all our second crops and had lots of pasture. I don't compare the mountain land to our Jersey river farms. That is the reason I spoke of 100 ewes. We had a lot of hay and sold a lot of grain and our hundred ewes were fed on our second crops. That is Jersey farming. (Applause.)

Mr. McCracken—May I also state in defense of the proposition that I made, that you had better not undertake to keep 100 sheep on 100 acres. It does all right when you have 140 or 150 alongside to pasture your sheep on.

The President—We would like to hear from some other States. Mr. Agee is here from Ohio; maybe he can give us some ideas on the subject.

Mr. Agee—Your discussion has interested me, but I have little to contribute. Years ago I was engaged in producing winter lambs for the Cincinnati market in connection with some production of potatoes.

One word about the ration for the winter lambs. I believe you will find that the proportion of protein should be less than it is in the rations of lambs kept until fully mature. What you want is fat. The earlier you put fat upon the winter lamb the better, and so with a little less protein and a little more fat-making material I think it is possible to get a better price. My friend, Henry Palmer, of Chester county, Pennsylvania, of whose success you may know, has for many years been supplying the Waldorf-Astoria Hotel in New York, and also one of the leading hotels in Philadelphia; he has had great success with the Tunis buck, although

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he has also used the Dorset. He gets a little more fat over the kidney—a little better carcass as the result of that cross.

A Member—Is that the same as the Broad-tail?

Mr. Agee—That is what it is, the name doesn't sound as well, but it is the same thing. There is a little more fat so my friend, Mr. Palmer, says. I didn't use that breed.

In my own experience I found the so-called mountain sheep, the coarse-wool sheep, wonderful milkers, and they gave me more money than some of others more highly graded. I got more twins and they were good feeders and went to market early. Yet I have had no unusual success, and am contributing this merely because my friend, Dr. Voorhees, told me to do so, and I am in Jersey and have to do what he says.

Report of Commission on Tuberculosis
in Animals.

Report of Commission on Tuberculosis in Animals,

For the Year Ending October 31st, 1907.

The agitation for pure, clean, healthful milk has become more general and exacting since our report of last year. More general in that, not only the larger cities, but very many smaller cities and towns are investigating the sources from which their milk-supply comes.

These investigations cover the condition of the stables as to cleanliness, ventilation, space allowed to each animal, feeds and the water-supply, also the condition of health of the dairymen, their clothing and methods of milking, the milking utensils and the methods of handling, cooling, transporting the milk, &c.; all these are important and should claim the attention of every milk producer.

But there is yet another matter that has attracted attention in recent years, and that is bovine tuberculosis. That this disease in its advanced stages may contaminate the milk from such diseased animals is possible, but it does not necessarily follow that every animal that may be but slightly affected is a menace, during her milking period, to the health of the person using such milk, and the requirements of some authorities that all cows furnishing milk to a particular market shall be tested with tuberculin and every reacting animal shall be destroyed, is so radical that, if it were put into general practice, the dairy industry would be seriously crippled.

A careful physical examination, coupled with the tuberculin test of *suspicious* animals, once or twice each year, and the removal of any that may be found to be diseased, is a reasonable and proper requirement to make of all who produce milk for public use.

Meanwhile it devolves upon the State to prevent, as far as possible, the introduction into the dairy herds of New Jersey diseased animals from other States. And every milk producer should

co-operate with the State and be on his guard at this point and not allow animals not having a clean bill of health to be added to his herd; such animals become a menace to the entire number.

Under the care of a watchful dairyman, who may be the owner, indications of indisposition of any kind will soon be detected, and if, as has been suggested, two, or at least one official examination be made each year, and diseased animals removed, the dairy animals of New Jersey will furnish a product beyond reasonable suspicion of disease, not only, but a product that will contribute to the health of all who consume it.

That badly-diseased herds are occasionally found (although this commission has been in existence several years) is due to several things, as, first, the commission has no power under the law to examine any herd, no matter how badly it may be diseased, unless requested to do so by the owner, or by the State Board of Health; second, as a consequence of this, numerous owners of suspicious animals have not hitherto applied for an examination, some of these being ignorant as to the character of the disease both as to its effects upon the health of their herds and its effect upon the milk; third, the limited appropriation for this work from the State, when we remember that there are more than 200,000 dairy animals in the State of New Jersey, and that these animals are being changed, either by purchase or breeding each year, it will be seen that \$15,500, the present regular appropriation, will not go very far in any single year, so that it would be impossible to cleanse all the herds of the State in twelve or thrice twelve months, but the work hitherto done is bearing good fruit. Not only have diseased animals, when discovered, been removed from herds inspected, but suggestions as to improvement of the stables, their surroundings, the water-supply and various other matters have been made; thus, this work is educative and helpful and tends to that improvement of the milk-supply, which some would seek to accomplish by an immediate, radical requirement.

It will be seen by reference to the table furnished herewith in connection with the treasurer's report that every county in the State, with two exceptions, has been visited during the year past, that 256 dairies have been inspected, that 3,632 cows have been examined, 575 of which were condemned and slaughtered. The average sum paid for those animals was \$23 per head.

If the State proposes to supervise the milk-supply, every herd

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from which milk is sold should be visited and a conservative inspection, such as has been previously outlined, made. A book of record should be kept for future reference, containing the name and post office address of each owner or tenant, the number of animals kept, buildings, conditions, surroundings, &c., &c.

By this means the State, through its appointed authority, would be in touch with each dairyman and have a fair record of his establishment from year to year. None would be omitted from inspection, the work would be comprehensive, and, if properly done, should be satisfactory to all consumers of milk who are reasonable in their demands.

Such supervision would lead the owners to more care in the breeding of dairy animals, to greater watchfulness against introducing diseased cows into the herd and better management in all the details of dairy work. A somewhat larger appropriation than is at present allowed would be required at the start, but a beginning should be made, taking up the work by counties, meanwhile attending to all voluntary applications of dairymen as at present.

The assistant in the work of the commission, Mr. S. B. Ketcham, has already listed over 1,400 dairies with the name of the owner and a brief outline of conditions prevailing. Such a record is of much value in the prosecution of this work, and it would be far more valuable if it included all the dairies of the State.

Then there should be put into the hands of every milk producer a concise statement of necessary requirements in the production of clean, healthful milk, calling attention to the disease—tuberculosis—its general character, how it spreads, conditions in stables and surroundings that will contribute to its increase or aid in reducing and controlling it.

Such an *official* circular would claim and should receive the attention of the recipient. Ignorance could then no longer be pleaded as an excuse for conditions that should not prevail, and anything, anywhere, that is a menace to human health and good morals, should be removed.

Owing to the multiplicity of writers, inspectors and critics of the dairy industry in the recent past, some of whom are wise and others not qualified to intelligently discuss, much less regulate, a business concerning which they know nothing practically, the mind of the public has been centered upon the milk-supply as being the one prolific source of most of the ailments that affect the

people, and it will be of great advantage to all concerned if a general line of supervision of this industry can be decided on that will be reasonable and rational in its requirements and conservative in its enforcement, thus preserving from ruin the business it seeks to regulate.

CATTLE IMPORTED FROM OTHER STATES.

If the water in the reservoir is to be clean and healthful the sources of supply must be free of disease germs and any contamination. Similarly, if we should keep our dairy herds now in the State free from disease from outside sources, the avenues of supply must be guarded and all incoming animals examined, inspected and tested, at least so long as surrounding States require such inspections from this.

It was for this purpose the law of 1899, chapter 181, was enacted. The purpose of the law, as far as it goes, is right and altogether for the interest of honest dairymen and all milk consumers. It is defective in that no provision is made for policing the channels of importation along the borders of the State, and in not providing sufficient funds to do the work. These points should claim the attention of our lawmakers.

In various ways, not necessary to enumerate here, the law is evaded by unscrupulous men, and unfortunately there are some so-called veterinarians, who are either not competent or not reliable, who wink at such nefarious business. As stated in the report of last year "the commission has no control over outside veterinarians," but we do reject them and their work when both are found to be unworthy of confidence.

If he is a criminal who would willfully pollute the water-supply of the people, as named above, even more so is he who, being placed on guard to protect the State from diseased animals from without, allows suspicious animals to pass in as sound, himself being, it may be, in collusion with the dishonest dealer.

The records of this office show that there have been imported from November 1st, 1906, to October 31st, 1907, 7,232 cows; of these 2,093 were brought in under permit and tested after their arrival, and 5,139 were tested before they were shipped.

FRANKLIN DYE,
Secretary.

COMMISSION ON TUBERCULOSIS.

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

<i>Counties.</i>	<i>Total Number Examined.</i>	<i>Total Number. Condemned.</i>	<i>Total Sum Paid.</i>
Bergen	27	6	\$169 50
Burlington	466	91	2,042 25
Camden	113	17	383 25
Cape May	18	3	90 00
Cumberland	341	64	1,512 00
Essex	224	27	696 00
Gloucester	93	13	280 50
Hunterdon	375	61	1,374 00
Mercer	242	67	1,578 00
Middlesex	21	7	156 75
Monmouth	178	40	1,030 50
Morris	199	39	855 00
Ocean	8	3	73 50
Passaic	7	2	45 00
Salem	274	37	787 50
Somerset	124	21	391 50
Sussex	696	60	1,410 75
Union	41	5	106 50
Warren	185	12	247 50

Total appropriation, regular	\$15,500 00
Total appropriation, supplemental	3,000 00

\$18,500 00

Total sum paid for cows	\$13,230 00
Expenses of inspection, veterinarians	1,614 76
Expenses of commission	450 91
Secretary, assistant and stenographer	2,816 00
Stationery and blanks	56 55
Tuberculin for imported cows	156 25
Ear tags for imported cows	113 00
Postage	62 53
	<hr/> \$18,500 00

Contagious Diseases of Animals.

Contagious Diseases of Animals.

REPORTED BY STATE BOARD OF HEALTH.

To the Board of Agriculture of the State of New Jersey:

GENTLEMEN—In accordance with the provisions of section 10 of the act approved May 4th, 1886 (General Statutes, page 50), the following report of the action of the State Board of Health for the prevention of the spread of infectious diseases of animals during the year ending October 31st, 1907, is presented.

On February 11th, 1907, five cases of equine mange were reported in Hopewell township, Mercer county, and February 14th, 1907, five cases of this disease were reported as existing in Califon, Hunterdon county. The animals were examined by veterinarians and appropriate action was taken. The local boards of health in the townships in which the disease occurred supervised and enforced effective quarantine, and there was no spread of the disease from the premises upon which it first appeared. Two cases of mange were reported as existing in Hudson county. In one instance the affected animal was destroyed and in the other suitable measures were adopted to prevent uninfected animals from contracting the disease. The occurrence of scabies in horses in Atlantic City last year, and again in widely separate portions of the State this year, would indicate that the owners of horses should use special care to detect the existence of this disease at its earliest appearance, so that it may not be conveyed to other animals, and when any animal indicates by rubbing against immovable objects that there is some irritation of the skin the advice of a veterinarian should be at once sought. Two cases of rabies in dogs were reported, one occurring in Salem county and the other in Jersey City. A report was received of a case of anthrax in the person of a man. The history of the case proved that the person who contracted the disease was employed as a freight handler, and in this

capacity the hides of cattle had passed through his hands. Undoubtedly some of the hides were infected with the bacillus anthracis. No cases of anthrax in animals were reported.

The total number of cases of glanders reported during the year was 108, 147 having been reported during the previous year. Five cases which were not included in the summary for the year ending October 31st, 1906, were also reported. Sixteen horses were destroyed in Bergen county, and there is reason to believe that the animals were affected with glanders. Examination of the summary for the present year shows that over 80 per cent. of the cases of glanders which were reported occurred in Bergen, Passaic, Essex, Hudson and Burlington counties. These counties are located near the cities of New York and Philadelphia, and the cases are often traceable to animals purchased in these cities. Of this number thirty-eight cases occurred in Newark and eleven in Jersey City. Of the total cases reported forty-six occurred in Essex county, twenty-eight in Hudson county and eleven in Burlington county, the remaining cases being distributed over various parts of the State.

SUMMARY.

Animals destroyed on account of glanders	108
Cases of rabies reported	2
Cases of mange reported	12

Very respectfully,

HENRY MITCHELL,

Secretary.

Corn Improvement.

Corn Improvement.

BY PROFESSOR F. C. MINKLER.

MR. PRESIDENT, MEMBERS AND VISITORS—I feel confident there is no one in this audience more disappointed than myself due to Professor Bowman's inability to attend this meeting. Evidently the way things have shaped themselves more responsibility rests with me than I had anticipated; however, any subject that is of vital interest to the farmers of this State I am perfectly willing to lend my influence and what little knowledge I have in discussing it, for I am confident that the farmer is primarily the bull wheel of progress. The question of corn breeding and corn improvement has received very little attention from the growers in this State, and comparatively recently has the idea been taken up by the growers in the corn belt. Possibly you will think that I will open this discussion of corn improvement from a standpoint of western conditions, I trust, however, that this will not be so, as I spent the greater portion of last summer visiting different farming sections of this State and took special notice of the steps being taken by the farmers toward the improving and selecting the different varieties of seed corn. To my surprise I found that a comparatively large percentage of those who attempted to grow corn paid absolutely no attention to the selection of their seed in the fall, but rather went to their corn crib in the spring and selected the samples which they used that year. A very small percentage of them selected the most promising ears at the time of husking from the shock, and a still smaller number made it a point to go into the fields and select the choicest ears from the most promising stalks before the corn was cut and put into the shock. However, as I stated before, a large percentage of the New Jersey farmers I visited practiced the system of getting their planter out in the spring before they attempted to select the seed corn. The planter

being ready the crib was invariably the source. Seemingly they disregard utterly the importance of careful and methodical selection, giving no heed to the germination tests, which are highly recommended by all corn experts, for they continue to make an indiscriminate choice of the corn as it is found in the crib in the spring.

Now, let us consider briefly the importance of having our seed corn properly tested as regards its vitality or seed conditions. Without a uniform stand of corn it is impossible to harvest a maximum yield. Take the farmer who grows 100 acres of corn, which is, perhaps, rather large for a New Jersey farmer, but anyway, let us use this acreage as our standard. Suppose he finds that only 70 per cent. of the corn which he planted actually grows or germinates, this means that he will cultivate during the year seventy acres of corn, thirty acres of bare ground; that he will spend three out of every ten days doing worse than nothing, using his machinery and horses and his time cultivating bare ground. In the fall he will have only seventy bushels of corn where he should have 100, which means that he will have only \$70 where he might have had \$100, providing he had made sure at the start that the seed corn planted would grow, and, therefore, that he would have a uniform stand throughout his field. While New Jersey is not noted especially as a corn-growing State, being out of the corn belt entirely, yet if I am to judge of the average yield, as was estimated yesterday by the resolution, which was earnestly debated and finally adopted, fixing the yield at 36.5 bushels per acre, I must confess that this is better than we have ever been able to do in Iowa, the king of corn-growing States.

While it is possible that we have farmers in this State who produce as much as 150 bushels of ears per acre, it is nevertheless a fact that we have a large number whose farms produce less than fifty bushels, yes, even less than twenty-five bushels per acre, and since we have the greater number of corn growers who harvest less than thirty-six bushels per acre, I feel confident that the approximate estimate is plenty high. In spite of this fact I must confess that I have never seen such mammoth stalks or such a promising outlook for corn in Iowa as was found in Salem county last summer.

There is no doubt in my mind but that the selection and storing of seed corn is one of the most important questions that confronts

the New Jersey farmer at the present time, and at the outset I would say with all emphasis and all earnestness that the crib method should be condemned in the extreme, and the farmer who depends upon his crib, his neighbor or even the seed-house to supply his seed corn is taking daring chances, and the sooner he resolves to breed and select his own samples at the proper season the more success he will have.

It is usually estimated that a bushel of corn will plant six acres of ground. The seed obtained from a single ear, if properly planted and cultivated, will in one year yield approximately ten bushels. It is easy, therefore, to see the importance of selecting seed that will grow under the most adverse conditions, in order to have a yield that can be rated above the average named for this State. The method which I am about to outline is the one practiced on our own farm at home. The idea is not original with us, but rather it is the result of the agitation recently made by experts in our own State, and is substantially as follows: We go into the field, usually between the 1st and 15th of October, make a selection of the ears to be used and saved for seed; this is accomplished before frost has wrought any injury to the individual kernels. The ears are selected from the most promising looking stalks, those that produce the ears low on the stalk, the reason for this being that if the ears are attached high on the individual stalk and open skyward, chances are that during a bad season or in case of heavy winds the stalks are more liable to be broken down, and, therefore, their growth will be retarded. It is also desirable to select ears that show early maturity or early ripening qualities; also that as the result of their ripeness that they hang down rather than up, the reason of this being that if the husks on an individual ear of corn are loose and dry and the ear still points upward that more moisture, the result of rains or heavy dew, will be found in the cob and on the kernels, and its presence will prevent the drying out or further ripening of the ear. We go through the field with baskets, selecting the ears as has been suggested, and carry them out to the side of the field, where they are placed in a spring wagon and taken to the barn. The husks are all removed and the individual ears tied together in such a way that they do not touch one another at any point and are suspended in an open shed on cross wires, especially erected for this purpose. The shed in question is dry and open, the air circulates freely and the ears

dry out in a comparatively short time. Enough seed is selected at this time to allow for a thorough culling in the spring or late winter when the samples are removed, placed on temporary tables, where the individual ears are examined and made ready for the germination test. It is possible some of you may think that the freezing which would result in this open shed would injure the germ, which is not the case. The husks, as I stated before, have all been removed and the circulating of the air through this open shed hastens the drying out of both the cob and the kernel, and it is admitted that freezing does not injure corn that is thoroughly dry and free from exposure to the prevailing rains. There is nothing to freeze if the moisture content is reduced to a minimum.

Long before the 1st of March the corn is removed from the wire rack and placed on the temporary table, which is made by placing planks on empty barrels, in such a way as to allow room for two rows of ears placed side by side on each table. The ears are placed with the butts all pointing in one direction and are arranged according to size of the ear, or more particularly as regards the general size of the individual kernels. Undesirable ears are discarded; also all those that do not conform to the ideal type which we are trying to perpetuate, this ideal being an ear that shows ability to be productive. Four kernels are removed from each individual ear that has passed the preliminary examination as regards general size and shape, and are first placed opposite each individual ear for examination and finally placed in the germination box in order to determine their vitality or seed condition. Each ear is given a number, usually marked on the plank directly under the ear with a piece of chalk, and the corresponding number is placed on the square in the germination box where the individual kernels are placed. It might be well at this time to explain what is meant by the germination or test box. Usually a tobacco box, measuring about two feet square, is used for this purpose, moist sand, leaf mould, saw-dust or bran is used as a filler, on top of which is placed muslin cloth that has been marked off into small divisions, usually about an inch square. Each square is given a number which corresponds to the number given the individual ear; for instance, the four kernels from ear number one are placed in square number one and so on until the total number of squares are covered with kernels, which have been placed germ side up. This muslin

CORN IMPROVEMENT.

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cloth upon which the kernels have been placed is again covered by another piece of muslin, which in turn is covered by some more of the filler, which is usually moistened soil or any substance that readily retains moisture. The box is placed either under the stove or near a sunny window to await developments. Warm water is used daily in moistening the contents of the box, care being taken to keep it in a room where the temperature does not vary a great deal from sixty degrees. Under ideal conditions, at the end of ten or twelve days, the filler is removed from the top of the last-mentioned piece of cloth, and the top cloth is carefully removed. This leaves the kernels exposed and it is easy to ascertain the number of kernels that show indications of germination. Some will be found that have sprouts one-half inch long; others will probably be only swelled or enlarged, while others will show plainly that their germ is dead and that they will not grow under any consideration. As a result of this test the ears are again arranged, this time according to the percentage of germination. The ears from which the four kernels all grow are arranged together and marked 100 per cent. germination; those from which only three out of the four showed signs of germination are arranged together and labeled 75 per cent. germination, while the others are rated according to the findings of the test, nothing being retained that tests below 60 per cent. The average number of kernels per ear is usually estimated at 1,052, and therefore, it is readily seen, that, while the check of four out of one thousand is fairly small, yet at the same time it is a fairly good indication as to the vitality of the individual ear from which the kernels are taken, since the four kernels are taken from different parts of the same ear. The individual ears passing the test satisfactorily are now examined more carefully and those which conform closest to our ideal are used as the supply of seed corn.

The butt and tip kernels are always shelled off since they usually vary in size and shape, and when they are mixed with the corn taken from the middle portion of the ear, it is almost impossible to so manipulate the planter so as to secure an even and regular drop in every hill. Furthermore, the small tip kernels have less plant food or starchy material with which to feed the young starting plant before it takes root and energy from the soil, and it is very important that precautions be taken which insure a strong, vigorous and lasting growth in case of a late

or cold season. An ideal sample of corn is one made up by selecting a number of uniform ears. It is readily seen that the samples exhibited here are seriously at fault in this regard, as it is impossible to find any two ears in any single sample that are anywhere near alike. An ideal ear is one of medium size rather than one very large or bulky. This holds true with any variety. Too many times the average corn grower selects his samples for mere size alone, utterly disregarding maturity quality or feeding value. The size of the cob or the shape of the kernel is utterly ignored, it being maintained by him that corn is corn irrespective of color, shape or conditions of storage. It is always desirable to have an ear of corn that is uniform, or nearly so, in its entire diameter. Long, slim, pointed ears with very large butts should be discarded at once because the percentage of corn to cob, which is the standard for productiveness, is invariably low with such ears. The rows should be straight and regular and the size of the kernels should not vary greatly in any portion of the ear. Large, coarse or poorly-shaped kernels or abbreviated rows on an ear of corn, in any region, is very undesirable because it shows a lack of breediness; also a lack of finish as well as maturity, and is usually followed by small, irregularly placed kernels at the tip which indicates that the matter of selection has been overlooked, and furthermore, that different portions of the same ear were fertilized with stray pollen at vastly different intervals. It is necessary that the ear have nearly the same diameter throughout its entire length, as this indicates constitutional vigor which is a suggestion that the corn will do something in spite of cold ground and unfavorable conditions. Both the butt and tip region should be well filled and in no case should the cob extend from the end of the ear bare and uncovered. The individual kernels should also be carefully considered, if we are to improve our corn by breeding. Short pointed kernels are undesirable in many ways; first, because they invariably have small germs, weak growing plants, and will not grow under unfavorable conditions. The germs should extend well up toward the crown, be broad, smooth and entirely free from wrinkles and should be plump on both sides, especially in the region of the tip. The portion of the kernel containing the largest percentage of valuable food nutrients is that portion in the region of the tip, measuring about one-third the distance of the kernel. The kernel with a

small germ is low in feeding value, and furthermore, it will not exhibit the necessary strength and vigor which is required in case it be placed in soil that is cold and wet, or where the season is unfavorable, as is very often the case.

The method of improving corn by selection is perhaps more practical in the case of the average farmer, who does not generally understand the many complications which arise when the breeding plots are the basis of improvement. However, every county, township or community in this State should have a recognized corn breeder, who made it a business to furnish tested seed to his neighbors each year. In this way it would be possible to greatly improve the quality as well as the amount of corn in each section, which would mean much to the farmers, especially those who count their corn as the leading grain crop. Early selection of seed from the field, followed by a careful study of the individual ears as regards size, shape and maturity, together with a rigid selection and sorting of the best kernels, all this checked up by a careful and complete germination test will greatly increase the average yield of corn per acre in this State.

Now, I simply wanted to open discussion on this corn proposition, and it would be well to let somebody else offer some suggestions, Mr. President. (Applause.)

Dr. Voorhees—Are there any questions to be asked on this corn proposition? I think we cannot use our time more profitably than by getting an idea of good corn rather than by debating some points which cannot be so easily demonstrated here.

Mr. Agee—It has been my privilege to hear Professor Holden, of Iowa, and the corn experts of many States. You New Jersey people here have a man who knows how to present the subject; that corn talk is all right. (Applause.)

Mr. Lipman—Sometime ago Secretary Dye asked me to send a sample of corn for exhibit. I have done so. That was about six weeks ago. Since then I have been studying in the short course at Rutgers, and I have brought other samples, and when I brought them I was ashamed of the first ones.

Dr. Voorhees—Why?

Mr. Lipman—Because the first samples were not exactly up to the standard; the ears were long and thin, and they were not even and didn't have the characteristics that Professor Minkler said they should have. I would suggest that if farmers want to

have good corn they should go down and take a short course and learn how to select their seed corn, or if they can't do that they should send their sons down. (Applause.)

Mr. Lanning—The professor spoke of seven-tenths of the corn that is planted germinating, while three-tenths did not germinate, and, therefore, we were cultivating three-tenths of our ground and getting no profit from it. I would like to ask if we haven't lost more corn by having it planted too thick than by having it too thin?

Mr. Minkler—I would say in reply to the gentleman's question that it is desirable to have three kernels, or, say two kernels, in every hill germinate, rather than four kernels in one hill and no kernel in the next hill. If you simply start out and want but one stalk to the hill, make sure that every individual kernel is going to grow, and you can control the thickness by manipulating your corn planting, rather than by planting a thousand kernels and only expecting 700 to grow. It is three kernels in every hill that we want rather than an average of three kernels. You can simply govern that by selecting individual ears that have the same size of kernels.

Dr. Voorhees—I want to ask whether selecting a grain which has a sharp point and then a reduced germ, whether that grain of corn, that is, the one with the point on it, would be likely to be less vigorous as a plant than the one which had a larger germ. Would the vigor of the plant be modified in any way by the size of the germ?

Mr. Minkler—I would say decidedly, yes, because the growing portion of the kernel of corn depends upon the accumulation of food that is stored in the individual kernel, and when you plant a kernel of corn that has a narrow point and a small germ or growing point, and if there was a scarcity of food and the season was late and the ground was cold, that little plant would starve to death. On the other hand, if you take a kernel of corn, which has a large germ and an abundance of starch and put that under the same conditions, it would live a great deal longer and the germ would be there ready to grow when the warm weather approached.

Mr. Lanning—The professor is correct. We want a good seed to plant or we cannot get a good crop of anything, and that is the reason I asked the question. It is so necessary that we have good seed to put in so that when we plant three grains of corn we can

have three spears to germinate, but my question was whether we are not losing more corn by not selecting our seed by planting the whole ear of corn regardless of the size of the grain. We are taking the fertilizer of our soil to grow a stalk and not get the corn.

Mr. Minkler—At the Iowa Station an experiment was planned to test this point. A piece of ground was divided into plots of same size and the conditions of fertility and cultivation were the same in each case. One stalk per hill was grown in the first plot, two stalks per hill in the second and so on up until seven stalks per hill was reached. The yield was harvested separate, and while I cannot give the figures accurately, the result was about as follows: More seed ears were harvested where one kernel was planted per hill, but the total yield was low. The yield increased gradually up until the plot where five stalks were found, where the total amount of corn was the largest, but fewer seed ears and more nubbins were gathered. The best all around results, as regards size of ears and quality of corn, was obtained from the plot where three kernels per hill were planted. The conclusions were that too many stalks—five, six or seven—were undesirable unless fodder or leaf growth was wanted; that one or two stalks were insufficient where the ground was rich, but if size of ears and evenness was desired fewer kernels were more desirable than more, and that average soil will readily feed three stalks if properly tilled. The personal equation modifies results, but generally speaking it is desirable to have three stalks in *every hill*.

Mr. Roberts—How thick do you plant it?

Mr. Minkler—We plant three feet six both ways, sometimes three feet eight.

A Member—What about the seed from the butts and the tips? The old style was to discard them.

Mr. Minkler—I would ask my good friend if it is possible, when he selects seed from the individual ear, whether he takes one kernel from the butt and one from the tip and one from the middle? The object of removing the butt and tip kernels is to secure a more uniform size of kernels, not that they will not grow nor fill. I don't think you will have any trouble about having butts to your ears or tips to your ears if you plant any individual kernel.

Mr. Roberts—There is a prejudice in our State against white corn. I don't know why it should be so. In the Southern States

they most all want white corn. I would ask whether it is considered at the Iowa station, that white corn has an equal feeding value with the yellow corn?

Mr. Minkler—The question of the feeding value of the different varieties of corn has been studied by different experiment stations, and, while no definite result has been given, because the varieties are so different, I think it is conceded in a general way that the yellow corn is more early in its maturity, that the feeding value is a little bit greater than with some of the whiter varieties, where you get size at the expense of maturity. If you select a large sized white variety the chances are it will not mature, for you get size at the expense of maturity. It is generally conceded in any good laboratory that the feeding quality of the yellow corn is a trifle higher, but it depends more upon the individual who has selected that corn, whether or not he has tried to increase his protein or his starch.

Mr. Agee—Then it is a matter of variety and not of color?

Mr. Minkler—Yes, that is it. The only reason why the yellow corn has a little advantage in its food value, as a general rule, is due to the fact that the yellow varieties are earlier and mature sooner, but, you can take your white corn and simply select the yellow corn characteristics and the food value will be just as great.

Dr. Voorhees—I think the local markets have something to do with the color. Nowadays we have yellow cornmeal, in fact it is not yellow enough, and they add a little yellow, and that may have some influence upon the matter. The difference in the food value is not very great. But I have noticed that if the color is not quite up to the standard they add a little coloring to it. The demand is for color, not that the color carries with it any idea of improved food value.

Mr. Dye—Mr. President, Professor Minkler suggested the advisability of producing a corn with the ears attached near the ground. I think that is very desirable. We all know that during the last season the corn all over the State of New Jersey was blown down and very materially injured. If we could have corn of a shorter stalk, I think it would be a great gain. I would ask Mr. Minkler if he knows of any regularly conducted experiments along that line?

CORN IMPROVEMENT.

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Mr. Minkler—In this regard I will cite, any of you who want more information, to a man named Asa Turner, whose address is Fair Isle. He has been selecting his seed corn for many years and kept the ears that are lower on the stalk and bent down. I was in that man's field, and his idea is to get the ears as low down on the stalk and try to get them to bend down as much as possible, after they mature. I don't think there is any question but that high growing stalks will, when the wind commences to blow, go down easier than where the stalk is short and the ear is nearer the ground. That is the value of going into your standing corn and selecting your seed ears on the stalk, then you can notice their individuality.

Mr. Dye—The report which you accepted yesterday, shows that we had 10,137,838 bushels of corn last year. Now, I am quite sure if we adopt Professor Minkler's suggestion we will bring that up to 12,000,000 annually. Now, about this corn exhibit, I do not know that any of those who brought it here wish to take it back home with them. If not, and they are willing, we will turn it over to Professor Minkler to be used with the classes at Rutgers College.

A Member—I am what you call a business farmer. I just started in the last two or three years. I got credit for being a good farmer by putting lots of manure on. I had business here to-day and happened to step into this meeting and I will tell you right now I want somebody in this room to sell me an A No. 1 lot of corn, for seed and I will pay double price. I can raise good corn because I put lots of stuff on. If there is any gentleman here that is willing to help a friend along, I will be glad. That's what we're here for. I would just as lief pay \$4 a bushel for reliable seed corn if I can get the best. I haven't got the ability or time to look for it, but I want to be on time next year.

Mr. Lipman—A few years ago when I wanted to have good seed corn I was advised to send to Illinois. I got it from the northwest, and after trying it a few years, I found I could raise better corn here in New Jersey than the original sample from the northwest. Last year we had splendid results. You have the samples before you now; this is the corn I have raised. I don't mean to advertise, because I haven't any corn to sell.

Dr. Voorhees—No seed at \$4.

Mr. Lipman—Well, if this gentleman wants a bushel I will let him have it. (Laughter.) It seems to me it would be a great benefit to the farmers of New Jersey if the State could establish a seed breeding farm, a corn farm, where all the farmers of New Jersey could go and get their seed corn.

Mr. Stokes, of the Stokes Seed Store, Philadelphia—This question of testing the corn for germination is especially applicable for this particular coming season. In twenty-five years' experience in handling seed corn, I have never known such a dearth of good germinating corn to be found. You can't get it. I had a few lots sent in, two or three, that seemed as though they would grow, but nine-tenths of the lots submitted to me have been rejected.

The Soil-Fertility Problem.

The Soil-Fertility Problem.

MR. PRESIDENT AND LADIES AND GENTLEMEN—I appreciate the invitation from the New Jersey State Board of Agriculture through my good friend its secretary, Mr. Dye, and want to come before you as a practical man who knows that he is addressing successful, practical men intensely interested in this great question.

It would be carrying coals to Newcastle to carry profitable discussion of the soil-fertility problem into Dr. Voorhees' State. The doctor is a source of supply of facts to all of us throughout the States west of you, but there is expected from me only a viewpoint of one practical man and a presentation of things as they appear to one such man. It is a puzzling time when our leading scientists differ widely and the foundations of our old beliefs concerning soil fertility are questioned by some men who are in the position of leaders. I purpose stating things that I should bank upon if again I were building up the fertility of a farm as I once did, and these are things I should not dare at this time to doubt practically in the field, regardless of all academic discussion.

NATURAL STRENGTH OF LAND.

The natural strength of the soil should be counted upon first. All farming land has stored within it relatively large amounts of various elements of plant-food. In some instances one element may be sadly deficient, and possibly more than one, but where land once had been productive I should count with confidence upon the presence of a considerable store of fertility that should be included in one's capital. Analyses have shown the presence of tons of plant-food in most arable land, and I should view that store as my rightful stock in hand just so far as availability could be secured. We incline too much to overlook this matter of

natural strength. Soils cease to be productive, and we are quick to say that they are exhausted. The absence of productivity is no evidence that original stores have been used up, but only that availability is not present. In the light of all past experience, and as a result of observation of nature's ways of treating worn land, it usually is a safe assumption that the addition of good supplies of organic matter will prove beneficial. There is nothing in recent results of scientific experimentation to destroy the old-time faith in rotting organic matter as a prime factor in soil productiveness. The man who neglects humus-making material as a big consideration in building up the soil or in maintaining fertility marks out a difficult road to success. I do not say that land cannot be made productive without concern about this one factor, but I do say that in practical farming in the east commercial success will be rare wherever there is failure to fill the soil with good vegetable matter. The means to this end are many. Where the supply of stable manure is abundant and cheap it affords high-grade material for this purpose. The amount of land whose supply of organic matter may be secured in this way is relatively small. The legumes are next in point of desirability. The man whose land will produce the clovers abundantly finds little in the soil-fertility problem to trouble him. Somewhat extended observation throughout our Eastern States, however, is convincing, that the area which will not produce the clovers satisfactorily is large and is constantly increasing. I wish I could get you to accept the obvious fact that the area of land that will not produce clover in the States east of the Mississippi is increasing rapidly. For some reason or other very much land tends to become more and more unfriendly to the clover plant, and it is this fact, only partly recognized, that gives to the soil-fertility problem its immense importance to-day. It is idle to say to the average man who wants to improve the productiveness of his land that he should grow red clover, feed the hay upon his farm and return to his land the heavy clover sods and the manure from the hay. He knows that the land which needs clover most is refusing to grow the plant freely, and science is helpless if it cannot point out means of success. Either it must indicate to him some means of securing legumes or else it must indicate means of maintaining fertility with profit without aid of legumes. I express only personal conviction when I say that I believe most land in this country can be

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made to produce clover sods, and that probably the only exception is in sections where, temporarily, I hope, some virulent disease has attacked the plant. The vital question is: Why has clover become less certain as a fertilizing crop?

THE NEED OF LIME.

A blue-grass country is usually a rich country. The evidences of material prosperity as shown in farm homes and barns are rarely absent where blue grass makes a luxuriant crop. It is the rule that blue grass thrives best in a limestone soil, and by a limestone soil I mean one that continues rich in soluble lime. The practical farmer has learned to estimate a limestone soil highly, and analyses show that this cannot be due to any unusual amounts of plant-food. A study of Dr. Hilgard's recent book upon soils, taken in connection with one's own observation, is reasonably convincing that carbonate of lime is one controlling factor in soil productivity. It assists in freeing the natural strength of the soil. It favors bacterial life and it is a corrective of soil poisons. In this practical discussion of the soil-fertility problem it is unnecessary that I should be able to indicate with exactness the ways in which lime serves us, and in working out a scheme for the maintenance of soil fertility I should not dare to ignore the prime importance of full supplies of carbonate of lime. There is evidence that much land outside of limestone belts can be given in great measure the advantages of a limestone soil by the free addition of lime. Personal experience upon my own land, strengthened later by a series of experiments at the Ohio Experiment Station, and strengthened still later by hundreds of experiments throughout Ohio and Western Pennsylvania, is convincing that one cause of clover failure and of some diminution in yields of cereals and most other crops is due to the lack of lime in the soil. This applies even to some areas known as calcareous, where the sampling augur and laboratory test have shown that the original supply of soluble lime in the top soil has leached away, leaving it far less rich in lime than is the subsoil. It is the tendency of all lands outside of the arid regions to lose continually some of their lime content. Recently, while in Washington, I was shown some crystals by Professor

Whitney that were said to be poisons which had accumulated in land and that were hostile to plant-life. Personally I know nothing about toxins, but the statement by Dr. Whitney that lime destroyed his toxins was wholly consistent with the effect upon clover that results from the liming of land unfriendly to clover. There is an immense area—I know not how great—that changes at once from unfriendliness to friendliness, so far as clover is concerned, when lime is applied. At the Ohio Experiment Station the untreated soil contains only one-fourth of one per cent. of carbonate of lime, and this land is not naturally favorable to clover. Where acid phosphates have been applied to this land for a long series of years the unfriendliness has greatly increased. At the Pennsylvania Experiment Station, where the natural lime content is higher, the treatment of plats with sulphate of ammonia for twenty-five years has served to render that soil unfriendly to clover. At the Ohio station, where the lime content is increased by the addition of one ton of caustic lime per acre, there is immediate gain in clover production and there is increase in the yield of cereals. There is no fixed percentage of carbonate of lime that must obtain in the soil to make it friendly to bacterial life and to the clovers. The amount seems to be relative, and I have no facts of value to offer on that point, but I stand for the statement that some increase in the lime content favors clover over large areas in this country. It probably is safer to apply the lime in the form of pulverized limestone. Indeed no harm can result from such an application while it is possible to use too much caustic lime. Roughly speaking, two tons of pulverized limestone will correct as much soil acidity as one ton of caustic lime, and the choice of material is to be determined largely by the cost of application. The lime should be applied to the surface soil as the tendency of the lime is to go downward, and there is some evidence that it shows greater effect upon clover when applied a year or two previous to the seeding, although in my own experience the lime always has been applied shortly before the seeding to wheat, which was followed in the spring by the clover seeding. These are details. The point I seek to emphasize is that the content of lime in a soil which is not doing well should be one of the first considerations of the land owner. A soil rich in lime may not act satisfactorily, and there lime may not be the cure at all, but where there is a deficiency in lime profits will continue to be

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limited until the demand is met. It is a consideration that cannot be ignored, and it presents itself whenever the clover ceases to do well. Investigation on this point then is due, and if the absence of proper supplies of lime is noted one prerequisite of success becomes apparent.

