

MEMBERS OF THE NEW JERSEY STATE BOARD OF AGRICULTURE. 1902.

Picture taken by W. G. Johnston, Esq., of the "American Agriculturist."

STATE OF NEW JERSEY.

Twenty-Ninth Annual Report

OF THE

State Board of Agriculture

1901

NEW JERSEY STATE LIBRARY

Printed by Order of the Legislature.

TRENTON, N. J.:

MACCRELLISH & QUIGLEY, STATE PRINTERS, OPPOSITE POST OFFICE.

1902.

To the Hon. Foster M. Voorhees, Governor of New Jersey:

SIR—In accordance with the act creating the State Board of Agriculture, adopted April 22, 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 1901.

FRANKLIN DYE,

Secretary.

Dated Trenton, November 25th, 1901.

State Board of Agriculture.

OFFICERS FOR 1902.

PRESIDENT.

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

VICE-PRESIDENT.

JOHN T. COX,.....Readington.

TREASURER.

WILLIAM R. LIPPINCOTT,.....Moorestown.

SECRETARY.

FRANKLIN DYE,Trenton.

EXECUTIVE COMMITTEE.

WALTER HERITAGE,Mickleton.

H. V. M. DENNIS,.....Freehold.

WM. H. ROGERS,.....Plainfield.

WITH ALSO

THE PRESIDENT, VICE-PRESIDENT, SECRETARY AND TREASURER.

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.

TWENTY-NINTH ANNUAL MEETING

OF THE

New Jersey State Board of Agriculture

HELD IN THE

State House, Trenton, N. J.

Wednesday, Thursday and Friday, January 15th, 16th and 17th,

1902.

BOARD OF DIRECTORS

New Jersey State Board of Agriculture.

1902.

Term of office, one year, dating from January 1st, 1902, to January 31st, 1902, for all except County Board Directors.

CLASS A.

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

CLASS B.

GEORGE W. F. GAUNT, Master of State Grange, P. of H.
M. D. DICKINSON, Secretary of State Grange, P. of H.

CLASS C.

D. AUG. VANDERVEER, State Horticultural Society.
CHAS. B. JESSUP, Burlington County Pomona Grange.
JACKSON HYER, Central District Pomona Grange.
A. CLARK GARDINER, Gloucester County Pomona Grange.
E. M. HEATH, Hunterdon County Pomona Grange.
A. D. BURT, Salem County Pomona Grange.
GEORGE CARHART, Warren County Pomona Grange.
JOSEPH EVANS, American Cranberry Growers' Association.
JOSEPH J. WHITE, American Cranberry Growers' Association.

BOARD OF DIRECTORS.

BOARD OF DIRECTORS.

NAME.	ADDRESS.	TERM.	COUNTY.
L. H. PARKHURST,	Hammonton,	2 years, . . .	Atlantic.
V. P. HOFMANN,	Egg Harbor City,	1 year, . . .	"
MALCOLM H. ANGELL, . .	Etna,	2 years, . . .	Bergen.
SAM'L R. DEMAREST, JR.,	Hackensack,	1 year, . . .	"
GEO. L. GILLINGHAM, . .	Moorestown,	2 years, . . .	Burlington.
CLAYTON ANDREWS, . . .	Moorestown,	1 year, . . .	"
R. COOPER MORGAN, . . .	Blackwood,	2 years, . . .	Camden.
BENJAMIN WILLIAMS, . .	Blackwood,	1 year, . . .	"
JOSEPH W. PINCUS, . . .	Woodbine,	2 years, . . .	Cape May.
VOLNEY VAN GILDER, . .	Ocean View,	1 year, . . .	"
W. S. BONHAM,	Shiloh,	2 years, . . .	Cumberland.
A. W. ONTHANK,	Vineland,	1 year, . . .	"
J. B. ROGERS,	Newark,	2 years, . . .	Essex.
S. H. BURNETT,	Chatham,	1 year, . . .	"
THEODORE BROWN, . . .	Swedesboro,	2 years, . . .	Gloucester.
ASA MOORE,	Mullica Hill,	1 year, . . .	"
WILLIAM DUBON,	Pittstown,	2 years, . . .	Hunterdon.
H. F. BODINE,	Locktown,	1 year, . . .	"
SAMUEL B. KETCHAM, . .	Pennington,	2 years, . . .	Mercer.
JOHN M. DALRYMPLE, . .	Hopewell,	1 year, . . .	"
WM. FITZ RANDOLPH, . .	New Market,	2 years, . . .	Middlesex.
DAVID J. PERRINE, . . .	New Brunswick,	1 year, . . .	"
E. A. SEXSMITH,	Wall,	2 years, . . .	Monmouth.
D. D. DENISE,	Freehold,	1 year, . . .	"
W. B. LINDSLEY,	New Vernon,	2 years, . . .	Morris.
S. E. YOUNG,	Afton,	1 year, . . .	"
CHAS. M. RORER,	Cassville,	2 years, . . .	Ocean.
H. R. WILLS,	Toms River,	1 year, . . .	"
CLARK FLITCRAFT, . . .	Woodstown,	2 years, . . .	Salem.
JOEL BORTON,	Woodstown,	1 year, . . .	"
HENRY S. VAN NUYS, JR.	Millstone,	2 years, . . .	Somerset.
WM. H. ROGERS,	Plainfield,	1 year, . . .	"
B. K. JONES,	Beaver Run,	2 years, . . .	Sussex.
E. C. ROE,	Unionville, N. Y.	1 year, . . .	"
OGDEN WOODRUFF, . . .	Elizabeth,	2 years, . . .	Union.
F. E. WOODRUFF,	Cranford,	1 year, . . .	"
HENRY PURSELL,	Phillipsburg,	2 years, . . .	Warren.
JOHN H. ALBERTSON, . .	Delaware,	1 year, . . .	"

OTHER ASSOCIATIONS.

ISAAC S. CRANE,	State Dairy Union.
J. M. LIPPINCOTT,	State Dairy Union.
W. H. GULICK,	Kingston. Princeton Agricultural Association.
FRANK W. STOUT,	Kingston. Princeton Agricultural Association.
JOSHUA HOLLINGSHEAD, .	Mt. Laurel Farmers' Club.
J. H. M. COOK,	Bee-Keepers' Association.

BOARD OF DIRECTORS.

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The Committee on Credentials reported, January 17th, that each organization entitled to representation has a delegate or delegates present except the Warren County Grange. Several of the organizations are represented by but one delegate when they have the privilege of two.

M. D. DICKINSON,
JESSE B. ROGERS,
HENRY W. PURSELL,
Committee.

STATE BOARD OF AGRICULTURE.

Twenty-ninth Annual Meeting.

TRENTON, N. J., January 15, 1902.

At 10:30 A. M., in the absence of the President, the Secretary called the meeting to order and stated that the President, Dr. E. B. Voorhees, was sick, and his physician has forbidden him to go out. Under the circumstances, therefore, it will devolve upon our Vice-President, Mr. John T. Cox, to take the chair, and I ask Mr. Cox now to come forward.

Mr. Cox—Gentlemen of the State Board of Agriculture, unexpectedly I am called upon to preside over your deliberations this morning. I ask from you and each of you your indulgence, your assistance and your sympathy, feeling assured that with them added to my own efforts we will conduct the meetings of this Board with pleasure and satisfaction to all.

In the performance of my duty I will now call upon the Rev. Dr. Brooks, of the Prospect Street Presbyterian Church, Trenton, to open this meeting with prayer.

The President then announced the members of the Committee on Credentials, viz.: Mr. M. D. Dickinson, of Salem county; Mr. J. B. Rogers, of Essex county; Mr. Henry Pursell, of Warren county:

The Secretary then called the roll, and the following named gentlemen answered. (See report of Committee.)

The President—The next in order is the presentation of the Order of Business as prepared by the Secretary for your approval.

The Secretary—Gentlemen, before you act upon the Order of Business I wish to say that in the fourth session, to-morrow morning, as you will see on the third page, at the hour of eleven

o'clock, we were to have Dr. Currier. I received a letter from his son and his wife three or four days ago stating that he had returned from the South sick, and they did not think it prudent for him to take so long a journey and attempt to lecture, which they regretted exceedingly. Immediately on that information I wrote to Dr. True, of the National Experiment Station Bureau, asking him to come and give us an address on the "Progress of Agricultural Education." Dr. True has signified his intention of being with us at that hour.

So far as I know there are no other changes in the program, and if that meets with your approval it is ready for your adoption.

The program was adopted with the amendment proposed by the Secretary as the Order of Business of this session.

ORDER OF BUSINESS.

WEDNESDAY.

10:30 A. M.—12:30 P. M.

Prayer.

Calling Roll of Delegates.

Presenting Order of Business.

Minutes of Last Meeting.

Announcing of Committees appointed.

On Credentials.

On Resolutions.

11:00 A. M.

Reading of Executive Committee's Report.

Report of State Grange.

GEORGE W. F. GAUNT, W. M.

Report of Secretary of State Board.

12:00 M.

Report of Treasurer.

Introduction of Other Business.

Second Session.

2:30-5:30 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.

3:00 P. M.

Address and discussion of Horticultural questions. Conducted by Prof. H. E. Van Deman, late U. S. Pomologist, Washington, D. C.

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Third Session.

7:15 P. M.

"Reserve Forces in Plants," Illustrated with pictures.

By DR. BYRON D. HALSTED, State Horticulturist, New Brunswick, N. J.

8:00 P. M.

"The Mosquito Pest, and how it may be abated." Illustrated with fifty or more lantern views.

By DR. JOHN B. SMITH, State Entomologist, New Brunswick, N. J.

THURSDAY.

Fourth Session.

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

Prayer.

Unfinished and New Business.

10:15 A. M.

Address of President of the Board.

DR. E. B. VOORHEES.

11:00 A. M.

"Natural Laws Governing the Horse, and the Duty of Horse Owners in relation thereto." Illustrated by charts, &c.

By DR. J. C. CURRIER, Assistant Superintendent Farmers' Institute, Minnesota. (See Minutes.)

12:15 P. M.

Report of Tuberculosis Commission.

Fifth Session.

2:30-5:30 P. M.

"The Relation of the Live Stock Industry to New Jersey."

By PROF. THOMAS F. HUNT, Dean of the College of Agriculture, Columbus, Ohio.

3:30 P. M.

"Breeding the Dairy Cow."

By EDWARD VAN ALSTYNE, Superintendent Dairy Tests, &c., Pan-American Exposition.

Sixth Session.

7:45 P. M.

"Porto Rico—The Island and the People."

By MAJOR GEORGE G. GROFF, M. D., late Superintendent of Public Instruction in Porto Rico.

NOTE—This lecture will be given in the Auditorium of the State Normal School, and will be profusely illustrated with colored slides.

FRIDAY.

Seventh Session.

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

Prayer.

Unfinished Business.

10:00 A. M.

Report of State Entomologist.

DR. JOHN B. SMITH, New Brunswick, N. J.

10:30 A. M.

Discussion of topics handed in by the County Boards and Granges, with such other questions as may properly come before the Board.

12:00 M.

Closing the business of the session and adjournment.

The reading of the minutes of the last meeting, which have been printed, was dispensed with.

The Chairman then appointed the following committees:

Committee on Resolutions—Samuel R. Demarest, Jr., of Bergen; George W. F. Gaunt, of Gloucester; E. M. Heath, of Hunterdon.

Committee on drafting resolutions touching upon the death of ex-Governor William A. Newell, a former President of this Board—Hon. D. D. Denise, Emmor Roberts, Charles M. Rorer.

The Executive Committee's report was then read by the Secretary as follows:

REPORT OF EXECUTIVE COMMITTEE.

Your Executive Committee in conducting the work of the Board since the last Annual Meeting have met from time to time as the business seemed to require.

On February 25th the Committee considered the matters referred to them at the last Annual Meeting. The resolution relating to the carrying of freights on trolley or electric railways having no instructions accompanying it, it was decided to embody the action of the Board within the Minutes of the Annual Meeting for publication and to assist in such legislation should a bill be presented.

The resolution referring to a short course in agriculture received favorable consideration, was endorsed by the Committee

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and such action was taken as would best promote the object sought. Resolution referring to adulteration of paris green was referred to State Entomologist, whose explanation showed that no legislation could be reasonably asked, owing to the unpreventable variations in the manufacture of the green.

The resolution referring to the Dairy Commissioner's powers and the ingredients used for the preservation of milk, the Committee considered the points indicated, covered in Assembly Bill No. 93; the Committee favored its passage.

Considering the services of Mr. D. D. Denise, in behalf of the farmers of New Jersey and his work to advance the agricultural and horticultural interests, the Committee adopted the following resolutions, which they present as a part of this report:

WHEREAS, The Hon. D. D. Denise has rendered long-continued and faithful service in the interest of agriculture for the farmers of New Jersey, both as a member of the Board of Visitors of the State Agricultural College and Experiment Station for ten years, during which time those institutions have been strengthened and their efficiency increased through his assistance; as a member of the State Legislature, during which time he secured the enactment of a number of laws of great value to the farming interests; and as a member of the Executive Committee, Treasurer and President of the State Board of Agriculture for fifteen years—the last six as President—during which time the membership, usefulness and popularity of the Board have been decidedly increased; therefore,

Resolved, I. That the Executive Committee of this Board do hereby express their recognition and appreciation of the services of Mr. Denise in behalf of the farmers and of the agricultural interests of New Jersey, as stated in the foregoing preamble.

Resolved, II. That we record our appreciation of Mr. Denise as a member of the Executive Committee and as its presiding officer. His desire always was to have a full expression of every member on all matters coming before the Committee for consideration of interest to the farmers of the State, and his rulings were considerate and just.

Resolved, III. Notwithstanding Mr. Denise is now *ex-officio* to the Board, it is our earnest desire that he will continue his active interest in its progress and usefulness.

In view of the possibility of an appropriation being made by the Legislature whereby the agricultural and horticultural interests of the State could be represented at the Pan-American Exposition, the Committee resolved that they would co-operate with the State Commissioners in the preparation of a creditable

exhibit, provided the funds necessary for such purpose be placed to their credit before the work shall be entered upon.

The Committee estimated \$12,000 as the necessary sum to make a creditable showing in the two departments named. The Committee were unanimous in the opinion that the Hand-Book prepared by the Secretary of the State Board of Agriculture and distributed at the Columbian Exposition at Chicago should be revised, enlarged and printed, so as to advertise the agricultural and horticultural interests of New Jersey, and be circulated at the exposition.

Under the law creating the office of State Entomologist, Insect Commissioners were appointed for Atlantic, Monmouth, Ocean, Hudson, Middlesex and Salem counties.

A resolution was adopted that Professor Smith, as State Entomologist, be authorized to prepare, from his collection of insects of New Jersey, an exhibit, to be placed in boxes furnished by the State Museum Commissioners, to be deposited in the State Museum at the State House, Trenton, the same to be the property of the State Board of Agriculture.

The Vice-President and Secretary were designated to look after legislative matters.

At their meeting March 6th the Committee heard a draft of bill to establish a short course in agriculture at the Agricultural College as presented by President Voorhees. The Committee, after due consideration, decided it would do better to lay this matter over to the next session of the Legislature, when it would be more likely to have the support of the agricultural community.