Mr. McCracken—Let us understand whether this stone is burned or unburned.

Mr. Agee—When I say limestone, I mean raw limestone, and when I say lime I mean burned limestone. We have upon the market to-day and in use both the caustic lime, that is limestone, burned, and the natural limestone, which has been pulverized and bagged and that we call ground or pulverized lime. One ton of that is about equivalent to one-half ton of lime. To be accurate, fifty-six pounds of the lime is equivalent to 100 pounds of the limestone. At the Ohio Experiment Station, where we began with the use of caustic pulverized lime, we have finally gotten to the use of the pulverized limestone instead, but either one will correct soil acidity. The pulverized limestone will not give as much immediate effect as the lime, because the lime breaks up the organic matter. Lime is a stimulant, but I am not pleading for the use of lime as a stimulant. I am simply advocating the use of enough of this material in the soil to make the soil friendly to clover, friendly to bacterial life and friendly to crop production; and you can get that friendliness either from pulverized limestone or from lime.

PHOSPHORIC ACID.

The blue-grass region of Kentucky has world-wide fame. Prosperity is writ all over it. Analysis shows that the stone of the section is rich in lime and in phosphorus. We have learned to associate the quality of that blue-grass section's products with the presence of phosphorus in the limestone. Our scientists some day may prove to us that our assumption is incorrect, but the experience of thousands of practical farmers throughout our Eastern States and the experiments of scientists, like your own Dr. Voorhees, Professor Thorne, of Ohio, and Dr. Hopkins, of Illinois, combine to teach the controlling influence of phosphoric acid in fertilizers used on the greater part of our Eastern States.

Analysis shows that nature was stingy in her supplies of phosphorus when our soils were made and that the supplies were tightly bound chemically. A study of the sales of commercial fertilizers this country over is enlightening. Farmers are proverbially slow to invest and yet vast sums of money are expended for fertilizers and the major part of this sum goes for phosphoric acid. The man who has the soil-fertility problem before him does well to take into consideration his supply of phosphoric acid. Having settled the question of lime content, and assuming now that it concerns land that once has been productive—land unlike your seaboard sands—he naturally will suspect a deficiency in the supply of phosphorus in his land. As was stated earlier in this paper, well rotted organic matter is the first consideration, but the securing of sods to be rotted in the ground is dependent upon the presence of lime and of all other elements of plant-food, and, having the lime, the phosphorus looms up next in importance. I am presenting this matter from the standpoint of the man out on the farm who must have income from the land, who must have productiveness, who does not know his land well, and who has taken up each consideration as it must be taken up in respect to its importance. He will make sure first that the lime content is right. It is unwise to farm much of the land east of the Mississippi without regard to that one consideration, because maximum productivity cannot be gotten from the land if there is any lack of lime in it. Our scientists have made the matter plain, and either with ground limestone or caustic lime, he must first make the lime content right. Assuming that it is right, then the next consideration would be the content of phosphoric acid. Naturally he takes that next, because the greater part of the money expended by the farmer is and has been for phosphoric acid, experience showing that it is one of the great needs of the soil. There probably is no safer supply of phosphoric acid than in animal bone, but it is idle to refer all men to this one carrier, as it could supply only a small fraction of the great and nearly universal need of phosphoric acid in our eastern soils. The evidence now appears clear enough that rock phosphates treated with sulphuric acid do, in time, tend to produce soil conditions unfriendly to the clovers, where the content of lime is small. Where the land is rich in soluble lime no observation of mine has led me to fear the

effect of acid phosphate, but the immense acreage of land deficient in lime makes the matter of phosphates tremendously important. As a practical man having land to be fertilized, I should not hesitate to use the treated rock, if lime was abundantly present or if the cheapness of the acid phosphate as compared with other carriers would justify occasional liming for the correction of any injurious effects. During nine years our Ohio Experiment Station has been testing the efficiency of untreated phosphate rock as a carrier of plant-food, and, simply stated, the results show about the same increase in yield per dollar's worth of fertilizer in the case of untreated rock as in the case of treated, that which is often spoken of as "floats." That is to say, while one pound of phosphorus in the floats can be bought for one-third of the cost of one pound of phosphorus in the treated rock, yet there has been no actual cash saving by use of the cheaper carrier. We did think that in the second series of crops in this five years' rotation some residual effect of the slowly rotting rock would be apparent in the crop, but there is no evidence of this. In this experiment the untreated rock is mixed with stable manure to hasten its decomposition. The use of this rock may prove to be more profitable than that of acid phosphate on account of the escape from ill-effects upon clover. I am wondering that slag phosphate as a carrier of phosphorus has not been made more popular in this country. It has given good results at the Ohio Experiment Station for fourteen years in the fertility experiments, and there are some small sections of the east in which the use of this phosphate has become very popular. The supply is got largely by importation from Europe and should be in the hands of more enterprising men.

SOIL INOCULATION.

The practical farmer must give fuller recognition to the work of soil bacteria. It is not necessary that he know much of the nature of these bacteria, or that he know how much he owes to their work, not only in the breaking down of plant-food, but also in the addition of fertility from the air, but he should accept the statements concerning their importance and concerning the

value of stable manure as a promoter of bacterial action. This leads practically to the distribution of farm manures over larger areas. In building up the fertility of the farm to-day, the supply of stable manure should be viewed not so much as a supply of fertility as a favoring medium for bacterial life, and this would lead to light dressings of large areas rather than heavy dressings of small areas. Too much emphasis can hardly be put upon this point. A few tons of manure per acre, thinly distributed with a spreader, may easily be worth, in the long run, twice as much per ton to the farmer as double the quantity on half the area. When land has drainage, when it is supplied with carbonate of lime, when it is given a little manure to foster bacterial life, and that manure is reinforced by commercial fertilizer, the conditions are present for constantly increasing productivity.

THE CONTROL OF MOISTURE.

The productiveness of land is so very dependent upon moisture supplies that a discussion of the problem of making land productive involves almost necessarily a consideration of the moisture conditions. Most land has enough fertility in it to produce a good crop if moisture were present in right amount at all times during the growing season. We may have lime and we may have all necessary available plant-food and yet fail to secure the humus-making sods on account of lack of moisture. The making of sods on thin land is an art. One matter to be borne in mind is that some needed moisture for starting the plant is in the land while it is being prepared for seeding. It is essential that the seed bed be made fine and firm in order that the water in the subsoil can rise to the surface where the young plant starts life. The tillage of a spring planted crop often favors a late summer seeding to clover and grasses. The soil is aerated, the toxins are destroyed, the weed seed in the surface soil are caused to germinate, the water rises rapidly from below and the soil at the surface is rendered friendly to plant life by the constant tillage. Manures for such seeding should go upon the surface of the ground and be worked into the surface of the soil. We then have the fertility and the moisture where plant life begins and growth

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is well nigh assured. The sod thus gained adds largely to the supply of organic matter when it is inverted and rotted in the ground, and in the decay of this vegetable matter comes some freeing of the mineral plant-food and some increased capacity of the soil to hold moisture, and thus the soil is made more capable of helping itself, adding to its own supplies of nitrogen, making use of some part of its natural mineral strength and furnishing favoring conditions for friendly bacteria.

In this scheme of soil-building I have spoken only of the clovers. As a matter of fact in practical farm work it usually is not feasible to make all the land immediately capable of producing good clover sods and there is recourse to such legumes as the soy beans, the southern field pea and the vetches, and also to other plants not legumes, such as rye. In my own experience the southern field pea has played an important part. It will produce a heavy growth on land too acid for clover and too thin for heavy clover. In sections where the land is thin and where there is too much heat for profitable oat production, as on one of our Southern Ohio test farms as well as upon my own farm nearby, we learned to follow corn with the field peas, making the peas into hay from all the richer land and cutting the growth on thin places into the soil as a coat of manure. These pea fields, whether mown or unmown, were then prepared for wheat by use of the disk and cutaway harrows, and the fertility was left in the surface of the soil where it belongs. Moisture rose easily through the soil below and the seedings to wheat, to grass and to clover have been highly successful. Such preparation for wheat almost insures a profitable crop of that cereal and a first-class clover sod. In this four years' rotation we have but one crop that is sold from the farm and two crops in the four years that are legumes. It is an entirely practical scheme for thinnish land where the southern field pea, or farther north the soy bean, can be grown.

Summing up, the owner of land outside of market districts considers first the natural strength of the soil and assists nature to make some use of these stores. This means the incorporation of organic matter. Productivity of the land and rotting vegetable matter are closely related. To secure such supplies the content of lime is a prime consideration. It is idle to continue to labor with land badly deficient in lime. Granted the lime, we naturally consider the supply of phosphoric acid next, because four acres

out of five in the Eastern States show first their lack in phosphoric acid. Manure we treat as a medium for bacterial life as well as a source of plant-food and distribute the supplies as widely as possible. This is reinforced with all needed plant-food, the phosphoric acid, the potash where needed and the nitrogen, and the supplies of plant-food are bought all the more freely at first because experience has taught that when the heavy sods have been secured and have been rotted in the ground a greater degree of independence of outside helps will have been gained and fertilizer bills may then be reduced.

Now, Mr. Chairman, I have presented these points with the belief that they are fundamental, and that they are the things I would depend upon first and absolutely in handling thin land, and I shall be pleased if there may be careful criticism—adverse if the truth calls for it—on this intensely practical subject of soil fertility. (Applause.)

A Member—Will you tell us how to apply this lime; is it wise to put it on top of the wheat ground this time of the year, where the ground has a top-dressing of manure?

Mr. Agee—On my own farm I have always applied the lime immediately before the wheat-seeding. At the Experiment Station they have shown that there is more effectiveness from lime when applied a year or so earlier. When you have plowed land for corn put the lime on, working it into the surface of the soil, allowing the lime to have eighteen months or two years before the clover is sown to make the land friendly to the bacteria and to the clover. Now, coming to the question of applying both lime and manure the same season, I should not hesitate to do it if I could not get clover without it. I would want them mixed with the soil quickly. That is to say, if I were going to apply lime and manure to the same field, I would get the lime in immediately after the plowing, work it into the soil, and then top-dress with manure. Dr. Voorhees, who is present, probably would say that there would be some little loss of nitrogen, yet you want the sod, and the lime is essential if the land is sour.

Mr. Craig—In your distinction between burned and ground, I did not understand whether the ground lime is burned, and then also whether the slaked is included. Where we lime we burn the limestone and then take it to the field and throw water on it and slake it; should that be done, and does caustic lime mean lime that is unslaked?

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Mr. Agee—I am now discussing lime for land in sections outside of the limestone area, where the lime has to be brought in, where there are freight charges, and where you must have the most possible from a small investment of money. You understand where the lime has been slaked there has been added moisture, so that weight has been increased without any increase in power of correcting the acid. I wish you knew how embarrassed I am in discussing this in the presence of Dr. Voorhees. (Laughter.) To save freight charges we like to bring in the limestone burned, the lime pulverized and bagged. That is what you call ground lime—pulverized lime. We like to use it in a pulverized condition. You who live in a limestone section can slake the lime in piles in the field, and probably you use fifty or 100 bushels to the acre. With us, where it is costly, fifteen to twenty-five bushels per acre are applied, and we must drill it in. There is no objection to using slaked lime except that you are handling more weight and far more bulk.

Mr. Craig—One more question; are manure spreaders a success? I would like to ask one that has used one for ten or twenty years, whether he is still using it? I think a good many are used one year, and after that they are given up in disgust.

Mr. Roberts—Manure spreaders wear out rapidly, but the lime spreader is the vehicle for putting it on for me. I can do it nicer that way than by any other way. Our practice is to buy the lime in the lump, take it as it comes. Take it home and slake it with plenty of water, and then right away before it gets to be a carbonate—it gets to be a carbonate very soon after it is exposed to air—put it on even. I can do it with a lime spreader quickly and easily and very satisfactorily. If anyone has a better way of doing it you have got a good one.

Mr. Butterhof—A gentleman has asked what kind of drills would be the best for the application, whether a wheat or a fertilizer drill, or whether there is a special one for that purpose.

Mr. Agee—One word about manure spreaders. I want to quote Director Thorne, of the Ohio station: That station has had two in use for many years, and he makes the statement that eight loads of manure applied with a spreader are easily equivalent to twelve loads put on as most farmers apply it, with the carelessness of most of us.

With regard to the application of lime, about ten years ago I

used lime first as an experiment, and I wrote the manufacturer of my grain drill asking him to make a special fertilizer cone which I have used with great satisfaction, being able to drill in a thousand to fourteen hundred pounds of ground lime, going over the ground once, and I recommended this device, and somehow it has not been very successful in other hands. The Ohio station has a home-made lime spreader costing \$17, a V-shaped box about nine feet in length with a force feed, and it does very good work. We have on the market two or three lime spreaders, but they are costly, and a manure spreader will do the work, but not down to a thousand pounds per acre not very easily.

Mr. Roberts—Yes, it will; if you want to put only a little lime on, have a little straw spread evenly over the bottom, then put in your lime and drive ahead with your horses and you will get it on evener than any other way, and it goes all over the ground. The fault of the drill is, it goes in rows too much; the manure spreader throws it even like the snow falls. I like it best.

Mr. Agee—A Michigan manufacturer wrote me the other day that he had made for his own farm a device that would not cost over \$10, attached to the rear end of a wagon, that would distribute the lime, and asked me if there was a market for it. I told him if it worked there would be. We are going to have an immense demand for devices of this sort.

A Member—Have you ever found any ill-effect from using lime in connection with seeding down wheat, in close connection with commercial fertilizer, say phosphoric acid, whether it would have any bad effect?

Mr. Agee—We have Professor Voorhees with us to set us right on such points. It would seem that the lime ought to make available phosphoric acid unavailable, but scientists tell us that after soluble phosphoric acid goes into the soil it ceases to be water soluble anyway. I refer this question to Dr. Voorhees, whom I take as my authority in such matters.

Dr. Voorhees—That question arises very frequently, and I think it depends very largely upon how evenly the lime is distributed and how well it is worked into the soil. If you apply lime evenly over the entire surface, and then follow with cultivation so that it is worked into the surface two or three inches, thoroughly distributed into that upper surface, you can then use your commercial fertilizer without fear of any undue fixing in

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the wrong place. We want the soil to fix, but the object is to distribute it first, and if you have all the lime on the surface it is going to fix in the wrong place. Distribute it everywhere, then put on your fertilizer, and when the rain comes it will fix in the soil where you want it. The difficulty comes where lime is applied without evenly distributing it, and then follow immediately with an application of commercial fertilizer. In that case you get a very much less return, possibly that year, than you would if you had it in the right place in the soil. It does not follow that you don't get your return some time, but you don't get it at the time you want it. The purpose of having your material soluble, is to distribute it; otherwise, you might as well use the ground rock or some other form which is not soluble. There is no danger of loss except you do not have it evenly distributed. What you have said in regard to lime and clover applies with equal weight to other legumes.

Mr. McCracken—If you have finished the lime question, I want to ask a question on legumes. I am not afraid of following out the suggestions of Friend Agee. We find out that to some of the land which he has described as unfriendly to clover, we have been trying to furnish the nitrogen which it will take two years of clover crops to do it. That is the expensive part of the fertilizer, and costs here twenty cents a pound; can't we furnish that with the other legumes, such as cow peas? We can produce a crop of cow peas in sixty to ninety days, where it takes two years to produce a crop of clover, taking the risk of two winters. Now, Dr. Voorhees, on an analysis of the green crops, gives us the value of the nitrogen when in cow peas as ten pounds of nitrogen in a ton of green cow peas, which, at twenty cents a pound, is worth two dollars, and we can produce that in a period of sixty to ninety days without taking any risk of the winter. Now, the point I want to get at is this, must this crop, in order to procure this great nitrogen value, be turned under or will it do to feed it down on the land? Will we get the greater part of the nitrogen from this crop into the soil by feeding it down? I have hogs feed on the cow peas on the land, because labor is scarce and the hogs work cheerfully and very cheap, and the point is, can I get the same benefit from this crop of cow peas if I feed it down, as if I plowed the ground?

Mr. Agee—I don't say that you get the same benefit, but I know

it is good practice to get the food value out of the cow pea, with animals that feed in the field. Whether full value is gotten back, I don't know, but I presume that there is some loss of soluble nitrogen from the manure when it is made in the field. All of it might not be there the next summer. To answer the question in a practical way, it is good farm practice and most of the fertility is left in the field.

Mr. McCracken—If we don't get it all, it has not cost so much. The Minnesota station claims they were able to produce 245 pounds of pork on some of their best land, per acre. It is the labor question we are fighting. If we can get approximately or nearly all—if we are getting half we are doing a good business.

A Member—What effect will the lime, for the benefit of clover, have on the growing of the potato crop, will it tend to increase scabby potatoes?

Mr. Agee—I don't doubt that it will. Where the scab germ is present it thrives after applications of fresh stable manure or lime. It can be stamped out by making the land very acid, as I know by experience. I have used lime on land that was acid, experimenting with it in connection with fertilizer, and have gotten an increased yield of potatoes. I believe bigger crops of potatoes can be grown on land that is not deficient in lime, but there is always danger of a rougher skin and of scab. I could not advise any man to lime land immediately preceding potato crops, but if he can't get clover without lime, then he should take the chances and apply lime.

A Member—How about five years between potato planting and applying the lime?

Mr. Agee—You ask a question that I can't answer. If I could not get the clover without the lime, I should apply the lime and get the clover and take my chances on the potatoes, whether the lime went on two years previous to the potatoes, or whether it went on four years previous.

Mr. Hirsh—Do you have any knowledge of the benefit of growing Cowhorn turnips, as advocated by Robert Seeds, of Pennsylvania?

Mr. Agee—No, I have no practical experience with Cowhorn turnips, but I know that all kinds of turnips feed upon some phosphoric acid in the soil that other plants cannot get hold of, and there is some gain in the amount of available phosphoric acid resulting from plowing down turnips. It is easily possible to over-estimate the value; there is some.

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A Member—I heard Robert Seeds talk about that, and his claim was that Cowhern turnips did bring up the soil fertility.

Mr. Agee—Yes, there is no doubt but that they increase productiveness in some degree.

Mrs. Dobbins—Is it advisable to put the droppings from the poultry yard around fruit trees as a mulch while the ground is frozen?

Dr. Voorhees—There would be very little loss during the winter unless your trees were on the side of a hill, where the leachings would be carried away. There would be very little fermentation, but I think you would get quite as good results if you would keep the manure in good condition and then in spring put it over your mulch. You ought to be a little careful about applying hen manure to fruit trees unless you have your soil well supplied with the mineral, because it is a nitrogen fertilizer, very quick acting, and unless you have the benefit of the minerals you are liable to force the leaf and twig growth in advance of the fruit development. Be a little careful.

Mrs. Dobbins—How about wood ashes?

Dr. Voorhees—That would be most excellent. If you apply wood ashes and then put on your hen manure in the spring and not in too large a quantity, there would be no danger of loss and a real advantage in fertilizing the trees. The danger of loss in applying manure of any sort in winter is not so great as one sometimes thinks, especially on level ground. Frequently there is some loss, but ordinarily there is very little loss on level land, because of the wonderful power that the soil has of absorbing nitrogenous substances. If it is spread on icy beds and then rains come, there is likely to be a good deal of loss, but ordinarily there will be less loss that way than any other way that I know of.

Mr. Butterhof—I would like to ask the professor if this phosphate slag is identical with the Thomas slag, and from what it is derived?

Dr. Voorhees—That is the Thomas phosphate powder. It is obtained in the manufacture of iron from phosphatic iron ores and it carries ordinarily about eighteen per cent. of phosphoric acid, and about forty per cent. of lime. There is one company in this country which did formerly manufacture it, I think, at Pottstown; whether it is now or not I don't know. It is a very excellent and insoluble phosphate, and for building up soils I don't know of anything better, because it has lime always associated with it and the phosphoric acid is in a fine condition.

Some Essential Principles in the Practice
of Market Gardening.



View of a Portion of the Celebrated Dahlia Farm at Atco, N. J. Portion of 30 acre field.

Some Essential Principles in the Practice of Market Gardening.

BY PROF. R. L. WATTS, STATE COLLEGE, PA.

President Voorhees—I take pleasure in introducing Professor Watts to this board, although many of you know him now. I am also glad to say that Professor Watts is to help in our short course, beginning the 24th of this month, and possibly the education and training that the farmers of New Jersey have given Professor Watts, have been responsible for his recent election as Professor of Horticulture of the Pennsylvania State College. This is the second appointment in Pennsylvania of a man who has previously received his education in New Jersey.

Professor Watts—Mr. President and members of the State Board of Agriculture, I am pleased to have this opportunity of addressing the leaders of agriculture in New Jersey. I am greatly indebted to your State for the valuable information gleaned at the farmers' institutes, to Dr. Voorhees whose books, bulletins and addresses have been most helpful to me, and to Secretary Dye for the many courtesies extended while assisting him at the institutes. I have been with you not only during the winter seasons, but I have had the pleasure of looking over many of your farms during the summer time so that I am quite familiar with the methods employed in the great trucking sections of your State. New Jersey is universally regarded as one of the great trucking States of the Union and this is justly so, for eleven per cent. of your improved land is devoted to the growing of vegetables for commercial purposes.

I am not responsible for the subject assigned me on this programme, "Some Essential Principles in the Practice of Market Gardening," for this topic was suggested by the Secretary of your board. The

most essential principles in market gardening are very old principles and it is scarcely possible, with an audience of this character, to advance principles which are not well known. But the greatest need in all of the States to-day, is not the teaching of little known principles, but it is the old principles which the mass of cultivators have not fully grasped that demand the attention of teachers and writers who are laboring for the advancement of vegetable gardening.

The achievement of success in all the pursuits of life depends largely upon aims and the determination and tenacity of purpose. A young man remains as motorman on a trolley car because he aims no higher. The store clerk does not become manager because he is satisfied with a clerkship and aims no higher. The same principle holds in market gardening. Average yields and profits in New Jersey and Pennsylvania are much lower than they should be. You have a great trucking State and yet the last census shows that the gross receipts from the sale of vegetables in New Jersey is only a trifle over \$60 per acre. Who is to blame for this state of affairs? Not the men assembled here to-day, or the regular attendants at farmers' institutes, or the men who pursue the short winter courses at your agricultural college, for these men have high and definite aims. But it is the large number (but getting less every year) of cultivators who are satisfied with ordinary results who are responsible for the low average receipts per acre. It is this class of men who need to be aroused and who need a better understanding of the essential principles in the practice of market gardening.

A FEW AIMS.

The great aim of every grower of vegetables for commercial purposes should be to make his operations pay maximum profits. In order to accomplish this it is necessary to consider the following factors: 1st, yield; 2d, quality; 3d, earliness; 4th, marketing and market problems; 5th, principles relating to the business side of market gardening. These factors are not necessarily arranged in order of importance. The character of the vegetable grown, the market to be supplied and other local conditions determine the relative importance of the five factors which count for the largest profits.

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I have often observed that truckers who obtain large yields are generally if not always prosperous. Quality need not necessarily be sacrificed for quantity. With vegetables quantity and quality usually go together. This is not true to the same extent with fruits, for the largest and best producing apples, pears and peaches are often the most inferior. This is true of some varieties of vegetables. But quality in vegetables is generally secured by quick growth and quick maturity, and quick growth cannot be secured without high fertility and high fertility is conducive to large crops. It is important to get quality to as great an extent as possible by the selection of proper varieties and then to supply every condition which will influence yield. A large class of gardeners fail to realize large profits because yields are too small. And many gardeners' aims are too low so far as yields are concerned. The most of us do not procure more than ten to fifteen tons of cabbage per acre, while more skillful growers get twenty tons or more from the same area. Many potato growers are highly pleased with 150 to 200 bushels of tubers per acre while others average 300 and are striving for 400 or more. These men with high aims are an inspiration and a benediction to cultivators everywhere.

Quality never counted for as much in getting good prices as to-day. It is not many years since vegetables lacking uniformity in every particular sold for prices that meant profit to the grower. But dealers and consumers everywhere now demand the best, and keen competition crowds much of the inferior produce to the dump heaps before reaching the consumer. By the term quality is meant not only flavor, but also appearance which is a most important factor in making satisfactory sales. Attractiveness is gained by desirable size, form, color and uniformity in all these particulars.

Earliness is not always important. Some New Jersey gardeners find midsummer or even late vegetables to be more profitable. It is generally less expensive to grow vegetables late in the season, especially those that require starting under glass in order to reach the market early. But when there is an attempt to secure earliness there should be no neglect of any matter which will hasten maturity.

A great deal of produce commands low prices because of improper grading, packing and marketing. Then again, good business methods are not always employed in the selling of produce. All of these questions are important factors and will be discussed later.

THE SEED QUESTION.

Producers of all kinds of farm crops are just beginning to realize the full importance of using high-grade seeds. Yields, quality and profits may be materially increased without a proportionate increase in the cost of seed. Although a few cultivators know the value of superior seeds, the majority of truckers and market gardeners have not given the question careful and intelligent consideration. If the seed germinates properly they are usually satisfied, and with many growers the vitality or viability of the seed is practically the only factor considered, while this is only one of several important elements that enter into the question of seed selection.

The seed itself may possess high germinating qualities and yet give very unsatisfactory results so far as the matured crop is concerned. Good seed means much more than a high percentage of germination. Seed is not good unless the resultant crop is satisfactory. And the resultant crop will not be satisfactory unless the variety is true to name, and the best results will not be procured unless the variety represents a well-bred strain. There is often more difference between strains of the same variety than between varieties of the same vegetable. It is obvious to all intelligent cultivators that the use of high-bred vegetable seeds is just as important as the breeding and raising of high-grade farm animals.

High-class vegetable seeds may be secured in three ways, namely, from reliable dealers or seedsmen, from special growers of select seeds and from selections made at home. Each method has distinct merits.

When seeds are purchased from dealers it is generally safest to buy from the introducers. Nearly every large firm exercises special care in the breeding of certain varieties of vegetables that they have introduced. They pride themselves in the merits of these varieties and special efforts are made to maintain or to intensify the qualities which make them valuable. It is natural for houses to take the most interest in varieties of special value which they have introduced. Although this general principle holds, some houses have greater reputations than others for the distribution of all classes of high-grade seed.

It is not uncommon to find a trucker or market gardener who has been signally successful, and he attributes much of his success to the

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selection and saving of seeds from his own crops. Such men often create, unintentionally, a demand for their seed. There can be no objection to the use of seed from these specialists if proper care and intelligence has been exercised in selecting, harvesting, curing and storing.

There is a growing tendency among market gardeners to save their own seeds. It is not a desirable practice with all classes of cultivators. In fact the desirability depends almost entirely upon the skill of the grower and the adaptability of soil and climatic conditions. The average gardener would find it extremely difficult to produce his own celery and cauliflower seed, while it is comparatively simple to procure from the home plantations the very finest seed of tomatoes, cucumbers, sweet corn, peppers and many other vegetables.

In the selection of seed it is exceedingly important to note the vigor of the plants and their power to resist disease. Then specimens should be taken from the most productive plants. Uniformity in size, flavor, color and form should be given the closest attention. There is no reason why a careful, observing, thoughtful gardener should not produce seed of the highest quality and be able to improve the strains from year to year. Some of the finest examples we have seen of splendid results from home-saved seeds have been among the gardeners of this State.

STABLE MANURES.

I have been very much interested in recent years as to the views held by market gardeners regarding the value of stable manure for crop production. There are a great many men on Long Island and quite a large class in New Jersey who seem to think that stable manure is indispensable, while a much smaller class of gardeners practice green manuring to such an extent that stable manures occupy a small place in the treatment of their soils. The great fundamental principle in the handling of all soils devoted to the production of vegetables is to maintain the supply of vegetable matter. Much of the manure brought from the cities is very deficient in actual plant-food and the manure is valuable more because it adds humus to the soil than to its content of actual plant-food. Manure is costing New Jersey truckers from two to three dollars per ton, spread in the field, and there is no objection to the payment of these

prices if the grower can make a profit on such costly applications of plant-food. To do this it is necessary to intensify in every possible way. More than ordinary ability is required to make a profit on manure at three dollars per ton.

GREEN MANURES.

I have learned some valuable lessons in New Jersey relative to the use of green crops for manurial purposes. The soils and climatic conditions of the State are generally well adapted to the growing of those green crops which are worth the most for manurial purposes, such as cow peas and crimson clover. Some, if not a great many, of your truckers are taking advantage of this fact and spending less money than formerly for stable manure shipped from the cities. This indicates progress, and it is to be hoped that green manuring will become more and more popular with producers of vegetables in this and other States.

A little personal experience in the use of green crops in the restoration of soil fertility may be of some interest to you. Some years ago we performed an experiment which was the beginning of systematic green manuring on my farms. We selected an impoverished plat of land that contained two and one-third acres. The ground was plowed in August, harrowed, a fine seed bed prepared and rye sown in September, using seed and fertilizer rather freely. The rye which made a fair growth was plowed under the following spring when about two feet high and oats and Canada field peas sown. When the oats were shooting into head, in August, this crop and the field peas were plowed down and rye sown again in September. The next spring the rye was plowed under and the ground planted in Danish Ball cabbage. This course of green manuring consisted of three crops plowed under consecutively without an intervening cash crop. The physical character of the soil was completely changed. A dead soil was brought back to life by the addition of vegetable matter. The soil was made inhabitable again, both to plants or crops and to bacteria. It is true that this course of green manuring cost some money. Soil cannot be built up by the use of stable manure or green crops without considerable outlay of capital. And lands will not produce the owners profitable crops unless they are first made fertile, and too many

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truckers are trying to make big profits on poor soils. This cannot be done. The course of green manuring which has been described cost about \$75 for acreage named. This included interest on the land and all outlay for labor, seed, fertilizer, &c. Did the experiment pay? This plat of ground, which was previously too poor for profitable gardening, produced one of the best crops of cabbage we have ever grown that sold for \$655.

The course of green manuring which we have discussed would not be practicable in many parts of New Jersey, but it serves to illustrate the point that soils may be made very rich without the use of a pound of stable manure. Many progressive gardeners know this, but comparatively few are using green manures to as great an extent as would be profitable. The best green manures are the legumes, as cow peas, crimson clover, red clover and vetch. Rye may be sown later in the season than any other cover crop, and it is worth more than is generally supposed. With favorable soil conditions the root growth is enormous.

Many farmers hesitate to plow under heavy green crops because of danger of souring the land. To prevent this trouble it is desirable to use some lime, harrowing it into the soil thoroughly, after plowing. If the furrows are thrown on edge, rather than flat, the capillary movement of the soil will be interfered with to less extent and there will not be so much danger of the soil souring, and the land should also be rolled or compacted soon after plowing. A heavy plank drag will do this work almost if not quite as well as a roller and will pulverize the soil to a much greater extent.

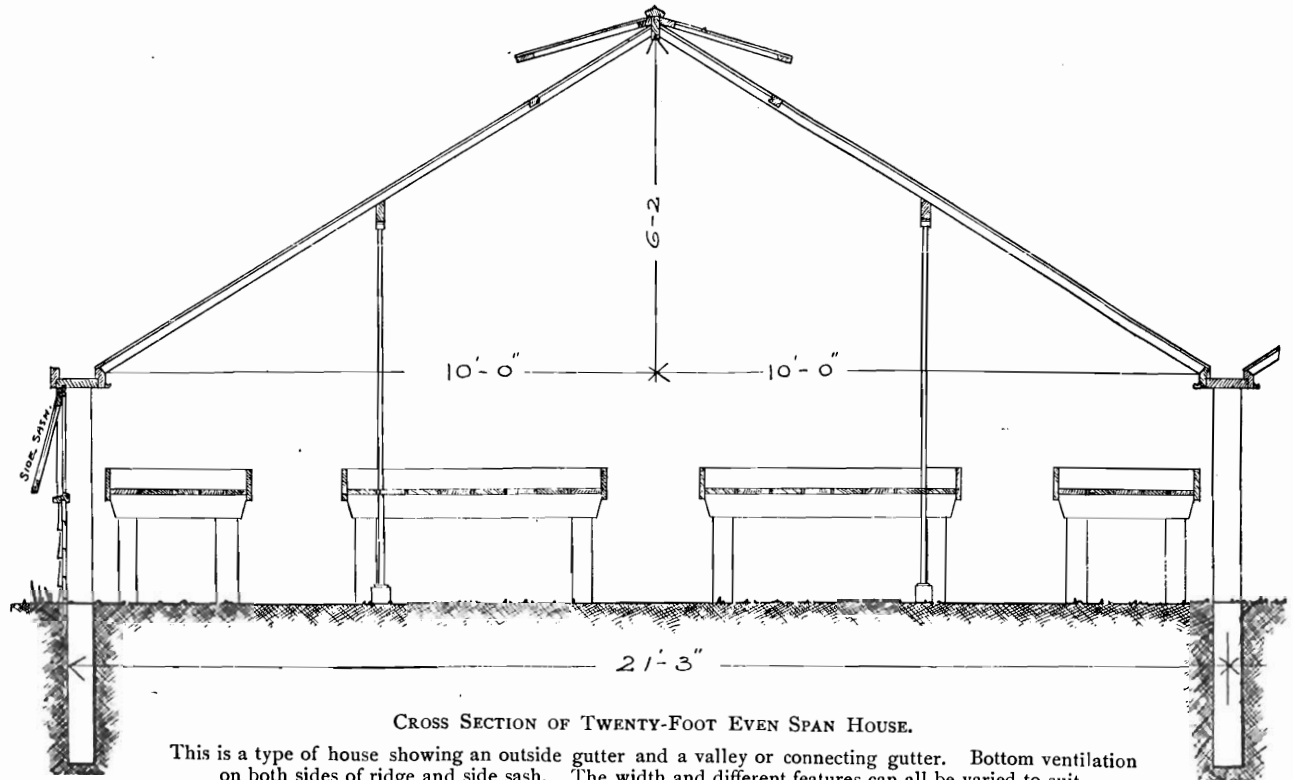
One of the finest examples that can be cited in your State of splendid results from the use of green manures, is on the farms of Horace Roberts, president of the New Jersey Horticultural Society. Mr. Roberts grows about 500 acres of vegetables annually, but no stable manure is used except that produced on the farms. His soils improve from year to year and this improvement can be attributed only to the use of green manures. Dwarf garden peas are grown to a very large extent on the Roberts farms, between fruit trees, and such vegetables as sweet corn, cabbage, tomatoes, cucumbers, watermelons and muskmelons. The peas are harvested and the vines plowed into the soil. Cover crops are invariably started in the fall which not only help to maintain the supply of humus, but also serve to reduce the loss of soluble nitrates by leaching.

COMMERCIAL FERTILIZERS.

Truckers who use green manures to the exclusion of stable manures generally find it profitable to use commercial fertilizers more liberally. The plant-food contained in green manures does not become available so quickly as that of stable manures. But it is ordinarily less expensive and certainly less troublesome to buy plant-food in the condensed forms of commercial fertilizer, rather than manure, unless manure is wanted for the purpose of making humus. And when fertilizers are purchased the best forms should be procured at the least cost and combined in such a manner as to be the most valuable for the crops to be grown. In order to have entire control of all the problems connected with the preparation and use of fertilizers, home mixing is advocated and practiced to a considerable extent. The advantages of home mixing are well known by New Jersey market gardeners and need not be discussed at this time.

THE VALUE OF GREENHOUSES.

If there is any one thing needed more than another among the market gardeners of New Jersey it is more greenhouses. Too many men are depending upon hotbeds for all work requiring glass, when greenhouses would serve their purposes to much greater advantage. Hotbeds are not economical, neither are they convenient to operate. So far as uniform results are concerned all points are in favor of greenhouses. Ventilation, temperature and moisture are much better controlled in greenhouses, and a properly constructed and heated greenhouse is a source of pleasure to the farmer's family during the winter time when farm life is not so attractive as at other seasons of the year. It is not difficult to make the greenhouse pay a profit by forcing crops before it is time to sow seeds for the early vegetable plants to be planted in the open ground.



CROSS SECTION OF TWENTY-FOOT EVEN SPAN HOUSE.

This is a type of house showing an outside gutter and a valley or connecting gutter. Bottom ventilation on both sides of ridge and side sash. The width and different features can all be varied to suit.

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MARKET PROBLEMS.

A great many men succeed admirably in the production of fine vegetables, but fail to realize a profit because of failure to market the produce in the right condition and in the right packages. Last fall I spent a day looking over the New York market, and it affords me pleasure to say that some of the finest and best packed vegetables exhibited had been grown and packed on New Jersey farms. At the same time we saw some New Jersey produce which was far from what it should have been to command the highest prices. Now, it is very evident that some of your truckers thoroughly understand the essential points that count for high prices while others need information concerning the most important factors in the selling of produce. The first essential is rigid grading. One inferior specimen in the package may repel buyers or result in an abnormally low price. Every specimen strictly first class in size, shape, color and soundness will go far towards getting the best price. The second essential is the right kind of a package. Most packages are too large. They are too large because produce carries to market better in small packages, and small packages are more attractive and more popular with the consumers because they may be carried home with very little inconvenience. A day or two spent at the retail stores should convince the most skeptical of the merits of the small package. The right kind of a package embraces the idea of using a clean package. Soiled and discolored packages are always repulsive to buyers all along the line of middle men as well as the consumers. Vegetables to sell well must look well. This is the great fundamental principle which should be kept in mind by the packer. It is absolutely necessary to give the vegetables an attractive appearance. Catch the eye and the sale is more than half made. Skillful and intelligent marketing is unquestionably the most important item in commercial gardening.

Mr. Perrine—I wish to ask a question: I heard the gentleman refer principally to rye as green manure; I didn't hear him mention wheat; now, is there a difference in plowing under wheat or rye for green manure; does that have any different effect? If you don't get in the clover, can you get your green manure with wheat or rye in plowing for potatoes next spring? Is there any difference whether it is wheat or rye?

Professor Watts—I think Dr. Voorhees can answer this question better than I can.

Dr. Voorhees—Our experience is, that the wheat is quite as good, if not better, because you have got a larger yield early in the year—that is, not as early as you would plow for oats, but early in the season. It has a larger root system, and, as a rule, I think it doesn't acquire its food as readily as rye, and the yield itself is a little richer in nitrogen, therefore you get a little more organized nitrogen in the surface soil. One objection that arises in the case of wheat is because of the higher price of wheat, but I should prefer the wheat if I cared to have the green manure turned under a little later. In either case it is a very important matter that the green crop be turned under before it has made too much growth, if you are growing the green crop for the improvement of other crops, and not for the rye or wheat itself. If it grows too large then you have great difficulty in turning under that vegetable matter.