As the subject of agricultural education is to be treated at this Annual Meeting, it is for the Board to decide what action shall be taken in this matter.

The Committee took action deferring payment of expense bills of delegates to the last day's session, believing it to be the duty of paid delegates to attend to the business of the Board until the adjournment, and directed the Secretary to print such notice on program.

The Joint Committees of the State Board of Agriculture and the State Horticultural Society having decided that if only \$5,000 is set over to the use of the State Board of Agriculture

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and the State Horticultural Society for the purpose of making an exhibit at Buffalo, that the State Board of Agriculture only make such an exhibit, the sum deemed to be inadequate for both.

The Executive Committee, on motion, appointed Franklin Dye to attend to the collecting, preparing, setting up and supervising of the exhibit at the Pan-American Exposition and to have general charge thereof as superintendent.

March 26th, Secretary reported he had engaged Prof. H. E. Van Deman to address the Board at next Annual Meeting and to base his address on questions furnished by the agricultural organizations of the State. The Committee also decided that time during the last day of the session be given to the discussion of such general agricultural subjects as the farmers desired to present. To cover the two points named, the following letter was sent to the Secretary of each County Board of Agriculture, in the hope of receiving, fresh from the field, such items for discussion by Professor Van Deman and at the special session as would be of interest to those urging such session:

DEAR SIR—By direction of the Executive Committee of the State Board of Agriculture, I write to your organization, through you as Secretary, suggesting that you prepare from one to three questions on some important phase of Horticulture, Dairy and General Farming, to be submitted for consideration at the next Annual Meeting.

These questions should be carefully considered and should have a practical bearing on the subjects indicated. Should your society send one or more such question, they, with others received, will be referred to a committee for classification, and such as may be deemed of sufficient importance by the Executive Committee will be presented at the Annual Meeting for discussion.

The desire of the Executive Committee is, by this course, to treat these subjects with reference to their local as well as to their more general importance. The questions should be carefully stated and plainly written, and be sent to this office by December 1st next.

Respectfully yours,

FRANKLIN DYE, *Secretary.*

But two counties responded to this letter, Middlesex sending one question and Warren three.

Complying with a request of the Secretary, President Voorhees was appointed to consult with the Secretary in relation to the construction of a pavilion at the Pan-American Exposition,

and, in general, to co-operate in the affairs connected with that undertaking.

One meeting of the Committee was held in Buffalo, N. Y., July 18th, for the purpose of inspecting the New Jersey pavilion, the exhibits, etc. After a visit of inspection and comparison with other exhibits, the Committee approved and accepted the pavilion and exhibit as collected, prepared and set up, giving it their unanimous endorsement.

Early in September the Committee met, by invitation, at the home of the Treasurer, chiefly for the purpose of examining the County Board reports and to make the usual appropriations to the several Boards.

The Treasurer's report shows the sums set over to the several counties to aid them in their local work and to compensate the secretaries, or whoever may be designated to write their annual report to this State Board.

The Committee at this meeting directed the Secretary to make special inquiry of the County Secretaries as to the extent of the canning industry—number of packing houses, total pack and acreage; also the number of silos. Of fourteen reports received up to January 10th, 1902, only four noticed the above questions so far as the county is concerned. One part of the work of the County Boards and their Secretaries is to co-operate with the State Board in securing valuable and *timely* information concerning the conditions of agriculture and crop prospects from year to year throughout the State.

By failing to answer such questions, as far as possible, and to assist the Executive Committee and the Secretary of the State Board in this way, one object of the law encouraging the formation of County Boards is defeated, and your Executive Committee most earnestly urge County Board members and officers to take a new interest in this matter, otherwise they will fail to fulfill the purpose for which they were created.

October 25th, Committee met to close up the accounts for the fiscal year ending with the 31st of that month. This was done and the accounts of the Board were presented and accepted by the State Comptroller. At this meeting Dr. Voorhees, as Director of the State Agricultural Experiment Station, filed

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with the Secretary of the Board, as required by law, report of the violations of the concentrated food stuffs law during the past fiscal year and the analyses made by the Station.

The last meeting held by the Committee was held January 14th, 1902, when the usual matters received attention. Committees were appointed and arrangements made for this Annual Meeting.

Farmers' Institutes.

The Executive Committee authorized the Secretary to arrange for Farmers' Institutes in such localities as seemed to be sufficiently interested to warrant the expense. A list of these was published in October, 1901. Up to the date of this report twenty-four Institutes have been held, including seventy-eight sessions. Other meetings are advertised and some yet to be arranged for.

It is very desirable that farmers should take an active co-operating interest in these meetings. Agriculture to be successful must be progressive. Resting in present attainments will not secure highest results; therefore it behooves farmers to lay hold of all available scientific and practical knowledge.

The Farmers' Institute affords one such opportunity. It should be the ambition and pride of each locality, where it is possible to hold an Institute, to make their meeting one of the best in numbers and interest. It is the hope of your Executive Committee that a deeper and more general interest will be manifested by the farmers of New Jersey in all that contributes to more intelligent practice in all agricultural matters.

Doctor Newell's Death.

Since this Board met one year ago Dr. William A. Newell, ex-Governor of New Jersey and the second President of this Board, has passed away. It is fitting this Board should take some action in relation to his life and official connection with this Board. We have requested our President to appoint a committee to bring in a suitable minute for your action.

Gentlemen of the Board, your Committee have endeavored faithfully and honestly to perform the duties assigned to them by you. We now submit program of subjects for your consideration during these sessions, with the names and speakers engaged to open the discussions. We trust this meeting will not be behind any of its predecessors in interest and practical value, and that you will all return to your homes feeling you have been paid for being here.

On motion, report was received and referred for publication in the proceedings.

The report of the State Grange was then presented by the Worthy Master, George W. F. Gaunt, which was, on motion, received as a part of the proceedings for publication. (See Report.)

A delegate from the Princeton Agricultural Association was, on motion, admitted to representation in the Board.

The President—The next matter of business is the report of the Secretary of the State Board.

The Secretary, before reading his report, said:

"It is not an easy matter to write a report that shall be fair to all parts of the State, not detracting from prosperity or progress and yet not setting it out in too glowing a light lest some will say, 'Oh, you set New Jersey agriculture in too high a position altogether as to prosperity.' It is also to be remembered that the greater part of this was written for the Governor, in order that he might have some idea of what the departments are doing.

"Reports of crop conditions and yields throughout the State of New Jersey are far from comprehensive, owing to the lack of properly organized and efficient system of collecting and reporting. I am satisfied that we have got to take hold of that question if we are going to do the work as it ought to be done, and I want to call attention to it."

The report was then read, and, on motion, received and made a part of the proceedings, with the understanding that any alterations in the acreage and condition of crops as found in the report

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be referred to the Executive Committee for consideration. (See Report.)

The President—The statistical report of the Secretary will be revised by the Executive Committee.

Mr. Denise—Mr. Chairman, the President of our Board is not present with us to-day, and I am informed that he is quite sick, and I think it might be well for this Board to send a telegram to him expressing our sympathy; and I move you, sir, that such a telegram be sent and that the Secretary be authorized to send it. (This motion was duly seconded and unanimously carried.)

The Treasurer then read his report, which was referred to an auditing committee to be appointed, who should examine the accounts of the Treasurer and report later.

TREASURER'S REPORT FOR THE YEAR ENDING OCTOBER 31ST, 1901.

1901.

Dr.

To amount received from Comptroller,..... \$4,364 90

Cr.

Jan. 16, 17, 18.	By Delegates' expenses to Annual Meeting,	\$327 94
	Speakers and expenses,.....	335 04
	Hotel bill of speakers and Executive Committee,	57 58
	Stenographer at Annual Meeting,....	125 50
	Lantern service and janitor,.....	31 00
Sept. 18.	Express bills,	140 71
	Appropriation to County Boards,....	660 00
	Appro. to Horticultural Society,....	300 00
	Executive Committee's expenses,....	415 70
	Treasurer's salary,	100 00
	Stamps,	62 05
	Expended on Institutes,.....	1,809 38
		<hr/> \$4,364 90

The President then appointed as Auditing Committee Walter Heritage, H. F. Bodine, Wm. Fitz Randolph.

The President—The introduction of other business is now in order. If any member of the Board has any other business to introduce, we should be glad to hear it at this time.

The Secretary—Mr. Chairman, it is unfortunate, I think, that the Executive Committee's report—I do not say anything about

my own—does not get into the hands of the Board immediately, so that any point that they may suggest for discussion as of importance to the farmers may be taken up at once and discussed. It ought to be done. They are the executive of the Board, and are expected to watch over those matters which are of interest to the farmers. Such consideration would, I believe, increase the usefulness of this Board.

I think we might properly, if it meets with approval, discuss for a little while that question of Farm Help. Let the members tell us what the conditions are in their several localities and what we can do to improve the condition, if anything. Or must farmers give up the business and go out of agricultural work because of the scarcity of help? Some of our brothers from Gloucester county are employing, I believe, colored help from the South. How does it work down there?

Mr. Brown—I would say, Mr. President, that good help is getting scarcer than it has been. We get considerable that is not good. There seems to have been more of a scarcity of help this last year than before. Some of us have hired Italians. In the tomato-picking and asparagus-cutting season they seem to help out very well. I don't know how extensively that will be done next year, but very likely we will have to employ more Italians for the extra work.

Mr. Roberts—Are there any who employ Italians who report as to their adaptability as team-drivers? I do not remember seeing an Italian driving a team, and I don't know whether they can be used for that purpose.

Dr. Ward—I had a number of Italians employed for several years, and found them very poor team-drivers. They don't seem to get the knack of handling horses, although in the vicinity of Newark there are many contractors who are Italians, and Italians are drivers of these contractors' teams. But as drivers for farm teams working on a farm, they seem to lack the knack of handling teams there. And I also think they are very unreliable, although I have had them for a number of years for my main help. During my visit the past summer to Buffalo I found that during my absence somebody else had hired some of my men, offering them a little better inducements than I

had been giving, and, notwithstanding my absence, three of them left. I came home, and the week following we came into that damp weather and my hay suffered.

Now, to show the ingratitude. Three of those men had been with me four years. Every Saturday night they had their money, and yet, after all, during my absence, they took occasion to leave in that way.

Unfortunately for them, they did not like their new places; they found it was harder work, and two weeks after I returned three of them came back, but I sent them away. And since then the three men have been back I suppose about a half dozen times, but I think where the men leave in that way the safest way is to keep them away. They are unreliable, that is the trouble with Italians. They are good workers if you are right over them all the time. That has been my experience.

Mr. Gratz—Mr. President, I will tell you the reason why you all have trouble to obtain good help upon the farm that have been reared on the farm; my impression is that they have to work longer hours and have harder work with less pay than is given for any other kind of employment.

Mr. Denise—I only employ American help. I have never employed any other kind of help. Perhaps I am a little better situated than most farmers. My farm is near a town, and it does not seem so difficult to get men to work out on the farm when that is the case. I have never had any difficulty in getting help. The greatest difficulty I have to contend with is that they drink too much. To-day you may have a dozen and to-morrow not over eight. But, so far as Italians are concerned, I don't think there is anybody in our locality that employs them. The Southern colored people are employed out in the country quite a good deal, and they are fair help. And with us the farmers now-a-days don't seem to want to employ very much help in the winter season, and that just suits these Southern colored people. They want to go back to the South and spend the winter months down there. They don't like the cold weather here in the North, and, as the farmers have not much use for them in the winter, both are suited.

The Secretary—Do they earn enough to spend the winter down there?

Mr. Denise—Yes, I think they can live more cheaply down there; that is about the chief advantage. The canning industry with us has grown to such large proportions that it employs nearly all the available help. I suppose we have got probably one of the largest canning establishments there is in the State. That firm has rented I think about eighteen hundred acres of land this year and devoted it entirely to peas and beans. They will grow two crops on some of it, which will make the total acreage about twenty-five to twenty-eight hundred acres a year. That demand makes help a little scarce with us. I tell you, when you want help, pay the wages and you will get it all the time. When I want help and want the work done, if I cannot get them for less than \$1.50 per day I will pay it. But, of course, like everybody else, I am going to get it just as reasonable as I can. But you must hire help, and you can afford to pay a little more for better help; you will find it cheaper.

Mr. Evans—Mr. Chairman, if the farmers will take care of their help and try to furnish them employment as much as possible in the winter—and there is a great deal of work about the farm that could be done in the winter time that is really done in the summer—and by employing married men and providing comfortable quarters for them, we will remove a great deal of this trouble. I have followed that plan for the past twenty-five years, and have never had any trouble with help. Some employers complain that I pay about ten cents a day more than they do, but I consider that I get good men, worth more than double that difference. Then I arrange my work so there is something to do in the winter time and in stormy weather. Another thing, I think an effort ought to be made to have them get their meals at home; let their wives prepare their meals for them. That relieves the farmer's wife and it works a great deal better. All these things go a long ways towards making it comfortable and desirable for laboring men to live in the country.

Mr. Sexsmith—This question of help is vital to the farmers in our neighborhood. We have had some trouble there, and it is due, perhaps, to a great extent to the fact that my home is within

two miles of the seashore and there is a great deal of business there in the summer. A young fellow who is bright can go there for two or three months and get better prices than we can pay, and our help leave their places with us and become unreliable for farm work.

I have been hiring American help; my home is near New York, and that has been a sort of a source of supply; some young fellows there I used to know are very glad to come down for the summer and get in a new neighborhood and new life. I have to pay high prices, but I find up to the last two years I have been able to get them.

I have looked up this help matter quite extensively. In the last year I made myself acquainted with some market gardeners out on Long Island and saw what they were doing. One gentleman out near Flushing employs about fourteen men. He employs Poles or Polanders, and, really, it is admirable to see those men work. He says he has no trouble with them whatever. He has given up both Italians and Germans; of the latter he says they drink too much; the Polanders do not drink. He employs these men at \$1.00 to \$1.25 a day and they board themselves. They work long hours and are satisfactory. I cannot get men to do the work they do.

But his situation is all right; he can hire those men by the year, and, as they have their families with them and live there, they are contented. He referred me to the intelligence office where he got his help in New York. He seemed to think that the help problem was not a serious thing. He said he would not hire American help. "Next spring, if you want help, put yourself in touch with some of these intelligence offices, and get Polanders; don't get Germans and don't get Italians." I need help only about eight months of the year, and whether these people would want to come down and locate there just for eight months is doubtful.

Mr. Roberts—My experience has been very much in the line of our friend Evans. We have never had any trouble. We have had good hands. We have furnished nice houses for the married men to live in, and everyone boards himself. I do not think it costs us any more than it does the people who hire single

men by the month. I am sure the men stay by us better. We do not hire the same men at all seasons of the year. Some men don't care to work in the winter, but we have to put up and do put up with a good deal of transient help, and with that we have considerable trouble. The one besetting sin that bothers us is intemperance. Our team drivers are tempted into saloons on the highway, and some of them who stay at home are tempted by saloons close at hand. That is the serious part of it, it appears to me. If we could eliminate that temptation the question of help would be very much overcome.

In reference to the Poland people, we have had some excellent Poles. They have been exceedingly satisfactory. But as to their drinking qualities, they drink just as bad as anybody else.

Mr. Rogers (of Somerset)—Mr. Chairman, speaking about Poles, they are very good help. There is only one thing about them that I hate, and that is, they cannot take to you. About the time they understand your work and get their pay, they leave you; because they have friends who are getting a dollar and a quarter a day they want as much.

Now, as to the married men, it is all right for these old gentlemen who have got plenty of money to hire these high-priced men. But I tell you, just as soon as a young farmer commences farming with a small capital and hires these high-priced men, and gets two or three families running, and tries to keep them running, he is going in the sheriff's hands right away.

Mr. Hale—Mr. Chairman, we have colored help in our neighborhood, and I find when people there want help they send down South. In the spring of the year it is very seldom but that we can get help up in a few days, and after all is said and done they are pretty satisfactory help. They have their faults; some of them leave us, too, but that is the case with the German and Poles and others. Many come and they are dissatisfied. You cannot help that. I don't believe there is a man here but what feels dissatisfied with his lot sometimes, and he is ready to throw down the hoe and leave the farm; that is just the way it is with these men. But I believe with some of these gentlemen that if we take care of them fairly, will give them enough to eat, or, if you are fortunate enough to have homes for them, give

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them a comfortable home and something to induce them to stay there, they will do so. Gentlemen, we have got to treat our help at any rate humanely. You cannot expect to use your help, I don't care what they are, like the old-time slave or like beasts—drive them through. They must have a little leeway, and this idea of working from sunrise to sunset, it seems to me that has gone by now. We can hardly expect it. I say to my men, "Give me a solid ten hours a day work and I won't find any fault. That is to say, when you go in the field don't stop and talk to every man who comes along the road; but work. Work steady along until twelve o'clock, and then it is dinner time. Start again at one and look forward to six o'clock, and when six o'clock comes, if you will work from one to six steady, I am willing for you to quit, and you can look forward to that," so that when the men from Princeton and different places are going home from their work my men are there, too, and they feel better satisfied. We do have a little bother sometimes, living right near Princeton; the Princeton employes get a dollar and a half a day, and some of our men go there. That is a little more I think than a farmer can afford to pay, except in times of special work, like gathering crops; then probably for a few days he can afford to pay the good men those prices. But as a rule farmers cannot do that.

But we try, as I said, to treat our men well. We do not overwork them. We do not want to overburden them in any way, and we usually get along pretty well with our help. Of course help is scarce, and we all have to try to do the best we can.

There are lots of colored people down South, and what they want is to come North. In the spring you will find them floating this way, traveling our roads, and the people can get at them then pretty well.

A Delegate—I should like to know if the colored help are able to milk cows and handle horses and keep them clean?

Mr. Hale—Some of them do very well.

Mr. Rogers—My experience is they are very good horsemen, but when it comes to cows they say that is woman's work.

Mr. Pincus—Mr. President, I wish to relate an interesting matter of experience that we had last spring. I am connected

with an agricultural school at Woodbine, and last spring they sent out about five hundred circular letters to different farmers, in this State entirely, in order to see what is the situation in regard to the labor question, if the farmers wanted probably intelligent helpers, and what they wanted, and we succeeded in placing last year fifteen boys on different farms by that method in New Jersey. We have some scattered in New York and the New England States, and the general trouble seems to be that our boys cannot handle teams. But in regard to cow work, handling cattle, they seem to be very willing and very useful. Another trouble with our boys that the farmers have been complaining of is that some of the boys are young. Of course, they are young when they leave our school; they are about seventeen to nineteen years of age, and you cannot expect them to do as good a day's work as negroes or the Polish men, but still, taking it all the way through, they make pretty satisfactory help, and some of the gentlemen who have employed them have told us they are satisfied. Prof. Voorhees has employed two. Some of the gentlemen had an opportunity to visit our school, and they could see how they are prepared there. I also corresponded with the boys to try to find out what are their complaints against the farmers, and they seemed to complain that they had too long hours. That is the general complaint everywhere. They are made to work twelve and thirteen hours, and sometimes more, a day. They do not complain about their treatment; they seem to be very well satisfied with that. The only complaint was about long hours. And another thing is that they could not get work all the year around. One reason why we could not place more boys with the farmers in New Jersey was the farmers wanted them through the summer, and we wanted to get them a position for all the year around. After spending three or four years in school, they want to go out and work right along on a farm; they do not like to wait around. Some of them have been now in the employ of farmers for a year, and a couple of them have been in the employ of farmers for two or three years in some places, and they seem to give satisfaction. Of course, a few years will show what they will do. We will have some graduates now every year.

Mr. Borton—Mr. Chairman, it seems to me there are two sides to this question. We have heard mainly from the side of the farmer. There is something due the help from the farmer, and it seems to me that the farmer needs to systematize his business in the way of making more regular hours. He should arrange his work so that it could be made easier and more lovable by the laborer, and, as much as possible, make it piece-work; where he cannot get month hands then get men to do it piece-work.

We use the Southern help, colored help, very largely with us, and we have found them about as good, and rather better, than other help that we get as teamsters and in taking care of horses or cows. At the present time I have very good colored men from the South.

Mr. Denise—Mr. Chairman, I employ quite a good deal of help, and I never ask them to work over ten hours. Some farmers expect them to work thirteen, but I never ask them to work over ten hours. My men do not come to work until seven o'clock, and during those ten hours I expect them to work, and I have always tried to treat my help right. I believe in showing your hired people respect, and they will respect you. I have never had any difficulty whatever with hired help, and I have been there a long time now.

Mr. Randolph—Mr. Chairman, the farmers in our vicinity have had considerable experience with Polish help, and I think they have found the trouble to come after they are there awhile. At first they are willing to work for low wages, but after they are there awhile they have an idea that the American people complain about wages and get a raise in their wages, and so they keep raising higher and higher until they are out of our reach. And I have also found that they have not a very great sense of honor. If you hire a man for a year, and someone offers him more, he does not consider anything binding. He will go. On the other hand, if they are hired with you for a year, they consider you are bound to keep them.

Now, in regard to employing married help. My experience has been that I had to keep both families. They are close by, and they think what belongs to you belongs to them, and men that are good workers, too. I don't find any fault with them at all;

they are smart men, but they seem to think they have every privilege, and if you were to add two and two together, you will find the farmer paying pretty good wages.

As to Polish help, they are robust and hearty, and some of them are excellent workers. I have had the same experience with Polish help in the house. They seem to find out that in the city they pay fifteen, sixteen or eighteen dollars a month, and they will go there, and get positions for their friends too.

A Delegate—The way we work our help in our section of the country is, if we have a good man, and know he is good, we try to pay him enough to make him feel interested, so that he don't want to leave us. There is a man I have in mind who had been with me six years, and every time I hire him he says, "Boss, I don't want another place; I am satisfied."

Now, I would like to ask this question of our ten-hour system friends, what do they do with this work before breakfast and after the men are gone? Don't you milk your cows until seven or until the men come to work? What is to be done with that work?

Mr. Evans—Mr. Chairman, that has been my practice for the last twenty years, and I realize that a good many of these arguments seem right, but I think if you take good men and treat them right, they will stay with you. I have had men stay with me fifteen years or twelve years lots of times, and they are reliable men. A man goes to buy a horse, he don't buy an old reprobate that can't do a half day's work or can't pull half a load. He wants a team which is reliable and will pay for his food. It is just the same with men. Some men think they can hire a man for a dollar a day, and they think that is enough. But I would rather give a dollar and a quarter a day and get men that will give me a day's work. My cows are generally milked before six o'clock, and it is satisfactory to me to have them quit then. I can take a farm to-day and make it pay a good deal more than is generally allowed for a farm to pay, and my tenants, I find, are dropping in right after my own plan. If you have a half dozen good, reliable men, when Sunday comes and you have work to do, the men are there, and they are willing to do the work. They will take care of you. That has been my experience.

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Now, some of you may think it is because we older men have got more money that we can do this, but that is the way we got it.

Mr. Denise—That is right, sir; you are right.

A Delegate—Mr. Chairman, may I ask the gentleman what time do they milk the cows in the morning?

Mr. Evans—At five o'clock, and on Sundays the men take turns; they come over there at half-past four o'clock, and generally we want the cows milked at five o'clock.

A Delegate—That makes more than ten hours.

Mr. Evans—A little more than ten hours, but I pay them a little more money than they get where there is no dairy, and after they have been with me eight or ten years, some of them, and the new ones come in, they see the men are there and that they are contented. If you want satisfaction, you have got to get high-grade men. They are just like a horse; they are worth twice as much as the others.

The Secretary—I would like to offer a suggestion about having the help boarded by their wives. We must come to that in order to have the nice girls stay on the farms and marry our boys. There is no reason why the old system of making a boarding house of a farmer's home, with his wife and daughters kept waiting on all kinds of people, should be continued. When I was in California in 1893, I found the Chinese very active as horticulturists. Perhaps they would come here in sufficient numbers to take up that business with us if a demand for them existed.

Mr. Roberts—I have a feeling that if we could only get the Chinese, a few of them would do us much good. In California they are the best orchardists; they are the best hands in many cases. If you want anything done, they say, the thing is to get a Chinamen and then you will get it done. Although there is an awful prejudice against Chinamen, my heart goes out toward them. Look at the laundrymen, see how they work from morning to night, faithfully. They are good citizens as I see them, and I am inclined to think in our zeal we have overshot the mark, and I am not particularly in favor of the new bill excluding the Chinese.

Mr. Collins—I think that is all right, but the gentleman might go a little further. The politicians get up a bill restricting immigration; that is always a popular cry, restricting immigration. I have known of a good many men, some of the best men I ever had, would not be in this country if they had been restricted. Many of the very best people in Philadelphia and New York are immigrants who came over when they could not read and write English, and if bills are going to be drawn up in that way excluding people from this country, some of the best people will be kept out.

In regard to the nationalities mentioned, the Polanders are good fellows for driving teams, but the Italians, I do not think, are. But the Italians as a reserve force for anybody who has a few acres of extra vegetables or fruit, there is nothing like them that I know of. If they live near to the city, they go home to live generally, and when you want a few extra men or women at any particular time all you have got to do is to send for them and they will help you out.

Mr. Roberts—And now in regard to the unreliability of the Poles. It has been said that you could not depend upon them. Our experience has been exactly the reverse. We never had anybody who stood by us better than the Polanders, and they have been good hands to work at any hour we wanted them to work, as long as you ask nothing unreasonable of them. Altogether, we have had no fault with them, except the intemperance; that is the only thing.

The Secretary—Mr. President, the time is about here for a recess, and I would like to read to the Board what I have written to send to Prof. Voorhees:

“The State Board has begun its sessions, and regrets exceedingly the absence of the President. They send to him their sympathy, and hope he will be able to be with us to-morrow, if he can do so without risking health and life.”

The Board then took a recess until 2:30 P. M.

Afternoon Session.

The Board was called to order by Vice-President Cox, when the roll of delegates was called, after which the Committee on Credentials made partial report.

The Chairman—The next thing on the regular order is the appointment of a committee, consisting of one member from each county duly represented, to nominate officers for the ensuing year. The Secretary will call the roll of counties, to which you will respond, naming the member whom you wish to represent you upon that committee. The committee will be appointed at this time, and will report when they are ready.

In response to the roll-call the following gentlemen were named as members of this committee :

Atlantic County, V. P. Hoffman.
Bergen County, M. H. Angell.
Burlington County, John M. Lippincott.
Camden County, Benjamin Williams.
Cape May County, J. W. Pincus.
Cumberland County, A. W. Onthank.
Essex County, J. B. Rogers.
Gloucester County, Asa Moore.
Hunterdon County, William Dubon.
Mercer County, S. B. Ketcham.
Middlesex County, D. J. Perrine.
Monmouth County, Hon. D. D. Denise.
Morris County, S. E. Young.
Ocean County, C. M. Rorer.
Salem County, Joel Borton.
Somerset County, H. S. VanNuys.
Sussex County, B. K. Jones.
Union County, F. E. Woodruff.
Warren County, Henry Pursell.

A Delegate—Mr. Secretary, are there no farmers in Passaic county?

The Secretary—Passaic county is not organized. Are there any farmers here from Passaic county?

Mr. Hoffman—Mr. Chairman, I would suggest that the committee meet to-morrow morning at nine o'clock in the room back of the Supreme Court room.

The Chairman—The address and discussions on horticultural questions will be conducted by Prof. Van Deman, of Washington. Professor Van Deman, gentlemen. (See address.)

A rising vote of thanks was extended Prof. Van Deman for his valuable address.

The Auditing Committee then made their report as follows:

REPORT OF AUDITING COMMITTEE.

This is to certify that the undersigned Auditing Committee have examined the accounts and vouchers of the Treasurer for the fiscal year ending October 31st, 1901, and find them correct.

WALTER HERITAGE,
H. F. BODINE,
WM. FITZ RANDOLPH,
Committee.

The report was, on motion, received and placed in the minutes.

Mr. Dickinson—Mr. Chairman, I have here a credential of a delegate sent to this Board from the Mt. Laurel Farmers' Club. What does the Board desire to do with it?

The Secretary—There is another one sent from the Bee Keepers' Association. Mr. J. H. M. Cook is here from Essex county as a delegate representing that. I will read you the law on the subject, and then the Board can act on the matter.

"The Board shall have power to elect to membership such State organizations as may from time to time apply, by a majority vote of the Board, or at the annual meeting assembled, and such organization shall, upon election, be entitled to two delegates, the same as provided in section 2 of this act."

A motion was made that they be admitted, which was duly seconded and unanimously carried.

The President—The delegates of these associations are therefore admitted to membership to this meeting of this State Board.

The Board then adjourned to 7:15 for the evening session.

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Evening Session.

Called to order by Vice-President Cox, who introduced Dr. Byron D. Halsted, State Horticulturist, who delivered an illustrated lecture on "Reserve Forces in Plants." (Dr. Halsted then read a paper, after which the lights were turned out and the illustrations were shown and described. See address.)

The Chairman—This lecture will be immediately followed by Professor Smith, who will talk about that interesting bird called the mosquito.

Dr. John B. Smith, State Entomologist, then delivered an illustrated lecture on "The Mosquito Pest and How it May be Abated. (See address.)

Mr. Denise moved a vote of thanks to Dr. Halsted and Dr. Smith for their interesting lectures.

Carried unanimously. Adjourned to Thursday, 9:30 A. M.

FOURTH SESSION.

TRENTON, N. J., Jan. 16th, 1902,
9:30 A. M. to 12:30 P. M.

Vice-President Cox called the meeting to order, and prayer was offered by the Rev. Hugh B. MacCauley, of the Fourth Presbyterian Church of the City of Trenton.

The Secretary then called the roll.

The Chairman—We are now ready for the introduction of new business; any unfinished business or resolutions, this is the time to present them.