Mr. Gandy—In regard to onion seed, I would like to ask if he can give a reliable house where we can buy onion seed.

Professor Watts—I always hesitate in naming a seed-house or recommending it. I am not a practical onion grower, so I would not like to make a recommendation. I think this friend from Matawan, N. J., could give information that would be desirable. I don't know but what our best onion seed is coming from Connecticut. I think Gregory is as good as anyone.

Mr. Crane—Would it be advisable to give a light top dressing of lime after plowing under the green crops, provided there was time for that to act before the next crop was sown?

Dr. Voorhees—It is always desirable to have a sufficient amount of lime in the soil to prevent any acidity following the rapid disorganization of vegetable matter.

Mr. Gillingham—Mr. Watts spoke of several desirable houses to procure reliable cabbage, and among those houses he did not mention Gregory's. We in our neighborhood have been in the habit of getting it from Gregory, and they are reliable.

Professor Watts—As a rule, I prefer to get the seed of vegetables from the introducer. Now, Peter Henderson & Company introduced the four varieties of cabbages named, and it is safe to get these seed from this firm. I don't say the others are not as good; they may be better. The average market gardener is at the mercy of the seedsmen. He might buy the Early Jersey Wake-

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field cabbage and think he is getting something good, only to find it an inferior strain. I have used seeds where some of the heads would be conical and some round, and some flattened. So it is important to buy it from the best houses.

A Member—Have you had any experience with cabbage rot?

Professor Watts—We have not had a great deal of experience with the cabbage rot. I don't think it is as destructive in Pennsylvania as in some sections of New Jersey. Really I don't know of anything of a practical character that can be done with cabbage rot except to rotate. It is not safe to follow a closer rotation than four or five years, but in spraying nothing has been done along that line with any success.

A Member—Some of us grow crops that are not harvested until the 1st of September or even a little later, when we would like to grow leguminous crops which we cannot do with crimson clover. Is it possible to sow the winter vetch at that time?

Dr. Voorhees—Yes; we have seeded winter vetch as late as October. In an open winter it will make considerable growth.

A Member—About the 1st of October how much growth will it make?

Dr. Voorhees—That would be difficult to answer, it depends so much upon that particular season, but I have seen vetch seeded as late as that make considerable growth. It is not a heavy cover, but a good growth, much more than you would get from any other crops. It starts very early in spring and makes very rapid growth and then covers the ground up to the 1st of May.

Mr. Gillingham—How does that compare with crimson clover?

Dr. Voorhees—So far as nitrogen is concerned it is quite as good. The chief objection is that the price of the seed is too high, except you have just such conditions as you mention, where you could not get another legume in to take hold of the soil before winter. We have been attempting to follow that line up and we have grown vetch seed in South Jersey, Atlantic county, on this light sandy soil, seeding after turning down cow peas from which cow pea seed had been obtained, and it promises to be rather a useful line of investigation. If we can reduce the price of the seed I think winter vetch is one of the best winter legumes that we have.

A Member—Does it do equally well on pretty stiff soil?

Dr. Voorhees—No; it does quite well on heavy soil, but not nearly so well as on the lighter soil. We have grown it in New

Brunswick, but with rather indifferent success, nothing like as well as upon light soil, and it seems rather to be better adapted for the very light soil than any other legume we have. It does not seem to get away as crimson clover gets away, when the wind blows, and carries the seed.

Mr. Jones—Would pea vines plowed under, if plowed following year, make a good clean crop?

Dr. Voorhees—What crop to follow?

Mr. Jones—Any kind. The place I reside on at the present time has been for twelve years rented by a canner of peas and beans, and he planted the ground to peas and beans, peas mostly, and they are harvested along about the latter part of June or the 1st of July. The beans and peas are all hauled to the factory and the vines brought back and spread on the farm, then the ground is plowed again, and they sow crimson clover for the next year; that was done twelve years straight. I want to ask if it was too much of the same manure and whether it would be advisable to sow crimson clover?

Dr. Voorhees—I don't think there would be any danger provided you didn't see any difference in the growth of the crops—that is, that it is possible to so increase the vegetable matter in the soil and the decomposition that results from decay as to injure the soil, but that is manifested almost immediately in the character of the crops. If the crops will grow well I should continue it.

Mr. Jones—My neighbor grew more potatoes, but I beat him in vines.

Dr. Voorhees—Your difficulty is you haven't sufficient mineral fertilizers to balance up, and it is quite likely that having so much there, that it caused your potatoes to grow for too long a time. You have more nitrogen than can be used up with the amount of mineral food that the plant can contain. I would suggest in that case not to apply nitrogen fertilizer and increase the potash and phosphate.

Mr. Jones—Would you recommend rye or wheat instead of crimson clover?

Dr. Voorhees—I would use a larger amount of mineral fertilizers first, and if that does not work, then I would reduce the nitrogenous organic matter by substituting rye or wheat.

Mr. Pikaart—I noticed that Professor Watts laid stress upon the construction of the greenhouse. Is it not a very important matter the manner of constructing and ventilating the house, and

the handling of your plants before setting them out? He made no explanation of that. I would like to hear what his view is.

Professor Watts—The trouble is on a subject of this kind there is so much ground to be covered. I have given a series of lectures to the boys at the State College, and we covered the ground fairly well in nineteen lectures. Now we have had to treat the whole subject in one. I prefer an even span-house to a three-quarters or two-thirds span, with all the glass you can get in it. The old method was to use rafters, and these should not be used at all. You should use a rather heavy sash and not closer than eighteen inches. A neighbor is putting up a house with the sash bars twenty-four inches. I don't know whether that is to be recommended or not, although a few houses built in recent years have been built in this way. But, at any rate, 95 per cent. of the roofs and walls should be glass.

As to the ventilation, I much prefer a line of ventilators on each side of the ridge. I don't know that it is very important, although some growers prefer additional side ventilation, but I don't care for it. I have one house with wall ventilators, but they are seldom used. There may be times when it would be an advantage. I prefer ventilation on each side of the ridge, and prefer that the runs are not continuous.

As to the ventilating machinery, it is important to get machinery that works easily. I don't know of any better than that called the "Little Giant," manufactured at Richmond, Indiana. I find that it is used in many modern houses.

As to the method of handling plants, I don't think I will have time to take that up. You start them in the greenhouse, transplant in the cold frames.

Secretary Dye—Can you give us a statement of those houses that we can have produced in the report?

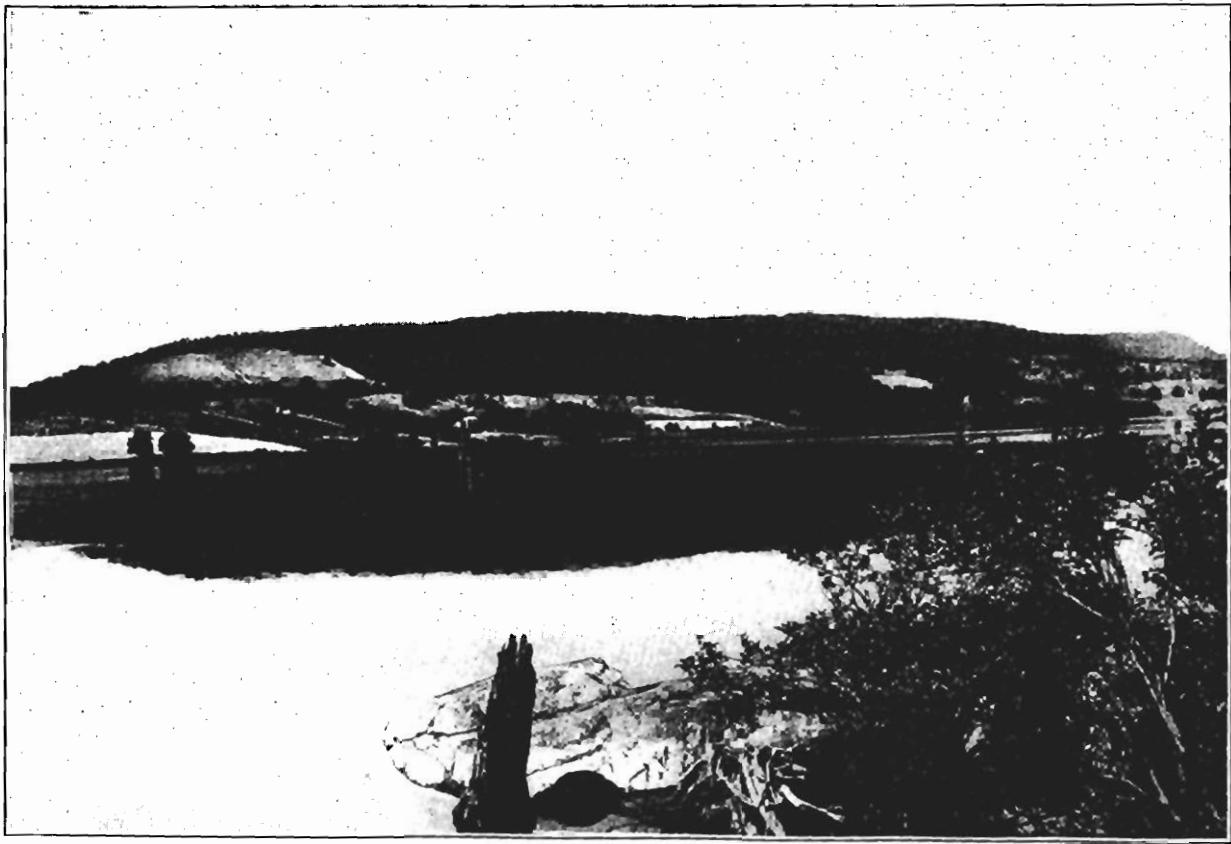
Professor Watts—Yes.

Mr. Pikaart—I find that a greenhouse ventilated at the foot of the rafter at the post or pitch is very influential in making the plants stocky and firm.

Professor Watts—Of course it depends largely upon what you want the house for.

Mr. Pickard—For tomatoes it is best. Transplanting them and hardening them in there, and I have gotten tomatoes as early as the 16th of June—that is, up in Passaic county.

A Paying Crop for Poor Lands.



Culver's Lake and a part of Kittatinny Mountain. The Stokes' Forest Reserve lies above the broken line.

A Paying Crop for Poor Lands.

BY ALFRED GASKILL, STATE FORESTER.

MR. PRESIDENT, LADIES AND GENTLEMEN—It has come to be pretty well understood that the relation between agriculture and forestry is a close one. We talk a little about it as occasion offers. It has seemed to me that the opportunity that is given to me to-night to say something on behalf of forestry as one of the resources of this State was worth taking advantage of in a peculiar way. After I have read what I want to say, I will then turn to a series of lantern illustrations that will illustrate and elaborate these things to which I want to call your attention. I have called this address "A Paying Crop for Poor Lands," because, after all, the essence of forestry is that it shall use those lands which are of little value, and sometimes of no value at all, for other purposes.

These are days of projects for the fuller development of the country, of thought and planning for the better use of a wonderful heritage. For two hundred years we have literally mined our crops, we have reaped where we did not sow. Farmers, miners, lumbermen have done this and have moved steadily westward, ever seeking virgin stores and wasting, not conserving, them when found.

The farm lands of the east are fallen in value because the soil cannot produce staples in competition with the virgin land of the west, and few farmers have tried to meet the new conditions. Some of the boys and girls have gone west to work that land; many more have taken up the wearing life of the cities. Did it ever occur to you that a whole generation has devoted itself to exploiting the west and establishing industries in the east, utterly neglectful of the possibilities in the land of the older States? Many keen observers believe that the opportunities of the next fifty years will be found in applying modern ideas to the soil of

the east, making the farms pay more than they ever did, and the basis of this belief is the simple fact that the consuming population of the country is east of the Mississippi river, and always will be.

But I am here to talk forestry—forestry for New Jersey. The situation as I see it, and the proper point of view, are indicated by what I have just said and by the words of the man who probably has done more than any other for the farmers of this country. James Wilson, Secretary of Agriculture, said: "Every tree is beautiful, every grove is pleasant, every forest is grand; the planting and care of trees is exhilarating and a pledge of faith in the future; but these æsthetic features, though elevating, are incidental; the people need wood!" Let me try to show you that our farmers are the ones to profit by this need. For the moment, therefore, let us put aside all consideration of trees as individuals, forget if we can their dignity, beauty, friendliness and charm, and see what there is in the suggestion that a wood crop is possible to every farmer.

First of all, we must bear in mind that New Jersey is not, and never will be, a lumber-producing State in the sense that many States of the north, south and west are; its population is too dense to afford the necessary room. But that fact, and the industries that flourish in our cities, furnish a constant nearby demand for forest products. If you try, you can't go fifty miles from the stump of a tree and not find a market for its timber. The northern half of the State is directly tributary to Newark and the group of cities about it, and to the great Metropolis itself. Central Jersey and South Jersey find an unflinching demand for their product in Philadelphia. In addition to this is the home market. Every farmer and every family in the towns and villages all over the State is a wood user, comparatively few are wood producers. Contrast this situation with the conditions found in a great lumber-producing section—Minnesota, Arkansas or Oregon. There the lumber camps are far from organized communities and the value of the product is lessened by high freight charges.

These facts fix for us the kind of forestry that must be practiced—in the main an intensive management of woodlots, most of them small in area and of diverse ownership. New Jersey can never produce more than a fraction, perhaps a fourth, of the wood that



A badly-treated hardwood forest. The crooked, useless trees, not the thrifty young ones, should be cut first.

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she uses; but let us produce that fourth, instead of the tenth, or thereabouts, that we now do.

Another point is worth remembering: Our situation is so fortunate that even firewood is salable. As a rule, the measure of success in forest administration is the amount of firewood that can be disposed of. Of course, a forester's chief effort is to produce the greatest quantity of high-grade material, but no tree makes timber entirely, and if the tops and branches go to waste the fraction that is sold has to cover the whole cost of production.

Another great advantage that we have is a spontaneous forest in every part of the State. Planting need be resorted to only where fire has destroyed all the seed trees, as in some parts of the Pine Belt, and where cleared fields are wanted in forest again. The idea that forestry begins and ends with tree planting is well enough on the prairies, but has no application here. Still another reason for maintaining forests is that our climate is everywhere favorable. Tree growth is more rapid here than it is farther north. The last reason for woodlot forestry is perhaps the strongest of all—trees grow without fertilizer, with a minimum of care, and the crop is harvested when you please. No direct outlay, no labor problem, and an assured sale for all that is produced.

Of course, I don't pretend that there are no drawbacks to a crop that requires forty or fifty years or more to grow. But is the time altogether a disadvantage? Why do you hope to get something more than a living from your fields? Does not every one count on putting by a part of his income? A German proverb says: "A forest is safer than a safe." Put your surplus in a woodlot as many European farmers do; it will earn more interest than bank stock. Moreover, the established forest, rightly managed, may yield something every year. It may take a tree fifty years to grow, but if you have fifty trees from one year old to fifty years old you can cut one every year, and you can keep on doing it forever if you provide for a young tree in the place of every old one that is felled.

The present condition of our forests is almost uniformly poor, for they have been neglected and abused to the last degree, though they are generally better now than they were twenty years ago, and we may get some encouragement from the knowledge that Europe committed the same mistakes that we have. Some countries, notably Germany, Switzerland and France, have repaired

these mistakes, or are trying to repair them. Others, like Spain, Italy and Greece, have done little or nothing. In this respect it is not too much to say that twenty years ago this country was two hundred years behind the most advanced countries of Europe; to-day we are not more than fifty years behind and are striding forward at a rate that, in respect to policy and purpose at least, will place us beside them, or perhaps in the lead, by the end of another generation.

The extent to which the farmers of New Jersey should be interested in this question is indicated by the fact that only 69 per cent. of our farm area is reported as improved; that means that we have, approximately, 833,476 acres of land, rated and taxed as farms, which presumably are yielding very little. Is that right? Is any man looking out for number one who allows thirty-one acres of the hundred in his farm to lie unproductive?

But it is time to get down to something concrete, else you will think that forestry is simply a lot of hurrah. Unfortunately much of what is said on the subject is, and unfortunately, too, we know comparatively little about the habits of our trees, and very little about their rates of growth, which, of course, is the important thing. Nevertheless, some facts are known and we are constantly learning more. Let me give you a few examples of what has been learned regarding several forest tracts in this State and how that knowledge can be used to calculate the amount and value of a wood crop.

On the State reserve on Kittatinny mountain parts of the land recently cut over contain an average of 150 young oak and chestnut trees to the acre. These, in the course of twenty years, will be large enough to yield a good crop of railroad ties, telegraph poles and lumber; but, for the sake of a long-time example, let us assume that the area is completely cut over and contains only a sufficient number of strong chestnut stumps. From accepted growth tables these may be expected to produce in forty-five years at least 200 merchantable trees to the acre, each tree capable of yielding three railroad ties, or their equivalent in material of higher value. At present prices chestnut ties will net not less than forty cents each, or \$1.20 to the tree. If you wish a high factor of safety, say that instead of 200 trees to the acre you get but 100 of suitable size; in that case the harvest after forty-five years will net \$120. This sum is easily convertible into a rental of eighty-six cents paid



A hardwood forest immediately after an improvement thinning. All mature and all defective trees have been removed, all thrifty young ones are left to grow.

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every year and invested at 5 per cent. compound interest. That is, if the eighty-six cents were received at harvest time every year and put in bank at 5 per cent. it would amount to \$120 in forty-five years. And please remember that eighty-six cents equals 5 per cent. interest on \$17. How much rough woodland, or indeed fair farm land, is now worth that?

Another instance that I ran across only a short time ago will prove several things. First, that it is not necessary to wait forty-five years for a crop where the trees are already partly grown; second, that it is unwise, or even foolish, to cut trees just when they are making their best growth. On the Pennsylvania side of the Delaware river, a short distance below the Water Gap, but best exposed from this side, was a stand of fine chestnut poles about twenty years old and six inches in diameter. Last summer it was cut clear, and the wood sold for mine timbers at two cents a lineal foot. If the cost of cutting was one cent and the poles averaged twenty feet in length, each one would bring twenty cents net. I was unable to learn exactly how much the tract yielded, but since the stand was a pretty dense one, it may be assumed that 300 poles were obtained from each acre. That would give a profit of \$60. Now, let us say that that \$60 was invested at 5 per cent. compound interest for twenty-three years. At the end of that time it would amount to \$184.20. Then let us say that another crop of poles was cut from the stumps left at this cutting. At that time there should be rather more than the last cut, since twenty-three years is equivalent to an average growth of seven and one-fourth inches in diameter. You may, therefore, assume that the owner will get from the next crop about \$80 an acre, instead of the \$60 that the last one yielded. This \$80, added to the \$184 in bank, makes \$264 as the total net income twenty-three years hence. Now, suppose that instead of cutting these young trees last summer, the owner had allowed them to grow for twenty-three years. Within that time a proper thinning would yield something, but let us say that the woodlot had no attention, it was simply left to itself. In twenty-three years' time the average six-inch chestnut tree will grow to be twelve inches in diameter, and if there were then only 250 trees, instead of the 300 that we started with, the forest would yield 750 ties worth at present prices \$300 net. In other words, there is a gain of \$36. But it is possible to figure even a greater profit. These young chestnuts

were tall and straight, many of them would undoubtedly produce good electric poles. We may say, therefore, that the crop might be thirty forty-foot poles worth \$4.50 each, sixty thirty-foot poles worth \$3.50 each, sixty tie trees worth \$1.20 each, and 100 small trees, fit for mine timbers, worth twenty cents each. This is a total of \$437 to set against the \$264 that is the accumulated income of two immature crops. If the income from the two cuttings be resolved into 5 per cent. rentals it is found that \$60 taken every twenty years is equivalent to \$1.81 a year, while \$437 taken every forty-five years is equivalent to \$3.13 a year.

I do not expect you to attach great weight to these problematical figures; they are offered solely as evidence of what woodlands may produce under present conditions. It is entirely safe to say that if the future shows a lower rate of interest on forest investments than these figures indicate it will not be because the crop cannot be produced, but because the value of the land has increased. We have fairly accurate growth tables for chestnut and can calculate with reasonable certainty on the outcome. Nor is there any error in ignoring the charge for protection and care during the time that the crop is growing. In the case of a small tract, that is rarely counted, since it goes along with the rest of the farmer's work, but even on a large property it need not be considered, because we have not taken into account the firewood that is sure to be produced, nor the certain advance in lumber prices.

In the southern part of the State property owners are chiefly concerned with the growth of pine. It must be confessed that we lack definite information regarding the rate of growth of pine trees on our poor soils, and I am afraid it will be a good many years before we can hope to have trustworthy figures, simply because the pine forests have been so exhausted that there is practically no grown timber which can be used for the production of yield tables. But of two things I am sure, namely, that very little of our true pine land will fail to produce, *spontaneously*, trees of merchantable quality, provided there is seed within reach, and that the growth of the trees when once established will increase, rather than deteriorate, with the development of the forest, since the soil cannot fail to be strengthened by the trees themselves.

A short time ago I made some studies on a tract which has not been burned for perhaps ten years. It is covered with a fair stand of young pines about five feet high, and the trees grew more last



A woods road cleared out to serve as a fire line. Such a line, 15 feet wide, can be cut for \$15 a mile.

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year than any year before. From an analysis of these areas, and a comparison of the conditions with those fixed by European standards, we can conclude with reasonable assurance that any pine area of this character is capable of yielding a crop worth not less than fifty cents an acre a year at present prices. This is not much perhaps, but you must bear in mind that fifty cents is 5 per cent. on a value of \$10, and I don't believe much of our pine land is valued that high yet. This kind of forest will produce common box boards such as are used by the glass factories in great quantities, and are now worth in the neighborhood of \$11 a thousand. If felling, sawing, transportation, &c., cost \$7, the grower has \$4 left, and that I am sure will figure out about the return I have indicated.

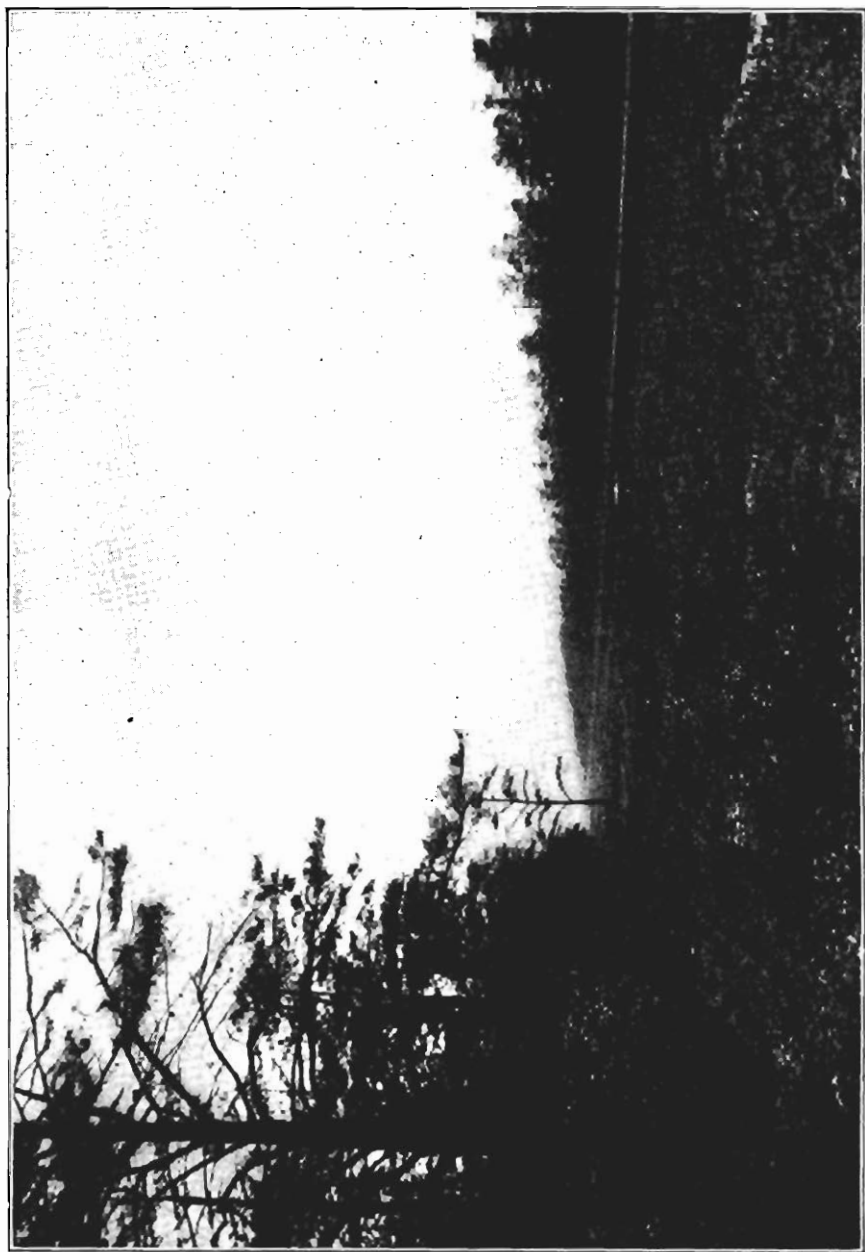
A word about what to grow. If waste land is to be planted up and a choice is offered, put in soft woods—some kind of pine or spruce; there never will be too much of that. But in most cases there will be no need to plant; take the woodlot as you find it and develop it. Make every piece yield not only a crop but a full crop. Foster the trees that grow most rapidly and yield the most valuable wood, but get over the notion that certain species, as beech, maple, aspen and the common pitch pine are worthless. The time is coming when any wood will be salable. It is doubtful if we shall find it profitable to grow high-grade lumber to any extent; that had better be imported. It will usually pay best to work on comparatively short rotations and produce, first electric poles, next railroad ties, then box boards and rough lumber, with firewood, or perhaps charcoal and alcohol, from the tops and thinnings.

I wish I could say something direct and positive about how a piece of woodland should be treated to get from it the highest returns, but that can be done only in specific instances and on the ground. This, however, is worth noting; if your land is sandy, foster the pines and don't think of anything else. Nature teaches that trees of that kind will make the best growth, and after all pine wood is the most valuable that the world produces. On wet ground, or on moist spots in the fields, encourage the native white oak, pin oak, hickory, elm, ash. Don't be misled by old-time notions about the values of timber. England rates the lumber from her gnarled, crooked, old oaks more highly than that which comes from our virgin forest trees. Quartered oak is, and ought

to be, largely venerate. The world knows no substitute for hickory and must have it. Elm and ash are only a little less valuable. And remember that almost any cheap wood is going to be used for railroad ties. Preservatives of various kinds are applied for the purpose of lengthening the natural life of the wood. Even soft pines are now largely used in the west and south, and I have no doubt that white maple will be accepted before long. Wherever chestnut grows foster that above all else. It is not so valuable as the oaks for some purposes, but it grows more rapidly than any, and furnishes material valuable for many uses.

If I may say a word on the other side, be shy of trying to establish foreign trees; few are better in any way than our native ones. Catalpa thrives in this State only on the best soil, and, after all, has no advantage over chestnut. Other woods of which we hear fabulous stories, the eucalyptus, for instance, are not adapted to our climate at all. Avoid black locust because it is sure to suffer from an insect called the borer. And don't sell your wood, whatever it is, too low. Farmers are apt to think an offer of \$50 an acre for a piece of woodland too good to be refused. Lots of stands in this State are worth \$200 an acre, and the buyers know it.

I see that some of you are skeptical and are asking why, if there is so much in forestry, people have not taken it up. The question is a fair one, though the answer is threefold: In the first place, lumber has been so plentiful and cheap, trees so often a burden, that few could see a reason to foster more. We have got past that now. In the second place, more people are taking care of their woodlands than you think; not a few have found out that it pays. The great deterring force is fire. Its ravages, and the indifference of the people to it, are alike proverbial. Fires, and fires alone, have reduced the value of forest land almost to the vanishing point. But we have reached better days in that respect also. The State fire service, though less than two years old, has succeeded in reducing the annual loss to less than a tenth of what it has been for a generation at least, and the forest commission means to keep on until forest property is as safe as any other property. To do this we must have the hearty co-operation of every citizen; it looks now as if we *should* have it. There is no more sense in asserting that forest fires are inevitable than that highway robbery is inevitable. Fires we shall always have, of course, and theft too,



A railroad right-of-way in the pines cleared up to prevent forest fires.

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probably, yet we need no more be dominated by the one than by the other.

With respect to State control of forests we can safely follow the best practice of the old world. That is, leave a private owner free to do as he pleases when he does reasonably right, or when his wrong-doing can work no great harm, but give him the choice of following State directions or selling out to the State when he proposes to do the wrong thing. On steep mountain sides, and sometimes on river banks, forests need protection from selfish interests; in other cases the chief sufferer from mismanagement is the owner. Don't misunderstand me; this position is warranted only when a community has distinctly adopted a policy of forest conservation. In some parts of this country, the southern Appalachians for instance, the general public is in such danger of suffering from private interests that only the national government can give relief. In this State there is no present need to interfere with private owners. As fast as means are provided the Forest Commission will acquire land and establish State reserves. These will be used as concrete examples of forest management and for the good of the people in other ways, but the development of reserves will not obscure the even more important work of helping forest owners. All that they can be induced to do for their own advantage will benefit the State.

Let us sum up the argument. It is that a farmer, or any owner of non-agricultural land, can make that land productive by growing trees. He can do this in most cases by simply taking care of the existing forest, favoring the better trees and letting each stand until it is mature. No direct outlay is required, since trees grow without fertilizing and require no cultivation that does not pay for itself. The crop is produced and harvested with comparatively little labor and is always salable at good prices. In a broader sense the development of commercial forests all about us means the maintenance on a permanent basis of many dependent industries. That surely is good housekeeping. Every farmer must be his own forester. He cannot afford to employ one, and need not if he could. Anyone can learn the fundamental principles of silviculture from books—Pinchot's *Primer of Forestry* is a good one, and the State forester will give personal direction for the asking and his traveling expenses.

The actual situation, as to opportunity at least, may be fairly compared, I think, with that in Saxony, Baden or Württemberg. In other words, New Jersey has a better chance to develop a system of forestry, as forestry is known in the old country, than any other of the United States. There is not the slightest reason why forest land here should not yield \$3 an acre as in Württemberg, or \$5 and upwards as it does in Saxony. When that comes about our present land values will seem ridiculous.

One point more. Do not go into forestry with the idea that there is any "get rich quick" about it. If stocked land is bought low, as is possible now, it will almost surely pay a pretty high return, but for the farmer it offers simply an opportunity to get a good income from land of little value.

Mr. Roberts—Near where I was raised there is a forest of old timber, in which there were quite a good many tall, large yellow, two-leaf pine. It was told me fifty years ago there was no match for it in the State of New Jersey. I have never seen its equal. Now most of those pine are dead. The present owner won't have them cut and he won't sell them, but they are going to destruction. Wherever you find a clump of these pines they are dead or dying. Rather sad it is so, but being so 'tis pity, and pity 'tis that 'tis so.

Mr. Gaskill—I agree with Mr. Roberts entirely, and it is quite as true that man also grows old and dies. I am afraid that his pine trees have reached the limit of natural life.

Mr. Fort—I think that is true, and when these trees begin to die from whatever cause, and any of the limbs or tops are left laying around the butt of another standing tree, I don't care if it is vigorous, the worms will get into that tree, and, when they do, in a year or two that tree will die. When I was young I started to buy pine timber at \$5 and \$10 per acre, thinking when I was older I would have some fine timber. But the cranberry growers came along, and they will cut and set fire anywhere and go home and let the fire go over thousands of acres of young growing timber. And then we have a class of men who want to pick huckleberries, and they will go in in the month of May and start a fire, and in the winter they will steal the wood off and sell it at \$1 a load, and in some places they build roads to cart that wood and huckleberries to market. I own some land, and there is not a better lot of timber grown than will grow on that soil, but when the fire

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comes that way, every three or four years, it burns it, and this is about the month of May. I think the State foresters can do good service if they will burn the forests over in February when there is no sap, do that three or four years, and then a fire will have nothing to feed on. Commercialism has a great deal to do with the burning of our forests. There is no more valuable timber than white cedar, and that will grow in all our swamps now. If a man dies who has protected a cedar swamp that is large enough to make rails and some little logs, as soon as he is buried the children sell it off. He has protected it all his life and they will sell it to get a little money out of it. They are skinning all the cedar swamps.

Mr. Rider—I arise to defend the cranberry growers. I wonder if my friend and brother, if he saw a neighbor stealing his chickens, would say that everybody in the neighborhood is a chicken thief? Because one cranberry grower sets fire to protect his bog, does he judge them all to be that kind?

I have been in the business about twenty-five or thirty years, and the first thing I did was to clear all underbrush and rubbish about my cranberry bogs. Others saw me and they followed my example. That is, we cleaned it up for a certain distance about the bog, and in the spring every year, before the sap starts, we burn it off. The result is, at one place three miles in extent, no fire has crossed for twenty years. I was surprised recently when a man came along who has a saw-mill; he said, "You have some nice timber." I said "Where?" "Around your cranberry bog; what do you want for it?" I said, "You haven't money enough to buy it." There are now large trees which were only scrub pines when I cleared it out. There is a border of timber around the place as far back as the fire line extends. Our fire line always stops the fires that come upon us from either direction, and it is unusual for such to originate with cranberry growers. I know of some who have done and boasted of the thing which Mr. Fort says, but he must not judge all by one. Some people don't care how much they injure their neighbors so long as they protect themselves, but the honorable cranberry grower protects himself, and while he is doing that he is protecting his neighbor. The cranberry growers' interests are jeopardized by fire. We stand in with the Forestry Commission and we want to prevent fires generally. I am glad to say that during the last few years, since the Forestry Commission has been appointed, we have had fewer fires than ever before. If

my friend had protected his forest and cleared out the underbrush and burned it off in the spring when the sap was not in the wood, he would have fine wood there to-day notwithstanding the cranberry growers and the huckleberry men. They could not set fire to my forests because there is nothing there to burn.

Mr. Pickard—I notice Mr. Gaskill had a view of the northern section of the State; we have some very fine timber there, and we have men that take a great deal of pride in keeping it in shape. I speak of the Ramapo section, and one evil we have to contend with is that in the fall of the year men come from the city of Paterson and other towns and go in there and carelessly throw matches on the dry leaves and we have to fight the fire, but this last year I noticed there was quite an absence of forest fires.

The Parasite Question, Practically
Considered.

The Parasite Question, Practically Considered.

The phrase, "the struggle for existence," is fairly well understood now-a-days as the effort of an organism to maintain itself and reproduce its kind despite the obstacles that may arise. And it is a struggle that applies to species as much as to individuals and to the individual as a member of the species.

The problem is different, of course, for different types of organisms, but resolves itself into two prime factors in each instance: First, securing food sufficient to reach maturity—the active struggle; second, the avoidance of the dangers peculiar to its kind—the passive or defensive struggle.

The active struggle makes positive demands on by far the greatest number of species; the defensive struggle, in many cases, makes no demands upon the animal that it can meet, and that is especially true among the lower types of organisms—among which we may for the present class the insects.

The object of this essay is to call attention to a few of the dangers met by some of the insects and the methods of meeting them so far as there are any.

It has been said that were insects of certain kinds allowed to develop unchecked for even a single year they would destroy every green thing on the face of the earth; and if another set were then allowed to develop in the same way the year thereafter, they would also eliminate all other existing animals, including man.

When we consider that the progeny of a single pair of scale insects may in one season reach the almost incredible number of 1,000,000,000 individuals, and that this is not unique, these assertions lose some of their startling character and become quite understandable. But as no such startling results happen, and as, on the whole, the number of insects of each species is about the

same from year to year, it is only another way of saying that such insects are subject to so many dangers that an unusual fecundity is required to keep up the species at all. In many cases out of one thousand eggs one pair of individuals comes to maturity; surely a frightful waste of life!

But nature is lavish of life; it is the cheapest thing it has and so brings it forth and sacrifices it in reckless abundance. For our present purpose we will only enumerate some of the factors and go into details concerning a few.

First of all among the enemies of insect life come climatic conditions—extremes of heat, of frost, of wet or of drought. Insects living within a faunal region are, as a rule, hardened to all the normal variations in that faunal region; but the mere fact that they occur only in one faunal region is in itself a statement that they are not able to endure the conditions of another.

Abnormal cold, then, during a given winter may produce a mortality that causes widespread disaster to a species exposed to it. A few years ago an unusually cold winter in South Jersey killed off all save a small percentage of the corn worm (*Heliothis armiger*), and for three years corn was almost free from the pest; but the third season it was again present in noticeable numbers and now it has reached its usual abundance.

This, by the bye, is a species that is largely checked by its own disposition, for when a number of specimens get into one ear of corn every meeting between them means a fight until either one larva only remains or until they are so widely separated that they do not meet.

Some ten years ago a borer, a Scolytid beetle, was developing widely in the southern pine forests and causing millions of dollars of loss. The best efforts of the owners of forest lands, under direction of the United States Department of Agriculture, were unavailing to check the pest, and it seemed as if enormous areas of forest were doomed to absolute destruction. But a great freeze during one of the winters about that time almost absolutely exterminated the insect and for years not a living example could be found. It has never since recovered from that check and is now barely able to maintain itself against its natural enemies of other kinds.

Intense heat, while it is rarely so destructive of insect life as intense cold, because there is more chance of shelter from it, does

nevertheless figure as a check in some cases. Certain soft scales in California do well on Citrus and olive trees in most sections of the State; but along the edge of the high areas adjoining the desert, or in irrigated actual desert, the sun occasionally gets so hot that it really bakes the scales exposed to it; so these never become as troublesome as they do nearer the coast.

Sudden variations in temperature are fatal to a great number of species, especially of plant-lice. I have seen a crop threatened with serious injury from the hosts of plant-lice developing on it almost completely cleaned by a drop of thirty degrees within a few hours.

Against natural agencies of this kind insects are helpless, and the individual stands no chance of escape through any act of its own. An accident of position that gives it shelter or protection may save it, or constitutional hardiness; but nothing in its own control. It is purely the creature of circumstances.

Another way in which climatic changes act is indirect, *i. e.*, when warm, rainy or sultry weather favors the development of pathogenic epidemic diseases. Insects suffer from infectious disease more than any other kinds of animals, and these diseases are in almost all cases favored by hot, moist weather.

A classic illustration of this method of control is found in the Chinch bug which sometimes, when it threatens destruction to a wheat or corn crop, is almost swept out of existence by disease.