Mr. Jessup—I have a resolution which I would like to present :

WHEREAS, The farmers of the State of New Jersey are in constant danger of being fined for maintaining barbed wire fences on their farms because of accidents to horses scared on the public highways by automobiles, steam or trolley cars, etc.; therefore be it

Resolved, That the Legislative Committee of this State Board endeavor to have the law changed so as to free persons maintaining barbed wire fences on their farms from all fines.

The resolution was referred to the Committee on Resolutions for their action.

Mr. Gillingham—I desire to offer the following resolution :

WHEREAS, There will, no doubt, be an effort made at the present session of the National Congress to reduce the amount of letter postage from two cents to one cent ; therefore,

Resolved, That this State Board enter its protest, through our Secretary, to our National Representatives against any reduction in our postage until free delivery of mail is extended to all residents in the rural districts.

The resolution was then referred to the Committee on Resolutions.

Secretary Dye—I desire to offer a resolution :

Resolved, That the State Board of Agriculture, recognizing the necessity and value of competent veterinary services to live stock owners, agricultural interests and the preservation of public health, do heartily approve and endorse the movement for a State Board of Veterinary Medical Examiners, to regulate the practice of veterinary medicine and surgery in the State of New Jersey.

The resolution was referred to the Committee on Resolutions.

Secretary Dye—While we are waiting for the Nominating Committee to get through, here are three questions that were sent in from the Warren County Board of Agriculture in answer to the letter which I referred to yesterday. I will read one of them now for discussion, as our dairy session is not far off.

“Is it best to raise calves from good cows or buy cows in the market when the milk is sold.”

What do you say about it Mr. Gillingham, you are a cow raiser?

Mr. Gillingham—I should say raise them.

Mr. Vanderveer—I think you get better results by raising cows from good stock and choice selection.

The Secretary—I want to state what will come out in the tuberculosis report; that you have bought in the last year in the State of New Jersey nearly 12,000 cows, according to the record of our books in the office. So you see what an out-go there is from this State for cows raised in other States. The question for you to settle is whether it is more economical and better for

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a good grade of stock to raise your cows from you own cows, whose life and record you know, or continue to buy, as the people from other States tell us, their rejected cows. It seems to me Mr. Gillingham's answer is right.

Mr. Hedden—In a small way, I follow the plan of raising my own calves, and I find that it is better to raise cows than to try and buy them.

Mr. Dalrymple—I started on that line about eighteen years ago. I purchased two good registered Jerseys, and I have been raising heifer calves from these cows, and I have them tested, and find they are free from tuberculosis and all disease. I have been practicing this, and I think the Secretary will bear me out in the statement that I have a good herd. I would not buy anything without they went through the tuberculosis test all right. I think it is much better to raise your own stock.

Mr. Lewis—I have bought better cows than I have ever raised, but I am in the habit of raising my own cows.

The Secretary—Is that a reflection on your ability as a raiser?

Mr. Rogers, of Mercer—My experience is that I can take the poorest cow in my barn-yard and raise better cows than I can buy.

A Member—In raising your stock, eight times out of ten you will get what you go for. A man that goes for trading horses knows the way to go for them, and it seems to me where we are raising good calves from good cows we are on the right road. You can hardly go through the country and buy eight or ten cows that will not have several poor ones. We have bought some in the stock-yard in Newark; I suppose we bought twenty-five since last July, and half of them are only very ordinary.

Mr. Rogers, of Somerset—The question appears to be very plain: you raise half a dozen cows; if you have good ones you keep them, the poor ones you can sell. You can't always buy good ones. If a man has a good cow he wants to keep it, and he is right. You can raise cows a good deal cheaper than you can buy them.

Mr. Burk—In the last twenty-five years I have never bought cattle. I started at first with a York State heifer, and then I

got hold of a Guernsey. I have a herd now of about twenty-three head. I prefer to raise my cows.

The Secretary—Another question from the Warren County Board: "What is the best and cheapest food for a cow to produce milk of good quality without wearing her out in a short time?"

The question is one of importance to dairymen, whether they shall crowd a cow for a short time for all she is worth, and wear her out in two or three years, as this question seems to imply, or by feeding her in such a way as to conserve her constitutional vigor and have her do good maximum work for a longer period. The question, therefore, is, What is the best feed to cause a cow to do good work for a long period, rather than force her for a short time?

Mr. Gillingham—As far as my experience goes, we want to follow nature as nearly as possible. Of course in the summer season we have the green succulent pasture, and in the winter time silage, the cheapest feed you can raise. While our feed is so high this winter, the silage cost no more this year than it has other years when other feed has been lower. Therefore, I should say that for winter food, the cheapest and best food for the condition of the cow, as well as for the pocketbook of the dairyman, would be ensilage. Of course balance that with the protein feed to the best of our ability and in the best form. I guess the cotton-meal feed is the best, and you have to be careful with that or we will wear the cow out. That is the best protein feed. Of course there are other protein feeds that balance up the ensilage.

Mr. Rogers, of Mercer—I would like to ask Mr. Gillingham whether the acid of the ensilage hurts a cow's teeth?

Mr. Gillingham—Not in my herd—I never heard of it. I think there is more danger of a cow's teeth being hurt by dry corn fodder. Our ensilage ought to be put in when the corn is in the green state and the heavy stalk is in sugary condition. Last year, from the time the ground was ploughed, our ensilage cost us \$1.40 per ton, after it was in the silo, and paying \$1.50 for the men to put it in. We had about eighteen to twenty men to put it in, and we paid the extra hands \$1.50, and our ensilage cost \$1.40 per ton. That is the cheapest feed you can get.

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Mr. Onthank—I have a resolution I would like to offer, and I might preface it with a remark that quite a little interest has been taken in the matter, of some steps to prevent forest fires, especially in South Jersey. The bill was formulated last winter and presented, but I think it got no further than the committee to which it was referred in the Senate, and in behalf of this movement I offer this resolution :

Resolved, That the Legislative Committee of this Board be requested to use their influence to secure the passage of a law for the protection of the forests of New Jersey, as recommended by the Governor in his last message.

The resolution was received and referred to the Committee on Resolutions.

Secretary Dye—I am sorry there is not a fuller expression on the part of the dairymen present, but I would like to anticipate the afternoon a little, and have a word on the feed ration of the cow in order to lengthen life from our speaker, Mr. VanAlstyne.

Mr. Van Alstyne—I think perhaps the reason why we didn't get a fuller expression of opinion was because the first gentleman covered the ground, that the cheapest food was ensilage, because it was economically put in, and because it was succulent, and, when supplemented by protein, certainly is the cheapest food we can get. The best food for a dairy cow is the June pasture; the more nearly we can approximate to that in the line of economy and the best food for the health of the cow the better we are off. But for a man to say just what the best grain foods are is a good deal more than I would undertake to say. I think we have to be guided by the particular food we can buy. I am no stickler for a ration that has to be balanced down exactly to one to five and a half, although I believe in a balanced ration. If I had time I might elaborate that a little, but I will say this in proof of what I have to say: Last summer at Buffalo the cattle there were fed rations that varied from one to four to one to six and a half, and for the time being the ration that was one to four to one to six and a half brought just as good and apparently better results as though we had fed a standard ration. As to the question whether silage will make the cow's teeth sore, it was a tradition handed down from the early days. When the silo was first

introduced it developed a great deal of acid, and it might have affected the cow's teeth; and yet, while I have heard that statement, I have never found a cow so affected. I have fed ensilage, I think, thirteen winters, and I have never noticed a case. A short time ago I sent two cows to the butcher that had been in my dairy until they had passed their usefulness. One was thirteen and the other fourteen years old, and the thirteen-year-old cow had silage all her life, from the time she was a calf up, and she had every tooth left in her head. The silage did not injure her teeth.

Then, as to the other part of the question, which is very important—will it wear a cow out by feeding a good food—most emphatically no. On the other hand, an underfed cow will wear out just as quickly as an overfed one. If you want to find a class of people that wear out quickly, you go to the city and find people that are overfed, without proper exercise, who feed on all sorts of stimulating food. That is not conducive to health and longevity, and I do not believe that feeding a cow to such a ration as was fed at Chicago, or even less—eighteen to twenty pounds a day—is conducive to health and longevity of the cow.

As a matter of fact, we found last summer at Buffalo that the dairy cow fed eighteen to twenty pounds of grain, for the time being she made a little more milk, but it cost more than it came to. Again, it is what a cow digests and assimilates that does her good, and when we feed her more we feed her at a loss. The average ration is about twelve pounds per day, which is certainly as much as they could possibly eat and take care of, and I am inclined to think that had they had a smaller ration they would probably have made just as much net profit; but they certainly were not fed an excessive ration.

I was very much interested at the Cornell University two years ago, perhaps, looking at the record of the different cows there. There was one cow thirteen years old, and in that time she had nine calves, and the average of the entire period of her ten years of usefulness was nearly three hundred pounds of butter per year, and that cow, so far as I could see, was a good, sound, healthy cow, one good to look at.

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Now, it was a balanced ration, and it certainly did not wear out the cow, and if it did, if a reasonable ration wears out a cow, and I can get as much out of her in three years as I could get in six years by hanging on the ragged edge, why then I would wear them out and get another cow. (Applause.)

Mr. Crane—I would like to give my experience in regard to ensilage, or at least in regard to corn-fodder. I have no silo, but I have my dried corn-stalks in good condition. I cut them up with a Tornado cutter and put them into a large iron box made by a boiler maker water-tight; then I pour boiling water over them and the fine feed over the cut stalks, and it makes a sweet food; cows like it—eat up every particle of it—and they give good results. This winter I have been fortunate enough to have a fine crop of turnips, and, on account of the high price of corn meal, I have abandoned the feed and put in cotton-seed meal in place of it. My cows are doing finely, and I think my milk that I produce in my own dairy is costing me but very little more than in ordinary years.

A Member—How much cotton-seed meal?

Mr. Crane—We don't feed very strong; we sprinkle the cotton-seed meal over the stalks, and perhaps they get about two or three pounds a day of cotton-seed meal each time.

Mr. Dalrymple—How long do you cut your stalks?

Mr. Crane—They are cut up very small by a Tornado cutter; the knives are in spiral form, and they dig the corn all to pieces. Formerly I used a square cutter, and after feeding the cows we would sweep up three or four bushels of pieces, because the cows could not eat them. They made their teeth sore. But this cutter cuts them all to pieces, so that there is not a handful left from forty bushels; they eat it up clean. I believe it is just as good as any ensilage. In fact, while they are mixing it, it smells so sweet that it is almost inviting to the human appetite.

Mr. Diecks—I am not so situated as to have a silo. We raise the evergreen sweet corn. I give it to them at night and in the morning, and there is hardly anything left. You could feed the Indian meal, but I have concluded that under the present price you cannot afford it. We have been trying brewer's grains, five pounds to each cow, five pounds of sprouts and two pounds of

cotton seed mixed, and our cows never did better. We average eight and one-quarter quarts per day to the cow, and one-sixth of the cows are dry. We have about thirty cows. I wrote to Professor Voorhees and asked him if he thought I ought to feed something in addition to this; he said no, he didn't think I could improve it any. We feed hay and all the corn-fodder they can eat, and our cows are doing very nicely. I am not opposed to the silo at all; we would have one if we were so situated, but we cannot have it on account of the room. But we find in the fall when we quit feeding green corn, and feed dry corn, we can make just as much milk.

Mr. Crane—I didn't say what I wanted to say in regard to cut fodder. I think every farmer and dairyman could help himself in this direction. I have fed turnips from the first of November, given them turnips twice a day as long as we were carting from the field. We fed them twice a day, and now we are feeding them about half a bushel each, or three pecks, and we are getting splendid results.

Mr. Rogers, of Mercer—This question is a great one with us young farmers. We have to farm a good while before we have the knowledge of some of the older farmers. I sowed the soy bean; I sowed it with a potato planter at a width of two feet nine, and what I want to know is whether they are valuable as a cow feed. I sowed them as a forage crop, and didn't use them all, and they are standing yet.

When the first frost came and the leaves dropped to the ground the ground was covered, and if they are good for cow-feed, I will grow them as a fertilizer and cow-feed also.

A Member—They will take the place of cotton-seed meal.

Mr. Rogers, Mercer—Another question I want to ask: I sowed some corn for fodder with a four-foot planter, and by figuring that out I got the ears of corn on each stalk. I want to know whether it is practical to sow that way for the silo.

Mr. Van Alstyne—May I say a word in answer to that, because it is a question of a good deal of moment. I think we have run to the extreme on the matter of putting corn in the silo. We first formerly put in the thin, round corn-stalks, and that made sour silage, and then we found that when the corn was about

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matured it was better. When we got the corn on the stalk and put that in the silo, that answered the purpose exactly, and it was very much cheaper.

I would not advise any man to add any meal to his ration when he has sufficient corn in the silo; that is superfluous.

Now, we have gone to the other extreme, just as we usually do. If a little is good, a good deal is better, so we put into the silo sixty or seventy bushels of corn, and the result has been that it has been rich in corn, a good deal more of that kind of feed than the cow needs, and the gutters are full of droppings mixed with corn. I am of opinion that for every ten ton of stalks fifty bushel of ears is as much as an ordinary dairy cow can digest. How to get it down to that amount is a question that each man must solve. In my own case I have met it in two ways, in one by planting a little thicker, and produced a small ear, and so I reduced the amount of corn; or, in the other case, planting as we have been doing for the last four or five years, and then taking off a portion of the ripest ears before putting it into the silo, so as to reduce the amount to about fifty bushels of ears to every ten tons of stalks.

I do not see any benefit in feeding a cow what she don't want. It is a waste, and it is also an injury to the cow. I am thoroughly satisfied that an excessive amount of corn in silage is a waste and an injury to the cow's digestion.

The Chairman—Considerable liberality has been extended to the members of the Board in discussing this question. We should now take up the regular program. We were to have had a paper by Dr. J. C. Currier, the Assistant Superintendent of the Farmers' Institute of Minnesota; the Secretary will explain why he is not here.

The Secretary—Yesterday I received a letter from Dr. Currier's wife and son, in which they said that Dr. Currier had come home from the South sick, so that it was impossible for him with safety to venture upon the long journey from St. Paul and make an address here. As the next best thing I immediately called upon Washington, and, knowing that this Board is deeply interested in the progress of agricultural education, and that the State Grange has been prominent in that work, I could think of

no better subject to take up at this hour than the question of Agricultural Education. And so I made a draft upon the United States Department of Agriculture, and Prof. True very kindly consented to come here and talk to us at this time.

The Chairman—I have now the pleasure of introducing to this State Board Dr. A. C. True, Director of the Office of Experiment Stations, U. S. Department of Agriculture. (See address.)

The Secretary—If you will allow me, Mr. President, I will offer a resolution :

Resolved, That it is the sense of the New Jersey State Board of Agriculture, now in session at Trenton, that the movement by the United States Department of Agriculture to secure an appropriation of \$5,000 to be used by the department during the next fiscal year in studying the needs of the Farmers' Institutes and ascertain some ways in which the department may help the Institutes meets with our hearty approval and endorsement.

Moved and seconded that the rules be suspended, and that the resolution be adopted without reference.

Which motion was carried, and the resolution was adopted.

The Chairman—We have been under considerable strain of mind because our President has been detained from being present. I am glad at this point to announce that the President's address is with us, and I now introduce Mr. Lane, Prof. Voorhees' assistant, who will read that address.

Mr. Lane—Mr. President, ladies and gentlemen, I assure you it is a great disappointment to Prof. Voorhees not to be able to be present this morning. He has been hoping every day to be sufficiently improved to come down here, but at nine o'clock this morning he was hardly able to sit up, although I believe if the doctor would have allowed him, he would have come down, even if he had to be carried. (Applause.)

He was most anxious to be with you.

Mr. Lane then read the President's address. (See address.)

The address was, on motion, received as a part of the proceedings.

Mr. Borton—Mr. President, we were necessarily compelled to go hurriedly from the excellent address of Dr. True to this very important address of our President, which you have listened to

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with so much pleasure. I feel that we ought to extend our thanks to Dr. True. While I and others were disappointed in reference to the question of the horse, I feel that we must be more than gratified that the subject had been changed as it was to the education of the farmer, and that Dr. True so clearly outlined the avenues open to us to-day, the different colleges and the work of agriculture that is going on. And as to the horse, let every farmer who knows that the horse is one of his most useful animals apply the golden rule, "As ye would have the horse do to you, do ye also to the horse."

I move that we give a rising vote of thanks to Dr. True for his valuable and highly appreciated address.

Carried unanimously.

At this point a recess was taken until 2:30.

FIFTH SESSION.

TRENTON, N. J., Jan. 15th, 1902,
2:30 to 5:50 P. M.

The Chairman—The Committee on Nominations is ready to report.

Mr. Denise—Your committee ask 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, of Hunterdon county.

For Treasurer, William R. Lippincott, of Burlington county.

Executive Committee—Walter Heritage, of Gloucester county; William Henry Rogers, of Somerset county; H. V. M. Dennis, of Monmouth county.

Mr. Chairman, I move that the report of the committee be received and adopted.

The motion seconded and unanimously adopted.

The Chairman—I declare the officers named duly elected to serve this Board for the ensuing year.

The Chairman—We next have an address on "The Relation of the Live Stock Industry to New Jersey," by Prof. Thomas F. Hunt, Dean of the College of Agriculture of Columbus, Ohio. The speaker and the question upon which he will talk were suggested by Professor Voorhees, President of this Board.

Prof. Thomas F. Hunt then read a paper on "The Relation of the Live Stock Industry to New Jersey." (See address.)

The Chairman—Are there any members who desire to ask any questions of Professor Hunt?

Mr. Roberts—I had the pleasure of seeing these cattle from Texas referred to by the speaker this present fall, and I saw one yearling steer weighing 800 pounds, that took a prize, that was butchered. I speak of this in corroboration of what we have heard. But these calves that get up to this weight live on their mothers from the time they started. I have had calves right here in New Jersey that weighed over 700 at nine months old, which ran to their mother.

Mr. C. H. Cook—We had some Jersey delegates to the Live Stock Association meeting at Chicago. They usually show them everything, and were very kind and courteous, but nobody got a chance to see where they made the oleo. The manager said they had no secrets. They do make a pretense of showing their oleo to strangers.

The Chairman—Not at the live-stock show.

Dr. Hunt—No, you are right. I have myself been in the place where they mix the goods; that is as near as I got to it; but where they mix the raw lard, I never got that far, but I would have liked to have gone through. It was not any lack of interest on my part that I didn't get there.

Mr. Cook—These people are well equipped for everything. There is a matter that can well be imitated by our farmers generally. The Armour's do not waste anything; every part of the animal is utilized.

The Chairman—We will now take up the subject of "Breeding the Dairy Cow," by Mr. Edward Van Alstyn. It gives me great pleasure to introduce Mr. Van Alstyne to you. (See address.)

A rising vote of thanks was given Professor Hunt and Mr.

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Van Alstyn for their valuable addresses, after which the Chairman asked if there were any further resolutions to be introduced.

Mr. Denise—

Resolved, That the State Board of Agriculture favor the appropriation by the Legislature of the State of New Jersey of a sufficient sum to make a thorough investigation of the mosquito problem as it exists in the State, and of the methods by which these enemies to health, comfort and agricultural prosperity may be diminished and destroyed.

The resolution was referred to the Committee on Resolutions.

Mr. I. S. Crane—It is well known that there is an abuse in the lower part of this State in regard to the sale of milk. There are a great many dealers, especially in Philadelphia, that insist upon buying milk by the bushel instead of liquid measure, and of course they sell milk by liquid measure.

Now, in our part of the State all the milk from Sussex to Essex county goes forty quarts to a can, and I cannot see why this is so in the southern part of the State. They practice this, but they do so to the damage of the producer.

I was talking at the breakfast table with a financier who knows something about the bank account of the dairymen of the southern part of the State, and he said generally they had no bank account; they were hard-working, close men, and they didn't make much money. Now, then, I would offer this resolution in behalf of the Dairy Union of this State.

Resolved, That a committee be appointed by this Board to institute measures that the dealers in milk shall be compelled to accept forty (40) quarts instead of forty-four (44) quarts in their purchase of milk; that liquid measure instead of dry measure shall be the rule in the purchase of milk throughout the State.

I suggest this go to the Committee on Resolutions.

The Chairman—The resolution will be received and referred to the Committee on Resolutions.

Secretary Dye—I have a resolution I desire to submit:

Resolved, That the New Jersey State Board of Agriculture, now in session in the City of Trenton, do hereby reiterate their desire for the enactment into law, by the National Congress, of the House bill formerly known as the

Grout bill, and introduced into the fifty-seventh Congress by Hon. James T. McCleary as House Bill No. 1, and we do hereby call upon our Senators and Members of Congress to do all in their power to secure its passage.

I move that the resolution be adopted without reference, which motion was seconded and unanimously carried.

Mr. Collins—This Board is on record as being in favor of the subsidy bill. Those who read the papers last year know how that held up the Grout bill. It is just possible that the same thing may occur again. Now, I suggest that we unwind and set ourselves right on the subsidy, so that the politicians cannot say when we go down there that we are on record in favor of the subsidy bill. The farmers of New Jersey are just as much on record on the subsidy bill as they are on the Grout bill.

Mr. Roberts—At the live-stock convention one of the things on which they congratulated themselves was that they had been able to defeat the Grout bill, and it was done by and through the aid of that Live Stock Association. They took the credit upon themselves for that. They had labored for it and they had defeated it, and they proposed to do it again if they could. They are just as honest and sincere as can be. The Governor of the State of Nebraska came there, and he said he came there in the interests of steer butter, and I had a chance to see things from the other standpoint altogether. I only mention this to show how different people look at this from different standpoints. I had no unity with them.

Mr. Borton—In reference to Mr. Crane's suggestion, I wish to say that I hope the Committee on Resolutions will give that their very careful consideration, and prepare a bill for our Legislature; I believe it is very much needed.

Mr. Crane—In connection with what the gentleman stated, I would like to say that I do not know that you can pass a law that would compel these people to sell milk by liquid measure. I do not know that, but the time is ripe just now for the people of the southern part of the State to take this in their hands and work it up. They can make a strike now, as the dairy interests are with them; and they can bring this matter about with but very little trouble if they go to work. It is in your hands, and I hope this committee will be appointed. I hope the Committee on

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Resolutions will report favorably, and then I hope a strong committee will take charge of it.

The Chairman—This resolution is referred.

Secretary Dye—I want to make an explanation and say, gentlemen, that we do not put on the program what is simply a bid. The program says that Governor Murphy has been invited and Governor Hoard has been invited. Governor Murphy wrote that he would be here if possible. He was not sure, but if he came it would not be to make a speech.

Governor Hoard's clerk writes from Washington:

"Governor Hoard has had a very narrow escape from pneumonia, and is confined to his room here at the National Hotel. He directs me to say that he is extremely disappointed at not being able to attend your meeting, but that it would be hazarding his health to attempt the trip at this time."

Mr. J. H. M. Cook—I have a resolution:

Resolved, That this Board instruct its Legislative Committee to use its influence in securing the passage of a law to prevent the spread of contagious diseases among bees.

This is from the New Jersey Bee Keepers' Association. They wished me to present it and secure the aid of this body if possible. I should like an opportunity to speak upon it when the committee report it.

The resolution was referred to the Committee on Resolutions.

Secretary Dye then read the report of the Tuberculosis Commission. (See report.)

Mr. Denise moved that the report be received and made part of the State Board's report. Adopted.

Secretary Dye—To the sweet potato men: In my report you know I referred to the fact that men in some of the other States are selling their product under the name of Jersey sweets. A young man in Baltimore told me last summer they had organized in Virginia an association largely to sell, and do sell, their Virginia sweets, putting them in New Jersey packages and then label them Jersey sweets. In some parts of New York State they manufacture a pure cheese, which is being counterfeited by a spurious cheese, which is being sold as pure. The honest makers

are seeking an enactment in Washington against them, and they would be glad of your co-operation in getting the law through. So, if the sweet potato men want a committee to co-operate on that matter, let them make their wants known.

A Member—I think the sweet potato men ought to have a representative. I think this Board ought to take action on this.

The Board then adjourned until 7:45 P. M., to meet at the Auditorium of the State Schools.

SIXTH SESSION.

TRENTON, N. J., Jan. 16th, 1902,
7:45 P. M.

The Chairman—The meeting will come to order. I wish to take this opportunity to announce that President Voorhees, of the State Board of Agriculture, is unavoidably detained at home on account of illness; notwithstanding his absence the State Board is here as usual upon this annual occasion. We are happy to have with us at this time such a pleasant and agreeable audience of people. We feel that the State Board of Agriculture, as well as the friends here present to-night, are to be congratulated because of the fact that we have with us one who is so well qualified to give us a description of what has become a part of the United States. We have present with us to night and I now introduce to you Major George G. Groff, M.D., late Superintendent of Public Instruction in the Island of Porto Rico. (Applause.) He will now proceed with his lecture.

Major Groff then delivered a very interesting and instructive lecture on the topic "Porto Rico—The Island and the People," which was profusely illustrated, after which the Board adjourned to Friday morning.

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SEVENTH SESSION.

FRIDAY, January 17th, 1902, 9 A. M. to 12:30 P. M.

The meeting was called to order by Mr. Cox, and opened with prayer by Rev. Dr. Maddock, of Trenton.

The Committee on Credentials presented their final report; was signed by the committee. (See full report, pages 9-10.)

On motion the report of the committee was accepted.

The Chairman—If there is no further unfinished business, we will now listen to the report of the State Entomologist.

Dr. John B. Smith, State Entomologist, then read his report. (See report.)

On motion the report was received and made part of the proceeding of the Board.

Mr. Morgan—I have a resolution that I would like to offer:

Resolved, That the Executive Committee of this Board use their best endeavors to have the State road law so modified that the ten per cent. now assessed against the abutting land owner be transferred to the township.

On account of the lateness of the hour, I move the adoption without reference.

Mr. Roberts—I hope it will not be adopted.

Mr. Denise—I do not think it is within the province of this State Board to take up every little thing within the townships.

Mr. Roberts—This is not a little thing. In the starting of the stone road law there was a gentleman appointed to prepare a law. It was done with a great deal of care, and it has worked marvelously well. It was done in the face of great opposition; people generally were opposed to it. There were quite a good many that caught on, slowly at first, but this idea of ten per cent. on the abutting owners, I think, is all right. It is comparatively a little part of the cost, and there is great danger now, when it has become popular, of the whole thing being upset. Certain persons that I know who have applied for roads years ago, excellent cases, they say there is no appropriation; you will have to wait a year or two or three; it may come in time.

Now, if you take away this, it will bring so many applications. It is not an unfair tax. I have been through that mill, and paid several hundred dollars of tax right on that line, and I never spent money that gave me more satisfaction, or for which I got better returns, and I hope it will remain as it is.

Mr. Morgan—The reason I bring this resolution is through the advice of gentlemen in Camden county. We haven't much stone road, and as my friend Roberts says he don't think it is an unfair tax. We rather feel it is, because those not adjoining the road, but right near by, a hundred yards, a quarter of a mile, two or three miles, or whatever it may be, the first thing after we get the stone road built then they make applicataion to the township for a gravel road right to it. Those who have paid ten per cent. have to turn right around and pay for the gravel road to the stone road. That is the reason of this resolution.

Mr. Denise—Suppose you live a mile or half a mile back of the road, don't you have to pay anything for the building of that stone road?

Mr. Morgan—Yes, but not ten per cent.

Mr. Denise—The gentleman who lives on the road does not pay the whole ten per cent. if you pay part of it.

Mr. Roberts—There is a road down where I live, runs right in front of my residence, and I am interested in it. It is probably as much used as any road in the county of Burlington, and my friend, Mr. Darnell, has charge of it. They taxed me as they passed by \$300, and I paid it cheerfully, and I don't think I ever spent \$300 that did me more good.

Mr. Ketchum—I can endorse what our friend from Burlington has said. Our experience has been in this county of Mercer there are more applications than they can handle. Some two years ago, in endeavoring to get a road to pass my own place, I cheerfully signed an application and helped with the survey of the road. We haven't been able to get it in yet. Now, if that road goes by my property, why should I not be willing to pay ten per cent. more? The men are willing, and in this section of Mercer county they are tumbling over each other to get the applications in and get the road built.

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It is nothing more than fair if a road goes by my property, and benefits it, that I should pay something, and ten per cent. certainly is not an unjust tax for me to pay. The county comes in and bears the balance with the State, and I hope that this resolution that has been offered recommending that this Board shall recommend a repeal of the ten per cent. will not pass.

Mr. Randolph—Mr. President, I endorse all the gentlemen have said. I want to see the law stay as it is. In Middlesex county the people having property along where the road is built cheerfully pay ten per cent. I would like to have such a road built past my property, and I would cheerfully pay it. The trouble is we cannot get enough of them. I think it is only just where the roads are built a man owning the property alongside of the road should be taxed.

Mr. Budd (State Road Commissioner)—Mr. President, there is really no necessity to change the law in that direction in order to enable the township to pay the per cent. There are lots of townships in the State that are willing to pay that ten per cent. I just received application for two roads in Washington township. The township authorities got together, or the people got together, and voted to pay that ten per cent. If the township will take the initiative in building this road, they would be quarreling among themselves which should have the first road built. Really, the ten per cent. is necessary for the initiative of the road.

The only change we need in the law to make it more equitable is to get a larger appropriation. Roads are being called for in all the different counties in the State ten times faster than we can find money to build them. Not only do we want larger State appropriations, but we want the privilege of the counties to assess one-half instead of one-quarter per cent. In some counties they want the roads so fast unless they do have that privilege they cannot build the roads in ten years that they have applied for. Those counties that want roads, in order to let the present generation enjoy them, should have that privilege, and I think the only amendment the law will need is the privilege of assessing one-half instead of a quarter per cent. and the increase of the State appropriation.

The Chairman—The question is on the adoption of the resolution.

The question was then put, and the resolution was declared lost.

Mr. Dickinson—I have a resolution:

Resolved, That all matters requiring legislative consideration, presented and receiving affirmative action during the annual meeting, are hereby referred to the Executive Committee of the Board.