The clover-leaf beetle is absolutely controlled nine years out of ten by a specific disease, and very often an epidemic in late summer kills off the pupæ of the Elm Leaf beetle in such numbers as to make measures against them unnecessary a year or two afterward.

The brown-tail moth is now a serious pest in Massachusetts and has spread throughout the New England States and into Canada. In 1905 the caterpillars in the Middlesex Fells, in Massachusetts, were present in countless numbers. In 1906, they were almost completely wiped out of existence by a disease of bacterial origin and no harm was done by them. In 1907 fully 60 per cent. of all the caterpillars that I saw in early summer were diseased, and the moths were scarcely noticeable later in localities where in previous years they had been a nuisance.

Climatic changes and disease are two important factors in insect control—absolutely beyond our direction and at present in-

capable of use for our purposes—and against these there is not much of a struggle.

There is no insect so insignificant as to be exempt from parasitic attack, and there is no stage that is exempt from the attack of parasitic and predatory foes.

Let us take a plant-louse, for instance, beginning in the egg stage. The eggs, during the winter, are subject to the attacks of small birds that seek them out when food is scarce and reduce their numbers materially. Crawling on the trees are numerous small mites, which pierce them and suck their contents, and in early spring a number of predatory beetles, chief among them the *Coccinellids* or lady-birds, attack them before they are hatched.

But quite a fair percentage of eggs survive, the stem mother develops and reproduction fairly begins. For a time there is little save climate to check it, for parasites and predatory insects are slow to start. But then come a series of them in rapid succession. First the true parasites—little, minute, wasp-like creatures that lay their eggs into the body of the plant-lice in which their larvæ develop. And when once started development is rapid.

Professor F. M. Webster has recently given us some account of the fate of one of the wheat-lice—the so-called “green bug.” This, with a start that threatens the wheat crop as a whole and does damage it severely, becomes so parasitized within the space of a week or two that it is the “bug” rather than the wheat that is destroyed. So abundant does this parasite become that in some experiments looking to its artificial propagation millions of examples were introduced into fields infested by bugs not yet parasitized, and these millions seemed scarcely to add to the local supply because, a short time thereafter, not only *this field* into which the parasites were introduced, but also the entire surrounding country were cleared, the experiment fields containing actually fewer parasites than others where none had been introduced. But such complete parasitic control is unusual in plant-lice. Usually, while the percentage of parasitism is large, it increases slowly and does not threaten the host. It may be worth saying here that a parasitized louse does not reproduce its kind so that the check to increase operates at once.

Lady-bird beetles come early out of their hibernating quarters, feed on the specimens as they find them and lay their eggs on the leaves where the aphids are thickest. A few day thereafter the

larvæ have hatched and destructive work among the prey begins. But the plant feeders usually keep ahead of these, too, for quite a period, and then come the lace-wing flies.

The lace-wings also lay their eggs among the lice and their larvæ join those of the beetles in the feast that is so abundantly spread for them, leaving enough, usually, for yet another enemy, the larvæ of the syrphus flies, which are totally different looking creatures, yet also destroyers of the plant-lice. With the advance of the season, the toughening up of the food-plant and the rapid numerical increase of parasitic and predatory forms, even the enormous reproductive powers of these aphids are insufficient to keep up the supply and they begin to lessen in number. And now, to avoid total destruction, the tendency to migrate becomes developed in the host. Those plant-lice that are winged simply fly away, sometimes drifting with the wind for considerable distances to new plants where they may find a chance to provide for a winter supply.

But what about our friends the parasites, the lady-bird beetles, the lace-wing and the syrphus flies? These have troubles of their own. The parasites find their supply of hosts reduced and many die without being able to oviposit at all. Others oviposit in insects already used and there is not enough for the two larvæ. None of the predatory forms discriminate very much and they eat parasitized aphids just as readily as they do others in the early stage of the parasite's growth at least.

The aphid-lions—lace-wing larvæ—will eat each other when they get a chance, and have no objections to coccinellid larvæ, while these in turn are subject to parasitic attack and will eat each other and their own pupæ if there is any shortage of food. The syrphus fly larvæ suffer from parasites and are eaten by the other predatory types, so that, being slow growers, they do not more than keep up their kind. And thus, at the end of the season, we have host and parasite back nearly where they both were at the beginning.

The troubles of a caterpillar may begin as early as the egg stage. We often find that from a single caterpillar or larva we get hundreds of parasites, and the puzzle is where did they come from, when no adult parasites had been seen since the previous year.

We know now, through researches made by French and Italian entomologists, that some species of parasites lay their eggs into the eggs of the host soon after these have been deposited, and as the

embryo larva develops the parasitic egg also undergoes a change and increases in size, but the increase in size is only an indication of a more wonderful growth that is going on; instead of forming a single parasitic grub within its host, it divides and subdivides until, instead of a single embryo we may have a hundred or more, all inclosed in what may be considered a modified egg-shell. And these embryos all increase in size with the host larva until, when the latter has reached its full size, the parasites fill its skin so completely that it looks as if it had been stuffed. Then each of the parasitic embryos forms its own cocoon, and, instead of a butterfly, moth or fly, we get anywhere from 100 to 2,000 or more minute parasitic wasps. This is termed polyembryony, and is a curious instance of a multiplication of an insect in the egg-stage or of one egg producing a large number of adults. One of these chain-like masses of larvæ may in a way be compared to a tape-worm in which segments continually develop behind the "head," each segment forming a complete reproductive individual.

Since this work has been published we have found quite a number of cases of this kind in American insects, and I need hardly call attention to the enormous powers of control that this gives to the parasite, since each brood of parasites comes to maturity with its host and is ready to attack as soon as its life begins.

In the common Hessian fly eighteen to twenty parasites sometimes emerge from a single larva, and all of these parasites are the products of a single egg. Each of these adult parasites may lay ten or a dozen eggs or even more, one each in a Hessian fly egg, and the result will be twenty times that number of larvæ!

An interesting point in this connection is that all the embryos and consequent adults developed out of a single egg are of the same sex. If the egg laid was fertilized and a female all the resulting adults developing from it, even if there be 100 or 200, will be equally females, and if the egg was that of a male the results would be equally males. And so it often happens that out of hundreds of parasites bred from a single larva all may be of the same sex.

I have spoken largely until now of helpless insects, those that have no means of defense except their enormous reproductive powers. There are other species that are better off in this respect and means of defense are either active or passive. Passive defense is largely an effort at concealment; the insect either actually

hides, lives in a protective covering, or resembles its surroundings so closely that it is easily overlooked. Active defense is possible to those species that are provided with stings or well-developed jaws or some other means of resisting attack. Such insects have usually a very moderate power of reproduction and a much larger proportion of them come to maturity.

A sort of defense that is both active and passive according as we look at it occurs in those caterpillars that have poisonous or "nettling" hairs or spines and which are avoided by most birds and animals for that reason.

I have said little of birds and other animal enemies thus far, not because they do not exert a very marked influence on the development of insect life, but because in proportion their influence is not so great. Birds eat enormous quantities of insects no doubt, but they eat indiscriminately those that are beneficial as well as those that are harmful, and those that are already parasitized as well as those that are not.

And so of snakes, toads, frogs and a number of other small animals; their food is predominately of the insect type, but a large part of it is predatory ground beetles and species that feed on plants of no economic importance. But all of these animals are of great importance in maintaining the balance of nature, because they do their part in checking the too great increase of predatory types.

An interesting practical question comes in as the result of this review of the struggle. Is it possible to so handle any of these natural agencies as to increase their efficiency or to introduce them into localities where they do not already exist?

This question has been answered both ways, and probably both answers are wrong and yet correct. Climatic conditions are as yet beyond our sphere of influence, and we are unable to modify weather conditions in the least.

Insect diseases we can propagate and have propagated. For years laboratories for the distribution of chinch bug diseases were maintained in some of the States of the middle West and in New Jersey, and elsewhere experiments were made with one of the diseases of the San José scale.

The difficulty here is that all these diseases due to micro-organisms—fungus or bacterial—depend for their propagation largely upon weather conditions, and unless these conditions occur

the disease will not spread. All that we can do is to see that the disease germs are spread about—everywhere—so that when conditions do become favorable there should be nothing to prevent the prompt start of an epidemic.

As to parasites, we have not yet found any way of making our natives more effective against their present hosts. Their relations, as they stand now, are the outcome of centuries of adjustment, and all our interference with natural conditions thus far has made matters worse for us and has favored the injurious species rather than their checks.

As to the introduction of parasitic and predatory forms from other countries to work on our native insects, there is not a single case of unqualified success on record. As to the fight against introduced pests, that stands on different ground, and the unqualified success of the *Vedalia cardinalis* against the Cottony Cushion scale in California is the one instance that will occur to every one in this connection.

The most extensive and scientific experiment of this character ever attempted is now under way in Massachusetts against the Gypsy and Brown-tail moths, and that has behind it the combined forces of the State organization and the United States Department of Agriculture. It has been in progress two years and hundreds of thousands of parasites from all over the natural range of these moths have been bred near Boston and have been released free from secondary parasites. The outcome will be of enormous scientific and practical interest and yet will not be conclusive either way, because we cannot predicate from our results with one species what will happen with another.

Vice President Cox—Any questions to ask Dr. Smith upon this subject?

Mr. Gillingham—The doctor spoke about these imported predatory insects. Where did they come from and what kind of insects will they feed upon, the scale?

Dr. Smith—They generally feed on caterpillars and other leaf feeders; they are large insects and their original home is China.

Thursday, January 16th, Dr. Smith being called on by Vice President Cox, proceeded as follows:

Dr. Smith—During the time that Mr. Gaskill was speaking last

evening, I remembered that I went over to the other side to see what they were doing along just this line, and particularly with the idea of getting some information concerning their methods in forest entomology. Take economic entomology as a whole, in America we are way ahead of the European countries. They cannot begin to touch the work we have done, and they are way behind us in their ways of treating insect pests. They really don't need it so much, because agriculture is older there and the relation of crops to insects and of insects to crops has become much more firmly established by centuries of cultivation. Here everything is newer, and we are going in on a much larger scale than they do there, hence our problems are more pressing.

But there is one direction in which they are and have been ahead of us for many years, and will be for some years to come, and that is forest entomology. During the period of my visit I went to several of their forestry schools and through some of the territory that had been planted within rather recent times. I went with my father to his old home that he had described to me a good many times. He had told me about the bare hills surrounding the place where he lived as a boy, and also that he had helped to plant trees on those bare hills. It was nearly fifty years between the time he left Germany and the time he revisited it, and when he first saw the place he didn't know it, because every hilltop and all the surrounding country was covered with forest growth. They had been cutting trees from these once bare hilltops for many years, and for every tree taken out a new one was put in. They had established a forestry division there, and I spent some very pleasant hours with the foresters, learning about their methods.

Mr. Gaskill showed you some pictures of forestry work, and if you remember those pictures you recall how much wood was left on the ground everywhere; not only stumps, but tops, twigs and branches that had been cut off.

He showed another picture, of a girl, carrying a load of wood on her back. Most of the wood that is burned by the peasants in a large part of Germany is gathered and made up in bundles in the woods from twigs that have been broken from the trees or that have been cut off. Nothing is allowed to go to waste. They need the wood; it is a wood famine that exists, and every part of the material is made use of in some way or other. That has a direct

economic value, because these twigs and branches, those old stumps, those tree trunks or parts of tree trunks that are allowed to rot furnish entrance for a large series of wood-feeding insects.

That was brought out here in the discussion of the pump-log question, and it was recognized, and has been for a long period, that any leavings on the ground furnish an entrance for insects that feed upon the wood, and after the insects get the entrance upon the dead woods that they prefer, if they don't find other dead wood, they will attack live wood and make dead wood out of it. In other words, some insects prefer dead wood, if they can get it, but if they can't they get the nearest thing to it.

Now, forest entomology means in European countries generally taking advantage of the habits of the insects so far as can be done. So, in the first place, they clean up and get rid of all the wood that falls to the ground, and then they go just a little bit further; they know that there are always insects present, and they fix a few trees until they reach just the condition that the insects like, and use those trees as traps. The insects are naturally attracted to those trees, and when they become thoroughly infested they are cut, hauled out and used in such way as to destroy the insects.

That is one of the things that we must do here as soon as we do anything practical—control the insects of the forest. If I had known last night what Mr. Gaskill was going to talk about, I would have given you a different talk myself. I think the subject that he presented is one of vital importance in the State of New Jersey, and you will never be successful in getting a good growth of forest trees until you also take steps to control the development of the insect pests in the forests.

That is not so difficult a task, and does not mean spraying the forest trees. You saw one picture in which every tree had a black band around it. It meant that all had what is called "raupen leim" or glue to prevent insects traveling up and down the trunks. Those that are up may have to come down to pass a portion of the life cycle, and they cannot return. If you can keep them up, a large portion will die. On the other hand, a good many are blown down and want to make their way up the tree again, and if you can keep them down they will be killed. So it is one of the general practices to put a band around trees early in the spring and keep it there during the season.

Furthermore, there is a general keeping down of the under-

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growth. That matter was aired to a certain extent in the discussion of forest fires. A forest fire is one of the things that they try their very best to prevent, and the starting of a fire in a forest is a punishable offense.

Just as an illustration: While I was there visiting they got a gang of Italians to work in the construction of a railroad. They were not from a forest region, and had not learned how to behave in a forest, so some of them thought there was a good opportunity to build a fire and cook their food. As soon as the smoke rose above the trees every forester in that vicinity concentrated toward it, and the gang that had the fire was promptly taken into custody, and afterward transported out of the country. They didn't want people in Germany who didn't know enough not to start fires in the woods.

Something of that sort we must do here. We have made a start, and a good start, but the public and the people who live in the forest have not yet been educated up to the point of realizing the importance of keeping fires out of it.

I know something about the pines and the people who live there, and a more generally careless set of people does not exist in the world. Most of them have absolutely no conception of the danger of throwing away matches, cigars or cigarettes. In Germany, a man who smokes a pipe and goes into the woods must have a cover to it, and if he is found without a cover he gets out of the woods pretty soon.

Wherever a fire has been insects come immediately afterward. Any insect that feeds on wood will naturally gravitate to a fire-injured tree. So, after the fire problem comes the insect problem, and the insect problem can be met as easily as the fire problem. It does not mean spraying and expensive apparatus. It does mean a little knowledge of tree growth, a little knowledge of insects, and somebody to do the work that has a little information on the general subject.

In Germany, France and Switzerland they have forestry schools, and the men who attend those schools get enough entomology and forestry to understand the habits of the insects and the habits of tree growth. Those are the men that enter the government service and the service of the municipalities to take care of the forests.

Mr. Gaskill showed you a number of very interesting slides from the immediate vicinity of the largest city in Germany, Berlin.

Within half an hour by rail from that city there are extensive forests that are visited every Sunday by many hundreds of people, and on summer Sundays generally the whole forest is filled with visitors. They don't harm the forests. It is their park. The only thing I never could get used to is to trees standing in such regular rows. That always struck me as frightfully unnatural, and to see them ranged in straight lines takes away all idea of a natural woods. Of course, when you get the trees older, and they are cut here and there, that is lost to some extent.

There was one thing that I was rather surprised Mr. Gaskill didn't touch upon, and that is the importance of the beech in the European forest. The beech is cultivated there next to the conifers, and they find it exceedingly useful. It grows rapidly, makes a good firewood, and they make use of it for a considerable number of other purposes, so that next to the conifer it is perhaps the most important tree.

There is another thing that Mr. Gaskill didn't touch upon, perhaps because it is not of such importance here at the present time, and that is close planting and using from the time you get the sapling. They plant in Europe so close that it is impossible to get between the trunks, and begin to cut to make bean poles. Then comes the next size used for another pole purpose, and every year after the forest has once been started some income is derived from it.

Mr. McCracken—I want to ask the doctor a question regarding some shade trees and wind-break trees at our home. A number of white pine and other trees were planted on the lawn in front of the house, or rather to one side of the house, in front, between the house and the road, and those trees were allowed to grow right down to the ground, the limbs clear down to the ground, and have always remained that way. The trees are now probably sixty feet in height, white pine and other forest trees. Last summer, in order to clear the view to the road, I took out all the under branches to a height of perhaps six feet. Now, I find under those pine trees there is a bed of pine leaves, the accumulation of years, lying there. I walked over it only a day or two ago, and I wondered whether it should be removed. This bed of fallen leaves that has accumulated for many years is six or eight inches deep. Should that be removed in order to protect the trees?

Another question I want to ask: To the right of the house, to

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the northwest, we have a line of trees, perhaps twenty-five rods long, of spruce, which were planted some forty years ago. It is a single line, the limbs starting out right from the ground, many of the limbs lying on the ground, making a thorough wind-break, it is true, but it is not as sightly as I would like to see it. The question is whether there is danger of the insect pest getting a start in this accumulation of dead and half-rotten leaves and fallen material, and some dead branches, perhaps, on the ground. Should those limbs be taken off, say two or three feet from the ground, leaving the ground clear?

Dr. Smith—In answer to the first question: No, I should not remove the mulch. That is nature's mulch method, and you don't want to disturb it. One of the difficulties in keeping trees on a lawn is that they are planted and grow under entirely unnatural conditions. In the woods you will have that mulch all the time, and it keeps the ground moist. It is a good thing, and I would not disturb it.

As regards the question of the wind-break, I would not do anything more than, I think, simply to cut out the dead wood of considerable size. The broken twigs that are on the ground underneath there I would not meddle with at all.

A Member—I noticed a discussion recently in regard to planting new trees where others had died. I refer especially to the apple tree and the myrtle. I had a case where a myrtle tree had died. It was, perhaps, a foot across. I took out the stump and put in a new one, and some have claimed that it would not live over a year or so. We feel that is so with apple trees. Is it wise to plant trees in the place of those, or is there any remedy for that condition by treating the soil in any way?

Dr. Smith—That is a question I cannot answer satisfactorily. The subject is one under discussion, and the claim is that certain kinds of plants and trees do create a soil condition that fills it with a toxin that is fatal to other trees planted on the same soil, but it is not settled, and I know so little about it that I prefer not to give any definite answer. I know only what I have seen in the general discussion, and nothing of my own personal knowledge.

Mr. Fort—Many of us are interested in the growth of the yellow locust, and in many sections when we put out the young trees they get ten or twenty feet high and are attacked by insects that destroy them. Is there anything we can do to protect them?

Dr. Smith—Only one thing can be done, and that is on the line of the trap method that I spoke about. The parents of the borers that work in the locust trees are very fond of getting on the golden rod in the early fall. You will find them there as soon as they hatch out, and the thing recommended is to see that there is plenty of golden rod near the locust groves, and collect the insects when they resort to it in the fall, and thus prevent them from laying their eggs.

Report of the State Entomologist.

Report of the State Entomologist.

BY JOHN B. SMITH, SC.D.

During the season of 1907 especial attention was paid to orchard inspections throughout the State, but more attention was paid to the northern sections, because there, on the whole, the fruit growers had not been quite so ready to attend to their trees as has been done in the southern counties. The more hilly parts of our State contain large areas especially suited for apple growing, and there are many scattered orchards of old trees and trees in full bearing, but there are few young orchards coming on to replace those that are dying out.

That a large number of trees in Sussex, Warren and Hunterdon counties are really dying off is unfortunately true, but it is not true that the San José or pernicious scale is responsible for all the dead trees. It is quite the practice now to charge this insect with all the ills that an orchard tree is heir to, but in many of the orchards visited this year, and in which trees were dying off, the scale was only a minor factor. On many dying trees I could not discover any scales at all; on others so slight an infestation that it could not possibly be responsible for existing conditions.

Comparatively few of the fruit growers in that section ever spray their trees at all with either fungicides or insecticides. There are some localities where this is not true, and the new peach orchards that are now being put out are in general well cared for, but as regards apples the statement is more generally accurate than it should be. In consequence there is a large percentage of wormy apples which reduces values and blight, canker and other diseases spread absolutely unchecked.

Efforts were made to reach these growers, to call their attention to the condition of their trees and to suggest methods of treatment. Both the entomologist and his assistant were engaged in this in-

spection and missionary work in the northern sections of the State, and in the southern counties inspections were also made, chiefly in response to requests and to verify results obtained with various insecticides.

The results of the applications made are better reported upon in connection with the work of the Experiment Station, but in general it may be said that where the fruit growers are really in earnest in their efforts to save their trees and to grow clean fruit they are meeting with a satisfactory measure of success.

The summer of 1907 was not so favorable for the development of scale insects as some other seasons have been, and in consequence some of the growers in some localities have jumped to the conclusion that the day of the insect is over, but that is a serious mistake. In some other localities the insects are as bad or worse than they have been, and while it is impossible to predict the character of the season of 1908, it is not likely that it will be as unfavorable as was that of 1907.

The meetings of the official inspectors and of the Association of Economic Entomologists were held in Chicago during the last days of 1907, and these meetings were attended by the entomologist. Representatives from the Nurserymen's Association were in attendance and the practical work of inspections was freely discussed so as to harmonize the relations of the inspectors and growers of stock and to facilitate shipments of stock in interstate trade.

Nurseries were kept under closer inspection than ever before, and in a general way the trees grown in New Jersey were better and cleaner than ever before. It has been demonstrated that absolutely scale-free trees can be grown in our State, and we have nurseries in which the stock is in strictly first-class condition from every point of view.

Most of the nurseries were visited during the growing season to determine their condition, and owners were advised whenever it seemed necessary. The formal inspections, therefore, were rapidly made after September 1st and by far the greater number of all certificates were issued before the end of the calendar year. The number of nurseries has increased somewhat and more certificates have been issued than in any previous year.

Some trouble was caused during the shipping season of 1907-'08 by stock purchased from other States and reshipped under New

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Jersey certificates. This has caused a more stringent supervision of such stock, all nurserymen being now required to report to the entomologist the receipt of foreign stock that appears in the least suspicious.

Mr. Edgar L. Dickerson has been continued as assistant to the State entomologist, and most of the actual nursery inspection work has been done by him.

The following is a list of certificates issued under the series of 1906, but granted after the presentation of my previous report:

- No. 73. Newcomb Bros., Port Norris (limited to strawberries).
- “ 74. Samuel H. Wilson, Lebanon (limited to peach).
- “ 75. Fleming Bros., Califon (limited to peach).
- “ 76. George A. Shultz, Jamesburg (limited to peach).
- “ 77. C. A. Conover & Son, Lebanon (limited to peach).
- “ 78. E. B. Conover, Fairmount (limited to peach).
- “ 79. Isaac Hildabrant, New Germantown (limited to peach).
- “ 80. J. H. Lindsley, White House (limited to peach).

The certificates granted for 1907, to the date of writing, are as follows:

- No. 1. Henry A. Dreer, Inc., Riverton (limited to florist and greenhouse stock).
- “ 2. J. T. Lovett, Little Silver (limited to pot-grown strawberries).
- “ 3. Bobbink & Atkins, Rutherford (limited to evergreens and florist stock).
- “ 4. Peter Henderson & Co., Jersey City (general).
- “ 5. Henry A. Dreer, Inc., Riverton (general).
- “ 6. J. T. Lovett, Little Silver (general).
- “ 7. Charles Momm, Irvington (general).
- “ 8. Fred. Menzi, Irvington (general).
- “ 9. K. Herman Stoye, Eatontown (general).
- “ 10. M. H. Kruschka, Asbury Park (general).
- “ 11. W. A. Manda, Inc., South Orange (general).
- “ 12. Wm. F. Bassett, Hammonton (general).
- “ 13. J. Murray Bassett, Hammonton (general).
- “ 14. Henry E. Burr, East Orange (general).
- “ 15. J. H. O'Hagan, Little Silver (general).
- “ 16. W. H. Forristel, Plainfield (general).
- “ 17. Ralston Brothers, Allenhurst (general).
- “ 18. A. W. Wadley, Bound Brook (general).
- “ 19. Theo. A. Ball, Westfield (general).
- “ 20. Elizabeth Nursery Co., Elizabeth (general).
- “ 21. Jos. H. Black, Son & Co., Hightstown (general).
- “ 22. Charles Black, Hightstown (general).
- “ 23. Carlman Ribsam, Trenton (dealer).
- “ 24. Wm. Henry Maule, Hightstown (dealer).
- “ 25. T. C. Kevitt, Athenia (limited to strawberries).

- No. 26. Bobbink & Atkins, Rutherford (general).
- " 27. Red Towers Nurseries, Hackensack (general).
- " 28. George H. Peterson, Fair Lawn (general).
- " 29. J. F. Randolph, East Rutherford (dealer).
- " 30. Chas. L. Stanley, Plainfield (dealer).
- " 31. Edwin Allen & Son, New Brunswick (general).
- " 32. Michael N. Borgo, Vineland (small fruits).
- " 33. Wm. B. Ellis, Vineland (small fruits).
- " 34. K. E. de Waal Malefyt, Ridgewood (general).
- " 35. Hiram T. Jones, Elizabeth (general).
- " 36. John Casazza, Vineland (small fruits).
- " 37. T. E. Steele, Palmyra (general).
- " 38. Samuel Brant, Madison (limited to peach).
- " 39. Willard H. Rogers, Mount Holly (general).
- " 40. Chas. B. Horner & Son, Mount Holly (general).
- " 41. J. T. Garrison & Sons, Bridgeton (limited to strawberries).
- " 42. S. B. Stevens & Son, Bridgeton (limited to strawberries).
- " 43. Ellsworth Pedrick, Bridgeton (limited to strawberries).
- " 44. David Baird, Baird (general).
- " 45. Julius Roehrs Co., Rutherford (general).
- " 46. J. H. Lindsley, White House (limited to peach).
- " 47. John Moore, Little Silver (general).
- " 48. Chas. A. Baird, Baird (dealer).
- " 49. Frank Lenz, Irvington (general).
- " 50. Charles Bird, Arlington (general).
- " 51. Charles A. Bennett, Robbinsville (general).
- " 52. Wm. M. Simanton, Asbury (limited to peach and apricot).
- " 53. W. G. Eisele, West End (general).
- " 54. James McColgan, Red Bank (general).
- " 55. Jos. J. Ayars, Williamstown (general).
- " 56. George A. Steele, Eatontown (general).
- " 57. S. T. Hillman, West Cape May (dealer).
- " 58. J. C. Williams, Montclair (dealer).
- " 59. I. D. Cole, Rutherford (dealer).
- " 60. A. S. Wallace, Montclair (dealer).
- " 61. Hartung Bros., Jersey City (dealers).
- " 62. C. W. Iford, Little Silver (dealer).
- " 63. James L. Hall, Farmingdale (dealer).
- " 64. North Jersey Nursery Co., Newark (dealer).
- " 65. Michael N. Borgo, Vineland (dealer).
- " 66. F. & F. Nurseries, Springfield (general).
- " 67. Wm. H. Morgan, Westmont (dealer).
- " 68. E. B. Conover, Fairmount (general).
- " 69. James H. Vliet, Gladstone (general).
- " 70. Wm. Rose, Red Bank (general).
- " 71. George A. Shultz, Jamesburg (limited to peach).
- " 72. John McCleary, Sewell (general).
- " 73. Stanton B. Cole, Bridgeton (general).
- " 74. S. H. Paulmier, Madison (general).
- " 75. Arthur J. Collins, Moorestown (dealer).
- " 76. John B. Lauhoff, East Rutherford (dealer).
- " 77. W. S. Pullen & Co., Hopewell (general).
- " 78. J. E. Kuhns, Cliffwood (limited to strawberries and raspberries).

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- No. 79. R. D. Cole, Bridgeton (general).
“ 80. Stumpp & Walter Co., Dumont (general).
“ 81. Samuel C. DeCou, Moorestown (general).
“ 82. Samuel E. Blair, Nutley (general).
“ 83. Alvah L. Reynolds, Madison (general).
“ 84. Warren Shinn, Woodstown (general).
“ 85. J. E. Heritage, Marlton (limited to strawberries).
“ 86. Wm. W. Lukens, Princeton (dealer).
“ 87. Mansfield Eick, Bissell (limited to peach).
“ 88. David V. Higgins, Ringoes (limited to peach).

Improvement of the Rural Schools.

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Improvement of the Rural Schools.

BY PROFESSOR LOUIS BEVIER, JR.

MR. PRESIDENT AND MEMBERS OF THE STATE BOARD OF AGRICULTURE, LADIES AND GENTLEMEN—I had supposed that this meeting would be rather in the form of a question and answer interview between you and me than in the form of an address. At the same time, old questions are always new, and no man who is studying the school problem but has at least some idea on the subject of the afternoon's address.

The old classic picture of Whittier is, I am sure, in all your minds:

“Still stands the schoolhouse by the road,
A ragged beggar sunning.
About it still the sumachs grow,
And blackberry vines are running.”

That old picture brings up always to me some of the pleasantest recollections and some of the saddest recollections of my boyhood; some of the pleasantest because we had a royal good time in the old country schoolhouse and in the playground outside; some of the saddest, for we did waste a fearfully large proportion of our time.

At its best, that old one-room country schoolhouse was not such a bad thing—at its best. It has been my privilege to know a few men and women who seem to be able to do the impossible; who seem to be able to take a group of young people from kindergarten age to college age, dominate them so thoroughly as to hold each boy and girl, young man and young woman to his self-appointed task—mind that word—and to turn them out of that one-room ungraded country school independent and indefatigable workers. The great law of compensation does operate whether we will or whether we will not, and if you have an artist in human

life for a teacher it is possible to get self-directed activities that shall be often more fruitful than wisely-directed activity from the outside.

But at its worst what a place it was! The desks were being carved, notes were being written, slates were being passed, mischief was being perpetrated, flirting was going on, innocent and un-innocent amusements flourished and work was at a discount.

I have in my own remembrance the conviction that a good deal of the time, so far as I can now see, save for the physical growth, save for wholesome pleasure, save for baseball in the summer and skating in the winter, was pretty much wasted in that one-room ungraded country school.

At its best it is described by Ian MacLaren, in his most famous book, his *Classic*, and is great, but such schools were the exceptions and their age has passed.

In the State of New Jersey we are endeavoring to form, to cause to grow, by the co-operation of the State department, the State Board of Education and the local boards of education, we are trying to produce a State system of education that shall be really worthy of the name and shall provide wisely for all the children of school years from the age of five or six to the ages of eighteen or twenty.

It has come to be the interpretation of the constitution of the State of New Jersey, and of the laws enacted by the Legislature, that it is the legal right—not the privilege at all—the legal right of all pupils in the schools of our State to pursue a well-graded course of instruction, suitable to their ages, until they finish the so-called twelve years of the public school system.

To that end, wherever a pupil reaches the highest grade in any local school, he may claim, not as a privilege, but as a right, transference from the governing board of that school to a school that is accessible, maintaining a higher grade of work, until he shall have gone on without loss of time through the twelve years. When this comes to be really consummated as a fact in the State of New Jersey we shall have done a fine thing for public education. It is coming to be the fact far faster now—progress is making toward that goal far faster now—than at any previous time in the history of public education in the State.

It was only two years ago that the enactment passed the Legislature of the State providing that when a board of education sends

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a pupil from their own district to a neighboring district, to a high school or to a school of lower grade, the State will step in and meet a large portion of the expense from the public treasury. In the case of high school pupils, the grant is \$25 from the State. In the case of a lower grade, \$5. It then rests with the local board of education receiving these pupils to make an appropriate and proper charge. In many cases the tuition charge is \$25, and the matter is balanced in that way. The sending board pays \$25 to the receiving board and receives the same amount for each pupil from the treasury of the State. In cases where the local cost of the secondary education is higher, the local board properly sets a somewhat higher tuition fee, and a small portion of the tuition fee rests upon the sending board, to be added to the amount that they receive from the State, and they are still able, at a low cost, to furnish "adequate school facilities" for all the pupils under their care.

Two years ago this law went into operation. Last year there were 1,711 pupils transferred in the high school grades alone, a thing absolutely unique in the history of the State of New Jersey. There is nothing like it in all the past history. This year that number is to be, I venture to say, doubled. A small high school in a neighboring community had last year thirty-one pupils. This year it has sixty-four, twenty of them pupils from outside districts, where they had finished the course of instruction provided, and coming on to a higher grade, their expenses are wholly met by their own boards of education, and not at all by their parents, save only as their parents are taxpayers with all the rest of the community.

Now, to make my remarks as brief as I can, I want to specify three or four benefits which the State has given to all schools, with particular application to the condition of the country schools, and then to point out four fields in which large improvements might easily be made and toward which improvements our efforts are now being directed.

As to the State aid under recent legislation, you are aware that for every teacher in the public schools of the State an appropriation of \$200 is made from the school moneys of the State. Now, you will see that this specific appropriation bears with particular helpfulness upon country conditions, upon rural conditions, upon conditions in small towns as against the large cities. The point, of course, is that the average salary paid, and the average salary which is demanded in a small town or in the country, is consider-

ably smaller than that which is paid and demanded in the city, partly owing to the difference in the cost of living, and partly to other conditions which we cannot now discuss, but the point I want to make is a very simple one. Two hundred dollars is a far larger percentage of the amount of cost to which the local board is put in employing the teacher, a far larger percentage in a small town and in a rural community of the State, than it is in the city, and to that extent it is a particular form of benefit which is peculiarly helpful to the rural communities.

The second point, which I refer to as vastly more important, is the provision for the appointment of a supervising principal. The law provides, as you know, for the appointment by a rural board, or by any board in the State, of a supervising principal. In the cities this simply means a city superintendent of schools. In the old-fashioned country school districts there was practically no supervision. Some member of the board of education, or one of the school trustees, as they may have been called, came around once in a while looking to see whether the stove was working right; he also looked at the water pail to see if it needed cleaning, and that was the kind of supervision that the rural school enjoyed, or did not enjoy.

This provision enables a local board alone or in co-operation with others to employ a supervising principal who shall give his whole time to the supervision of those rural schools. In other words, it is the prerogative of the country boards of education to secure if they will just as expert school supervision as exists in the city. Of course, it is a self-evident fact, and needs no reiteration that the right to education is not a different one in the city from the right in the country; that the right of the country boy or girl is just as undeniable as that of the city boy or girl. The education may properly be of a somewhat different kind, but the right to a well-ordered system of education is certainly just as clear.

For each supervising principal the State makes an appropriation of \$600—you will observe that specially. In the country an effective supervising principal may be obtained and is obtained at a salary running from \$1,000, let us say, to \$1,500, and the \$600 of the State is, perhaps, 50 per cent of the amount of the salary that such an officer receives, and only one-half of the cost of such supervision must be met by local taxation. On the other

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hand, in cities no such condition is possible, and the percentage which the State allowance amounts to is considerably less.

The third point in this connection is the allowance for days' attendance. You are all aware that the importance of this matter of allowance for days' attendance has been greatly increased by the recent decision of the Court of Errors and Appeals. If the law of railroad taxation at the average rate for the State proves to be constitutional, and it has been so declared by the Supreme Court of the State and by the Court of Errors and Appeals, and, therefore, so far as the judicature of our own State is concerned the matter is settled. If, I say, it shall be allowed to rest without further appeal to the United States Courts, or, if on appeal, it shall be declared constitutional, as we all believe it will, the days' attendance allowance from the State will at once raise all over the State, country and city alike, to an average of from \$5 to \$10 a pupil in all the courses, and this money can only be expended, you understand, for the running expenses of the school and not for buildings or improvements of that kind. This will enable the rural communities at once, if they please, to employ and pay a higher grade of teacher and supervising principal than ever before.

And once more, there is a provision that the State refund 75 per cent. of the transportation charges where a board undertakes to transport its pupils to a neighboring district, in cases where the particular grade of instruction desired is not given in the local schools.

I have pointed out four particulars in which it seems to me the rural schools are especially fostered by the State. I pass on to note some points which should be carefully studied for their improvement. Some things can easily be done, some things are more difficult. In the first place, there must be better grading. The time for the one-room ungraded school, where children shall all sit together from the early kindergarten age to the college age, boys and girls studying different things at different hours for different times under one teacher—that must pass away. It is impossible of successful administration except by the unique man or unique woman who has a God-given gift, and this teacher we cannot hire. He simply appears. It is significant that now and then, very rarely, a measure of success is made under those conditions.

To be as specific as possible, I would say that we ought to aim at once to place the children between the ages of six and ten—that is

to say, the children of the primary department, the first four grades—under a single teacher. That is to say, one teacher should not be expected really to teach more than the first four grades in a single room. When that step is accomplished—it is already in some counties pretty well approached—a vast improvement will have been made in the country schools in the effectiveness of the teacher and in the quality of work that the country pupils can attain as compared with the city pupils.

Further, it is impossible at the present time, perhaps undesirable, to abolish the neighborhood school, but that neighborhood school in a sparsely-settled region should provide for only the smaller children, and the children of the grammar grades should ordinarily be transported. In our State it is generally easy to furnish transportation by co-operation of the rural board of education with the board of a neighboring village or town where provision is made for a well-equipped school of grammar grade. And I should say that still another point should be observed of the children between ten and fourteen. We ought never to expect one teacher to have charge of more than two grades. In other words, we should provide two teachers for those four grades, and this necessity does not depend so much upon the number of pupils as it does upon the kind of work, suited to the age of the children, done in these grades.

The high school proposition is already in the way of adjustment, as I have indicated. When the pupils reach the high school age they easily use the railroad or trolley, and can usually find their way to some centre of high school instruction all over this State. It is a fact that in more than one county of our State every single local board of education—I wish you would note this—has, by affirmative action, not negative action, provided for this full twelve-year course for each pupil under their care. The higher grades are therefore giving comparatively little difficulty.

Passing to the next point, a good deal still remains to be done. We must have better teachers in the country schools, and not to mince matters or to make it a matter of mystery, we must pay higher salaries to get them. I say it is a shame—gentlemen, I say it without any hesitation—it is a shame for you people in the country districts to be content with the sort of teachers you sometimes have, ill-prepared, without careful training, picked up where you can, and hired at a low cost.

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Let me emphasize one point. In general the proportion of money contributed toward the support of the school by the local community from local taxation varies in this State between very wide points. In the cities it runs up to as high as 70 per cent. by local taxation as against 30 per cent. received from the State. In the country districts it runs as low as 20 per cent., or even 10 per cent., by local taxation to 80, 85 or 90 per cent. from the State.

You cannot have the kind of schools you ought to have unless the proportion runs differently from that. You will be aided, we shall all be aided, by the added amount of money that is to come to the schools from the railroad tax, but you in the country must be willing to provide better salaries in order to induce well-prepared teachers to take the country schools. You ought to have just as good teachers in the country as in Newark, or Jersey City, or Plainfield, or the Oranges, and you cannot expect a woman to take a salary of \$300 or \$400 when she can get one of \$800, \$900 or \$1,000. She won't do it, and she ought not to be asked to do it.