I move the adoption of that resolution without reference.

The Secretary—Several resolutions have been referred to the Legislative Committee, and we have no such committee. Unless some action is taken in this connection, they will not be considered.

The resolution was adopted.

Mr. Denise—With your permission, the committee appointed to prepare a resolution relative to the death of Dr. Newell are ready to report.

WHEREAS, Since the last meeting of this Board, it has pleased the all-wise God to call away from earthly duties William A. Newell, M.D., the second president of this Board; therefore, be it

Resolved, I. That in the death of Dr. Newell this New Jersey State Board of Agriculture has lost a life-long friend, officer and member.

Resolved, II. That the numerous positions held by Dr. Newell as a thorough, practical farmer, upright citizen, leading physician, Governor of New Jersey, Member of Congress, and later Governor of Washington Territory during its formative period into Statehood, all testify to his valuable character and useful life.

Resolved, III. That more than all, perhaps, he was distinguished as the inventor of the Life Saving Service which bears his name, and which will continue to be the means of rescuing from a watery grave hundreds who, without it, would certainly have perished.

Therefore, we record our high appreciation of his valuable life, as shown in the various relations named, and our satisfaction that he was permitted to live to a good age in the full possession of his powers to the last, and has left such a precious legacy of good works to all who mourn his loss.

D. D. DENISE,

EMMON ROBERTS.

The resolution was unanimously adopted.

Mr. Demorest, the Chairman of the Committee on Resolutions, then made the following report:

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WHEREAS, There will no doubt be an effort made at the present session of the National Congress to reduce the amount of postage from two cents to one cent; therefore, be it

Resolved, That this State Board enter its protest, through our secretary, to our National Representative against any reduction in our postage until free delivery is extended to all residents in the rural districts.

The committee unanimously recommend that it be adopted.

The resolution was unanimously adopted.

The next resolution referred to the committee is the following:

Resolved, That the State Board of Agriculture, recognizing the necessity and value of competent veterinary service to live-stock owners, agricultural interests and the preservation of public health, do heartily approve and endorse the movement for the State Board of Veterinary Medical Examiners to regulate the practice of veterinary medicine and surgery in the State of New Jersey.

Your committee unanimously recommend the adoption of that resolution.

The resolution was unanimously adopted.

The next resolution is:

Resolved, That the Legislative Committee of this Board be requested to use their influence to secure the passage of a law for the protection of the forests of New Jersey, as recommended by the Governor in his last message.

Your committee unanimously recommend the adoption of this resolution.

The resolution was adopted.

The next resolution is as follows:

Resolved, That it is the sense of the New Jersey State Board of Agriculture, now in session at Trenton, that the movement by the United States Department of Agriculture to secure an appropriation of \$5,000 to be used by the Department, during the next fiscal year, in studying the needs of the Farmers' Institutes, and ascertain some way in which the Department may help the Institutes, meets our hearty approval and endorsement.

The committee recommend the adoption of this resolution.

The resolution was unanimously adopted.

The next resolution is as follows:

Resolved, That the State Board of Agriculture favor the appropriation, by the Legislature of the State of New Jersey, of a sufficient sum to make

a thorough investigation of the mosquito problem as it exists in the State, and of the methods by which these enemies to health, comfort and agricultural prosperity may be diminished or destroyed.

Your committee unanimously recommend that this resolution be adopted.

The resolution, with the recommendation of the committee, was concurred in.

The next resolution is as follows:

Resolved, That a committee be appointed by this Board to institute measures that the dealers in milk shall be compelled to accept forty (40) quarts instead of forty-four (44) quarts in their purchase of milk; that liquid measure instead of dry measure shall be the rule in the purchase of milk throughout the State.

The committee unanimously report that this resolution be adopted.

On motion the report of the committee was concurred in.

The next resolution is as follows:

Resolved, That the New Jersey State Board of Agriculture, now in session in the City of Trenton, do hereby reiterate their desire for the enactment into law, by the National Congress, of the House bill formerly known as the Grout bill, and introduced into the fifty-seventh Congress by Hon. James T. McCleary as House Bill No. 1, and we do hereby call upon our Senators and Members of Congress to do all in their power to secure its passage.

Your committee unanimously recommend that it be adopted.

On motion the report of the committee was concurred in.

The next resolution is as follows:

Resolved, That this Board instruct its Legislative Committee to use its influence in securing the passage of a law to prevent the spread of contagious diseases among bees.

Your committee unanimously recommend the adoption of this resolution.

Mr. J. H. M. Cook—I would like the privilege of saying a word about that.

The Chairman—If there is no objection, Mr. Cook will be allowed the privilege of the floor.

Mr. Cook—The industry of bee-keeping is not so important an interest as a money-maker, perhaps, as some other industries; but it is very important to the prosperity of the fruit growers and to people who wish, with their other business, something which will furnish to them a home production of the natural sweet honey.

This industry is carried on in a small way by hundreds of people in New Jersey. It is a special line which must be studied by the scientists who understand the method and nature of the honey bee, and lately there has been a disease among bees that has been spreading over our country, known as foul brood. It is a contagious disease. It has been studied and examined by practical bee keepers all over the State, and it has been ascertained that it can be eradicated by proper means. It is spreading because careless bee keepers allow their bees to become corrupt with this disease and carry it to surrounding apiaries. Several States in the Union, six or more, have passed laws similar to which the bee keepers of this State wish to have passed here. New York State has a good law, Wisconsin, Connecticut and several other States, and the bee keepers have organized a State bee keepers' association, and one of the objects of that association is to secure a law which we consider necessary. The best law is the Wisconsin law; it is the law which we desire this State Board to sanction. It is simply this, that there should be an inspector of apiaries in the State, and when he is notified of the existence of this disease, it is his duty to instruct the bee keeper where the disease exists and give him full instructions how to remedy and eradicate it. If he does not do it, and allows his bees to become corrupt through this disease, it is the inspector's business to go and destroy this colony and prevent its spreading. That is all we wish the inspectors to do—to see that it is stamped out where it exists, and it can be stamped out by proper management. But from a careless bee keeper it will spread to all the bees, and for the protection of the good bee keepers we desire such a law. It is a law for the good of all bee keepers, for the good of fruit growers and for the benefit of all farmers. It is simple in its operation, and only the actual expense of the inspector to be paid.

That is all we wish. I hope the Board will lend us their support in the endeavor to get this law passed.

Mr. Angell—In our county there are a number of bee keepers—from fifty to one hundred—but there are a large number keep from three to ten colonies, and if it is true, as stated by these gentlemen, and I don't know any reason why it is not, I think it is wise for us to take action to prevent this disease reaching these colonies. It is an important industry to some of our people.

Mr. Roberts—There are more interested in bee keeping. Every man that raises red clover, every man that raises fruit, is presumed to be interested in the welfare of our bees. A great many of us never raise them for honey purposes, but they are counted our friends in the distribution of pollon. I have often thought that their influence in that direction has been over-estimated, but I am quite willing to stand as a friend of the bees and give the bees my support.

Secretary Dye—At the Farmers' Institutes this winter, feeling this interest was of sufficient importance, particularly in the northern part of the State, I had a gentleman lecture on the bee interests and honey production. Mr. Herman, of Englewood, the lecturer, told me that one fruit grower had requested him to put a colony in the center of his fruit farm. So he went over there and built a house and put in some ten or twenty colonies, and the result was that he has taken out twelve hundred to twenty-four hundred pounds of honey for himself last year. The industry is important; it is valuable for many reasons. The only question in my mind is where this matter is to be located. The Legislature is averse to creating new offices, and I suggested when this question was up before to attach it to the duty of the State Entomologist; perhaps that might be done.

The vote was then taken and the resolution declared carried.

Mr. Demorest—I have another resolution:

WHEREAS, The farmers of the State of New Jersey are in constant danger of being fined for maintaining barbed-wire fences on their farms, because of accidents to horses, scared on the public highways by automobiles, steam or trolley cars; be it

Resolved, That the Legislative Committee of this State Board endeavor to have the law changed so as to have persons maintaining barbed-wire fences on their farms free from all fines.

You committee unanimously recommend that this resolution be not adopted.

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Motion that the report be concurred in.

Mr. Fithian—I have something to say about that resolution. I hope the Board will vote to concur in that resolution. In our part of the State wire fences have come to stay, and it seems to me that automobiles or locomobiles have come to stay, and they are causing a great deal of trouble, and just as sure as any of us has a barb-wire fence and somebody has an accident, we will have to pay for it. Barb-wire fences are on my place and other men's land.

A Member—There has been several cases with us, and they have contested the law. I hope that resolution will be passed.

Mr. Denise—That is a law I never heard of.

Mr. Demorest—There is a law in regard to barb-wire fences passed May 15th, 1894: "That no fence constructed of barb wire, or wire on which is strung or fastened barbs or points, shall be deemed a lawful fence between the lands of adjoining landowners, unless the erection thereof shall be consented to by such adjoining owners, and that without such consent all such fences are hereby prohibited.

"That every person who shall, without the consent of the adjoining landowner, erect any such fence as is prohibited in the foregoing section as a line fence, or boundary fence, between his lands and adjoining proprietors, shall be liable for any and all damages which may be caused thereby to horses, cattle or other animals belonging to such non-consenting adjoining proprietor."

Secretary Dye—Is there not plenty of good fencing without the barb wire?

Mr. Demorest—That is what we thought also. A man who wants a fence along the highway or along the road can put up wire fencing, but not barb wire.

Mr. Denise—If I had my say, I would make it finable for any man to put a barb-wire fence along the highway. I think they are a nuisance and an injury to the public.

The Chairman—The question is on the report of the committee.

The motion was then put; the chair declared the report of the committee concurred in and the resolution lost.

Mr. Gillingham—The Dairy Union has made no report; the delegates are here.

The Chairman—If there is no objection, the report of the State Dairy Union will be received.

Mr. Gillingham then read the report of the State Dairy Union, which was received and ordered filed.

Mr. Chairman, I would like to ask if this Union is not to be continued, what should be done with the funds in their hands, \$71.16, or whether it is your desire to continue the Dairy Union?

Mr. Crane—It is true that the Dairy Union has not accomplished any great work; in fact, it has not seemed that there was any work for them to do, but I think it would be a very bad move to disband it. I think the interests of the dairymen of this State are of the greatest interest to agriculture, and we ought not to throw away this Union. I believe its existence is necessary.

Mr. Collins—I am not surprised now that the Dairy Union does not seem to be appreciated when one of the directors gets on the floor and says he does not appreciate it himself. He says that occasion may arise when they may have something to do. But you have something to do to pass this Grout bill. You tried last year, and did not succeed. Now, is there not something for the Dairy Union to do to get this Grout bill passed, or a similar bill? I say if they appreciate the necessity, they have something to do now, and they will have for years.

Mr. Gillingham—In explanation, I will state that the Secretary has done all he could in regard to that. He has written to these people that he is satisfied oppose the bill. He has also written to our Representatives at Washington, asking them to do all they could for this measure.

Secretary Dye—The Grout bill was the original bill you were after. Mr. McCleary has introduced the Grout bill in the present House, and it is No. 1 of the House to-day. Mr. Taney introduced another bill. It is to take off the tax on uncolored oleo. It serves to divide the efforts put in on the Grout bill. If the Dairy Union has a good, strong man, they cannot do better than send him to Washington and work to get this bill through, and if you do that, your expenditures will have been warranted.

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Secretary Dye—It will be remembered that some members here last year requested that a half day be set apart for discussing such questions as the farmers wanted to present. The Executive Committee tried to comply with that request, and, as presented to you in the Secretary's report day before yesterday, letters were written soliciting topics for discussion, fearing they might not be presented at the meeting, but those farmers have not presented any subjects for discussion at this time. The business of the Board is done, the resolutions are offered and acted upon, addresses have been made, and the Executive Committee, as far as I know, have no other business to present.

That being the case, if there is nothing more, I do not see why we should not adjourn.

Mr. Rogers—I make a motion that a vote of thanks be presented to the Committee on Resolutions.

Motion carried.

Mr. Roberts—There was one matter that we have brought up here and have talked it over year after year. I understand that there is to be a motion to extend and revise the game laws of the State. I do not know whose business it is to give attention to that. My own ideas are that the game laws are a nuisance. They give the public, not only of this State, but in adjoining States, people that are not our citizens, a large part of them, they pay no taxes here, but it gives them nominally a right, under the cover of our law, to come and trespass over our property, unless we put up notices all around every year under certain prescribed conditions that they must not come, and even if the notices are there, there comes a class of people out of the States that are very ugly behaved. They insult and defy and even threaten violence in some cases. It is a thing that ought to have attention.

Now, I hope that when that matter comes up, as it is said that it will come up, that our Executive Committee will give some attention to it and watch the matter. These people that I speak of are an intolerable nuisance. The rabbits are a horrible nuisance to a man that has fruit trees, but the trespassers are worse than the rabbits, and under our law it seems to give them a tacit right to come. They have no right, but the law really gives them that

license, and it gives them a standing, and for that reason the law is a nuisance. For many years on our farms we put up no notices. We were glad to see the rabbits killed. We would like to have every one exterminated as to that matter. But now we put up notices for the outlaws from the cities who have no conception of country usages.

Mr. Collins—I think I have heard the same thing here before, and the people feel disposed to say Amen, and it stopped right there. I believe the game laws are a nuisance, and I think if the State Board of Agriculture of the farmers of New Jersey would demand a law giving no one a right to go upon any tillable land of this State without the written consent of the owner. If they will adopt such a measure, and stick to it, they will have an honest platform. (Applause.)

Mr. Crane—This is in line of my thought. If you will reduce the open season to one-half of the time, fifty per cent. of the nuisance is gone. I think this is right. We cannot abolish the shooting altogether, so that one month of open season would be hunting season enough for the game.

Secretary Dye—I would suggest that instead of requiring the farmer or landowner to put up notice of prohibition, that the hunter shall come to the landowner and get written permission, and that he be required to show that before he goes on land not his own. Make every man a trespasser when he leaves the public road. I think it will have to come to that. Why should it not? Then you will have protection.

Mr. Denise—If you want to argue this question, you must go before the Game Commission. I have no trouble with gunners, and I don't allow anybody to go on my land without my permission. The State of New Jersey has no right to let anybody go over our land. It would be illegal. I do not believe there is a gentleman that cannot stop gunning on his premises if he wants to.

Mr. Roberts—Granting all that, where is the use of our publishing to the world, to everybody outside, that for certain seasons you have a right to come on? Why should you invite them?

Mr. Denise—We do not.

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Mr. Roberts—We do it through our legislative enactments by stating that such time is open season.

Mr. Denise—It is open season provided the farmer is willing to let them do it; it is not if you don't want them to do it.

Mr. Roberts—They do it. Suppose I am ten miles away from my farm, I can't keep them off.

Mr. Denise—Of course if you are away you cannot do it. There is such a difficulty, but you have the law on your side.

Mr. Roberts—We have law that distinctly gives them the right to come. These men are not learned in the law. Some are in one handicraft and some another; but as to the rights of farmers, they don't know anything about them; they do not even know how to get over the fence; they get right on the middle of a rail and break it three times out of four.