The third crying need is better supervision. I am going to speak quite plainly. I have met a good many men who thought they were capable of supervising schools. I have met farmers and mechanics who thought that they could go into schools and could tell the teacher how to teach.

Now, I certainly do not assume to be able to go to your farms or to your shops and tell you how to farm or how to do your work in your shop. The secret of getting good schools is in employing the man who knows and giving him, within certain limits, a free hand, following his work with a keen interest and inquiry and the freest criticism; if he does not get his work in good shape employ somebody else who can. But, above all, have a supervising principal. This principle in this State has only just begun to work its perfect work. In some counties where the county superintendent has been practical and aggressive, almost all the schools are supervised by men professionally trained in educational work, but there are many, I could mention them by the dozen, many districts that have not yet taken pains to provide a supervising principal, and all the supervision their schools receive is the occasional visit of one of the members of the board of education—that is all. Some of them do not get even that.

If you expect good work under those conditions you are the most optimistic and deluded set of people on the face of this earth.

If any factory should be run without supervision it would be run into the ground. If any school system is expected to run without supervision those who expect it are tempting Providence. Of course, if you have an angel of light as a teacher, she will do her very best, or he will do his very best without supervision, but unless he or she is an angel of light the result will be a failure. You have in the past employed teachers, graduated from your own grammar schools, who have crammed up for the county examinations, and without even a high school course, with simply a grammar school preparation for the county examination, have been given charge of your country schools, and then you say the State ought to help the country school. Even God helps only those who help themselves.

I do not mean this as applying everywhere. I know by personal experience of some rural schools where they are doing magnificent work; we are improving rapidly, and it is only a matter of education, a matter of mutual understanding on the part of parents and boards of education, when intelligent supervision, which is vital, will become universal. Of course, gentlemen, you will have to get the right kind of men and you will have to pay them.

I am afraid my friend here, the president of this board, will say I have omitted the most important thing, and have dwelt on the non-essential things. Perhaps that may be true, but I am not wise enough really to give you a message on some of the vital things.

Ladies and gentlemen, the problem of education is an everlasting one, and the kernel of the whole thing, the real vital question at the bottom of it all, is a deeper and wider one than administration, important though administration may be; what are we to teach the children and how are we to teach them? How shall we get the best kind of activity at each age that shall develop power to deal with the practical problems of life, capacity to fill positions as they offer, in later years, of honor and usefulness? We do not know; it is a continuing experiment. We think we know some things better than we did, and there is a great trend, not involving the cutting off of the older courses, toward the development side by side with them of a new line of things.

And that brings me to my last point. We must improve the quality of the teacher, and progressively modify the curriculum

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that guides our teaching. Is it not quite manifest that the rural schools should put the pupils into proper harmony with their surroundings? Is it not clear that they should awaken the deepest and intensest interest in the life of plants and animals, in the industries that go on about the child on the farm and in the community where he lives? We have largely failed to do that—largely, not altogether. So we must adopt better methods of bringing nature study, now firmly intrenched in all the schools, into a practical form that shall really take hold of the intellectual life of the children in the rural schools and bring them into closer sympathy and touch with the activities of country life.

How to make nature study in the earlier grades contributory, and wisely contributory, to that intelligent interest on the part of the children is a difficult problem. Towards the solution of it much has been done, but much still remains to be done. In the high school it is much easier. After the children have reached the age of fourteen, sufficient maturity has been reached so that the sciences that relate to agricultural industry can be so taught that they will receive them. To that end we are draughting in the State of New Jersey an outline of a course for rural high schools, which shall, on the side of science, make it practical, and which deals with the practical relations of science to the industry with life.

Get better teachers; get supervising principals by all means; co-operate by transference of the larger pupils; make your curriculum as good as the best professional teaching and the best professional knowledge can make it for the time, and the haze will clear, we shall be making real progress, and the end is yet unseen. (Applause.)

President Voorhees—You have heard this very interesting address of Professor Bevier, and he is willing to remain and answer any questions that might be asked on any of the points. The matter is open to discussion.

Mr. Fort—I want to ask the professor a question: Will he agree to furnish a supply of teachers that are qualified? He says, all you have to do is to pay the price. In securing a teacher it is just like securing good help. You take this farm help at \$15 per month, and they are dear at that, and you give them \$30, and they say they will give you good service. The good

teachers are not to be had. I have been in that work, and I know it is a most difficult matter to get good teachers—sure thing. There is a great deal of talk about this higher education, and there is not as much in it as I wish there was. I heard of a class of young girls that one-half failed to work out an example in long division with two or more figures in the divisor. The young people in the high schools know all about fractions, and I examined some who don't know what a fraction is. Now, how are we to know whether these scholars are fit to enter the high school—how is our local board to know anything about it?

A Member—Get a supervising principal.

Mr. Fort—Yes, that is all right. Here is a young man that goes to the high school and can't do long division. I am particularly interested in schools, and I like to see good schools, and that is the most difficult thing that we have to get—good schools, and get children to take interest in their studies and the parents to take interest in the schools. We have difficulty with the children in our district who will not submit to discipline. Unless the parents will join with the teachers in trying to get them to submit to discipline and have good order, we can't get along. When they do that we will hope for some advancement, but we have abolished corporal punishment, and the children know it, and they are up to the times.

Dr. Voorhees—Professor, can you answer all those questions?

Professor Bevier—I do not know what the question is.

Mr. Fort—I want you to tell me where we can get those teachers. (Laughter.)

Professor Bevier—If I had a ready answer to all the just criticisms that can be made against the work of this or that school, or this or that teacher, I certainly should be glad to give it. The problem which is just raised is certainly one of the most difficult. The supply of teachers is small, but you certainly can have a wider choice if the salary is made larger. It is not that you will thereby be guaranteed a perfect teacher; you will not. You are fallible; my friend there is fallible; so am I, and in the choice of a teacher the personal equation counts for much. In the first place, in choosing a teacher let your supervising principal do most of the choosing. I am speaking frankly, and I know whereof I speak. I will tell you a little anecdote, may I, Mr. President?

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Dr. Voorhees—Certainly.

Professor Bevier—I do not want to take too much time.

Dr. Voorhees—Take all night.

Professor Bevier—I visited a high school in the round of my official duties last year, and as the result of inspection found that the authorities were endeavoring to comply with the reasonable requirements of the State board of education. The school was shorthanded, however, and it was necessary to hire an additional teacher. They had a superintendent of schools, but the board hired a teacher without consulting him, and they got a man of such a stripe that the school, without exaggeration, is now in what I might call a dreadful condition. I am not saying a word about the relative ability of a mechanic, a lawyer, a physician, a carpenter, a farmer, and a teacher. Socrates, many thousand years ago, taught us to know that sometimes the best wisdom is found in a place where we do not expect it, but I want the judgment of a farmer on agricultural things, I want the judgment of a mechanic on mechanical things, I want the judgment of a lawyer on legal questions, and I want my supervising principal to judge of a teacher. That does not prevent at all your using co-operative and helpful judgment, but the selection of a teacher, who is to experiment on the minds and hearts and souls of your children, ought to be put in as expert hands as possible. It is a difficult thing to get a good teacher, and always will be. The higher you set the standard, the more difficult it becomes. But there are many good teachers in the State of New Jersey, and the country schools ought to have their share of them, and you ought to get them, or your share of them at least. You cannot get them all. The cities want some. (Applause).

Mr. Rider—I am heartily in favor of paying higher salaries, and I want to give the reason. Farmers know very well they have to study the principles of supply and demand, and if we understood them a little more it would be better for all concerned. If the market, for instance, for wheat should advance to \$2 a bushel, how long would it be before we had plenty of wheat? Every farmer in New Jersey would grow wheat because he was going to get \$2 a bushel.

Now, if the young people who are being educated learn that teachers will receive good pay, we will have more of our young men and women to study teaching, and we will have a better sup-

ply to select from. I have had a good deal of experience in teaching school. I was in the business not because of the salary, but because I loved the work, and I remember very well the experience I had in the first school I taught. My memory went back to it when I heard the professor tell of children of all ages, from the A, B, C to algebra, and with fifty, or sixty pupils all in the little room about sixteen feet square. And not only that, but the variety of text-books for children differed in the same way. We had a half dozen different text-books, and it required generalship to bring the subject out. On the whole, we accomplished some good results. This is a personal matter, but I want to show that the teacher should be interested in his work. I don't think I ever thought of the amount of money I was getting. I thought only of the interest of the pupils, and my interest didn't last from nine o'clock until four. It began when I woke up in the morning until I went to sleep at night, and sometimes I dreamed about it at night. So, I say, give your teachers better wages and cut off those that have no interest in their work. Take those that are enthusiastic and love teaching and let those drop that are not teachers. (Applause.)

Mr. McCracken—I want to ask the professor for a little clearer understanding regarding the supervising principal. What relation does he sustain to our county superintendent, and also, how many are we expected to have in a county? My understanding was it was to be a co-operation of the township boards. How many townships are to employ the supervising principal?

Professor Bevier—I am very glad that question is raised. There are really two—the first is, what is the relation of the local supervising principal to the county superintendent? The relation is very similar to that which the city superintendent of education bears, for example, to the State superintendent of education. The two officers are employed by different bodies, the county superintendent by the State board of education, the local supervising principal by the local board of education. He has, therefore, no direct official relation to the county superintendent, but inasmuch as the county superintendent has the entire distribution of the public money and has a direct relation to all local school boards, it makes it a workable scheme. The local supervising principals are, therefore, in constant and intimate touch with him and report to the county superintendent as to the administration of the schools under their charge.

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Please notice that inspection is one thing and supervision of schools is quite a different thing. It is hard to get this distinction clearly in the minds even of some professional men. An inspection of a school means a visit now and then to see how things are and to make suggestions. The county superintendent inspects every school in the county, but he cannot supervise it. Supervision means a frequent weekly, sometimes a daily, visit to a school. It means taking a school completely in charge for a certain time, maybe for a day, initiating the young teacher, suggesting ways of improvement, above all encouraging him or her, and pointing out not so much her failures as her successes. It means the wise guidance of the development of the school in its relation to the community. You ought to have as supervisor a high-minded, broad-gauged man, and you ought not to attempt anything in the way of a straddle, half supervisor and half something else. He ought to be a professional school man.

The second question is, how many districts should co-operate? This really answers itself, and my friend who asked the question would answer it just as well as I can. It all depends; if the board of education has under its own control ten or more small schools distributed over quite a district of country, as is often the case, they ought to have one for themselves alone. If, on the other hand, they have much fewer, two boards may co-operate, or even three, commonly not more than that, because commonly there would be quite enough for a supervising principal to do. To answer the question definitely would mean plotting the map of New Jersey by school districts, and putting a red dot for each schoolhouse, and differentiating them all as one-room, two-room, &c. That is about as definite an answer as I can give to a very interesting question. The local boards have the responsibility wisely to decide how far co-operation is necessary and how far it is well to go alone.

Mr. Pikaart—I would like to ask the professor a question: I noticed that in the early part of his address he used the term "system." I would like to ask him if there is such a thing as a system of education in this State, or, to be more definite, a uniform system?

Professor Bevier—No, sir, nor in any State or in any country in the world in the strict sense. It comes pretty near to it in France, where the close articulation with a central authority has produced a great degree of uniformity. We are building our

schools on a different plan in this country. In the first place, we are building State systems and not a National system. In the second place, we are leaving a large amount of local discretion in the hands of the local boards. We believe that is wise; we believe too great a uniformity stifles progress. We may not be doing the best possible, we may yet learn something of the older nations; some of the results obtained in France seem to warrant imitation—seem to guarantee the wisdom of their organization. To answer your question specifically, we have only an approximation to a system, and we are aiming to make that as closely articulated as will make the whole efficient without hampering individual efforts. To make my meaning quite clear, we want to be sufficiently uniform, so that pupils moving from one part of the State to another, or from one State to another, may not find themselves out of harmony with their new environment; may not have their education dislocated, so to speak, and may be able to go on without loss or delay.

Mr. Pikaart—The reason I ask that question is this: From an investigation that I have made I find that the several districts throughout the State have the power to adopt their own system or course of study. Now, if a child should finish work, we will say in the fourth grade, how will the principal or superintendent of another district know, without giving that child a thorough examination, how far and what course of studies the child has pursued?

My idea is, that the State board of education outline and present to the several districts of this State a system or course of study that could be adopted, and must be, by the local boards of education. They have no option in the matter, they must take this up, and this child in the first grade, we will say, in Newark, or in some rural community, is taking up the same course of study, the same text-books as in some other district, and, after having finished the work in a certain course, moved from one district to another, and upon a certificate granted by the principal of that school the child can enter upon its studies without an examination, or without either going back or being further advanced than it really should be. That is the point I am aiming at—to have a uniform system throughout the State. I believe by doing so we will accomplish more, will probably get more efficient teachers and will raise the standard of the qualifications of the teachers.

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Professor Bevier—This is an exceedingly important thought. Of course, like all important questions, it has two sides. This is not the place to debate it, nor would I be prepared to debate it at the present time. You see there are two principles involved—the principle of uniformity, the imposition of a course of study from a central authority, and free local development to meet local needs or local desires.

As I said in a previous reply, they have attempted in France to solve the problem by centralization. We have not in this country. In some of the Western States the progress toward unification has gone further than it has here. In order to show how exceedingly alive the topic raised is, let me remind you of what, perhaps, is not familiar to you all, viz., that the State board of education is, through its agents, preparing an outline course of study for the ninth, tenth, eleventh and twelfth years. It is not, however, a course of study to be prescribed or imposed, but a course of study to be set up as typical, as desirable, as fitted for use where the local authorities adopt it. In other words, the State board is to suggest, but not to prescribe, and we believe this principle is working well, for the progress toward uniformity during the last ten years has been so great that for the most part the practical difficulties that the speaker suggests are really largely met, and pupils do go, as a matter of fact, from a school in one part of the State to another part of the State and are put into the corresponding grade there. In general, pupils who remove from one district to another are put into the corresponding grade and given a trial there, to see whether they are prepared to go on. Usually they maintain themselves. Further than that, systemizing or unification has not yet progressed. It is for the future to say how far unification ought to go.

A Campaign for Rural Progress.

A Campaign for Rural Progress.

BY KENYON L. BUTTERFIELD, PRESIDENT OF MASSACHUSETTS AGRICULTURAL COLLEGE, AMHERST, MASS.

The President—We have another paper, and unless there is some very important question on this topic, we will proceed to the next order of business, which is an address on “A Campaign for Rural Progress,” by Kenyon L. Butterfield, president of Massachusetts Agricultural College, Amherst, Massachusetts. He has made this a life study, almost, and is prepared to give us a good report concerning it.

Mr. Butterfield—I think it is a misfortune, ladies and gentlemen, that you are compelled to leave this very practical topic and take up one that may get you into the air. If I had my way, I would resign my place on the programme this morning very gladly and let this discussion go on, because I know you are interested in it, and it will do you good.

Yet I think that in a meeting of this sort, the value of which is so practical, it is well enough for us once in a while to get away a little from the things which have to do with the immediate business of the farm, and to look at some of the larger aspects of the question. This morning I want deliberately to take you away from the technical questions to consider matters that have to do with rural life—the significance of our rural problems.

It seems to me this topic is timely. I have been in the east five years, and I have been amazed at times to see the renewed interest in agriculture, the new interest in farm problems, and the rapid awakening with respect to the things of the country, whether practical, æsthetic or social. Now, while there is this increased interest, at the same time there is need of a campaign—and I use the word in its military sense—a need of getting together, not merely—although that is important—not merely for the sake of

discussing practical questions, but for the sake of looking at the problem in a large way and of doing something to solve it.

I don't know very much about the situation that the farmers in New Jersey have been in. My observation of eastern conditions has been in the New England States, but I take it that the eastern farmers generally may be classed together as having had to meet during the past thirty or forty years some rather serious difficulties. In some parts of the east they have had a rocky soil, in other parts a depleted soil. They have had to meet the competition of the west, that great agricultural empire which has been opened up during the past half century, and which has sent a great stream of agricultural produce to the eastern market, oftentimes driving out the old-type farmer, and while our New England people don't like to talk about abandoned farms, there have been abandoned farms, and there are to-day, and the competitor on the farms in the west has had something to do with this.

Then, of course, there has been the call of the city, which I suppose you here in New Jersey have felt peculiarly, lying as you do between two great cities. Great opportunities have opened to the boys of the farm, so many of whom go to the city and make a splendid success. Much of the leadership of the city to-day, as in the days gone by, is in the hands of the men who were the boys from the farm. This call to the city with its opportunity for leadership has taken away from our farms many a man who ought really to have stayed there. It has taken some who perhaps were not doing well, but it has taken away too many of our strong men and women. Then the scarcity of farm labor constantly pressing upon the small farmer has been another difficulty. Sometimes there has been a lack of enterprise and discouragement on the part of the farmer and lack of faith, and refusal to take up with the new things which have been proved to be true and helpful by the experiment stations. Oftentimes there has been a sort of blindness to the desirability and usefulness of these new things, a being wedded to the old just because it is old.

The farm has suffered because of the dominance of the urban ideal. I mean by that that the social life of the city, the visions of the city, the attractiveness of the city, these opportunities for industrial success in the city, have given a great many people in the city, and even people on the farm, an idea that in some way the farmer was inferior and farm life inferior in opportunity and

joy. And this urban ideal, this tremendous growth of the city sentiment, has, in my judgment, been a factor of discouragement to our eastern farmers. Agriculture has been a sort of a despised sister.

With all due respect to our city cousins, I think they have sometimes taken the attitude that agriculture was a low-grade industry. They recognized, of course, that they must have food, but they would get it anyway, and they have thought of the men who produced it as a sort of under-class—a different type. They have pictured the typical countryman of the comic papers. Even the countryman himself has half believed those things, and too often, instead of standing up and doing those things, which will place him shoulder to shoulder with his brother in the city, he has accepted this judgment of the city man.

These are some of the difficulties which the eastern farmer has had to meet, many of them along the business, practical side; many of them intangible, yet tremendously powerful with respect to the development or non-development of our rural communities.

So much for the discouraging side. Now, there is a hopeful side. In the first place, there is the intrinsic importance of our agriculture. It is interesting to me to see in the New England papers, because I read those more than any others, such constant reference to the importance of agriculture as an industry. In the country at large and in New England there is a recognition of the old saying that the politicians have been telling us all these years that agriculture is the fundamental industry. Manufacturing, financiering and railroad men know it just as well as we do, and are now coming to acknowledge it as they have never done before.

Agriculture is still the largest single industry in this country in spite of our growth in manufacture, in spite of our great banking and corporation interests.

The census of 1900 made this significant statement: Eighty per cent. of the raw material for manufacture comes directly from the farm, and the reason why the United States has developed so splendidly in manufactures during the last few decades is because of the accompanying agricultural resources of the United States. They have furnished this raw material on the one hand, and have also allowed the artisan, the man in the shop, to maintain a high standard of living at a relatively low cost.

How much do our transportation lines depend directly or indirectly upon the freight which the farms furnish?

Only a few weeks ago, at the height of the financial panic in Wall street, the "Springfield Republican" called attention to the fact that the farm products that were going out of our country at that time promised by a return current of gold, which would set in as a result of that export trade, very materially to relieve the situation. And you have probably seen comments yourselves about the impossibility, almost, of a serious crisis or general panic so long as the farms of our country were as prosperous as they have been during the past few years. (Applause.)

Men are coming to see that all our great industries, interlocked as they are, are just as dependent upon agriculture as they are upon anything else, and that we cannot ignore the work and the results of the labor of the American farmer.

When I went into New England I first went to Rhode Island and then to Massachusetts, and thus got into the heart of the industrial district, and I found that this idea concerning the farmer that I have been talking about was prevailing as if the farmer didn't amount to anything. I remember one lawyer, whom I overheard say, "Why the trouble with the farm is, that there is no career in farming for the bright boy." I thought I would look up some census figures in regard to farms in New England. New England is a little larger than Michigan. Michigan is a State of about the average agricultural rank. I found, taking item by item, amount of land cultivated, value of farm products, value of the farm land, that in every respect New England compares favorably with Michigan, and with respect to the gross value of products per acre of improved land, which is about the best criterion we can get, New England is far ahead—far ahead even of Iowa. Moreover, I found that the textile industry was the greatest industry in New England—indeed I suppose there is no place in the United States where that industry is so highly developed—yet the farm values in New England in 1900 exceeded the capital invested in the textile industry.

The State of Massachusetts is proud of its cotton manufacture—the manufacture of cotton goods. It is its largest single industry. Yet, even in rocky Massachusetts, the value of farm property exceeded in 1900 the value of the property invested in cotton manufacture. And the city of Boston ranks eighth in the United

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States as a manufacturing city, with 7,000 establishments in 1900. But the amount of capital invested in manufactures in Boston, in these 7,000 plants, was slightly less than the farm property of Massachusetts. Are not these figures significant in rocky New England, the very heart of manufacturing enterprise? Even there agriculture is an important factor in industrial development. I looked up some figures last evening with respect to farm values in New Jersey. These are not new. I expect Mr. Dye could have given me better ones. In 1900 they reported \$190,000,000 of farm values, and I find \$44,000,000 in farm products in the year 1899.

Mr. Dye—We have \$80,000,000, with the live stock, now, \$56,000,000 in farm crops and \$24,000,000 in live stock.

Mr. Butterfield—That is marvelous. I am sorry I didn't get the figures. I suppose you have got unlimited millions of capital in New Jersey invested in large manufacturing enterprises, but anything that has to do with nearly half a million of people, anything that has to do with 70,000 or more workers—even though the census shows a decrease in the number of rural people from 1890 to 1900—I say any question that concerns those workers is significant. It does not make any difference how big your other industries are. The people of the cities ought to recognize that as well as the farmers themselves.

Another hopeful thing is the splendid market which is being offered to the eastern farmer. There is none better in the country.

Another is the rapidly increasing number of instances of good farming. Intensified farming finds its best expression here in the east, unless possibly in the newly-irrigated portions of the west. Intensified farming is being followed more and more every day all over the east. The very fact that the farmers are gradually and even rapidly adapting themselves to the new agriculture, and that these splendid markets are getting away from the competition of the west, it seems to me is most hopeful. There are many people who go to the country for the summer just for pleasure, but my observation is that there is an increasing number of young men, brought up in the city, who are deliberately seeking a career in the country because they love its freedom and the independent life they find there. This to me is a hopeful aspect. There is I think there is a growing appreciation, upon the part of our public men, of our publicists, and of the public generally, of the signifi-

cance of the country. To my mind, these are all hopeful things. There is a discouraging side, but there is also a bright side.

I want to take the rest of the time allotted me to discuss more definitely a campaign for rural progress. What are we going to aim at?

In the first place, we must try to bring about, if we can, a more profitable business for the individual farmer. This is fundamental. We cannot have a successful industry unless the men who are in it individually are prosperous. We cannot develop other phases of our rural life unless, first of all, we have a prosperous rural community in a business sense. Yet that is not all.

I was very much disappointed about a year ago to read in a strong farm paper in the west an editorial which stated that the farmers of the west are too busy, and are going to be too busy for the next quarter of a century, to give any idea to culture. I don't know just what was meant by "culture," but I suppose the finer things of life. I say it was disappointing, because it is unfortunate that a man or a community or a people should get into their heads the idea that, given business success, everything else that is worth having follows as a matter of course. It is not true. Business success, prosperous industries are absolutely necessary and fundamental to the development of higher things of life, but it does not follow that these higher things come on of themselves without effort just because you have got the business success.

So, I say, that while we want every individual farmer to be prosperous, and we cannot get the larger prosperity without it, that is not enough. If we are going to solve the rural question we must have a prosperous industry. It is not enough that keen, alert men shall succeed in agriculture here and there. It is desirable that the whole industry, the whole people engaged in the industry, shall be fairly prosperous also.

Furthermore, that is not even quite enough. We want to develop the rural community. We desire that the opportunities for education, for culture, for enjoyment, for the development of boys and girls, for the happiness of the men and women who stay there, shall be just as satisfactory as any village or city in the land.

I go into Boston very frequently from Amherst, and about two-thirds of the way in, among the hills, the railroad goes by what is going to be a great lake. The city of Boston has spent millions of dollars upon a huge dam and on the other works that go with it,

to build out there, thirty miles from the city of Boston, a great reservoir. The water is to be drawn from the springs on the hills, and is to be kept pure until it gets to the consumer in the city of Boston. I often think that if it is necessary that the water-supply of a great city like Boston shall be kept pure, it is even of greater importance that the stream of life that is going into Boston and these other great cities, from the hills and valleys and plains of our land where the farmers live, must also be kept clean and pure. (Applause.)

The farm has made a magnificent contribution to American life, because it has sent boys and girls into the cities. It has got to do it in the years to come. And it is important, even from the city point of view, that all conditions of country life shall be favorable; that typical American life may be lived out in the country as well as in the best regulated cities. But I don't like to think of the country as merely a breeding ground for the city. I like to think of our rural life developing so that it will be generally recognized that the rural community is a good place in which to stay, that there are advantages there, that there are privileges there, that there are opportunities there.

Finally, it seems to me, and this to my mind is the real goal of all these things after all—we want to maintain a class of people in the agricultural industries and in our rural communities who are typical American citizens. It seems to me that in the days that are gone it might be said that the American farmer was the typical American citizen. He was a capitalist, not a very big one, but he owned his farm. He was a laborer, because he toiled with his hands. He was a middle-class man. As a rule he was fairly successful. He educated his boys and girls to careers of usefulness. He took part in politics. He was careful, alert and thoughtful. It seems to me in years to come we want to be careful lest our civilization shall so develop that we shall have a class of people on our farms, either as peasants or as tenants, who are not comparable with this typical American farmer that we admire so much. It seems to me that the goal of the campaign is these things I have just talked about. It is a peculiar problem. It ties itself up with our whole American civilization; it begins with the turnip and the cabbage, but it ends in the question of our American life fifty and a hundred years hence.

Now, about the agencies of this rural development. Of course,

the individual farmer is the key to the situation. It is his energy, his initiative that are going to do it. But, after all, what we call social agencies or institutions are going to be the keynote of this campaign, the agencies of this progress I think of three large principles, three large groups of institutions. The first is that group which has to do with research and education; the second great group adopts the principle of co-operation or organization, and the third is that group which has to do with maintaining ideals, with morality and the spiritual life of the community.

As a specific agent we have, first of all, the State attempting to help this campaign of rural progress.

The State, through its board of agriculture, has done a wonderful work in these Eastern States. If it could be picked out and brought together and its influence weighed what a tremendous showing it would make. I believe there is much work yet to be done by our States for agriculture that has not yet been attempted. Something is being done in the way of controlling insect pests and in other forms of control work. There is need of an agricultural survey, of stimulating and encouraging definite business propositions. I cannot dwell too long upon this, but the State may, through its board of agriculture, enlarge its energy and do more than has ever been done before for stimulating and directing and assisting the development of all parts of the State in an agricultural way.

Then we come to the schools, and we could talk an hour on the question of the rural schools. Just two or three things I must say: In the first place, the rural common school must be as good as any school. We cannot have the development of the boy and the girl that we want unless we have, right out in the country, accessible to the poorest boy, accessible to the smallest community, schools that will be as efficient as any school in the city. If that has to be brought about by State aid, let us have the aid; if it is to be brought about by revolution in the community, let there be that revolution. Let us stand forever for a rural school which shall be the peer of any school in the land.

And then the rural school must be loyal to the community. I don't mean to criticise the teacher or the school over which the teacher presides, but the facts are that too many of them have not been true to the farm. The ideals of the school, often taken from the examples in the arithmetic, and the atmosphere in the school,

too often lead the boy to prize the things of the city and to ignore the value and significance of the things right at his feet. I think sometimes even a bright boy gets to thinking that a clod of earth is nothing but dead, inert material, when he ought to know that it is full of life and vitality. And he gets to thinking that if he wants to use his brains he must be a college professor or a business man, when he ought to know that there is no man who needs so thorough an equipment as the modern farmer.

We must introduce agriculture into the schools in some way. We must have high school facilities brought home to the boys and girls of the farm. We must have a stronger sentiment for the agricultural college. Let the agricultural college develop fully its threefold functions, the first of which has been splendidly developed in New Jersey under your president here, the work of research. Find out the truth, that is fundamental. Then there is the work of the agricultural colleges. They have not had the patronage from the farmers that they ought to have. The day is coming when the graduate of the agricultural college will find a career on the farm. In fact, we in the colleges have practical exemplification of that when we want to find a man for the Experiment Station or to teach in the college, because we find that many men who are qualified for that can make more money and find a more satisfactory career in the practical commercial lines. Then we must develop the extension work. Our colleges must carry their message out to every farmer in the State.

I want to say one word in regard to organization. Take the grange as an example. It seems to me that we do not cherish sufficiently the vast amount of work of an organization like the grange. To my mind we cannot have rural progress or solve the farm problem unless the farmers themselves take the initiative in the way of organization, not only for social purposes but for financial purposes, and, in a sense, for political purposes. The power of the masses must be organized. Niagara ran for centuries without being used by man, but that tremendous power has been harnessed. Think of the power that the farmers have—they can control our political battles, they can dictate our policies. But they have not exercised their power, simply because it was not harnessed, because they didn't co-operate. I think those who are not in the grange, those who are not tied up with any farm organization, ought to think seriously of their duty, because we are not

going to get the progress we want unless the farmers demonstrate their ability to hold together and work together, not merely for social purposes, but to help tackle the big problems of their industry and their life. (Applause.)

This is not a religious meeting, but just the same I want to call your attention to the significance of the country church. In my judgment you are not going to have the type of the community you want, nor the rate of progress you want in the rural sections unless you have a strong, active, vigorous, modern church and the things that go with it, in order that ideals may be kept high, in order that the moral standard may be kept up and in order that all this industrial activity and progress and development shall be worked over into real human lives and growth and character. So I say that the country church problem is one of the most critical problems that we have, and one of the most difficult problems. And the work that the Y. M. C. A. is doing in the country districts is to my mind a very hopeful work, and the work of the country pastor is a very hopeful work, and yet something more needs to be done. The country church needs to be revived, revived, and a campaign for the country church, by which it shall take its place as a larger factor in the life of the community, should be entered upon.

I have just run over in a very hasty way some of the methods of rural progress. Now, when we get the campaign under way, what must we do? It seems we must utilize all these agencies. There is no one thing alone that will solve this problem; we need the co-operation of the State, the work of the school, the help of the farm organizations; we need the help of all individuals that are interested. It seems to me that we ought to look at this problem in a large way, to recognize that all these things are factors in the campaign, and we ought, if we can, to bring these factors together. They all have a common work, though each has a special worth, but they all tend toward the same thing. The church can do some things that the school or the State cannot do; the State can do some things that the church cannot do, and the school can do some things that the State and the church cannot do, and the grange occupies a unique position because it can accomplish things that the others cannot.

What I want to see in every State and every county, if we can have it, every year at least, if not oftener, is a conference on rural

progress, and I would like to see brought together the farmers, the representatives of the State boards of agriculture, of the grange, the school teachers, the school superintendents, the pastors of the country church, the country editors, the rural librarians, and anybody else that is in anyway interested in rural progress. Just bring them together all on a common platform and discuss the various phases of this rural problem. Have all of them try to get a large view of the whole problem and how everything can work together to solve it. We have had such conferences in Rhode Island and Massachusetts and we have achieved what we were after, laying before the people an idea of rural development through a campaign for rural progress.

During the Indian mutiny in the fifties, the city of Lucknow was besieged. It was garrisoned by a body of British troops, and after they had defended the city for a long while a messenger came from General Havelock, saying, that if they could hold out for fifteen days more he would bring relief. They were encompassed by a large army which beset them; there were women and children there, and the siege soon began to tell on them. Fifteen days passed by and there was no sign of relief. Weary weeks passed by and men and woman and children began to die of starvation. Disease crept in and the condition became almost unbearable. But still, with British grit, they hung on. Nearly three months passed in desperate struggle against famine and disease, and the foe without. But the flag of England still floated over the walls of Lucknow. By and by, one morning, ears strained to catch every sound seemed to hear over the hills the notes of the pibroch. After a time they were sure. They heard that old-time Highland war song, "The Campbells are Coming," and, as Tennyson says:

"All of a sudden the garrison uttered a jubilant shout,

Havelock's glorious Highlanders answered with conquering cheers,
Forth from their holes and their hidings our women and children came out,

Blessing the wholesome white faces of Havelock's good fusileers,
Kissing the war-hardened hand of the Highlander wet with their tears,

Dance to the pibroch! saved! we are saved! is it you, is it you?
Saved by the valor of Havelock, saved by the blessing of heaven!

'Hold it for fifteen days!' we have held it for eighty-seven!
And ever aloft on the palace roof the old banner of England blew."

It seems to me that we might say that the eastern farmer had been besieged in these decades that have gone by. He has had to

face the competition of the west, scarcity of labor, a rocky or depleted soil, conservatism on his own part sometimes, the call of the city. And yet, in these recent years, even to-day, we can see the army of relief coming on. Over on the right flank of that army, it seems to me, I can see men marching with banners flying which indicate that the farmer has at his disposal the immense forces and resources of education; education that goes into the schools, the education that comes out from the schools to train the farmer, so that every farmer in our land, in the happy time to come, will have placed at his disposal all the riches that the schools and the stations have brought. And over on the left flank of the army, it seems to me, I see marching there shoulder to shoulder a great division of farmers, working together through their various organizations. Also coming to the relief of the farm, and in the center, it seems to me, I see those forces which are making for ideals, which have to do with moral standards, which have to do with the development of spiritual life in the best sense, the church, and the Sunday-school, and the Y. M. C. A. and all those other agencies that are for the uplifting of men and of the nation. And it seems to me, as I see these forces advancing as one great army, I am witness of the dawn of a new day for the American farmer. (Applause.)

Report of New Jersey State Grange.

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Report of New Jersey State Grange.

BY GEORGE W. F. GAUNT, MASTER.

The past year has been the banner year in grange work in our State. Sixteen new subordinate granges have been organized and two Pomonas, making 119 subordinate and fourteen Pomona granges in the State. Nearly 3,000 new members have been added to our membership, making a grand total of 15,000 members. We have had an average gain of 2,000 a year for the past six years, the organization is firmly planted in every county in the State and our aim is to double the membership in a short time. Our grange fire insurance company has been steadily growing, giving safe protection at less than half the cost of the old-line companies. Our farmers have long ago satisfied themselves that any move the grange makes in New Jersey is in their interest, consequently the business has increased until we have over \$18,000,000 worth of property insured.

For a number of years subordinate and Pomona granges have been co-operating in the purchase of farm supplies at a great saving; this has been of a local character, however. It was thought at the last session of the State grange that it might be extended, and to further the co-operative business among the membership we have organized the Grange Commercial Exchange with a capital stock of \$125,000. (Incorporated under the laws of New Jersey, which, of course, permits us to do business anywhere on top of the earth.) The board of directors are all practical farmers and men of broad business experience. The stock of the exchange is not held by those outside the order who have an axe to grind, but by the subordinate granges and members as an investment. This being a separate corporation the State grange is not involved, and we expect in the near future to be able to report good results from the new department in grange work, not only in the pur-

chase of commodities used on the farm, but in the formulating of some plans whereby we can sell our products direct to the consumer. When this is accomplished we will be practicing the principles of co-operation which our founders had in mind when they wrote the "Declarations of Purposes of the Order."

Such a power has the grange become in our State, that in all matters pertaining to agricultural and other legislation involving the interest of the farmer we have been given most favorable hearings, and the final passage of such laws as fixing the standard of measurement for the sale of milk, bill for providing for the election of United States Senators by popular ballot, Direct Primary law, and many other measures still under consideration.

Agricultural education, manual training and home economics is now an actual fact in our State. A short course has been started with great success and promises far greater success through the co-operation of the State grange with other agricultural societies and the State Experiment Stations' forces.

The field meetings of the past year were the most successful in the history of the grange in the State, nearly every county held a meeting, while many of the subordinate granges held their annual picnics and harvest homes. We had the pleasure of presenting the master of the National grange, Brother Bachelder; Brother C. J. Bell, secretary executive committee; Brother H. O. Hadley, master New Hampshire State grange, and Brother A. M. Cornell, past lecturer of Pennsylvania State grange, who, by their strong, able and sensible arguments, made such an impression upon those that were so fortunate to hear them that we are having a great harvest of new applicants knocking at our doors for membership. These gatherings are becoming more popular each year as is shown by the increased attendance over the preceding year. At one meeting we had at a conservative estimate 30,000 people on the ground, and this was in a country where the farmers are very busy, but they have learned that it pays to take a day off with the patrons and participate in their annual gatherings.

I realize fully the hopelessness of trying to put anything new or original into a report upon a subject that has been so fully discussed as education. And yet, from year to year, it seems necessary that some notice should be taken of a subject which concerns us so vitally, as farmers, as lovers of our country and supporters of our government and its institutions.

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It is a matter of congratulation that agriculture is rapidly becoming a technical and scientific profession, and that a wholesome change is coming over the public mind toward industrial education, and especially the education that relates to the farm.

The subject of agricultural education is attracting more attention than ever before among all classes of our vast citizenship. The president has, on numerous occasions, in his messages to Congress and in his less formal addresses, called attention to the growing need of agricultural education. The last Congress provided for additional aid to agricultural colleges, and many bills were introduced providing for agricultural education in schools of secondary grade. "The State Legislatures are responding to the demand for more liberal funds for agricultural and mechanical colleges, as well as for aid to technical institutions of lower grade and in public schools. Furthermore, the programme of nearly every meeting of farmers, teachers and school officers in the central States during the last few years has included some consideration of the subject of agricultural education."

The secretary of agriculture has taken an active interest in developing the department work along educational lines. The department has done much to aid the agricultural colleges, to promote agricultural education in the land-grant colleges, to aid in organization of agricultural high schools and consolidated common schools in inaugurating training courses for teachers of agriculture in secondary and elementary schools, while much has been done to promote nature study with a view to impressing our youth with the dignity, value and attractiveness of country life and pursuits.

The National grange has always manifested a lively interest in the subject of forestry, and it is with gratification that we note the increasing interest being taken in providing expert and scientific instruction in the subject in many of the colleges of the country. During the last few years great advancement has been made in agricultural research work, and the experiment stations in most States are accomplishing far-reaching results in their efforts to test the old and discover the new in the realm of agricultural knowledge. "Meanwhile the movement for popular agricultural education has made rapid strides. The farmers' institutes have spread out to every State and Territory, and even to our possessions beyond the seas, and the attendance was increased last year by over 150,000 persons. Secondary schools of agriculture have been or-

ganized in a number of States. The teaching of elementary agriculture in the public schools is now authorized by law in over thirty States.

"Teachers in large numbers are studying agriculture in agricultural colleges and normal schools. The problems of agricultural education are now seriously discussed in the National Educational Association, and in State, county and local teachers' associations and institutes throughout the land."

Dr. Dick J. Crosby, government expert in agricultural education, says: "The long struggle for the adequate recognition of agriculture in colleges and universities is essentially won. The influence of our leading agricultural institutions is being felt in every quarter of our land. A healthful competition to secure the best men and facilities for agricultural instruction and research is rapidly spreading among the States. A narrow and illiberal policy toward agriculture on the part of college authorities is now possible only where college trustees and presidents do not often get beyond their own dooryard. College professors who do not recognize the validity of the claims of agriculture to good standing in college and university programmes thereby proclaim themselves moss-backs." We fully agree with Doctor Crosby as to the class of agricultural leaders our age demands:

"Men capable of organizing and managing large and complex agricultural institutions, such as the national and State departments of agriculture, agricultural colleges and experiment stations.

"Agricultural scientists capable of inaugurating and conducting the higher research.

"Men combining scientific accuracy with practical judgment, and thus able to conduct experiments of a more practical character.

"Men and women combining scientific and practical knowledge of agriculture with pedagogical knowledge and aptitude to formulate and conduct agricultural courses in colleges and schools.

"Men combining scientific and practical knowledge of agriculture with ability to attract and instruct adult farmers and others in popular assemblies.

"Men combining scientific and practical knowledge of agriculture with business ability, which will enable them to achieve success as progressive farmers and farm managers."

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The subject of agricultural extension seems to be taking strong hold upon the public mind, and in quick response to the growing demand that agricultural instruction be carried to the farmers, many of the agricultural colleges have organized extensive departments, and it is confidently believed that these efforts on the part of the colleges to meet the farmers on their own ground will be fully appreciated and great good will be accomplished.

Every department of our great national life seems to be aroused to the importance of extending utilitarian instruction in every possible direction. It is apparently being realized that the education that will do most to secure a desirable citizenship is the education that will best equip the individual citizen for honorably supporting himself in the struggle of life, to become a home builder and a doer of things worth while. This is the new education as distinct from the old classical idea that learning was for the separation of a limited class from the masses—an aristocracy of education. This country should recognize no aristocracy but the aristocracy of sound, sane and useful citizenship, and the best education is the education that will best secure this result.

In conclusion, we may say the grange feels an abiding interest in the development of industrial education, and we feel sure the grange has been no unimportant factor in quickening the public conscience to the importance of the new education.

The grange is itself an educational institution, and its records show that it has been a pioneer in advocating many of the educational theories now so enthusiastically advocated by the so-called educators. For many years the grange has been "a voice crying in the wilderness" for educational reform in the direction of utilitarianism. In the language of one of the greatest of educators, "the teachers of the old system fool themselves and mislead their pupils into the belief that a literary course alone can make scholars," but the grange is doing much to correct this feeling and to supplant the erroneous "old system" with the more scientific and fundamentally correct "new system" of industrial education.

Officers of the State Grange of New Jersey,
P. of H., 1908.

Master—GEORGE W. F. GAUNT.....Mullica Hill, Gloucester county
Overseer—CHARLES CHALMERS.....Vineland, Cumberland county
Lecturer—DAVID H. AGANSThree Bridges, Hunterdon county
Steward—JOHN M. WOOLMAN.....Elmer, Salem county
Assistant Steward—HENRY M. LOVELAND.....Cohansey, Salem county
Chaplain—ROBERT M. TORBET.....Paterson, R. F. D., Passaic county
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Gate Keeper—R. M. HOLLY.....Sussex, Sussex county
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State Grange meets first Tuesday in December, 1908.

POMONA GRANGES.

MASTERS AND SECRETARIES, WITH P. O. ADDRESS.

1. Burlington—*Master*, H. C. BRICK.....Medford, Burlington county
 Secretary, GEO. L. GILLINGHAM.....Moorestown, Burlington county
2. Sussex—*Master*, E. W. CLARK.....Beemersville, Sussex county
 Secretary, GEO. E. HURSIL.....Normanock, Sussex county
3. Hunterdon—*Master*, GEO. B. HARTPENCE.....Ringoes, Hunterdon county
 Secretary, WM. Y. HOLT.....Flemington, Hunterdon county
4. Cumberland—*Master*, WM. W. DuBOIS.....
 Bridgeton, R. No. 4, Cumberland county
 Secretary, L. F. GLASPEY.....Shiloh, Cumberland county
5. Mercer—*Master*, H. H. HUTCHINSON, JR.....Robbinsville, Mercer county
 Secretary, J. T. ALLINSON.....Yardville, Mercer county
6. Salem—*Master*, MORTIMER WARE.....Sharptown, Salem county
 Secretary, CARRIE R. ATKINSON.....Woodstown, Salem county
7. Camden and Atlantic—*Master*, A. H. HURFF.....Berlin, Camden county
 Secretary, H. E. HORNER.....Merchantville, Camden county

SUBORDINATE GRANGES.

GRANGES.	MASTERS AND ADDRESSES.	SECRETARIES AND ADDRESSES.	LECTURERS AND ADDRESSES.
near	Monroe Corwin, Cranbury, Middlesex Co.....	W. H. Havens, Cranbury, Middlesex Co.....	Mrs. J. B. Perrine, Cranbury, Middlesex Co.
rl Ridge	G. Ulmer Foulks, New Egypt, Ocean Co.....	W. H. Davis, Cream Ridge, Monmouth Co.....	Mrs. R. T. Ridgway, Cream Ridge, Monmouth Co.
nmonton	A. J. Rider, Hammonton, Atlantic Co.....	H. M. Salinas, Box 136, Hammonton, Atlantic Co..	Cora R. Bassett, Hammonton, Atlantic Co.
edesboro.....	Albertus Ire, Swedesboro, Gloucester Co.....	Caddie J. Gill, Swedesboro, Gloucester Co.....	Nettie H. Golte, Swedesboro, Gloucester Co.
eriset	James McCracken, New Brunswick R. D. 6, Middlesex Co.....	H. W. Kline, New Brunswick R. D. 6, Middlesex Co.....	Mrs. C. E. Kline, New Brunswick R. D. 6, Middlesex Co.
reestown	D. Davis Proud, Moorestown, Burlington Co.....	Caroline B. Zelle, Moorestown, Burlington Co.....	Emma H. Conrow, Moorestown, Burlington Co.
odstown	Chas. F. Wilkinson, Woodstown, Salem Co.....	Carrie R. Atkinson, Woodstown, Salem Co.....	Minnie Wilkinson, Woodstown, Salem Co.
eland.....	Robert E. Chalmers, Vineland, Cumberland Co.....	G. H. Putnam, Vineland, Cumberland Co.....	Mrs. J. A. Vanaman, S. Vineland, Cumberland Co.
goes.....	Wm. H. Brewer, Ringoes, Hunterdon Co.....	John S. Williamson, Ringoes, Hunterdon Co.....	Wm. O. Drake, Lambertville R. D. 2, Hunterdon Co.
ewell.....	D. Den Davis, Shiloh, Cumberland Co.....	Walton E. Davis, Shiloh, Cumberland Co.	Walton L. Minch, Shiloh, Cumberland Co.
umberland.....	W. H. Glaspey, Greenwich, Cumberland Co.....	Morris Goodwin, Greenwich, Cumberland Co.....	Anna T. Goodwin, Greenwich, Cumberland Co.
wick	J. Phineas Smick, Canton, Salem Co.....	Anna E. Harris, Harmersville, Salem Co.....	Anna Plummer, Canton, Salem Co.
ilmington	Walter Crispin, Woodstown R. D. 3, Salem Co.....	Leon A. Crispin, Woodstown R. D. 3, Salem Co.....	Jos. B. Crispin, Woodstown R. D. 3, Salem Co.
arrisonville	John Steading, Mullica Hill, Gloucester Co.....	Frank Mattson, Harrisonville, Gloucester Co.....	Lizzie B. Kirby, Mullica Hill, Gloucester Co.
ter.....	John B. Moore, Elmer, Salem Co.....	Mary W. Grant, Masonville, Salem Co.....	Leola Elwell, Elmer, Salem Co.
idgeport	John M. Folker, Bridgeport, Gloucester Co.....	S. Lewis Kille, Swedesboro R. D. 2, Gloucester Co..	Lizzie Hagar, Swedesboro R. D. 2, Gloucester Co.
arville.....	L. R. Brandriff, Cedarville, Cumberland Co.....	N. E. Diamant, Cedarville, Cumberland Co.....	A. H. Westcott, Fairton, Cumberland Co.
medford	Chas. H. Engle, Medford, Burlington Co.....	Anna E. Kirby, Medford, Burlington Co.....	Mary D. Hollingshead, Medford, Burlington Co.

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Haddon.....	Wm. Beideman, Merchantville, Camden Co.....	Amos G. Haines, Ashland, Camden Co.....	Amelia Bates, Haddonfield, Camden Co.
Antua.....	Benj. H. Leap, Wenonah, Gloucester Co.....	Hiram S. Leap, Wenonah, Gloucester Co.....	Arabella J. McKelvey, Wenonah, Gloucester Co.
Windsor.....	W. W. Tindall, Windsor, Mercer Co.....	B. D. Perrine, Windsor, Mercer Co.....	Mrs. J. M. Rogers, Windsor, Mercer Co.
Cope.....	Joseph R. Flanigan, Bridgeton R. D. 4, Cumberland Co.....	Mary D. Miller, Bridgeton R. D. 2, Cumberland Co.....	Ruth Holmes, Bridgeton R. D. 2, Cumberland Co.
Marlton.....	Harvey Rockhill, Marlton R. D. 2, Burlington Co..	Walter B. Winner, Marlton R. D. 2, Burlington Co..	Caroline S. E. Wills, Marlton, Burlington Co.
Pemberton.....	John B. Evans, Birmingham, Burlington Co.....	Henry R. Lippincott, Pemberton, Burlington Co..	Mrs. Reba Gauntt, Birmingham, Burlington Co.
Mullica Hill.....	Edward Duffield, Sewell R. D., Gloucester Co.....	P. Howard Avis, Mullica Hill, Gloucester Co.....	Mary C. Moore, Mullica Hill, Gloucester Co.
Deerfield.....	Frank I. Ware, Deerfield, Cumberland Co.....	W. B. Van Leer, Deerfield, Cumberland Co.....	Robert Peacock, Deerfield, Cumberland Co.
Centre Grove.....	Elwood Zimmerman, Millville R. D. 1, Cumberland Co.....	Lizzie J. Taylor, Millville R. D. 1, Cumberland Co..	E. P. Sparks, Millville R. D. 1, Cumberland Co.
Columbus.....	J. Herbert Deacon, Columbus, Burlington Co.....	Rilla E. Kirby, Columbus, Burlington Co.....	Mrs. Carrie Gauntt, Jobstown, Burlington Co.
Thorofare.....	Chas. H. Thomas, Woodbury, Gloucester Co.....	Chas. H. Budd, Thorofare, Gloucester Co.....	Annie H. Thomas, Woodbury, Gloucester Co.
Courses Landing.....	Charles Hackett, Woodstown, Salem Co.....	Mary Purtell, Sharptown, Salem Co.....	Alice L. Ware, Woodstown, Salem Co.
Crosswicks.....	Dr. Chas. L. Dey, Crosswicks, Burlington Co.....	Viola W. Haines, Georgetown, Burlington Co.....	Amanda W. Hannold, Crosswicks, Burlington Co.
Pennington.....	N. F. Woodward, Pennington, Mercer Co.....	Joseph R. Burroughs, Pennington, Mercer Co.....	Miss Verna Cover, Pennington, Mercer Co.
Vincentown.....	Frank L. Simons, Vincentown, Burlington Co.....	Mrs. F. Githens, Vincentown, Burlington Co.....	Eva Nixon, Vincentown, Burlington Co.
Swing.....	Wallace Lanning, Trenton, Mercer Co.....	Wm. H. Cadwallader, Trenton R. D. 1, Mercer Co..	Emma L. Cadwallader, Trenton R. D. 1, Mercer Co.
Mercer.....	F. W. Crusier, Hopewell, Mercer Co.....	Geo. Whitenack, Skillman, Somerset Co.....	Mrs. H. E. Dalrymple, Hopewell, Mercer Co.
Vantage.....	A. D. Hough, Sussex, Sussex Co.....	W. D. Wilson, Sussex, Sussex Co.....	J. W. Wilson, Sussex, Sussex Co.

SUBORDINATE GRANGES—(Continued).

GRANGES.	MASTERS AND ADDRESSES.	SECRETARIES AND ADDRESSES.	LECTURERS AND ADDRESSES.
Hamilton.....	R. Ellsworth Haines, Robbinsville R. D. 2, Mercer Co.....	Mrs. M. M. Nutt, Hamilton Square, Mercer Co.....	Jos. H. West, Hamilton Square, Mercer Co.
Friesburg.....	Jos. W. Perry, Elmer R. D. 3, Salem Co.....	Mrs. Attie M. Loveland, Cohansey, Salem Co.....	Miss Bessie Hitchner, Cohansey, Salem Co.
Williamstown.....	Harry S. Bateman, Franklinville, Gloucester Co.....	James Taggart, Williamstown, Gloucester Co.....	Mrs. E. C. Ritchie, Williamstown, Gloucester Co.
Locktown.....	Stacy G. Sherman, Flemington R. D. 2, Hunterdon Co.....	Lester Sherman, Flemington R. D. 2, Hunterdon Co.....	Mary D. Bodine, Flemington R. D. 2, Hunterdon Co.
Blackwood.....	Timothy S. Fox, Laurel Springs, Camden Co.....	Martin Schubert, Blackwood, Camden Co.....	Mrs. Maria Stetser, Blackwood, Camden Co.
Monmouth.....	W. A. Conover, Freehold, Monmouth Co.....	D. H. Jones, Freehold, Monmouth Co.....	Miss Bessie Du Boise, Freehold, Monmouth Co.
Fightingtown.....	Ancil M. Davison, Cranbury, Middlesex Co.....	Frank C. Danser, Cranbury, Middlesex Co.....	Lily S. Cox, Cranbury, Middlesex Co.
Allentown.....	George E. Hunt, Davis, Monmouth, Co.....	R. C. Waln, Allentown, Monmouth Co.....	Joanna Hendrickson, Yardville, Mercer Co.
Liberty.....	B. D. B. Smock, Matawan R. D. 2, Monmouth Co.....	S. B. Wells, Marlboro, Monmouth Co.....	D. H. Taylor, Holmdel, Monmouth Co.
Sergeantsville.....	Wm. E. Rittenhouse, Stockton R. D. 1, Hunterdon Co.....	E. C. Rockafellow, Stockton R. D. 1, Hunterdon Co.....	N. B. Rittenhouse, Sergeantsville, Hunterdon Co.
Livingston.....	A. W. Fund, Chatham R. D. 1, Essex Co.....	Rev. W. R. Burrell, Livingston, Essex Co.....	J. H. M. Cook, Essex Fells, Essex Co.
Morris.....	A. H. Reinmann, Hanover, Morris Co.....	Wm. A. Howell, Florham Park, Morris Co.....	Geo. A. Cook, Hanover, Morris Co.
Cingwood.....	Ellis B. Hoffman, Barbertown, Hunterdon Co.....	Alvah L. Larason, Barbertown, Hunterdon Co.....	Mrs. Katherine Thatcher, Frenchtown R. D. 1, Hunterdon Co.
Baldwell.....	A. E. Hedden, Verona, Essex Co.....	Carrie E. Dobbins, Verona, Essex Co.....	Prof. J. G. Lipman, 580 High street, Newark, Essex Co.
Roseland.....	Dr. J. C. Conover, Roseland, Essex Co.....	Witsel R. DeCamp, Roseland, Essex Co.....	Miss Mary J. Condit, Roseland, Essex Co.
Warren.....	Frank Housel, Asbury, Warren Co.....	Mae Oberly, Broadway, Warren Co.....	Henry J. Beers, Stewartsville, Warren Co.

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.....	Alex. P. Owen, Mickleton, Gloucester Co.....	Walter Heritage, Swedesboro R. D. 1, Gloucester Co.....	Bessie W. Ogden, Mickleton, Gloucester Co.
ong.....	D. C. Donnelly, Springtown, Warren Co.....	Hattie Donnelly, Springtown, Warren Co.....	John T. Hamlin, Springtown, Warren Co.
lle.....	George Morgan, Sewell R. D. 1, Gloucester Co.....	Walton H. Chew, Sewell R. D. 1, Gloucester Co.....	Thomas B. Kier, Sewell R. D. 1, Gloucester Co.
ourg	John H. Young, Belvidere, Warren Co.....	Warren Herman, Belvidere, Warren Co.....	.....
ngton	Samuel Bowman, Washington R. D. 1, Warren Co.....	Mrs. Joseph Bodine, Washington R. D. 1, Warren Co.....	Melville Bush, Washington R. D. 1, Warren Co. *
rove.....	R. S. Woolverton, Frenchtown R. D. 1, Hunterdon Co.....	Andrew R. Allen, Pittstown, Hunterdon Co.....	John A. Quick, Pittstown, Hunterdon Co.
Mills.....	M. W. Angell, Milford, Hunterdon Co.....	Mary E. Woolfe, Milford, Hunterdon Co.....	Mrs. L. L. McCullough, Bloomsbury, Hunterdon Co.
Stewartsville.....	Harris A. Godfrey, Stewartsville, Warren Co.....	John C. Boyer, Stewartsville, Warren Co.....	Mary Hager, Stewartsville, Warren Co.
.....	Wm. Locke, Clayton, Gloucester Co.....	Mary M. Gardiner, Aura, Gloucester Co.	Lizzie Kandle, Clayton, Gloucester Co.
Keys.....	Jacob Harper, Cross Keys, Gloucester Co.....	Edw. B. Gant, Williamstown, Gloucester Co.....	Nellie Hurff, Cross Keys, Gloucester Co.
View.....	Joseph Bodine, Flemington, Hunterdon Co.....	Wm. Y. Holt, Flemington, Hunterdon Co.....	Mrs. Augusta Higgins, Flemington, Hunterdon Co.
ide	J. Spencer Dilts, Three Bridges, Hunterdon Co.....	Wm. W. Foster, Three Bridges, Hunterdon Co.....	D. H. Agans, Three Bridges, Hunterdon Co.
are.....	Nelly S. Albertson, Delaware, Warren Co.....	John H. Albertson, Delaware, Warren Co.....	Lizzie Hartung.
.....	Wm. B. Nichols, Franklinville, Gloucester Co.....	E. R. H. Van Valen, Newfield, Gloucester Co.....	F. J. Van Valin, Newfield, Gloucester Co.
May.....	Edward Tuttle, Dias Creek, Cape May Co.....	A. T. D. Howell, Dias Creek, Cape May Co.....	Thos. H. Douglas, Dias Creek, Cape May Co.
l.....	Arthur Lozier, Ridgewood R. D. 1, Bergen Co.....	Mrs. C. C. Basley, Maywood, Bergen Co.....	Charles C. Basley, Maywood, Bergen Co.
ldn.....	Geo. Oughton Waldrick.....	Mrs. M. L. H. Pikaart, Midland Park R. D. 1, Bergen Co.....	Mrs. A. G. Smith, Midland Park R. D. 1, Bergen Co.
cas.....	Wm. J. McFarland, Mount Holly, Burlington Co.....	Miss Caroline S. Wills, Burlington, Burlington Co.....	Miss Emile B. Grant, Burlington, Burlington Co.

SUBORDINATE GRANGES—(Continued).

GRANGES.	MASTERS AND ADDRESSES.	SECRETARIES AND ADDRESSES.	LECTURERS AND ADDRESSES.
Spirings.....	Jacob Corson, Erma, Cape May Co.....	Laura Harris, Cold Springs, Cape May Co.....	
Bry	Chas. L. Tharp, Pattenburg, Hunterdon Co.....	Wm. C. Bird, Pattenburg, Hunterdon Co.....	Frank O. Godown, Pattenburg, Hunterdon Co.
n Valley....	Nathan H. House, Vernon, Sussex Co.....	A. S. Drew, Vernon, Sussex Co.....	Mrs. T. B. Storms, McAfee, Sussex Co.
ey	James D. Carlough, Allendale R. D., Bergen Co.....	Mrs. Emma Van Wagenen, Ramsey, Bergen Co.....	Gabriel H. Parkhurst, Allendale, Bergen Co.
n	C. H. DeVoe, Westwood R. D. 1, Bergen Co.....	F. J. Ludwig, Westwood R. D. 2, Bergen Co.....	James H. Ackerson, Westwood, Bergen Co.
ew	Geo. A. Dickerson, Beemerville, Sussex Co.....	Grace Clark, Beemerville, Sussex Co.....	Harold H. Phillips, Beemerville, Sussex Co.
.....	Herbert H. Jaggard, West Berlin, Camden Co.....	X. F. Ottiger, Berlin, Camden Co.....	A. S. Berton, Berlin, Camden Co.
Township,	Elizabeth Wallace, Tuckahoe, Cape May Co.....	Z. A. Townsend, Tuckahoe, Cape May Co.....	Mrs. Hanna Tonkin, Tuckahoe, Cape May Co.
gue.....	Harry E. Cortright, Port Jervis R. D. 1, New York.....	Clayton Quick, Port Jervis R. D. 1, New York.....	
ek.....	Edward M. Lyman, Park Ridge, Bergen Co.....	F. C. Pilkington, Woodcliff Lake, Bergen Co.....	Mrs. J. E. Mabie, Westwood R. D., Bergen Co.
Branch.....	John S. Crawford, Matawan, Monmouth Co.....	J. H. Douglas, Matawan, Monmouth Co.....	R. V. Crine, Morganville, Monmouth Co.
are Valley,	Adin B. Van Syckle, Layton, Sussex Co.....	Geo. E. Hursh, Normanock, Sussex Co.....	C. A. Dalrymple, Layton, Sussex Co.
e River	E. P. Jaeger, Waldwick, Bergen Co.....	Hy. Engle, Westwood, Bergen Co.....	J. H. Ackerman, Hohokus, Bergen Co.
e Township	John Ackerman, Paterson R. D. 1, Passaic Co.....	H. M. Berdan, Paterson R. D. 1, Passaic Co.....	Miss Lottie Kamp, Paterson R. D. 1, Passaic Co.
tstown	Henry D. Rue, Wrightstown, Burlington Co.....	Herman Croshaw, Wrightstown, Burlington Co.....	Viola Thompson, Wrightstown, Burlington Co.
n.....	John V. Painter, Lebanon R. D. 1, Hunterdon Co.	Jos. B. Anderson, Lebanon R. D. 1, Hunterdon Co.	Mrs. Jacob Hudnit, Flemington R. D., Hunterdon Co.
Arlington..	P. A. Bradsley, North Arlington, Bergen Co.....	Joseph Rache, Kingsland.....	J. R. Houghton, Kingsland.
gton	Wm. B. Shedaker, Burlington, Burlington Co.....	Hannah E. Shedaker, Burlington, Burlington Co.	Mrs. Julia Creely, Burlington, Burlington Co.

SUBORDINATE GRANGES—(Continued).

GRANGES.	MASTERS AND ADDRESSES.	SECRETARIES AND ADDRESSES.	LECTURERS AND ADDRESSES.
town	Geo. Redshaw, Jr., New Brunswick R. D. 3, Middlesex Co.....	Frank H. Smith, Box 18, South River, Middlesex Co.....	Mrs. Geo. A. Billings, New Brunswick, Middlesex Co.
r Market.....	B. DeWitt Giles, New Market, Middlesex Co.....	F. O. Nelson, New Market, Middlesex Co.....	Mrs. J. G. Edwards, New Market, Middlesex Co.
itan Valley...	A. G. Van Nest, South Branch, Somerset Co.....	Mrs. P. S. Phillips, South Branch, Somerset Co.....	C. S. Hamilton, Somerville R. D. 4, Somerset Co.
on	Ralph C. Wilson, Leesburg, Cumberland Co.....	Mrs. Laura Smith, Leesburg, Cumberland Co.....	John Riggins, Leesburg, Cumberland Co.
rlawn	Albert I. Ackerman, Ridgewood R. D. 2, Bergen Co.	Wm. H. Cadmus, Fairlawn, Bergen Co.....	Mrs. R. H. Ellis, Ridgewood R. D. 2, Bergen Co.
itan.....	Herman L. Lehr, Keyport R. D. 1, Monmouth Co.	Thomas Wilson, Port Monmouth, Monmouth Co.....	James C. Hendrickson, Keyport R. D. 1, Monmouth Co.
mingdale	Robert C. Thompson, Allenwood, Monmouth Co.....	Clara Palmer, Farmingdale, Monmouth Co.....	Mrs. Cora J. Thompson, Allenwood, Monmouth Co.
ayette	Brice B. Stanton, Lafayette, Sussex Co.....	Miss Anna Everett, Lafayette, Sussex Co.....	Samuel Warbasse, Warbasse, Sussex Co.
ite House.....	Walter H. Opic, Readington, Hunterdon Co.....	Ethel M. Burdette, White House, Hunterdon Co.....	Grant Davis, White House, Hunterdon Co.
nkford.....	Wm. B. Hough, Branchville, Sussex Co.....	R. O. Bale, Augusta, Sussex Co.....	Geo. A. McDanolds, Branchville, Sussex Co.
ewsbury	J. C. Richdale, Phalanx, Monmouth Co.....	F. A. Bloodgood, Red Bank, Monmouth Co.....	W. Van Fleet, Little Silver, Monmouth Co.
th Seaville.....	Chas. Foster, South Seaville, Cape May Co.....	Eli Townsend, Clermont, Cape May Co.....	L. T. Swain, Swainton, Cape May Co.
usville.....	J. Warren Fleming, Titusville, Mercer Co.....	J. K. Leigh, Lambertville R. D. 2, Hunterdon Co.	Mrs. I. B. Scudder, Titusville, Mercer Co.
rdyston.....	Alex. Watt, Hamburg, Sussex Co.....	C. E. Thompson, Hamburg, Sussex Co.....	James N. Kimble, Hamburg, Sussex Co.
mers' Enter- rise.....	Sanford J. Crown, Newton, Sussex Co.....	Paul P. Moore, Lafayette R. D. 1, Sussex Co.....	W. J. Hardin, Newton, Sussex Co.
e Anchor.....	Benj. Barrett, Blue Anchor, Camden Co.....	C. H. Craft, Blue Anchor, Camden Co.....	Wm. Marvin, Blue Anchor, Camden Co.
ermo.....	J. Edward Bauer, Beesley's Point, Cape May Co.....	Jesse T. Young, Beesley's Point, Cape May Co.....	Sallie P. Young, Beesley's Point, Cape May Co.

SUBORDINATE GRANGES—(Continued).

GRANGES.	MASTERS AND ADDRESSES.	SECRETARIES AND ADDRESSES.	LECTURERS AND ADDRESSES.
Andola.....	Geo. E. Rogers, Belmar R. D. 2, Monmouth Co.....	Edgar C. White, Belmar R. D. 1, Monmouth Co.....	Annie Low, Asbury Park R. D. 2, Monmouth Co.
Millstone Valley,	Geo. Randolph, Bound Brook R. D. 2, Somerset Co..	E. M. Davis, Box 31, Millstone, Somerset Co.....	Mrs. John G. Voorhees, Blackwell's Mills, Somerset Co.
Princetonville	Edgar C. Stillman, Trenton R. D. 4, Mercer Co.....	H. Raymond Dye, Trenton R. D. 4, Mercer Co.....	Mrs. Frank Applegate, Princeton, Mercer Co.
Washington Valley	H. D. Opdyke, Martinsville, Somerset Co.....	Lincoln Wallace, Martinsville, Somerset Co.....	Mrs. Ella Davis, Martinsville, Somerset Co.
Warren	Richard Ware, Salem, Salem Co.....	Clifford L. Crispin, Salem, Salem Co.....	Mrs. Carrie Fogg, Salem, Salem Co.
Wickham	John W. Jaminson, Cassville, Ocean Co.....	C. M. Rorer, Cassville, Ocean Co.....	Ella N. Jaminson, Cassville, Ocean Co.
Pleasantville	Rev. H. D. Speakman, Absecon, Atlantic Co.....	W. L. Turpin, Pleasantville, Atlantic Co.....	Mrs. Winfield Adams, Pleasantville, Atlantic Co.
Pompton Valley..	Chas. C. Howard, Pompton Lakes, Passaic Co.....	Samuel B. Steele, Pompton, Passaic Co.....	John F. Busche, Butler, Morris Co.
Swartwood Lake	A. W. Huff, Swartwood, Sussex Co.....	A. H. Meigs, Swartwood, Sussex Co.....	R. Van Stone, Swartwood, Sussex Co.
Stillwater	John W. Earl, Stillwater, Sussex Co.....	O. Van Horn, Stillwater, Sussex Co.....	Edward Yetter, Stillwater, Sussex Co.
Tranquillity.....	Geo. Coleman, Tranquillity, Sussex Co.....	Clarence Cooke, Newton R. D. 1, Sussex Co.....	James Mingle, Great Meadows R. D., Warren Co.
Clayton.....	R. Rogers Groff, Clayton, Gloucester Co.....	Miss Alice Davis, Clayton, Gloucester Co.....	Miss Verna Souders, Clayton, Gloucester 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	\$0 60									
Bergen.....	60											
Burlington.....	60	30	65	80	30	\$1 00	90	18	\$0 75			
Camden.....	90	38	65	100	20	90						
Cape May.....	80		25									
Cumberland.....	100	40	60	80	15	90						
Essex.....	70	40	75									
Gloucester.....	100	70	70	70	25	1 00	100	30	80	60	25	
Hunterdon.....	70	40	70	100	18	85	70	20	75	140	30	65
Mercer.....	92	35	80	110	20	97	100	19	75	105	32	55
Middlesex.....	90	27	70	100	18	1 00	100	18	85	140	40	50
Monmouth.....	100	66	65	100	25	1 00	100	18	85	90	18	60
Morris.....	60		80	85		1 05	100	20	80	100		65
Ocean.....												
Passaic.....		30	70		20	1 00		15	90		40	65
Salem.....	100	50	60	100	20	95						
Somerset.....	80	27	65	95	18	90	95	17	65	40	30	55
Sussex.....	75	25	80	80	28	1 10	85	18	70	100	30	60
Union.....	75	40	68				100	32	90	90	45	58
Warren.....	90	70	60	95	20		95	18	80	80	35	60

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	1½	\$18 00	75	45	\$2 50	50	30	\$3 60
Bergen.....												
Burlington.....				100	1½	18 00	60	80	2 50	60		2 50
Camden.....				110	1½	18 00	80	70	1 50	100	85	2 25
Cape May.....				150	1½	23 00	50	20	2 25	50	20	2 50
Cumberland.....				85	7½	17 00	75	15	80	90	30	2 00
Essex.....				105	1½	20 00	40	20	2 75			
Gloucester.....				95	1	19 00	100	50	2 00	50	25	3 00
Hunterdon.....	200	25	\$0 75		1½	16 00	100	90	2 25			
Mercer.....				100	1½	18 00	102	125	1 90	75	100	2 75
Middlesex.....				125	1½	18 00	125	60	2 00	60	50	2 00
Monmouth.....				100	2	19 00	125	125	1 25	50	35	3 00
Morris.....				100		18 00	50		75			
Ocean.....												
Passaic.....												
Salem.....				100	2	23 00		30	2 00			
Somerset.....				90	1½	16 00	100	30	2 00	75	30	2 25
Sussex.....	75	20	85	150	1½	16 00	95		2 50			
Union.....				80	1	23 00	40	30				
Warren.....	70	20	70	90	1½		80	25	80			

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	50	5	\$3 00	20	20	\$2 50	10	40	\$1 50	100	2,500	\$0 03½
Bergen.....												
Burlington	40		3 00	30		2 50	50		1 50			05
Camden	70			70	75	1 50				100	6,000	02¼
Cape May.....	25			10						100	3,000	
Cumberland	45	35	3 25	80	65	1 80	40	50	1 10			
Essex	110		3 00				25		1 50	100		
Gloucester	60		2 00	70		1 25		100	2 00			
Hunterdon	100		1 40	50		2 25						
Mercer.....	70		2 25	30								
Middlesex.....	120	90	2 00	25	10	2 75	25		1 50	100		02½
Monmouth.....	50		2 25	50		2 50	10		1 25	100		
Morris.....	75			10			60			75		
Ocean.....												
Passaic.....			2 00			3 00			1 00			
Salem.....	25		2 00									
Somerset.....	40		2 25						1 75	50		06
Sussex.....	110		1 75				25					
Union.....	70		3 00	60		2 00	25		1 75			
Warren.....	25	10	90				20		1 50			

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	75	1,400	\$0 07	80	800	\$0 20	110	2,700	\$0 08			
Bergen												
Burlington	75		10	50		15			08	100		\$0 10
Camden												
Cape May.....	125		07	25		20	125		06	125		12
Cumberland	75	400	07							65	490	15
Essex	75											
Gloucester	100		06	50		10	60		10	100	400	05
Hunterdon												
Mercer	100		10	45		12	50		12			
Middlesex.....	100		10							150		10
Monmouth	75		10	50		12	50		12	100		20
Morris	50			70			50			75		
Ocean.....												
Passaic.....												25
Salem.....												
Somerset	75		10	50		10	40		10			
Sussex.....												
Union	60		10	75		14	60		15			
Warren	75		12	60		15	75		15			

FARM CROPS.

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.....							50	2,000	\$4 00	150	2¼	\$0 30
Bergen.....												
Burlington.....	60		\$0 50	75		\$0 50				100		25
Camden.....										75	6	20
Cape May.....	100		30				100		5 00	100		30
Cumberland.....	40	140	45				100	875	5 00	125	4½	25
Essex.....				80		70	100		5 00	50		30
Gloucester.....	95	400	30	100	300	20	100		3 00	110	7	20
Hunterdon.....												
Mercer.....							100		4 00	110	8	25
Middlesex.....	110		50	100		50	100		4 00	100		30
Monmouth.....				100	300		100		4 00	100		30
Morris.....	50			25			100			100		
Ocean.....												
Passaic.....						40		5,000	4 00			50
Salem.....										125	6	
Somerset.....							65		3 50	80		40
Sussex.....												
Union.....							75		6 00	75		40
Warren.....				50			80			70		50

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	\$100 00	100	\$200 00	100	\$50 00
Bergen.....		175 00		175 00		50 00
Burlington.....		175 00	100	190 00	100	45 00
Camden.....	100	175 00				50 00
Cape May.....	100	175 00				50 00
Cumberland.....	90	160 00	85	150 00	110	45 00
Essex.....	100	200 00	100		90	50 00
Gloucester.....	100	150 00		200 00	105	60 00
Hunterdon.....	100	180 00			100	50 00
Mercer.....	100	200 00	100	175 00	105	51 00
Middlesex.....	100	160 00	100	150 00	85	40 00
Monmouth.....	100	200 00	100	200 00	100	40 00
Morris.....	100		100		100	
Ocean.....						
Passaic.....		200 00		200 00		55 00
Salem.....	100	150 00	100	175 00	100	55 00
Somerset.....	100	150 00	75	125 00	100	60 00
Sussex.....	100	150 00			100	60 00
Union.....	100	125 00	100	100 00	90	50 00
Warren.....	40	175 00	20	175 00	40	55 00

FARM CROPS.

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.....	100	\$ 07					100	\$ 10			100	\$ 14		100	100	
Bergen.....																
Burlington.....		08		\$ 00		\$ 00				\$ 20	18	75		90		
Camden.....								08	100	20	100	16	100			
Cape May.....		06½					100	08								
Cumberland.....	100		85				125	09	90	20	110	18	80			
Essex.....	100	07½					100	06	100	06	100	12	100	90		
Hunterdon.....	95	07½					80	08	95	22	100	18	70	90	70	
Gloucester.....	100	08½	100				100	07½	80	20	105	11	80	40	90	
Mercer.....	95	07	90	5 00	95	5 00	85	06½	80	22	105	17	85	75	100	
Middlesex.....	95	07½	100	5 00	100	5 00	90	09	100	25	110	17	95	60	95	
Monmouth.....	100	07	75	6 00	75	6 00	75	09	100	25	125	12	100	100	100	
Morris.....	100								50		100		80	100	100	
Ocean.....																
Passaic.....		09										16	100	70	100	
Salem.....	100	07½					100	07			100	19	75	50		
Somerset.....	100	08	100	6 00	100	4 75	100	08	50	25	100	12	100	75	100	
Sussex.....	105	07	100		100	6 50	110	08	100	18	100	12	75	80	80	
Union.....											100	15		100	100	
Warren.....	70	07½	60		60		70	08	40	22	90	10	100	80	65	

Reports of County Boards of Agriculture.

ATLANTIC COUNTY.

NOTE.—By order of the executive committee, only the name of the president, vice president, secretary and treasurer of each county board is printed in the State report.

Names of delegates to the State board are found in the list preceding the minutes in this report. SECRETARY.

OFFICERS FOR 1908.

President, JOSEPH BUTTERHOFEgg Harbor City
Vice President, A. J. RIDERHammonton
Secretary, VALENTINE P. HOFMANNEgg Harbor City
Treasurer, WILLIAM LIEPECologne

REPORT

BY THE SECRETARY.

One farmers' institute was held at Hammonton on December 16th, 1907, and one is to be held at Germania on March 12th, 1908.

The institute held at Hammonton was well attended. J. G. Curtis, conductor. The following subjects were presented:

"Peach Production; Squab Production for Market," by Geo. L. Gillingham; "Experience in Production of Grapes and Berries for Market," by Henry Pfeiffer; "Experiments in Cranberry Production," by A. J. Rider; "Asparagus Production," by C. C. Hulsart; "Practical Methods of Increasing Soil Humus and Selection and Application of Fertilizers," by J. G. Curtis; "Latest Developments in Dealing with Insect Pests," by Professor J. B. Smith.

The climatic conditions for the year 1907 were quite unfavorable to the farming community. Work and crops were fully two weeks later than usual, retarded by frosts on May 12th and as late as 28th. On June 3d a severe hailstorm blasted the hopes

of many farmers in and beyond the vicinity of Egg Harbor City, on a strip one mile wide and five miles long in a course of west to east. During the summer we had rather cool nights.

On September 23d a heavy windstorm visited a large area of the county, prostrating farm crops and denuding fruit trees.

Heavy, killing frosts occurred on October 22d and the first snow made its appearance on November 12th and 13th.

Corn, white and sweet potatoes, apples, pears, peaches, strawberries and raspberries show a decreased yield compared with 1906. Only grapes, blackberries and tomatoes show an increase. The prices realized for farm crops and fruits more than covered the loss caused by deficiency in crop yield.