Mr. Gratz—Is there no law in the statute book against trespassing and stealing? I do not see any necessity for legislation in this matter, except the removal from the statute book requiring people to put up signs. Nobody has a right to trespass upon your property without your consent.

Mr. Cline—Why not tell our representatives what we want. What I would like to see is to see the open season commence about the middle of November instead of the first of November; that would give the farmer the first opportunity. The first of November the farmers are not quite ready to enjoy the sport, but by the middle of November they can get ready. I have asked our representative if he has a chance to work that along.

Mr. Denise—We may discuss this for a week and it won't amount to anything at all. If you want to get down to business let the farmers have a committee appear before the legislative committee. The sportsmen have their committee. I served on that committee for two years, and I never saw a farmer there. We stand in this room and complain, but if you mean business you want to come there before that committee and present your objections.

Mr. Flitcraft—If you will permit me, I would like to ask if wheat is grown with smut in it, if that wheat is sown the next season, will it continue to grow smut?

Secretary Dye—I think I have heard Dr. Halsted say that—that the grain ought to be sterilized so as to kill that germ.

Mr. Roberts—I think the individual spores propagate, and any farm that is once infested with smutty wheat is in danger of keeping it a good while. In fact, I know certain farms that always have smutty wheat. They will get as clean wheat as ever was, and in a year or two it will be smutty. And they thresh—thresh in the yard—and the straw goes out and these spores go out and they are liable to spread. I believe that if a man once has smutty wheat, he had better keep his straw out of the barnyard or else keep his manure off his wheat field. I believe that smut is distributed in the manure.

If a man plants corn out of a crib of smutty corn, he will soon have lots of great smutty ears. It is in the spores; they do propagate. You cannot take too much care. I have three or four farms, but we never have had any smutty wheat in fifty years, and it was all in luck; we never happened to have it. But some of my neighbors, similar land, have smut all the time, and I try to tell them that it is propagated through their barnyard.

Mr. Flitcraft—I have had a little experience, but I wanted to get all the information I could. I think the only remedy would be to wash the wheat in a chemical—blue stone or some other chemical—to kill the germ. We have had trouble in the West, and we wash all our seed wheat every year.

Secretary Dye—There was no committee appointed on exhibits, and I move a vote of thanks to those who have brought these vegetables here for exhibition and inspection.

Motion carried.

Mr. Denise—We have nothing else to offer to the Executive Committee but our thanks for their services, and I move a vote of thanks to the Executive Committee for their services last year.

The motion was put by Mr. Denise and carried by a rising vote.

The Chairman—Before we adjourn I want to thank you for the kind assistance you have all extended to me. I want to thank you for the consideration you have shown me in having made my labors in the presiding chair so agreeable and so pleasant throughout these sessions. I feel that I am under obligations to the members, being so unexpectedly called to occupy

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this place, which would have been so gracefully filled by our honored President.

It is moved and seconded that we now adjourn.

Motion carried.

FRANKLIN DYE,
Secretary. .

President's Address.

It becomes my privilege as President of this organization to now deliver the annual address. I desire to say in the beginning that I regard this not as a task that must be performed because of my office, nor as a perfunctory duty, but as a pleasant and important part of my work for you, for I take it that the function of the chief officer of any organization that has for its object and purpose helpfulness in any direction should be familiar with said object and purpose not only, but capable of appreciating the work and directing it along lines which will be of the greatest service. The State Board of Agriculture has now been established for a generation, and at this period of our history it may be helpful to consider for a moment our origin and descent, and see in how far we have fulfilled in the past the purpose of the organization. We must remember that this institution, while not founded in the prayers and tears of pious fathers, as is the case in some of our older institutions, is still the child of the best thought of some of our best men, men who were not only familiar with the industry that we represent, but who also understood, in a degree almost prophetic, its bearing and relation to other industries and to the progress of the people in general. My judgment coincides with those who believe that the permanence and usefulness of any superstructure depends very materially upon the character of the foundation, and that this, together with the exercise of skill and knowledge on the part of those who direct and supervise its erection, measures its usefulness; and to-day as we seek the origin and follow the history and usefulness of this State Board of Agriculture we are profoundly impressed with the wisdom of its founders and with the skill and judgment with which the work has been directed, thus making it in all its history of very great service not only directly to the industry which we represent, but indirectly to all classes of our citizens.

The final incentive which fortunately resulted in the establishment of the State Board of Agriculture of New Jersey in 1872 was acquired by the interest and part taken in a National Agricultural Convention held in Washington, in which it was resolved to request the several States to establish Boards of Agriculture, in which they did not then exist, and the function of such Board was clearly pointed out in the preamble to the law passed in that year, namely, "That such a Board, in the proper exercise of its functions, would become a center about which to collect the results of successful farming, and from which to send out digested information in regard to the great questions of farm economy, tillage, crops, stock, fertilizers, reclamation of lands, drainage of farms, etc." It seems to me that the fundamental idea underlying here, though not specifically expressed, is *organization*, because if this Board was to become a center about which to collect results, there must be means whereby it as a center should come in touch with the various forces which have to do with the promotion of agriculture, as well as with practical men in all parts of the State; that this is true is clearly indicated in the first section of the act which made representatives from the Geological Survey, the Agricultural College and from the various county organizations of the State the members which should constitute the Board.

The wisdom of this basic plan, developed more fully by later State enactments, has stood the test of time, and has made this State Board of Agriculture one of the most useful and most powerful organizations for farmers of any State in the Union. There has been no dissipation of energy, because all the forces making for the uplift of the farmer are united and have worked in harmony. There have been no jealousies, no pulling apart, but, on the contrary, one united, concentrated effort on the part of all to do for the farmer and for his business all that science, joined with the best practice, could suggest. It is the best organization that farmers could have, because it is an organization of farmers, managed by farmers, for the sake of farmers, and its energies, therefore, are directed from the farmer's viewpoint. It has not been captured by any influence which has directed its work towards selfish ends.

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The "how" of the work of this institution being so clearly and so admirably provided for, the "what," or the purpose of its organization, is next in order of interest, and Section 5 of the original act is sufficiently broad to cover the whole range of agricultural interests, namely, "That the Board may investigate such subjects relating to the improvements of lands and agriculture in this State as they may think proper," etc. It will be observed that in this broad statement there is no limit to the lines along which the work may be prosecuted, and the history of the Board, as found in its annual reports, shows how fully it has carried out in its work the broad views of those who were its founders. It was early recognized as a State institution, with which the leaders in thought and in the industrial advancement of the State were glad to associate themselves. Two of the chief executives of the State have served as Presidents, and others prominent in political and private life have contributed their share to its progress. While the Board has not misunderstood its duty as provided for in the original act, the very great progress made in the various branches of natural science and its relation to agriculture has resulted in the delegation of certain scientific phases of the work to specific institutions, established to do the work contemplated in the original act. For example, owing to the very great advances in agricultural chemistry, and in our knowledge of the needs of soils in reference to amendments, the work of the Board in exercising a control over the sale of commercial fertilizers was in 1880 delegated to a new institution, the State Experiment Station, established mainly by the efforts of members of this Board, and which now has charge of that branch of the work, together with other lines of investigation and control having for their object the education and protection of the farmer.

The same is true of such matters as pertain to the inspection of human and animal foods, the detection and eradication of certain animal diseases. The work contemplated in the original act primarily engaged in by the State Board has been delegated to the State Board of Health, to the State Tuberculosis Commission, and, as the needs became more pressing, other organizations, which have work specifically provided. In all of these cases,

however, the origin of the idea and the accomplishment of the purpose have come about practically as a result of the work of the Board, and still all of the institutions are working together, recognizing the State Board as the official head and the medium through which suggestions as to development shall be presented and to whom the accomplishment shall be accorded, viz., the farmers who represent the Board.

The State Board, therefore, while responsible for the establishment of other institutions, which has relieved it of certain lines of definite investigation, still keeps in touch with all these institutions, and at the same time directs its energies toward the development and improvement of farm matters, which result in the upbuilding of the industry. It has been foremost in the agitation for and accomplishment of many improvements in rural affairs, which we now take as a matter of course without thinking of the source of our mercies in this direction, and the discouragements met in the early efforts and work that were necessary in order to secure the results.

This State Board of Agriculture was the primary mover in the matter of good roads for this State, and was directly responsible for the law now existing providing for State aid, which is the model now for other States. It was a matter that at the time it was first agitated did not have the support of either those who were directly or indirectly benefited, and, while the present law may not be the best, nevertheless, it is recognized that New Jersey has a better road law than any other State, and a larger proportion of good roads; and no one, whether he believes the law a good one or not, will deny that the movement was a good movement, resulting in much direct benefit to the farming and other industries of the State, as well as to the comfort of the traveling public.

The State Board of Agriculture was also foremost in its advocacy of rural mail delivery, taking the ground that the farmer was entitled to quite as much consideration as the resident of the city, and as early as 1890 active measures were taken by the Executive Committee of this Board towards its establishment. This was followed by frequent communications with the National authorities, and by a continual agitation of the movement by per-

son and by letter on the part of the President and members of the Executive Committee. Resolutions were adopted in 1892, 1893 and 1894 in regard to this matter, and the progress of the movement was laid before the Board at a number of their annual meetings. Notwithstanding much discouragement, the result was finally accomplished, and to-day rural mail delivery is an established fact in practically every State in the Union, and has, moreover, the hearty support of the authorities in Washington. This, too, like the good-roads movement, has its critics; certain influences are unfavorable, yet these influences are not, as a rule, such as have the best interests of all the citizens at heart. It is a sign of progress, and places the farmer on a stand more nearly with that of the city resident by bringing him into closer communication with the business world. Much has also been done in the way of adjusting transportation rates for farmers' produce. Efforts have been made to more nearly equalize freight rates, as well as to reduce them in certain lines. While much more is desirable and might be accomplished in this direction, the efforts have not been in vain. For example, the earnest, businesslike presentation of the matter of the discrimination in freight rates against pears has resulted in getting the same rates for pears as for apples, whereas formerly a higher rate was charged. This, while not a large thing, means considerable in the aggregate, and even more in showing that persistent and intelligent effort is bound to be recognized even by soulless corporations; it is, too, an indication of the work of the Board in the farmers' interests.

This Board has also taken a lively interest in the education of the farmer, thoroughly co-operating with the State Agricultural College in its efforts to promote college education, and was one of the first institutions in the State to recognize the importance of agricultural instruction in the public schools. This matter was earnestly agitated, and through its activity and instrumentality a book was prepared, suitable for the purpose, and conferences held with the State Board of Education with a view to having the work inaugurated in the country schools. So many difficulties presented themselves to the State Board of Education, the chief of which was the lack of competent teachers, that but little genuine progress has been made. Still, its agitation and its

work were fruitful of good results. Other States have taken up the same line of work, and it has resulted in the introduction in the schools of some States of what is termed "Nature Study," this to be supplemented by courses of agriculture in the high schools and short courses in many agricultural colleges. It is good work, and should receive the hearty support of all. Though the work of the Board in this line has not been directly useful in proportion to its importance, it has still been an influence for good in that direction. I forbear, however, to generalize further on the past work of the Board. Its history, as comprised in its annual reports, is a history of the advancement and progress and improvement of agricultural practice during the last twenty-eight years.

I must touch upon the work of the Board, both in its function as a center from which digested and important facts may be distributed as well as its activities in directing many important lines of work. In the first place, I desire to speak of it as an organized body, representing practically the entire State. There are now eighteen County Boards of Agriculture, well organized and officered, and in most cases doing in a limited way what the parent body is doing in a large way. In many of the counties two or more meetings are held annually, at which matters of particular importance to the farmers of these communities are discussed; these are in many cases attended by a representative of the State Board, urging complete organization and membership in the County Boards, and in directing the thought of the people along the right lines. These County Boards report their work to the State Board, and thus annually we have a complete history of the progress of the agriculture in different communities in the State. The very great usefulness of what may be termed "a community of interests," as exemplified more particularly in the larger organizations of business and capital, is not fully felt by the farmers. Yet the work is on the same line, and just as soon as the farmers as a body realize that there is "a community of interests," which can be conserved and upbuilt and made more helpful, just in that proportion will the farmers be benefited. Still, it must be remembered that organization may be a purely business proposition, and that as a business proposition it is selfish, and in

proportion as the organization is selfish—that is, as its purpose is only for itself and its ends—then will all sentiment and all personal help will be ruled out. It is doubtful whether organizations of this sort for farmers would from all standpoints be the best thing for them, since, owing to the fact that there must be a certain isolation, and therefore a certain dependence one upon another, a purely business organization would have a tendency to break down and destroy much of the delightful and helpful practices that now exist in various communities. Business organization for the farmers, to be of the best service, should be such as to present a solid front in business relations with other interests, but not organization against one another. The State Board stands ready and does assist in the development of this kind of “a community of interests.”

In the next place, the State Board has to do with, and is required under the law, “to collect and disseminate reliable and useful information, and to employ suitable persons to lecture before the State Board at its annual and other meetings and in the counties of the State.” Under this provision of the law, which is virtually a clause relating to education, the State Board has concentrated its energies and its funds mainly in providing for and conducting “Farmers’ Institutes”; the primary purpose of these Institutes is education, and not mere entertainment or amusement. Hence, in their organization and management, the plan has been to secure the best instructors in the various subjects pertaining to agriculture, and to distribute the work in such a way as to make their instruction applicable in the various sections of the State. For this purpose the various scientists of the Experiment Station and of the Agricultural College and leading practical and scientific agriculturists of this and other States have been secured in carrying on the work, and so far as the State Board is concerned generous provision from its funds has been made from year to year, and the work is ample to keep our farmers abreast of the times as to the advances made in science and its application to agricultural practice. I know whereof I speak when I say that from this standpoint the farmers of New Jersey are better informed than those of any other State. The discouraging feature of the work is that the farmers in all parts

There is another side also to this question of the inspection of animals as conducted by the State Tuberculosis Commission, which is perhaps not appreciated as it should be in its bearings upon the development and improvement of the dairy business. The Commission, together with such investigations as are necessary to determine the presence of the disease and its eradication, instructs the individual and the public as to the facts known and established, and as to the conditions which are both favorable and unfavorable for the introduction and spread of the disease, and recommendations are made for the erection of buildings and for the housing of animals and for their feeding and handling, which, if followed, must result not only in reducing the liability of a spread of this particular disease, but in improving the milk supply of the State from a sanitary standpoint, because these recommendations, when carried out, do result in the production of a cleaner and more healthful product. This has its indirect bearing upon the improvement of the public health, and, still further, it has its bearing upon the financial side of the milk question, as it is not only educating the producer, but is educating the consumer as to the importance of a clean and healthful milk supply, and creates in him a willingness to pay a higher price for such a product. This has been demonstrated in various instances in this State, and is not the least of the good results of its work.