The following address on grape growing is here given as being of general interest:

GRAPE GROWING.

BY HENRY PFEIFFER, COLOGNE, N. J.

Fruit growing is the most profitable occupation in this section, provided it is followed on proper lines and the proper soil selected for the different kinds of fruit. The most profitable fruit with me, all things considered, is the grape, with a home market that is ready to take everything that we can grow for years to come in the shape of well-ripened grapes of the proper varieties. We have no freights to pay, no packages to lose, and do not need the commission merchant. A large amount of the work that is to do in a vineyard—pruning, trellising, tying, manuring, ploughing, hoeing—can be done in winter, when other work is not pressing.

It has been learned that the soil of Atlantic county, rich in iron as it is, is pre-eminently adapted to the culture of the wine grape, that is, the production of those varieties of grapes that are rich in the special qualities so desirable in producing a wine that is a real medicine and a tonic for the sick and debilitated.

The grape vine will thrive on all soils in Atlantic county where it will not have "wet feet," and the varieties most desirable are as follows: Clevner, Franklin, Diogenes, Norton's Virginia, Black Nero and Clinton. Conqueror and Ives Seedling are also desirable, being great croppers, but not so valuable to the wine-maker, except as blenders with the heavy-bodied varieties mentioned above.

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The prices paid by our local wineries are from \$50 per ton for Ives Seedling grapes up to \$120 per ton for Clevner, Norton's Virginia, Diogenes, and Franklin bringing about \$90 per ton.

A vineyard should be started with first-class two-year-old plants, where these can be had. Otherwise one-year-old plants may be used, if they are well rooted.

The strong-growing varieties, like Clevner and Norton's Virginia, should be planted six feet apart in the row, with rows ten feet apart; the weaker growers like Ives, &c., may have rows eight feet apart.

This makes it convenient to drive with your team between the rows and saves work in manuring, hauling out fruit, &c., and cultivation with labor-saving tools.

Grape vines may be planted from November 1st to June 1st, and the earlier the better, as a rule, but no plants should be handled when there is frost in the air. The plants should be set perfectly plumb; this is of great importance, as it admits of close cultivation without endangering the plant, and a good supply of well-rotten stable manure should be applied while setting the plants. Good strong cedar poles, about seven feet long, should be set along the rows, half way between the plants and about twenty-four feet apart (every fourth vine), with the second pole from the end especially strong and well anchored to a stone or brick buried below the frost line. Strong double-galvanized wire should be used for this purpose only.

Double-galvanized wire No. 10 or 12 should then be stretched along the row and fastened by wrapping once around the anchored pole and then passing to the end pole and fastening securely. This takes nearly all the strain off the end pole and is much better than anchoring the end pole. The wire should be fastened to the poles along the row with galvanized staples driven about two-thirds home, only to allow the wire free play in the staples all along the row.

The wire should not be more than two feet from the ground the first and second year, for convenience in tying up the vines.

Hoed crops of low growth may be planted between the rows the first two years, thus reducing cost of cultivation of the vines to a minimum and not losing a crop.

Only one cane should be allowed to grow the first season, and this should be tied to the wire with a soft string that will not cut

the tender shoot. Tailor rags, or waste from the tailor shops, are excellent material for this work and can be had very cheap.

As soon as the vines have been tied to the wire, they should be headed along the wire in the direction of the prevailing wind; if this is done they will need very little tying after that, but generally trail with the aid of their tendrils and thus will be out of the way of the cultivator.

The next winter the vines should be cut back to about one foot in height, and the second summer two canes should be allowed to grow from the growth of the previous season and trained to the wire as before.

Stable manure should again be applied in liberal quantities and clean cultivation given.

The second summer or fall crimson clover should be sown between the rows at the last cultivation given, to be turned under next spring, when a dressing of 1,000 pounds of oyster-shell lime and an application of 600 pounds of acid phosphate and 200 to 400 pounds of muriate of potash should be applied broadcast. A row of cow peas should be drilled in between the rows. Clean cultivation must then be given until the cow peas interfere with the cultivator, then they should be cut down by running a disk harrow over them several times, then ploughed under and crimson clover sown. Thus two crops of legumes can be grown each season; this will do away with the necessity of applying nitrogen in any other form, and an annual application of phosphoric acid and potash, with an occasional dressing of lime to correct the acidity produced by the decaying vegetable matter, will be all that is necessary to keep the land in condition to produce abundant crops.

The wire should be raised the third year to the height of about four feet, and the canes tied to the same in such a way that each cane will meet the corresponding cane of the next vine, and is tied with it in one operation. Tied thus, the canes brace each other and the wind cannot slide them back and forth along the wire as it will do on a new and smooth wire when the canes are tied to it singly.

After this the vineyard may be pruned on the renewal system, or on spurs, as the owner may prefer, and either system will give good results, so we do not leave too much wood to allow over-bearing.

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In spring, as soon as the buds begin to swell, the vineyard should be sprayed with Bordeaux mixture and Paris green. This should be repeated before bloom, again immediately after blooming, and two or three times more at intervals of about two weeks, when the danger period for the black rot will generally be over. The Paris green may be omitted for the last spraying, as danger from insects will then be over also.

Summer pruning is an important part of viticulture and must not be neglected. It consists of removing all shoots that start from the vine so near the ground as to interfere with cultivation and would bring their fruit so near the ground as to have it soiled by heavy rains, and in shortening all the fruiting shoots to one or two leaves above the last bunch of grapes. This done, the shoots will send out from one to three laterals, and these must also be shortened to one or two leaves as soon as they attain a length of a foot or more. If we are working on the renewal plan, of course we must be careful to allow two canes to grow from a point on the vine about one foot from the ground to take the place of the bearing canes the following season. These may also be pinched back as soon as they are as long as needed.

Picking the fruit is comparatively an easy matter as compared with the picking of berries, and therefore not near so expensive. All the grapes on a vine, if properly grown, ripen at the same time and can all be gathered at the same time; while the different varieties ripen several days apart, thus extending the picking season for several weeks. Picking is paid for by the basket, the regular five-eighths basket being used; all imperfect berries are removed from the bunches, and the grapes are hauled to the wineries in these baskets or in trays holding about fifty pounds.

In large operations it is well to give each picker a number and a supply of tickets bearing his number to attach to the baskets he fills. Any careless work can thus readily be traced to the guilty party and more careful work secured.

Five pounds of grapes on an average are considered a good-paying crop per vine. But I have seen crops right here in Hamonton last fall that averaged over ten pounds per vine, and fifteen to twenty pounds on a single vine are not at all uncommon.

GOOSEBERRIES.

Of all the berries generally grown for market the gooseberry is, perhaps, most sparingly planted, and I can see no reason why this should be so, as the gooseberry is as profitable a crop as any berry that might be mentioned, and has a number of special features to advocate its planting on a much larger scale than has heretofore been done in this section. Of course, it will not thrive on a dry sandhill, but should have a soil somewhat moist, such as is generally selected for Gandy strawberry, and on such soil it will hold its own for many years, and will not have to be replanted every few years like blackberries or raspberries.

The old Houghton is, although a small berry, as profitable as any, and I know of a patch that has yielded immense crops annually for over fifteen years. And in the five years last passed I have not received less than ten cents per quart for my crop. The berries are stripped off the bushes with a sort of wooden comb, or by hand, and are then run through a fanning mill to separate them from the leaves, &c., and are packed in the regular berry crates, or in five-eighths bushel baskets, covered with canvas. Of course they must be marketed green.

Gooseberries should be set about four feet apart in the row and rows seven or eight feet apart. They should be forced the first two years with plenty of manure, for after that they will bear so heavy as to make wood growth rather slow, unless forced to do so by the application of an abundance of nitrogenous manures.

Low-growing, hoed crops may be planted between the rows the first two years after setting, thereafter the gooseberry will need the soil and be willing to pay for it, too. As soon as the berries are gathered, cow peas should be sown between the rows broadcast and ploughed down very shallow. All weeds should be removed from among the plants to avoid their going to seed. The cow peas may remain on the ground until the following spring, when they may be turned under and phosphoric acid and potash applied and clean cultivation given until the crop is again harvested.

Gooseberry plants are very shallow rooters and will not allow deep ploughing near the plants after the plantation is old enough to be well rooted, and care must be taken to not injure the plants by careless cultivation. It is, however, important to apply fer-

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tilizers and start cultivation very early in spring to force early growth and have the berries of largest possible size as early in the season as possible in order to be ahead of the larger English varieties that reach the market later in the season from upper New York. Very little pruning is necessary until the bushes get too large and interfere with cultivation. Then some of the lower and older branches may be removed to keep the plants in proper size and shape.

BERGEN COUNTY.

OFFICERS FOR 1908.

<i>President</i> , JOHN F. BOMM	Westwood
<i>Vice President</i> , CHAS. C. BASLEY	Maywood
<i>Secretary</i> , GEORGE P. F. MILLAR	North Arlington
<i>Treasurer</i> , FRED. V. STROHSAHL	Park Ridge

REPORT

BY THE SECRETARY.

During the past year the board has held five meetings. The first was a regular business meeting, when the delegates to the State meeting reported, speaking in high favor of what they had heard, and said those who did not go missed a grand treat.

At the second meeting Professor Smith was present and told how to check the San José scale by the use of lime and sulphur and the oil sprays, explaining the use of each with the advantages and benefits.

The next was a field meeting held on the farm of William Brandenburg, Jr., of North Arlington. Owing to the late cold spring crops were not far enough advanced as to make the best showing, but the members were shown clean crops growing nicely; in this way the members gain information by seeing what other members are doing.

The fourth was a field meeting held on the farm of D. H. Tice, of Chestnut Ridge, Woodcliff. This farm is devoted entirely to fruit, and at the time of meeting there were plenty of ripe apples, blackberries and raspberries which were enjoyed by all who attended; besides the small fruit there were hundreds of peach trees laden with fruit and a large quantity of vegetables between the trees and bushes. This meeting was the most largely attended of any during the year.

The next meeting, a farmers' institute, was held in South Ruth-
erford, and was conducted by State Secretary Franklin Dye. Mr.
J. G. Curtis spoke on "How Nature Makes Plant-Food Avail-
able." "Gardening for Women" was taken up by Mrs. Mollie
Allen. "Health of Farm Horses—How Can We Best Prevent
and Cure Their Diseases?" by Dr. C. D. Mead, was very profitable
and enjoyed by all. Mr. Curtis took up the subject of "Selection
and Application of Fertilizers." "Horticultural Hints," by Pro-
fessor Blake, of the State Agricultural College. "A Woman's Ex-
perience in Poultry," by Mrs. Allen. "Growing Forest Trees for
Profit," by Alfred Gaskill, State forester. This lecture was nicely
illustrated by stereopticon slides. These slides were colored photo-
graphs taken from nature and showed the conditions of the forest
all over our country as they are to-day, showing the effect of close
pasturing, forest fires and proper harvesting of timber.

The last meeting was the annual meeting, at which the officers
were elected for 1908.

The year just passed was unfavorable for farmers in this county
generally, as the spring commenced cold and late, a late frost
blighted nearly all the peach buds, making a very light crop.
Pears and apples about normal. The drought in July and August
made early sugar corn a failure, but the late table corn was a good
crop. Field corn produced small stalks owing to the drought dur-
ing its early growth, but the rain later made the yield up to the
standard. Early tomatoes ripened later than usual owing to the
cold, wet spring; the middle ones were backward causing an
abundance of late tomatoes. Strawberries were fine, but the crop
was shortened by the drought. As a whole the season would have
been very poor but for the high prices.

BURLINGTON COUNTY.

OFFICERS FOR 1908.

President, LEVI DUDLEYMoorestown
Vice President, HEWLINGS COLES
Secretary, BENAJAH P. WILLSMount Holly

REPORT

BY THE SECRETARY.

Suggestions, Crops, Yields and Conditions.

The spring of 1907 was cold and stormy and most discouraging to the agriculturists in this section of the country, as all fruit and vegetables were late, though most of the crops recovered by the late fall, and good prices have prevailed for nearly all products.

The same difficulty exists as formerly in the scarcity of help indoors and out, which makes farming most unpleasant and undesirable, and in my opinion this is the cause of farm land selling at the present low prices, together with the increase of tax and the high price of the lumber and the labor to improve property. If this state of affairs continues it may be necessary for some of us to resort to the kind of farming that can be done with little help, such as fattening calves and hogs and raising lambs, all of which are selling at paying prices.

I think the scarcity of help could be remedied to a certain degree if we were to provide comfortable quarters for the foreign labor. If each grange should have lodging-houses to accommodate several families it would not be a difficult matter to secure help, as many of them come together from their foreign homes and desire to remain so in this country; therefore, if each grange should make this provision they could get sufficient help. It would be well worth the trial of sending a representative to the immigrant sta-

tion in New York that he might send them to this section of the country instead of allowing them to go west, where land, not any better than ours, many miles from a railroad, is selling for twice as much as our well-improved farms located near the large cities. Something should be done to increase the value of our farms, as they do not sell for as much per acre improved as our forefathers paid for them in the stump forty or fifty years since.

The production of good milk is not sufficient to meet the demand, as the population is increasing and milk is more generally used. The old custom of selling milk by dry measure has been abolished, and milk is now sold as it should have been many years ago—by liquid measure. Even yet, by the new measure, the profit is not sufficient to induce many men who are now in the business to remain therein, as it is very confining and very difficult to hire men who will milk our cows. The price of milk will naturally become higher, as it costs more to produce it, feed and help being much higher and the demand greater.

The cold, wet and frosty weather in May destroyed many blossoms of the pear, peach, apple, plum and cherry. The cherry and plum were a failure; the pear, peach and apple, not more than half a crop. Those who were fortunate in having their orchard on a southern exposure had a fair crop of fruit and received a good price for the same, though the heavy winds and storms in the fall blew much of the fruit from the trees, which made it unsalable.

Strawberries were injured by the late spring and frost in May; therefore the crop was not as large as last year, though good prices were received, which made a very fair average.

About the same acreage of potatoes was planted this year as last. The early varieties were a poor crop, while the late ones made a good yield, and very satisfactory prices were received, which made the crop quite profitable.

Rye was about as last year—fair crop and good prices.

Wheat was an average crop, and good prices were received.

Tomatoes were late ripening, and many did not get ripe before the canning-houses closed; nevertheless, the late fall enabled the growers to sell most of them at good prices.

Boiling corn was not a full crop on account of the weather.

Field corn was not more than 60 per cent. of a crop. The late spring retarded its growth, consequently it was late in maturing.

BURLINGTON COUNTY.

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The heavy winds and storms in the fall blew the corn to the ground, therefore our corn is soft and in bad condition.

Hay was the largest crop we have had for several years, and a great deal of second crop was cut. We had lots of pasture during the whole season. Good prices have been received for good quality hay.

Cantaloupes were not more than half a crop, and of very poor flavor.

Cranberries have many enemies and the climatic conditions to contend with, which destroys many each year. The crop is about the same as last year. Satisfactory prices were received in the early part of the season, though they are a little sluggish on the market at the present time.

Pork was selling early at very satisfactory prices, although the price has fallen at the present time.

Calves have sold well and in great demand during the entire year.

Sheep and lambs have been in demand and much sought after at remunerative prices, though we raise very few in this section.

Turkeys, as usual, are scarce and high in price.

Fresh eggs are almost impossible to purchase at any price.

Butter has been and is now selling at good prices on account of the enforcement of the Oleomargarine laws.

CLIMATIC HISTORY OF BURLINGTON COUNTY, N. J., FOR
YEAR 1907.

BY THOS. J. BEANS.

The latest killing frost in spring was on May 12th, thirty-two degrees; the earliest in autumn, October 20th, thirty-two degrees, making 161 days for out-of-door growth of tender vegetation. There were many harmful local frosts throughout the spring months, and growth of tender vegetation was checked and often seemed on the verge of disaster. June was the coldest during the forty-three years' record. The summer was wet throughout. These conditions made strawberries late, but crop was good. Sweet potatoes did not start well and were a light crop. Field corn developed slowly, and much corn fodder was sappy and grain unripe at usual

harvesting period. On September 23d a violent wind broke down fodder and did crop much harm. Late crops of all kinds, except cabbage, were good, and second crop of grass heavy and of very good quality. Sowed grass seeds made vigorous growth. There were several heavy local storms in the county. On August 8th a thunderstorm of fearful violence crossed Moorestown and adjacent districts. Many buildings were struck by lightning and some burned, high winds aiding the harmful work. There were several visitations of hail. That of May 27th cut down growing crops, and was drifted and washed into beds that endured for several days. October came with twenty-four clear days, and was very favorable for gathering and storing sweet potatoes and marketing fall crops. December was mainly of singular beauty, with a mean temperature of thirty-seven degrees, permitting the large acreage of corn in fields to be husked in good condition. Much corn husked early was not. The fodder kept damp late, so that it could not be stored safely.

The bird-supply seems to be continuously diminishing.

CLIMATIC HISTORY OF BURLINGTON COUNTY, N. J., IN RELATION TO AGRICULTURE, FOR THE YEAR 1907.

Obs. lat., 40°; long., 74° 54'; elevation above tide, 71 ft.

	TEMPERATURE.			Rain and Melted Snow.	Snow.	No. of Days 0.01 Inches or More of Rain Fell.	No. of Clear Days.	No. of Partly Cloudy Days.	No. of Cloudy Days.	
	Max.	Min.	Mean.							
January	67°	32.6°	2.93 in.	7.6 in.	16	7	8	16	Sleighing. 81° Max., 1905. Max., 86° Rec. Freeze. 22d, 30°. 12th, 32°. Year 1882 as cold.
February	48°	.....	24.1°	2.86 in.	19.3 in.	12	14	5	9
March	86°	11°	42.0°	2.66 in.	13.0 in.	12	11	12	8	
April	70°	23°	46.0°	3.68 in.	8.2 in.	13	8	6	16	
May	85°	32°	55.8°	5.34 in.	.....	12	9	8	14
June	91°	41°	64.8°	6.85 in.	.....	10	14	6	10
July	90°	53°	73.3°	4.45 in.	.....	12	15	9	7
August	90°	51°	69.8°	6.48 in.	.....	16	10	14	7
September	88°	39°	67.3°	6.74 in.	.....	14	11	7	12
October	76°	26°	50.7°	3.89 in.	.....	7	24	3	4
November	62°	21°	43.8°	5.49 in.	0.4 in.	14	11	4	15	
December	62°	17°	37.1°	4.25 in.	6.0 in.	12	12	7	12	
Year	91°	.....	50.6°	55.62 in.	54.5 in.	150	146	89	130

CAMDEN COUNTY.

OFFICERS FOR 1908.

<i>President</i> , MARTIN SCHUBERT	Kirkwood
<i>Vice President</i> , R. COOPER MORGAN	Blackwood
<i>Secretary and Treasurer</i> , DANIEL W. HORNER	Merchantville

REPORT

BY THE SECRETARY.

The twenty-fourth annual meeting of the Camden County Board of Agriculture was held at Haddonfield, December 13th, 1907. President Martin Schubert, in a few words, welcomed the gathering and briefly made allusion to the importance of the meeting.

As usual, the programme was varied, relating not only to "*shop matters*," but certain features in legal and social matters were considered by good authorities and listened to with great interest. Charles Barton, a specialist in peach growing, told at length of some of the difficulties he encountered and the successes he met with in his efforts to produce good peaches. Benjamin Barrett made an exhaustive talk, from a practical standpoint, on growing small fruits. William Haines, a strawberry specialist of large experience, told of his experience in that line.

The afternoon session was opened with music. Judge Horner, of Burlington county, was present, and spoke mainly on certain features of the law, briefly reviewing common law and statutory law. The rights of individuals and also their duties one to another were dwelt upon with considerable emphasis. Mrs. William C. Raughley spoke upon the subject, "Husbands and Wives of To-Day As I See Them," which was full of suggestion and humor.

The subject, "Local Markets at Railroad Stations," which is

well worthy of being considered at farmers' meetings, was then taken up and brought out a general discussion, the trend of opinion being strongly favorable to encouraging local markets at railroad stations, as the experience of all showed it was more profitable to dispose of products at nearby stations than it was to cart them to market several miles distant.

The farmers here are still troubled with insufficient help, but their crops were planted and the yield gathered, thanks to a late winter, and, while not many millionaires were made this year, it is gratifying to know that the panic is affecting him less than any other class of business men hereabouts.

CAPE MAY COUNTY.

OFFICERS FOR 1907-1908.

<i>President</i> , DR. E. H. PHILLIPS	Cape May City
<i>Vice President</i> J. D. LUDLAM	South Dennis
<i>Secretary</i> , J. W. PINCUS	Woodbine
<i>Treasurer</i> , VOLNEY VAN GILDER	Ocean View

REPORT

BY THE SECRETARY.

During the past year three meetings of the board were held. At the first, held at South Seaville, on December 18th, 1906, the programme was entirely occupied by the farmers' institute. Speakers, among whom were J. VanWagenen, Jr., Charles Chalmers, A. F. Hunter and Professor R. L. Watts.

Mr. J. W. Pincus, of Woodbine, related his experience with the "Army Worm." At the evening session Professor R. L. Watts made an address on "The Education of the Farm Boy." This was followed by very interesting discussion, participated by a number of pupils of the Baron De Hirsh Agricultural School, who attended the institute in a body. An illustrated lecture on "American Attractions" was delivered by Rev. D. E. Clair.

The second meeting was held at Woodbine on March 16th, 1907. At this meeting Dr. E. W. Phillips and R. Schellinger, the delegates to the State board of agriculture, made extensive reports on the proceeding of the annual meeting. Mr. J. C. Wolferth, of Mickelton, N. J., delivered a very instructive address on "Tomato Growing." The address was followed by discussions.

A discussion was started by Mr. J. W. Pincus on dry-mash method of feeding poultry and the open-front poultry-houses. As several open-front houses were erected in Woodbine, the members of the board had an opportunity to visit them.

The third meeting was held at Cape May Court House, on October 31st, 1907.

At this meeting the officers and delegates were elected. Mr. L. T. Hallock, the proprietor of Woodlands Farms, located at Iona, N. J., delivered a very interesting and instructive address on "Poultry," which was followed by numerous questions and discussions.

During the past year a fifth grange was organized at Palermo, and also a Pomona grange was organized. All granges report increased membership.

The attendance at all the meetings of the boards was better than it was in past years, and it is hoped that with the increased activities of the granges it will increase still more.

GENERAL STANDING OF AGRICULTURE.

The season of 1907 was rather unfavorable to most of the farm crops in this county.

The precipitation during April and May was 8.67 and 7.16 inches, respectively, the average during the past years was three to four inches per month. The heavy precipitation retarded planting and prevented the growth of early crops.

The yield of Irish potatoes was very poor. Sweet potatoes had also a very hard season. Many of the first plants planted out were frozen, many were eaten by flea beetles, then followed a scarcity of plants for replanting, and many of those that were replanted did not have time enough to produce a crop. The demand for sweet potatoes was good at high prices. Lima beans were later than usual this year, and the prices in New York and Philadelphia markets were lower than they ever were before.

There was a scarcity of all kinds of fruit; practically speaking, there were no peaches in the county. Strawberries yielded a fair crop. Grapes produced a good crop. The Vineland Grape Juice Company purchased several carloads from Woodbine growers at \$45 per ton. This crop is quite profitable and many farmers are planning to increase their vineyards.

The tomato crop was rather uneven. Several growers reported exceptionally heavy yields—one ten tons per acre and another twelve tons, but most of the growers reported small yields. All the

CAPE MAY COUNTY.

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six canning factories were working during the past season, and farmers received \$9 per ton for their tomatoes. Besides canning tomatoes, one of the canning factories puts up pickles and horse-radish and another peas. There seems a general tendency among the farmers living in proximity of canning factories to increase their acreage, as several realized large amounts per acre.

The poultry industry seems to be constantly increasing in the county. There are quite a number of successful poultrymen, keeping flocks from 300 to 800 birds for egg-production, shipping the eggs to New York City and realizing handsome profits from their flocks. A large poultry establishment is in course of construction in Dennisville. The opportunities for profitable poultry-keeping in this county are great, as the climatic and soil conditions are favorable, and the demand for fresh eggs is becoming greater every year.

Some experiments were conducted at Woodbine during last year in clearing up land with dynamite. The result of this work may be of interest to the farmers of the State.

The acre of land contained 380 stumps. It took a man six days to take them out and he used 400 sticks of dynamite. The cost per acre was as follows: Labor, \$10.50; dynamite and fuse, \$26.50; total, \$37. The cost per stump was about ten cents.

While the cost is considerable, the work is much more easily done than by grubbing, and the stumps being split to pieces are easier removed from the land and can be utilized as fuel.

Four new silos were constructed in the county on two dairy farms near Cape May City. One of these dairy farms has a large registered herd of Jerseys and produces certified milk.

ESSEX COUNTY.

OFFICERS FOR 1908.

<i>President</i> , CYRUS B. CRANE	Caldwell
<i>Vice President</i> , AUSTIN E. HEDDEN	Verona
<i>Secretary</i> , JUSTUS W. DOBBINS	Verona
<i>Treasurer</i> , GEO. E. DE CAMP	Roseland

REPORT

BY THE SECRETARY.

The board held three meetings during the year, had very interesting programmes at each meeting, and questions well discussed.

On our first, January 9th, the delegate to the State Horticultural Society reported.

The report showed the society increasing in membership, and the meeting was one of the most successful in the history of the society.

The programme was composed of topics especially interesting to the fruit-growers of our State, and were ably handled by the speakers.

Our delegate brought several subjects of interest to us, which were well discussed by our members.

On February 4th our farmers' institute was held. The attendance was larger than at any previous meeting. Our people appreciate the efforts of our secretary and the State in the interest of agriculture.

Our second meeting was held February 11th.

The delegates to the State board made their reports. The report of State Secretary Dye and the annual address of the president, Professor Voorhees, were highly spoken of. Extracts from these were read and discussed with interest.

Our third and annual meeting was held December 11th. Re-

ports of officers showed our board growing in membership and interest, and doing good work.

Last spring a car of fertilizers was purchased through a committee appointed by the board.

The knowledge gained at our board meetings and farmers' institutes is being put into practice by many of our members, and good results are seen in their work.

The growing season the past year has been very unfavorable for farm and garden crops.

The spring was cold and wet, followed by a drouth, cutting some of our crops badly.

Prices have been higher, so the farmers have been well paid and are prosperous.

Milk is the one article which is produced at a very little, if any, profit.

The boards of health in some of our towns and cities have passed rules and regulations which, if complied with, will make the cost of milk production greater; the price of milk should, therefore, advance sufficiently above present prices to meet this added expense of production.

Market gardening is receiving more attention, and raising wheat and oats less than formerly.

GLOUCESTER COUNTY.

OFFICERS FOR 1908.

<i>President</i> , LEWIS M. MORGAN	Woodstown, R. F. D.
<i>Vice President</i> , JAMES C. WHITE	Sewell, R. F. D.
<i>Secretary</i> , ELBERT KIRBY	Mullica Hill, R. F. D.
<i>Treasurer</i> , WILLIAM M. BORDEN	Mickleton

REPORT

BY M. ELLA MORGAN.

Four very interesting meetings of the county board have been held during the past year with a very good attendance.

Some of the questions discussed were: "Growing and Marketing Specialties," "Progress in Establishing a Parcels Post for the Farmer," "Influence of the Grange Upon the Character of Its Members," "Benefits of the Rural Telephone," "Advantages of Keeping Farm Accounts," "The Present Outlook for the Dairyman," "What Do We Owe Our Boys and Girls," "Advantages of Keeping Farm Accounts."

A two-day institute was held at Swedesboro, November 20th and 21st, 1907, under the direction of the State board, and conducted by Secretary Dye. The attendance was good.

Among the speakers were: Professor R. L. Watts, J. G. Curtis, Dr. C. D. Smead, Mrs. M. McAllen, H. E. Cook and Colonel George Nox McCain, also some home talent.

Two very good papers were read on "What Has the Rural Phone Accomplished?" stating that at the first of last June there were 900 families in Gloucester and Salem counties connected by telephone, thus enhancing the value of farm property by helping to keep the farmer's life from being so isolated, and enabling him to keep in touch with the markets.

HUNTERDON COUNTY.

OFFICERS FOR 1908.

<i>President</i> , E. M. HEATH	Flemington, Route 2
<i>Vice President</i> , H. E. DEATS	Flemington
<i>Secretary</i> , WM. W. CASE	Frenchtown, Box 55, Route 1
<i>Treasurer</i> , F. J. TOMLINSON	Pittstown, Route 1

REPORT

BY THE SECRETARY.

Two meetings of the board were held during the year, in September and November. The September meeting, at Frenchtown, was addressed by President E. B. Voorhees, of the State board, on "Alfalfa and the Possibility of Its Culture in Hunterdon County." The meeting was well attended by farmers, who came to find out how to grow the wonderful crop. Several trial fields have been planted and have proven that the crop can be successfully grown on nearly all our land. Test plots from one to three years of age, at Frenchtown, Pittstown and Flemington, have proved successful. Several plots sown during August, 1907, have gone into winter in very fine condition.

Some plots have been successfully grown without inoculation, while others have failed evidently because the necessary bacteria were wanting in the soil, showing that it will be safer to inoculate the soil before seeding, in this part of the country at least. Probably one quart of alfalfa seed per acre, sown with other clover seed in spring of year, would produce enough bacteria in the soil to make inoculation unnecessary.

If alfalfa can be grown generally, and be made to produce the amount of protein necessary to produce milk, it will again push dairying to the front. But with wheat bran at \$30 per ton, and

other feeds in proportion, and butter-fat at thirty cents per pound, many farmers look in vain for the profit they should receive for their labor and capital invested.

FOUL SEEDS.

Dodder appeared in clover fields the past summer, and where not destroyed early it will require all the efforts of the farmers to eradicate it.

Wild mustard has spread so on some farms they are almost worthless as grain-producers, the mustard choking out every crop. Wild carrot flourishes everywhere, but while a nuisance, it is looked upon by many as a fairly good soil renovator. Daisy is also a serious obstacle to permanent pastures.

The horse nettle (*Solanum Carolinens*) is getting established in too many sections, and is little less obnoxious than the Canadian thistle, of which we also have a full share.

Our Legislature should place heavy penalties on the importation into New Jersey of clover seed infested with dodder.

GENERAL FARM CROPS, ETC.

Probably not in a generation have we had a season exhibiting so many peculiarities as the growing season of 1907, and yet on the whole it was fairly satisfactory. Owing to the excessively wet and cold conditions but little ground was ploughed during April, and oat-sowing continued to mid-May or later, and yet that crop, both in yield and quality, was one of the best in years. Corn planting continued nearly, or quite, to July 1st, resulting in good crops in certain sections and almost total failure in many others. Cold, wet weather, after September 15th, prevented ripening properly, while scarcity of farm labor left many fields uncut December 15th, and much will remain unhusked April 1st, 1908. The potato crop, while very late, was fairly satisfactory and of fine quality.

In general, farm crops have yielded an average throughout the county about as follows: Corn, twenty-three bushels; oats, thirty-two; wheat, eighteen; rye, twenty; buckwheat, twenty-five; potatoes, ninety; hay, one and one-half tons per acre.

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Tomato-growing around Cherryville has been quite highly developed the last two or three years, but owing to the excessively wet fall failed this year to produce profitable crops, thousands of crates rotting in the fields. Even under these very unfavorable conditions yields of as high as 400 crates per acre were attained by some and netted the growers, approximately, fifty cents per crate. They are all shipped to New York market, as, we are sorry to state, the last tomato cannery in the county, that of Everett & Scarborough, Lambertville, has had to suspend from inability to secure fruit enough to make it worth while to attempt business. Hunterdon county produces the best tomato grown, as the New York commission merchants have no difficulty in disposing of them at double the prices obtained for fruit from any other section.

Winter wheat and rye never went into winter in less promising condition than in the fall of 1907. Fully one-half the seeding was done after October 15th and under such climatic conditions that whole fields failed to germinate, the seed rotting in the soil. Some fields may lie dormant until spring and then develop, but the chance is a slight one, and fertilizers, seed and labor may become a total loss.

HORSES, CATTLE, HOGS, ETC.

Horses, cattle and hogs ruled high generally during 1907, but pork declined, selling for six to seven and one-half cents against eight to eight and one-half one year ago, while the demand for pigs for overkeeping is practically nil. Seven-cent pork has doubtful profit when fed and raised on feed at \$30 per ton.

The horse market shows little change from one year ago, the demand for good western stock still being heavy, as shown by the business of Sheriff E. W. Opdyck, who states that his sales have almost exactly equaled those reported one year ago, viz., fifteen carloads, 330 head of western horses, the prices considerably topping \$200 per head. A. S. Case, of Three Bridges, and other dealers, also disposed of many carloads at high prices during the year, and yet the breeding of high-class farm and draft horses is still practically neglected, but it would seem there should be big money in raising horses that at four to five years of age sell readily for \$200 per head.

Cattle prices generally are as high as one year ago, although

butter-fat, which ruled at record prices all summer, has now dropped considerably below the prices of one year ago. December payments for butter-fat ranging at thirty to thirty-two cents per pound against thirty-six to thirty-nine cents December, 1906. The demand for milk, however, at shipping stations is on the increase, and readily commands \$2 per cwt. at date. Many cattle and young stock have been imported from other States and sold at public sale, droves of as many as forty-head each being readily disposed of.

CREAMERIES.

Mr. C. R. Peterman, as usual, has kindly furnished the following reports of the business of the creameries owned by him for the year ending October 31st, 1907: Cherryville creamery, 1,093,389 pounds; Oak Grove creamery, 978,068 pounds; average price paid for butter-fat per pound, thirty-one and one-sixth cents.

This is a slight falling off in product compared with last year, but a gain in price of butter-fat of more than five and one-half cents per pound.

Locktown creamery report is appended also; it shows a falling off in milk handled of about 12 per cent., with a likewise increase of five and one-half cents per pound of price paid for butter-fat, making the cash returns for the diminished product greater than that of last year.

Report of Locktown creamery for the year ending October 31st, 1907, as taken from the books by Walter S. Bloom, foreman:

	No. Lbs. Milk Received.	No. Lbs. Butter Made.	Butter Sold for—	Skim Milk Sold for—	Average Test of all Milk Received.	Price Paid per Lb. for B. Fat.	Average Price per Cwt. for Milk.
November, 1906.....	108,146	5,537	\$1,724 85	\$56 97	4.29	\$0 34	\$1 45+
December, 1906.....	109,729	5,555	1,984 38	55 07	4.21	39	1 64+
January, 1907.....	112,310	5,618	1,921 73	54 20	4.16	37	1 53+
February, 1907.....	102,022	5,036	1,794 82	47 75	4.16	38	1 58+
March, 1907.....	123,114	5,915	1,998 14	57 77	4.04	36	1 45+
April, 1907.....	125,006	5,878	1,960 89	65 77	3.99	36	1 43+
May, 1907.....	156,849	7,203	1,986 51	81 46	3.90	30	1 17+
June, 1907.....	167,991	7,626	2,014 10	87 21	3.96	28	1 11+
July, 1907.....	162,729	7,620	2,072 67	95 32	4.02	29	1 16+
August, 1907.....	151,005	7,217	1,819 55	92 41	4.04	30	1 21+
September, 1907.....	138,311	7,151	2,088 05	86 04	4.05	34	1 37+
October, 1907.....	124,151	6,551	2,222 47	77 96	4.17	38	1 64
Total.....	1,581,363	76,907	\$23,588 16	\$857 93	4.08 ¹ / ₄	\$0 34 ¹ / ₄	\$1 39 ¹ / ₂
Average.....					4.08 ¹ / ₄	34 ¹ / ₄	1 39 ¹ / ₂

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It is also rumored that considerable quantities of "oleo" and "renovated" butter are being handled by certain merchants at some points in the county, greatly to the detriment of the splendid product of our local creameries. If the rumor is correct we hope the stuff is being sold strictly on its merits.

INSECT RAVAGES.

The San José scale is still flourishing and satisfactory results are not generally obtained from the various sprays. During 1906, a favorable season, a third brood appeared in October, which, from their immature condition, failed in many instances to withstand the rigors of winter, which created an impression in the spring of 1907 that the scale was on the wane. Owing, however, to the late spring, but two broods appeared during 1907, the September brood, perfectly maturing, and the microscope shows the scale is now quite generally established, promising to sweep the country during next summer. Carbolic acid has generally been abandoned as either a preventive or cure for the pest. My own observation shows it has had no effect in preventing the spread of the scale.

Other insect ravages have been slight, the Colorado beetle being practically a thing of the past. Not one made its appearance on the half acre grown by myself during the past season, although the growth of vine was heavy, and I have used no poisons for several years past. No evidence that either brown-tail or gypsy moth have located with us. Tent and other caterpillars were very scarce, and but little complaint has been heard during the year concerning the Angoumois grain moth.

FRUIT.

The apple crop fully equaled or exceeded that of 1906 both in quality and quantity, good fruit selling from \$1.25 to \$1.80 per standard barrel, while ground apples readily commanded thirty-five cents per cwt. at the cider mills.

Pears not a half crop, consisting mainly of Keifers, which so

far alone among the pears has remained practically scale proof, but little spotted fruit of that variety being seen.

No peaches in the county except in the extreme north, where a small crop was secured which realized good prices.

Small fruits of all kinds, even wild blackberries, very scarce. The cherry crop was not worth picking. Several orchards of peaches will be set next spring.

THE APIARY.

Bee-keeping has regained normal conditions, and while more or less disease exists in some parts of the county, yet it is held in such check as not to seriously interfere with the honey crop. The season of 1907, though very late, was a fairly good one and yield of fine quality, aggregating more than ten tons of surplus product for the county. Bees generally went into winter quarters in fine condition.

POULTRY.

Poultry about as last year, although the high price of feed, without an increase in the price of eggs, tends to greatly lessen the profits of the business and a tendency is manifest to reduce many large flocks of fowls as much as 50 per cent.

MERCER COUNTY.

OFFICERS FOR 1908.

<i>President</i> , J. T. ALLINSON	Yardville
<i>Vice President</i> , FERDINAND A. BLACKWELL	Pennington, R. F. D.
<i>Secretary</i> , FRANKLIN DYE	Trenton
<i>Treasurer</i> , LAURA A. BLACKWELL	Titusville

REPORT

BY THE SECRETARY.

The annual meeting of the board was held in Trenton, March 28th, 1907, with a very encouraging attendance, which was, in part, due to a notice sent to the granges early in the month by the directors of the board inviting them to send delegates to the meeting. This set forth the purpose of the county boards and a request that it be read in the grange.

At this meeting the officers were elected for the year and the annual address of President Green delivered. Other papers were read on "Potato Production," by Charles Black, Hightstown; "Paying Crops of Hay for Market, Cost, &c.," by J. H. Denise, Freehold, and "Methods of Bringing Poor Land Into Profit Without Cost to the Farmer," by Charles Howell Cook, Trenton.

Mr. Black emphasized the importance of securing a suitable soil, preferably a heavy loam, well filled with humus. A clover sod, or heavy coat of stable manure applied a year previous to planting are conditions required for success. Then we must have good seed, *perfectly grown* and free of disease. The speaker gave details as to distance apart to plant, varieties, fertilizers, kind and amount, &c., &c. The address led to a profitable discussion.

Mr. Denise said he preferred 1,500 pounds fertilizer instead of 1,000 pounds as stated by Mr. Black. He also stated that they

are growing in Monmouth county potatoes on the same ground from six, ten or more years by growing wheat and crimson clover to plow under.

Treat seed with mixture of sulphur and old soil, preferably left from the seed of the year before—this heals the raw surface. Did not think Bordeaux spraying to prevent blight of vine paid in their locality; rather, give the potatoes plenty of plant-food and rush them through to quick production and maturity.

Mr. Charles Howell Cook in his address claimed that society needed producers, and every acre of the farm should produce. He had at one time on his own farm twenty acres of non-productive land and it was an eyesore to him and discredit to the farm. It was heavy clay soil, pebbles, &c.

His treatment: Sowed oats and 150 pounds fertilizer; cut the oats quite young and used it as fodder for young stock. Then ploughed ground up and sowed crimson clover—cut it, sixty tons, and fed it to the milch cows, and the milk produced exceeded the same barn filled with the other hay. Then he sowed rye and reaped nineteen bushels per acre; used 150 pounds fertilizer. Next year, rye again. Then clover, and the next year ploughed it up and planted corn—southern white—and produced sixteen tons ensilage per acre—coat of manure applied right from the cow stables. Generally we should grow more of the crops needed right here in the city of Trenton and not let the farmers far away take our market.

The address of J. H. Denise is given in full, it being considered a very valuable contribution on the subject treated.

GRASSES AND CLOVER; THEIR USES AND ABUSES.

The point we wish to reach to-day is the commercial value of these two factors as they enter into the business venture of the farmer's life. They were the first to occupy the soil and respond to the demands of the beasts of the field for sustenance. Also, to the soil tiller for the reward of his labor. In this day of keen competition and scientific research it is our opportunity, yes, our necessity to increase, if possible, this *nature's gift* to man. We believe it can be done if given the same close attention that the cultivated crops receive.

In the Eastern States there are more acres under grass culture than all other crops combined. They are the least cared for, and are left to appropriate for their growth whatever of plant-food is left in the soil after the preceding crops have utilized what they needed. The grasses and clovers usually follow the grain crop, and start in the race of life a tiny, struggling plant, overpowered by the heavy grain growth, and, having no reserve force, frequently succumb to the inevitable.

If we, as agriculturists, expect to keep pace with the rapidity of the present age, we must study the little things and close up the leaks. We seldom have more than 50 per cent. of the necessary stand of grass in our stubble fields. Half a stand of grass means a half crop of hay. You can readily see this is suicidal for the expected net revenue.

REMEDY.

Do not seed to grass when sowing grain. As soon as possible after the harvesting plow under the stubble well (this *stubble* seems to be poisonous to young grass). The earlier this ploughing is done the more desirable. It is absolutely important to have a mellow seed bed. To obtain this the soil must be stirred frequently. The adaptability of present-day machinery for this purpose is abundant.

Do not work land when too wet, nor fail to have the surface soil made very fine, if you expect to get good results from your seeding. Grass seed cannot get a foothold in lumpy soil. Fertilization is essential to success. Cost of land, taxes, labor, fencing and seeding are the same for one, one and one-half tons per acre, when, with a well-fertilized soil, we should have a yield of two to three tons, other things being equal. *It is well to lime.*

APPLICATION OF FERTILIZER.

Apply about 400 pounds per acre of a formula running three of ammonia, ten of phosphoric acid, seven and one-half of potash. Composed of the following materials:

600 pounds 10 per cent. tankage.

300 pounds muriate potash.

700 pounds acid phosphate.

400 pounds bone meal.

Costing about \$24 per ton if you buy the materials in carlots and do your own mixing.

The advantage of this is, you know just what you have got. This can be applied with a drill at time of seeding. Sow from about August 1st to September 20th.

For mowing per acre:

Six quarts timothy.

Four quarts red clover.

Two quarts alsyke.

Always on a freshly-stirred soil. Sow both ways so as to avoid skips, or take a hay-rake with a seeder attachment; you can go twice same way and break joints; can let teeth drag lightly at last sowing. If soil is dry, roll.

If soil is sandy, sow red clover and timothy. Timothy needs clover to furnish nitrogen—six quarts of each. If only for one year for pasture, clover with a little red top. For permanent pasture, red, crimson and alsyke clover, alfafa and red top.

Allowing we have a good stand of grass we should have a yield from two to three tons per acre the following harvest. If drought shortens the first cutting, and we have a good second crop, harvest this, but do not cut too late nor shave too close.

With us there is a growing demand for the second cutting among cattle-feeders. In fact cattle relish and thrive on this better than the first, if it should be a little coarse and too old before cutting. Alfalfa loses half its feeding value if too old before cutting.

If the farm has sufficient stock to consume this second growth better feed it off, but do not allow any stock on lands for next year's mowing after October 17th. One-half of the mowing lands are materially injured by too close cropping late in the fall. It is a penny-wise and pound-foolish policy.

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TREATMENT FOR SECOND YEAR'S MOWING.

Prepare or have prepared for you the following mixture for top dressing:

- 800 pounds nitrate of soda.
- 400 pounds 10 per cent. tankage.
- 200 pounds muriate potash.
- 200 pounds bone meal.
- 400 pounds acid phosphate.

This will run about nine and one-half ammonia, seven phosphoric acid, five potash, at a cost of \$35 per ton home-mixed, 250 to 300 pounds per acre. Time of applying April 10th to May 1st.

The necessity for this high-grade ammoniated goods is needed to stimulate the timothy, the clover having mostly gone out.

Timothy, if properly fertilized, is not at its best until two or three years old. It will tiller out like grain, forming year by year little bulbs, thereby increasing the number of stalks according to the fertility of the soil. Yearly application must be made.

Timothy is the leading grass for hay, and, if harvested in good condition, commands the highest figure, although its feeding value is not equal to timothy and clover mixed if cut in time. I think there is a growing tendency on the part of buyers to give preference to the mixed hay.

HARVESTING.

Among the many introductions of labor-saving agricultural machinery, none are more highly prized in this day of scarcity of labor than haying tools. With the mower, tedder, end delivery hay rake, loader, and power to elevate it in the mow—with good weather it is only fun to gather hay.

Time to cut timothy for prime quality is just prior to the blooming season; may lose a little in quantity, but quality is superior and less liable to damage, if perchance it should get wet, and heavier bulk. If stored in large quantities it needs a little more for curing than in small bays. Do not cut more at a given time than you can properly care for according to the help at your command. Avoid leaving exposed to the dews if partially cured.

There is a time to do things, the result of which brings reward, and the neglect of same entails a loss. This applies very forcefully to hay-making. I would prefer to be a little longer in the gathering than to spoil a crop after it is grown. Stacking is a losing game. Sometimes, with an unusually heavy crop, we are obliged to stack a little. The loss in weight, after being mow-cured, is from 10 to 20 per cent., according to the dryness when stored. If hay generates too much heat after being stored, loss in weight is greater.

CLOVER.

Clover should be cut when bloom shows some decay. Hay will be better and the plant can better reproduce itself if cut early. You will also get a better second crop, which is equal to the first cutting for horses not at work through the winter, and also for neat cattle. Care should be taken not to over cure. This can be avoided by bunching when dry enough to house. Buildings should be closed when not in use. Hay will save in a greener condition in barn than in stack.

Our local markets need the bulk of the hay produced in this section, hence it brings the producer and consumer in close business touch. If hay is baled before October 1st stand bales on end either loaded in car, or if stood in barn, to avoid heating. The grasses and clovers exceed in value all other products combined in our State. This seems a little startling, but statistics justify this statement.

The farmer that would make a success of his business in this day must fertilize heavily and cultivate less acreage. Expensive labor demands this. Grow the crops adapted to his soil and the products that have a home market.

The annual address of President Green treats so comprehensively the conditions of agriculture in the county, it is given in full in place of extended paragraphs by the secretary.

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ADDRESS OF JOHN V. GREEN, PRESIDENT.

Agriculture is the most ancient of all callings, hence the most honorable, and it is our duty to sustain it as such. Great changes have taken place within the last decade looking toward the honorable position occupied by the "tillers of the soil," owing chiefly to the education of the agriculturist in all lines pertaining to his calling, and to co-operation and concentration of effort as taught by the grange and other societies. It is a strange thing to me that every farmer does not see the advantage of thus joining forces with his brother farmer, and thus secure everything pertaining to his interests, social, legislative or even political.

In this Mercer county board of agriculture we have an organization calculated to bring the farmers in close touch with their legislative interests, and being an offshoot of the State board, also in direct line with the workings of that body, we have advantages that no other county board has. We have also as our secretary the secretary of the State board, whose experience and advice is worth considerable to us. Therefore let us take a deep interest in this society by our attendance, by combining of thoughts and efforts to make this board what it should be.

We are particularly favored in being located in the center of the State and adjacent to the State capitol, where we can attend all the important meetings which are held here in the farmers' interests. We are also favored in our location in having in our county all the different varieties of soils for the production of all kinds of hay, grain and a great variety of vegetables, small fruits, dairy products, &c., which command a ready sale in the best markets of the United States. Our attention should be directed to the production of such lines as these markets require, viz., dairy products, fruits (large and small), poultry and eggs, vegetables and truck of all kinds, and not try to compete with the west in raising grain.

A few of these special products I will touch on, leaving you to suggest others that can be made especially remunerative to grow.

DAIRY INTERESTS.

This county is one of the best in the State for the production of milk, with a market here at our doors for all we may produce, and a good proportion can be sold at retail prices. There are some 12,500 cows in this county alone, with a valuation of \$562,500, and the value of milk sold at something like \$475,000 per year. The cities are growing at a remarkable pace, and requiring more and more the pure milk that should flow from our farms.

POULTRY INTERESTS.

A great impetus has been given to the poultry business within a few years, because of the wooden-hen or incubators, where the hatching of chicks by steam is superseding the old hen. Many more can and should be produced each season, as the supply of poultry and eggs does not begin to keep up with the demand. The field is still open to the progressive man, and *woman, too*. The production of winter eggs was ably and practically set forth by an address on the subject at the Pennington meeting held in December by Professor Gowell, of Maine.

VEGETABLES AND TRUCK.

The southern part of our county is particularly adapted for this business. In fact, within a radius of ten miles of Trenton, all vegetables and truck can be raised and carted to market, thus saving transportation charges, besides a great deal can be sold direct to consumers at retail prices.

FRUIT.

The northern part of the county is well adapted for raising the larger fruits—apples, peaches, pears, cherries, &c., while the southern part is well calculated for the small fruits. One thing is certain, however, the man who does not spray for the San José scale *will have no fruit*. The outlook, therefore, is for better

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prices, as less will be set out, and only orchards properly sprayed and taken care of will be remunerative.

Other special crops will suggest themselves, such as raising of hay, pork, asparagus, squabs, &c., all of which can be made to pay by following one or more lines as a *specialty* and making ourselves familiar with the business by reading, by studying and by experimenting.

We have the benefit of the Experiment Station close to us, and easily accessible, where a great deal of valuable information can be obtained, and the scientific knowledge to be obtained from there is second to none in the United States.

The short courses in agriculture recently established there are within reach of all farmers' sons of proper age.

Of course, the labor problem in raising all these special crops is yet unsolved, and we hear of farmers selling out and going to town because of this; but let them go, for every one that goes it makes a better market for those that are left! They all have to eat, and the "farmer feeds them all." The work has always been done somehow in the past, and will be done in the future, either by improved machinery or foreign labor.

The farmers of to-day are better business men than they were twenty-five years ago. With the telephone, the rural mail delivery and trolley systems, we, of this county in particular, are in close touch with the markets of New York, Philadelphia and Trenton, and the chances for a farmer to make money right here in Mercer county, New Jersey, cannot be equaled anywhere in the United States.

The December meeting was held in Trenton, when the crop report was presented by the secretary and revised by the members. A delegate was elected to the State board for two years and two delegates to the State Horticultural Society.

Following the business items, addresses were made by J. G. Curtis on "Selection and Application of Fertilizers," by H. E. Cook on "Dairy Requirements," by James McCracken on "Get There or Say You Can't."

Farm and crop statistics for the year are as follows:

We have in Mercer county 1,573 farms, the average size of which is eighty-two acres. The twelfth census value of these farms is

\$960,962; adding the 13 per cent. increase since that was taken is \$1,085,887.

The crops for 1907 are as follows:

<i>Crop.</i>	<i>Acreage.</i>	<i>Bu. Per Acre.</i>	<i>Total Bushels.</i>	<i>Price.</i>	<i>Total Value.</i>
Corn	2,200	35	77,000	\$0 80	\$61,600
Wheat	1,200	20	24,000	97	23,280
Rye	4,000	19	76,000	75	57,000
Oats	10,000	40	400,000	50	200,000
Hay	23,000	1½ tn.	34,500 tn.	18 00	621,000
White Potatoes	1,800	125 bu.	225,000	67	150,750
Sweet Potatoes	200	100 bu.	20,000	1 00	20,000
Total value					\$1,133,630
Miscellaneous vegetables and fruits					575,000
Milk					500,000
Poultry, eggs, veal calves, pork at \$100 per farm on 1,573 farms gives					157,300
Total					\$2,365,930

The Hopewell Valley Canning Company, Hopewell, report, through J. M. Dalrymple, Esq., as follows:

Tomatoes received at factory, 378 tons; price paid per ton, \$9; cans filled, 142,000; wages paid, not including salaries, \$2,340; value of product, including packages, \$13,860; largest yield from one acre, fourteen tons.

MIDDLESEX COUNTY.

OFFICERS FOR 1908.

President, B. DEWITT GILESNew Market
Vice President, SEWARD APPEGATEHelmetta
Sec'y and Treas., LEWIS D. WALKER, JR.New Brunswick, R. F. D. No. 1

REPORT

BY THE SECRETARY.

The first meeting of the year was held on February 16th, when the members with their wives met at Schussler's café, New Brunswick, and enjoyed a dinner, after which Toastmaster B. DeWitt Giles introduced the following speakers:

Professor E. B. Voorhees, of the College Farm, addressed the meeting on "Commercial Fertilizer and Fertility in the Soil."

Professor Van Wagenen, one of the teachers in the short course in agriculture, spoke on "The Education of the Farm Boy and Girl for the Future."

Professor Billings, also of the College Farm, gave a talk urging the farmers to give the board of agriculture their support, and told of the benefits to be derived by so doing.

Mr. Collins, of Westfield, talked on the "Relation of the Agricultural Press to the Farmers."

After the speaking some business was attended to; among other things, a motion was carried indorsing the resolution passed by the State board asking for an appropriation of \$100,000 for the agricultural college and \$15,000 annually for its support. This action was forwarded to our representatives at Trenton.

This meeting was well attended and was a helpful and enjoyable occasion.

The next meeting was held on May 18th. After disposing of the regular business, Dr. Ward, of Lyons Farms, addressed the meeting on the subject of "Peaches." He gave a complete account of his methods of growing peaches, from the preparation of the soil to the marketing of the fruit. Dr. Ward considers fruit-growing as profitable as any branch of farming that a young man can undertake.

In August the board joined the grangers in a picnic at Riverside park, on the line of trolley from New Brunswick to Bound Brook.

At the annual meeting, held November 16th, the officers and directors were elected for the coming year. As an aid to better work in the board a motion was carried to notify each director of his election and urge him to look after its interests in his own township.

The crop and stock report was prepared at this meeting.

The crops for the season have been reasonably good. Corn in part of the county was injured by drought. Wheat was exceptionally good. The first crop of hay was good, but there was no second crop. Potatoes a good crop, of good quality and keeping well.

Prices for most all farm products are high, but mill feeds are proportionately higher, and consequently there is not a large profit for the farmer who produces milk, pork and eggs.

Winter grain generally was sowed late, and on account of cold weather in October has made but small growth and is not in a good condition to go into winter.

The production of milk is somewhat less than a year ago.

MONMOUTH COUNTY.

OFFICERS FOR 1908.

<i>President</i> , JOHN H. DU BOIS	Freehold, R. F. D. No. 2
<i>Vice President</i> , D. HOWARD JONES	Freehold, R. F. D. No. 2
<i>Secretary</i> , D. AUGUSTUS VANDERVEER	Freehold
<i>Treasurer</i> , WM. M. MOREAU	Freehold, R. F. D. No. 4

REPORT

BY THE SECRETARY.

The board held two meetings during the year, the first on February 23d, 1907, at the court-house, Freehold. The reports of the delegates to the State board of agriculture and State Horticultural Society were read. Other topics discussed by the members were: "Growing of Corn," "Growing of Asparagus," "Growing of Rye," "Growing of Potatoes." The second meeting, held November 23d, 1907, was the annual meeting, at which the officers and delegates were elected for the ensuing year. Reports were read by the treasurer and directors. Topics discussed: "Method of Marketing Potatoes," "Judicious Use of Fertilizers." Institute meetings were held under the direction of the State board at Keyport, Red Bank and Matawan. The horticultural societies along the shore have held exhibits of flowers and plants. The five granges in the county have increased their membership, and also extended their business in buying and selling, thus saving in both ways. The season began with a cold, wet and backward spring with frosts until near the 1st of June. Potatoes were planted at about the usual time, but a great deal of corn and truck was late in getting planted, causing a delay of over two or three weeks in starting growth. Early in June, the weather changing to warm, growing condition, the tiller of the soil has been rewarded with bountiful harvests of most crops. The yield

has been large and quality fine, with the exception of small fruits, which were injured by late frosts. Prices have been good, and, altogether, the past season has been a most profitable one. Hay a good average yield of two tons per acre, and selling for \$19 to \$20 per ton. Corn a full crop, average yield sixty-six bushels of shelled corn per acre, price sixty-five cents. Wheat twenty-five bushels per acre, price \$1. Rye twenty bushels per acre, price eighty-five cents. Potatoes were fine in quality, with extra large yield, running from sixty barrels to over 150 barrels per acre—an average from twenty-five farms near Freehold of 125 barrels per acre, average price \$1.25 per barrel. Many of our best farmers make a specialty of growing potatoes; they procure their seed from New York State or Maine and use large quantities of commercial fertilizers—mostly home-made mixtures. The potato crop is the money crop of the farm where the soil is suitable and the grower has plenty of means. Sweet potatoes about one-half a crop, price \$3 per barrel. Apples and pears one-half a crop. Apples fine quality and high prices, making a profitable crop. Peaches a failure, yield 10 per cent; many trees killed by scale and injured by late frosts. Some new orchards are being planted of apples and peaches. Strawberries 75 per cent. of a crop, price ten cents a quart. Raspberries and blackberries one-half crop, winter killed, prices twelve cents a quart. Grapes full crop; not so many grown as formerly on account of low prices. Asparagus fair yield, good prices. Cranberries fair yield and price. Watermelons full crop, price \$20 per 100. Cucumber pickles full yield, sold for \$3 per barrel. Cabbages full yield, sold for \$4 per 100. Tomatoes full crop, average price thirty cents a basket. The number of horses and cattle about the same as last year. Cows \$5 per head lower, other cattle \$10 per head higher. Sheep, lambs and swine 25 per cent. less in number than last year. Pork one cent per pound higher. Turkeys same as last year, twenty-five cents a pound. Chickens 25 per cent. more than last year, twelve cents a pound. The milk business has not been very profitable, owing to the higher prices of feed-stuffs, cost of labor and the low price of milk the past year. The price of milk has been advanced lately to five and five and one-half cents per quart wholesale and eight to ten cents retail. There is a good demand for farms, and many have been sold to young men and persons from other States.

MORRIS COUNTY.

OFFICERS FOR 1908.

President, GEORGE E. FELCHFlorham Park
Secretary, W. F. ELYMadison
Treasurer, W. D. HOPPINGHanover

REPORT

BY THE SECRETARY.

The board has held two meetings the past year. One at the county hall in Morristown, on January 12th, 1907; much interest was shown and was very interesting in hearing the report given by Professor E. L. Dickerson as to the results of the different formulas used the past year and the different times of spraying, with the conclusions he had arrived at in visiting the different parts of the State the previous year. The report was such it left no doubt with all his hearers but that the scale could be checked and controlled if taken in hand in time and what orchards we had left saved.

The year just passed has seen thousands of our fruit trees taken out, having been ruined by the scale, which in some parts of Morris county seems to have gone beyond all control, and the trees left in such a condition that but one thing can be done, and that is to use the axe. Many took an interest in the start to destroy the scale, and the results seem to be that where this was done they seem to have confidence. It can from now on be controlled if the spraying is continued but a short time, and all seem to agree they are finding the fruit so much better that this alone would pay them to continue.

At the last annual meeting a very interesting time was had. One of the members who has sprayed for some years for better fruit (having no scale) and has had his fallen apples picked up to destroy the wormy apples, said of one kind he had, he had sold

288½ bushels for \$319.63, over one-half of which had been picked from the ground, as the heavy winds had caused them to fall, but these had run so fine that a commission house in Newark had sold some he had sent there for \$1.75 per bushel and fallen ones for \$1—sold as drops—which overrun the markets, as thousands of bushels were blown off by the wind this fall.

Other crops in Morris county the past year have disappointed many. In many places potatoes were of so little account that they were not dug. Here and there was a fair crop, but, on the whole, very poor, and many complaining of poor quality. Corn also has been a very light crop on the whole; in many fields the earliest corn was of no account either as corn or fodder.

As a general thing the farmers have had much to discourage them; the want of rain when needed, the scarcity of hired help, and of so little account when had, and with steamship runners on the other side of the water inducing the class of people we are now having come over under the expectation of receiving \$20 a month as greenhorns, not understanding one word of English or the work they are to do, and told they do not work but eight hours on a farm. One and all must give up if this is to be held up to induce our foreign labor to come. Many silos in some sections of the county have been built the last year or two, some farmers having more than one silo that will hold approximately 100 tons.

Many have given up making milk, and, on the other hand, many going into it more extensively and in a more scientific manner. Much better feed is used, a great many farmers now buying clover hay, paying over \$20 a ton by the carload lots. Bran, both wheat and buckwheat, beet pulp, corn and cottonseed meal, sprouts are now being bought by some by the carload, some making mixtures of five feeds, steaming the same, and finding they are making more milk, better milk and giving better satisfaction to their customers, getting eight and ten cents and no trouble in selling all they make, and much cleaner stables are now found than a few years ago. With the Drew manure conveyor many will hereafter clean twice a day; a few years ago many would neglect it for two or three days. We find cows now even clipped; before milking a man goes ahead with a brush and cleans down the udder, another comes with a cloth and pail of water and washes the udder and the teats, with the milkers each in a clean white suit, all utensils sterilized, must help to give us better milk.

OCEAN COUNTY.

OFFICERS FOR 1908.

President, C. MILTON RORERCassville
Vice President, P. DAVITTToms River
Secretary, R. C. GRAHAMHolmeson
Treasurer, H. R. WILLSToms River

REPORT

BY THE SECRETARY.

The Ocean county board of agriculture has been unfortunate in the selection of the days for the meetings, as the weather was unfavorable for a large attendance and they lacked the interest which usually is present at a good attendance, but the officers hope for a livelier interest in the future, as we have had a grange instituted with a good number of members which contemplate joining the board. We hope to bring the county board up so that it will be second to none in usefulness. Those attending these meetings get the benefits derived from the experience of others.

We want to extend the meetings to different parts of the county so as to get the farmers interested.

The beginning of the year did not look promising, but, when we come to balance accounts, we find no room for grumbling as the high prices made up for all deficiency. On the other hand, there is plenty of work and good wages for the laborer, and, with a full larder and good prospects, there is happiness in all families.

Stock looking well and no sickness reported. Winter grain looking good considering the late sowing, and gives promise of a good yield the coming year. Potato-growing is increasing in acreage each year, but the distance from railroad and market is a drawback, and makes the profit smaller than to those that are

near the same. A railroad, either electric or steam, from Trenton to this part of the seashore, would bring thousands of acres of **land under cultivation** which is capable of raising truck, hay and **grain**. The forest has been converted into lumber and charcoal; **it is now ready for the tiller of the soil.**

Cranberries seem to a paying crop where attention and good management is practiced.

PASSAIC COUNTY.

OFFICERS FOR 1908.

<i>President</i> , D. F. DUNCAN	Paterson, R. F. D. 1
<i>Vice President</i> , LEONARD PIKAART	Paterson
<i>Secretary</i> , AARON LAAUWE	Paterson, R. F. D. 1
<i>Treasurer</i> , F. T. TORBET	Paterson, R. F. D. 1

REPORT

BY THE SECRETARY.

The Passaic county board of agriculture held two meetings the past year. On March 27th the report of the delegates was received. On December 18th the officers and delegate for the year 1908 were elected. Although we have gained in membership during the year, we do not feel that we are strong enough to hold an institute, but are looking for better meetings next year.

Our granges are in a flourishing condition. Wayne township grange has 215 members, and Pompton Valley grange, organized last September, is gaining members very rapidly.

AGRICULTURAL CONDITION.

Our farmers have had a fairly prosperous year, although many of our crops were below the average, prices were very good. We have good markets—Paterson, with 130,000 inhabitants, and Newark being within driving distance; some of our largest truckers take their produce to New York City market.

Potatoes were not up to the average; dry weather in July and August cut the crop very short. Prices were good—\$2 and \$2.75 per barrel—good Jerseys selling, January 10th, ninety cents to \$1 per bushel.

Boiling corn for early crop was very short on account of drought, but the late crop was better and brought \$1 and \$1.75 per 100 ears.

Cabbage—Farmers who planted their late crop early got it started before the drought, and, when the rain did come, they grew fine and were free from insects and blight. Prices were good, \$4 per hundred head being the lowest price, Newark pickle factories paying \$14 per ton for all they could get.

Tomatoes were not an average crop, rot and blight were quite bad, forty cents per sixteen-quart basket being the average price.

Cucumbers were fair, with prices averaging about \$3 per barrel.

Carrots were good, price \$1.50 and \$2 per barrel.

Dairying is decreasing in this county, caused chiefly by the high price of feed and the scarcity of reliable help. This is to be regretted, as cattle-feeding and raising has always been the very foundation of successful agriculture. Price of milk is four and one-half cents per quart at the door, retailing in Paterson city from seven to nine cents.

Poultry for egg-production is on the increase; eggs are very high this winter, selling at five for twenty-five cents; that is the way the Passaic county farmer sells his eggs in Paterson, both wholesale and retail, the farmer allowing the huckster or grocer one egg when the eggs sell under eight for twenty-five cents, and two eggs when they sell over eight on the prevailing retail price.

SALEM COUNTY.

OFFICERS FOR 1908.

<i>President</i> , JOHN C. BORTON	
<i>Vice President</i> , SAMUEL H. MOORE	
<i>Secretary</i> , GEORGIE A. DUELL	Woodstown
<i>Treasurer</i> , JOEL BORTON	Woodstown

REPORT

BY THE SECRETARY.

The Salem county board of agriculture held three meetings during the year 1907. The papers read and the talks have been of special interest and advantage to the farmers, and many farmers have been benefited thereby.

While the year has been good for many farmers, yet the corn crop has not been up to the average; the late spring retarded planting and a high wind in September blew it down badly, so that very much of it has not matured properly, some farmers having left their entire crop in the field.

Farm help and the milk question are the two problems which the farmers of Salem county have to face the coming year. Some are reducing their dairies on account of the high price of feeds.

Our annual institute was held in December and was of special interest. The practical talk and dairy demonstration lecture by Mr. H. E. Cook at the dairy on the farm of Edgar C. Moore was much enjoyed by those present.

SOMERSET COUNTY.

OFFICERS FOR 1908.

President, A. A. CORTELYOUSomerville
Vice President, BERNARD MEYERFinderne
Secretary and Treasurer, ARTHUR P. SUTPHENSomerville

REPORT

BY THE SECRETARY.

This board held its fifteenth annual meeting, December 15th, 1906. The annual address of President Schenck was a masterly effort, taking for his subject "Farming in Somerset; Its Past, Present and Future." In it he presented the interesting development of farming in this county since 1688, its organization, quoting that part of the law passed by the legislative body of the province of East Jersey by which Somerset was set apart from Middlesex. It reads as follows: "Forasmuch as the uttermost part of Raritan river is settled by persons who in their husbandry and manuring their land forced upon quite different ways and methods from the other farmers and inhabitants of the county of Middlesex, because of the frequent floods that carry away their fences on their meadows, the only arable land they have, and so, by consequence, their interest is divided from the other inhabitants of said county," &c.

The judge then portrayed the primitive conditions then prevailing. The country was heavily wooded, most of the farmers owned slaves, primitive implements were used, and much hard labor was required in raising and gathering crops. He showed the gradual development of the agricultural interests since that time to the present day, and rehearsed the present-day advantages in machinery, intelligence, organized associations, education for

the business, short courses in agriculture at the State College. With progressiveness as the watchword the future success of the farmers of Somerset county will be insured.

This admirable address was well received and published in the county newspapers.

At this meeting we were favored with an address by Professor E. B. Voorhees on the subject, "Does Farming Pay? If Not, Why Not?" It was intensely interesting and instructive. The professor, born and raised among the hills of Somerset, seems to know what he is talking about, and our members think he does, and believe him. His addresses are, therefore, profitable.

At the meeting of February 16th, F. H. Castner, of Glen Gardner, talked on the subject, "Selection and Care of Breeding Stock, Hatching and Care of Young Chicks, Why It Pays to Breed Pure Stock."

The speaker, although not professing to be an orator, gave probably the best talk upon the subject ever presented before this board, being plain, interesting and comprehensive.

Mr. Castner is an intelligent, able and forcible speaker upon this subject, and we highly recommend him to other boards of this State.

The meeting of April 20th was addressed by Professor F. C. Minkler, of the Experiment Station, upon the subject of "Improving Corn and Live Stock," a timely topic intelligently presented and profitable to the members, whose appreciation was clearly manifested by the many questions asked the speaker, and the general discussion which followed.

The meeting of August 17th was not as largely attended as the former ones. Professor G. A. Billings, from the experimental station, gave an interesting and instructive address on the "Best Methods for the Production and Care of Commercial Milk," and was followed by discussion. Our meetings have been interesting and fairly well attended.

It is hoped that the young men, farmers' sons of Somerset county, will avail themselves of the splendid opportunity of taking the short courses in agriculture at New Brunswick.

It seems to us that it is an auspicious time to purchase farming land in this county. Considerable demand has been manifested, and many farms have been sold during the past year. Better

SOMERSET COUNTY.

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prices have been obtained, as our improved roads have created a larger demand.

Owing to a late, wet spring having delayed the putting in of crops, and a severe drought in the northern portion of the county the latter part of June, our farm crops are not up to the usual average; corn 20 per cent. below, oats not half the usual crop, wheat and rye a fair crop and hay nearly so.

Our fruit-growers have become discouraged, the scale having destroyed apples, peaches and plums. This pest, however, seems to be on the decrease, and our farmers will begin to plant fruit, and particularly peach trees, so that we may hope soon to be able to more than supply our home demand. All farm products and fruit have been in good demand, and good prices have been obtained. Wages are higher and laborers are becoming more inferior each year. The price of milk is higher than last year, the producer having received from three to four and one-half cents per quart, which retails at eight cents.

Our farmers and milkmen are generally in pretty good humor and little dissatisfaction is noticeable. We are all thankful to a kind Providence that our conditions are improving.

SUSSEX COUNTY.

OFFICERS FOR 1908.

President, THEODORE M. ROEBranchville
Vice President, F. R. DALRYMPLEBranchville
Secretary and Treasurer, GEO. A. DICKERSONBeemerville

REPORT

BY THE SECRETARY.

The officers named were chosen for the ensuing year at the annual business meeting of the board, held at Branchville in January, 1908. Although the meetings of the board have not been very well attended during the year, at this time the interest seems much stronger.

The year of 1907 has been one of varying conditions for our farmers; starting in with a very cold, wet and late spring, delaying spring plowing and seeding to such an extent that, with the scarcity of help, many farmers were unable to work as much ground as usual.

The acreage of corn was much smaller than in previous years, and, on account of lateness in planting and slow growth, owing to unfavorable conditions, the crop was poor, and, in many cases, a failure.

The grain that did mature is of inferior quality. The fall, too, was so rainy that corn fodder did not cure out so it could be stacked, but had to stand in shocks until needed for the stock.

On the other hand, the hay crop was the largest in years. The spring being favorable for a heavy growth, and after the growing season was over, the drought set in, during which the large crop was gathered with but very little damage.

Oats, rye and wheat were good crops. Very little buckwheat was sown, chiefly because of the lateness of the season, leaving no

time between corn-tending and haying in which to prepare the ground, but those who did sow it reported a good yield. The growing of this grain is on the decline in this county, owing to the fact that much of the land once used for this purpose was, a few years since, set with peach trees and cultivated and fertilized as orchards; now, when the trees are taken out, the owners find the land capable of yielding good crops of corn, grass, &c. Hence, instead of buckwheat being one of the regular crops, it is now only an occasional or catch crop.

Potatoes were a fair crop of good size and quality. Apples were not so large a yield as in some years, but the fruit was of better size and quality. Good prices have been realized for them.

The production of milk continues to be the principal issue throughout the county. The board of health inspection last spring affected the flooring of a large number of hay-mows over the cow stables, also providing for more light and ventilation, as well as whitewashing and cleaning up in general. It also was the means of starting what is called the dairymen's league, which, when perfected, will give the farmers a voice in the sale of the product, the income of which amounts to more than that of all others combined, a privilege of which they are now entirely without.

Some, heretofore engaged in dairying, thinking the requirements more than they could comply with and with feeds so high priced, have sold their milch cows. Such cows, as well as those brought in by drovers, sold very high during the fall, prices ranging from \$50 to \$90 for good-grade Holstein cows.

A few more horses are being raised on our farms than last year and of a better stock.

Pork production is slightly increased.

Poultry about the same as last year, although the prices for both fowls and eggs have been lower than last year.

UNION COUNTY.

OFFICERS FOR 1908.

<i>President</i> , EDWIN R. COLLINS	Westfield
<i>Vice President</i> , E. P. BEEBE.....	Elizabeth
<i>Secretary</i> , CHARLES H. BREWER,	Rahway, R. F. D. 2
<i>Treasurer</i> , OGDEN WOODRUFF	Elizabeth

REPORT

BY THE SECRETARY.

The annual meeting of the board was held December 19th and was well attended. The secretary reported an increase in membership. During the year eight meetings were held and some of the subjects discussed were: "Fruit Growing," "Pruning of Fruit Trees and Vines," "Potato Growing" and "Fertilizers." Instructive addresses were made by different persons on the subjects. Leading fruit-growers of the county report the disappearance of the San José scale. Fruit crops throughout the county, with the exception of grapes and apples, were light. Strawberries were the best crop among the small fruits. Peaches very scarce. Keiffer pears gave promise of a full crop, but dropped heavily, caused by a late frost. Raspberry and blackberry canes mostly winter-killed and crop very light, thus the fruit industry in the county was considerably below the average; however, present prospects for the coming season are good, and with more favorable climatic conditions we will soon be in line again. The past season has been one of extremes, starting in with a cold, backward spring. All crops made a slow start, and when they did get to growing well a period of drought reduced yields. Prices for all produce, however, have been good and agricultural pursuits have turned out fairly well. Help of all kinds has been hard to get at any price, and unless conditions change farmers and truckers will have to

cut down their acreage. This I believe, however, may be done without loss, by giving better attention and fertilization to less acres and the production of double the yield by a succession of crops upon the same soil. The question of commercial fertilizers is a broad one, just how much to use per acre, when and how to apply same to secure best results with the various crops grown upon the different soils, must be studied out by the farmer and trucker to meet prevailing conditions.

The good housewife in making her bread must have certain conditions in order that the yeast can properly do its work and thus make good bread. The same with our soils, which must be in a proper condition to take up and make available the fertilizers applied for the growth of the plants. Our soils lack humus, decaying vegetable matter, to lighten the soil, conserve moisture, and give better circulation for the air and sun in order to obtain best results from plant-foods applied, and to promote a healthy and vigorous growth of plants.

Some experiments are being made with cow peas. Alfalfa has been sown in two or three localities, and, I believe, with promise of success. Farmers should experiment along these lines, as each year finds the cities reaching out farther and farther, and with their expansion there will be a larger market for farm produce and a less amount of land to produce it upon. The opportunities for the fruit-grower, trucker and farmer are to-day better than ever before, and with the help of our experiment stations, institutes and agricultural societies he should obtain a knowledge that will, if carried out, insure success in whatever branch of farming he may follow. The dairy business has decreased somewhat throughout the county the past year. Lack of help with high prices of feed are said to be partly responsible for that condition. Farmers should give more attention to the poultry business, as the demand from the villages and cities for fresh eggs and chickens is large, and good prices can always be obtained for strictly fresh stock.

WARREN COUNTY.

OFFICERS FOR 1908.

President, SAMUEL REEDMount Hermon
Vice President, NICODEMUS WARNEBroadway
Secretary, WM. EUGENE OBERLYAsbury
Treasurer, JOHN ALBERTSONDelaware

REPORT

BY THE SECRETARY.

The county board of agriculture has held three meetings during the year. At our June meeting Professor Minkler gave us an address on stock raising in general. It was very interesting and enjoyed by all present.

This year has been more prosperous for farmers in this section than last year; crops were fairly good, except corn; realizing good prices for all kinds of grain. Oats, fifty-five and sixty cents a bushel; corn, seventy cents; wheat, \$1, and rye, eighty-five cents. Hay crop was fair and a good price for prime timothy hay.

Potatoes a good yield, with very little rot, except those that were dug after the heavy rains; price, eighty cents per bushel.

Milk has been a good price for the whole year. Farmers are becoming more interested in the building of silos.

The apple crop was poor, hardly enough fruit for home consumption.

The prices of horses and cattle, in fact all kinds of stock, are higher this spring than last; there seems to be as many for sale, but higher prices prevail. Dealers from this section have gone west to purchase horses and have returned with only half a carload, filling the car with cattle, claiming they were unable to buy, as prices were too high to obtain any profit.

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