While my connection with the work of the Commission has been rather tentative than otherwise until by your favor I was elected your chief officer, I have always taken a deep interest in its work, and have studied carefully its progress, and I am satisfied that the work that is being done, while perhaps not resulting in as rapid an eradication of the disease as may be desired on the part of the medical fraternity, is carried on in such a way as to eventually very materially reduce the possibilities of infection and the losses that occur from its presence, and at the same time to prevent any unseemly agitation that will result in a diminished milk consumption. It is conducted in a conservative and businesslike way, while at the same time is educative on broad lines. This department of the work of the Board merits its strong support and encouragement.

of the State are not taking full advantage of all the opportunities afforded them by these so-called schools. The Board does not do the work for the sake of doing it, and busy men in the various lines of agricultural inquiry do not feel repaid when they take their time and their best thought to communities which can gather a crowd of hundreds at an insignificant auction and a bare dozen at a farmers' Institute. Of course the officers realize the inherited tendency of farmers to attend to their own business, and also the difficulty of introducing or injecting into any body of men acquired characteristics. Notwithstanding the discouragements, so long as the farmers themselves in the most progressive sections of the State are favorable toward work of this character, and know that an Institute properly conducted is helpful in a practical way, and results in better farming and in a more profitable business, the work will be continued in a helpful and hopeful spirit. During the past year twenty-four Institutes were held, and more will probably be planned for the present month. These have, on the whole, been well attended, and a proper interest manifested. Still, it should be remembered by the farmers that the speakers that are brought, oftentimes at considerable expense, are just as capable of addressing one hundred or one hundred and fifty as a smaller number, and I strongly recommend that individual farmers who have felt the benefits of the work should act as missionaries to assist the Board in all legitimate ways to increase the attendance. It must be remembered that education is the one lever more than any other that will lift the industry and place it on a higher plane, making it a profession concerning the scientific problems of which no one need be ashamed to inquire.

Another line of work with which the Board is chargeable, and which in all its bearings is not understood as it should be, is that of the State Tuberculosis Commission. This is primarily a work of the State Board, and I have no hesitation in saying, from a careful examination of it in this State, that there is no other single line of work which is of greater service to dairymen and to the people at large. Its first, and perhaps primary, relation is to the public health, and its second to the maintenance of the health of the herds of the State. The question of the relation of tuberculosis of farm animals to public health is one which is of the

very highest importance, though it is one that admits of very considerable controversy. While much is known, yet there is much to be learned concerning the disease and its control. Leading scientists are not a unit in their views concerning its transmission from man to animal or from animal to man, nor are they a unit as to the best methods to be used in preventing its transmission or its eradication. Still, I think all must agree with statistics which show that this disease in the human family is responsible for a higher rate of mortality than any other one disease, and also that it is communicable, that it is preventible, and that it can be eradicated. With these facts there can be no question as to the State's duty in the matter of its supervision and control. One thing is certain, that no amount of disbelief in the presence of and in the spread of the disease, and its communicability, no amount of ridicule of the methods that may be used in the detection and eradication of the disease can change the facts as established; facts are stubborn things, and the thing to do is to recognize them, to use such means of investigation and such methods as shall be serviceable to the public, both from the standpoint of health and from the standpoint of the owner of cattle. The recent utterances of Dr. Koch, perhaps the foremost student of the subject in the world, concerning the differences in the bovine and human tubercle bacilli, and the probability that bovine tuberculosis may not be acquired by the human, were, in my judgment, uncalled for, unfortunate and not sufficiently substantiated by experiment, even though his conclusions may be finally proved to be correct. His action has already resulted in weakening the forces that have been at work, causing in the minds of many, particularly those not fully acquainted with the facts, an uncertainty and wavering as to their line of duty, and this, even though his statements were all facts, must result in great losses to owners of cattle. In other words, even if it should be established that the bovine tubercle bacilli is not communicable to the human family, there is no good reason for an abatement of effort to control and eradicate the disease from the standpoint of the owner of cattle, because the fact remains that the disease is communicable to cattle, and, if it once gets a foothold in a herd, will spread and result in loss to said owner.

Another line of work which the Board is in part responsible for is the control of the spread of insect pests, the chief among which perhaps is the San Jose Scale. Through the efforts of the Board a law was enacted in 1898, which created the office of State Entomologist, and made the Board of Agriculture responsible for the appointment of insect commissioners to co-operate with the State Entomologist in his work of inspection and eradication. This work is of importance, first, from the standpoint of the introduction of injurious insects, and, second, in their destruction. The Entomologist has been untiring in his efforts in both directions, and has had the hearty support and assistance of the insect Commissioners throughout the State; his investigations have resulted in the discovery of remedies which, if properly used, will, if not eradicate, prevent serious injury, particularly from the San Jose Scale, with a consequent encouragement and improvement of our horticultural interests. Here, as elsewhere, the earnest and hearty co-operation of the farmers of the entire State, both in reporting presence of the trouble and in taking prompt and active measures, cannot be over-estimated. Too much emphasis cannot be placed upon the necessity for a careful reading and study of the bulletins published and a prompt action in accordance with their suggestions. If our horticultural interests are to be properly conserved, it means work, earnest, hearty and intelligent, all along the line, which must be in the end effective for good.

Another matter which has engaged the attention of the officers of the Board this year is the exhibit at the Pan-American Exposition. In making this exhibit the Board labored under many difficulties and disadvantages, due chiefly to the facts that the appropriation made by the State was, in the first place, too small to permit of a proper exhibit of all our products, and, in the second place, because it was made so late that it prevented any previous preparation in the way of growing crops or in planning for the exhibit. All preparations were of necessity made after the appropriation was made in March. In this work an entirely new plan was adopted, namely, that it should not be a show, but an exhibition of the resources of the State, particularly along the line of market gardening, and of such a character

as to be educational rather than entertaining. The final outcome was exceedingly gratifying, though in the early season much unfavorable criticism was heard. This arose in large part because of lack of preparation, already referred to, and because the visitors expected a show, and did not expect to be taught anything in regard to the peculiar advantages of the State for various lines of farming. Nevertheless, it proved a very valuable object-lesson, and the high words of commendation from those leaders in education and in agricultural development along many lines from this and other States, who were eminently capable of passing true judgment, were a sufficient guarantee of the wisdom of the Board in adopting the method. Besides, the many medals secured gave evidence of the value of the exhibits in the minds of the judges. The fact also that the exhibits required constant renewal in certain lines made the matter of direction and supervision much more onerous, requiring the attendance of the Secretary for a large portion of his time. He is to be congratulated upon the very great success of the work, because it was in large part due to his indefatigable efforts. His own report will show in more detail the results that were obtained.

Another feature of the exhibition which received the highest commendation from leading officials in our own and other States was the very admirable hand-book, prepared by the Secretary, giving an historical sketch of the different counties in the State and statements showing the peculiar advantages of the State in reference to its location, its soils, its transportation facilities, and its public institutions. This hand-book was widely distributed at the Exposition, and a considerable number are still available for meeting the requests that are constantly coming to the office for information concerning the various opportunities afforded by the State for the location of farms, as well as for the establishment of various industries which use the farmers' products.

This rather desultory review of the progress of the Board from its first establishment and its present activities indicates only imperfectly what a force may be made of institutions of this kind. We find that, through the proper exercise of its functions,

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the farmers of the State are now protected in so far as it is possible for wise laws to protect. For example, they are protected in the purchase and use of commercial fertilizers by the exercise of a chemical control; they are protected in their purchase of feeding stuffs by the exercise of a chemical control; they are protected in the introduction and spread of insect pests by the exercise of an entomological control, and they are protected in the introduction and spread of tuberculosis by the exercise of a biological control. They are assisted and educated by means of lectures by progressive men in the various lines of agricultural activity at our annual meetings and at our farmers' institutes and County Board meetings throughout the State. They are assisted in promoting the agricultural interests of the State by the activities of the Board in publishing a hand-book, showing the resources and advantages of the State. They are assisted in their organization by the exercise of the functions vested in the State Board. Yet it must not be forgotten that the protection thus afforded by law is only indirect for those who do not take immediate advantage of the facts furnished and of the results acquired by investigation. The full advantage of all these helps is secured only when the farmer has full knowledge of their bearing upon him as an individual. These facts give rise to the question: Has the Board done as much as it possibly could do if it had the direct support and hearty sympathy of all of the farmers of the State in the promotion of such interests as are of vital importance to the individual farmer? It seems to me that this question can be answered by a general survey of the situation of some of the farmers at the present time, and their attitude as well as that of other interests toward the business of farming, and in order to get at this we must use comparative methods, which are, I am well aware, sometimes odious. Looking at the question from a business standpoint, we must admit that, as a whole, the farming business in this State is not what it should be when farms situated in those sections of the State which possess a high natural fertility, are well equipped with buildings and fences, well located in reference to markets, well supplied with pure water and pure air, and with the comforts

that may be derived from practically immediate contact with the towns and cities, are being sold at from \$15.00 to \$25.00 per acre. The question must arise, is the business profitable when such conditions prevail? When in going over the State, attending farmers' meetings, we find a conspicuous absence of young men in the audiences, and a lack of inquiry as to the principles which govern the business; when we find the boys leaving farms, and the homesteads passing into the hands of foreigners, we must inquire, Are the inducements to farming lines less than those in other lines of business or pursuits? The answer to our inquiry must be in the negative. Is not the cause, then, worthy of our earnest inquiry, and, while personally I have not had as much opportunity as I should like to study the question, I have been in a position the past twenty years that has enabled me to gather impressions, and you will pardon me if I give voice to one of two of them at this time. I am satisfied that, all things considered, the difficulty lies in the lack of proper education. The farmer has not a right knowledge of himself, of his power, which includes his environment. This matter of education is one which this Board, to be sure, has advocated in season and out of season, but it has not yet accomplished results in the way of facilities, which are, I am sure, possible, and which the experience in other States shows are possible. Are the farmers of this State satisfied with the conditions that now prevail? Are they satisfied that they have but one agricultural college, supported, not by the State, but by national funds, which is a college and not a school, fitting men for the higher walks of life? Are they satisfied that this College, so supported, and for this purpose, should furnish the farm and equipment necessary by carrying on experiments in the field and dairy, and still make its income meet its expenses? Is the dignity of this great industry maintained, so long as it accepts the charity of other institutions for these facilities, necessary for experimentation? Are they satisfied with the further privileges of education afforded by the institutes and boards of agriculture? Are these advantages sufficient to give to the boy the proper insight into the work that he must inherit if he stays upon his father's farm? The answer must again be in the negative. The very great advances that have been made in methods

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of teaching, in the number capable of giving instruction, and in the facilities whereby such instruction can be gained, in my judgment, offers no excuse for any farmer or farmer's son of the future lacking the knowledge of the principles which govern his business. The boy who is fond of business says the farm is too narrow a field. His point of view is that of the father, and shows that in a business way the possibilities of the farm are not understood. The farmer has been satisfied in the past to be a mere producer of raw material, and thus the commercial side of farming in its various bearings has remained undeveloped. He does not understand nor appreciate the opportunities afforded for bringing him in contact with the world, both as a producer and as a manufacturer, nor the importance to himself and to the world of such position, because he has not been trained to see its advantages. There are more business problems for the farmer of to-day than for the ordinary business man, yet other lines of business are attracting the boys from the farm, because, forsooth, they offer greater business opportunities. The spirit of money-getting and spending that is abroad in the land, the measuring of everything by gross dollars and cents, is, no doubt, responsible in large part for the tendency to leave the farm, because of the glittering, though oftentimes fateful, promises of greater opportunities of money-getting in cities and towns.

In the management of the boy, therefore, he must be early taught to see the true relations between farming and those lines of business which are carried on in cities, and I think it is readily demonstrable that the conditions obtaining to-day and the prospects for the future of farming are much more encouraging than they were in the past. The farmer of to-day should, first of all, be educated to the farm, but he should be a business man, and if he does not understand the principles which underlie his operations, and does not keep himself up to the times in the matter of business relations, he is following old-line methods of farming; he is not a successful farmer in the true sense. His business, therefore, offers but little encouragement to the boy who is anxious to do something worthy of a man, to come in close contact with the world, and who sees in his father's operations and the results of them nothing to excite his activities. This

matter of education is of vital importance. The teachings of science may be applied to agriculture in many ways, and while the education may be primarily for the sake of education itself in the purely æsthetic sense, it may be made to have its immediate application in improving farm practice, and thus have an important commercial bearing. It is not only in agriculture that education is all-important. Justice Brewer, of the United States Supreme Court, than whom there is no abler exponent of the principles of true progress, in a recent address before the New England Society in Philadelphia, had this to say concerning the bearing of education on our national progress and civilization :

“Another matter is education. So far as the elementary branches, it should be universal. It is not the privilege of a few ; it is the duty of all. We glory, and rightly, in our common school system. But it does not reach all or everywhere. Whatever stays its universal touch must be eliminated. Beyond this the higher, yea the highest, education looms up with imperious demand. We recognize no boundaries to scientific investigation and research. The unknown in the material world must be made the known. A weed is said to be a plant whose uses are yet unknown. Science must prove that there are no weeds ; that there are blessings and beneficial uses in even a Canada thistle. And so in all other directions. In every department of knowledge the eager, aspiring student must find the place and means for pursuing his studies. For this, wealth must place itself in the hands of science. It is beginning to do so. It must do so more abundantly, or else, by succession and inheritance taxes, it will be taken for all kinds of public uses. By doing so, this youngest of nations will become the great educational center, an example to all.”

These are noble, inspiring and patriotic sentiments. Shall not agriculture have her place the loftiest of them all, when they shall have reached fruition ?

Furthermore, it can be demonstrated that the successful farmers in this State, and there are hosts of them, are successful because in the last analysis it shall be found that they came to be familiar with the principles which govern in the growth of their crops, either through direct study or through long years of

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experience, together with that further knowledge of business relations which must enter in all successful operations. Is it not worth your while, as a Board of Agriculture, to take strong ground and retain it in favor of a more rational education of the men who are to be the future farmer-citizens of this great commonwealth? Is it not time that this Board, with its moral influence, representing, as it does, the best in the State, should see to it that this State, so rich in its natural farming resources, which has done so much indirectly for all classes of its citizens, should not maintain and support schools and colleges whereby all of our young men may have the opportunity of acquiring that which is so vital not only to the interests of the farmer himself, but to the interests of all of its citizens? This may not cure all our ills, it may not immediately solve the question of obtaining intelligent and industrious farm help, it may not immediately raise the price of farm lands in all parts of the State, it may not enable us to put more dollars in the bank, but it will certainly give us a better point of view, a more intelligent appreciation of the situation, and a wider training of both mind and heart, and thus build up a citizenship far superior to that ever before known, one which will be prepared to appreciate to the full that greater and nobler citizenship in store for future generations.

Annual Report.

FRANKLIN DYE, SECRETARY.

Reports of crop conditions and yields throughout the State of New Jersey are far from comprehensive, owing to the lack of a properly organized and efficient system of collecting and reporting. The time of reporting has been, as established by the law of 1887, December 15th of each year, and such reports are to be forwarded to the Secretary of the State Board by the Secretaries of the County Boards on that date.

These Secretaries have no power to collect data beyond the willingness of farmers to give, neither is their remuneration such as to allow them to devote the time necessary to make a canvass of their counties for this purpose. Correspondence is their chief means, and this is slow in coming in and meager as to detail.

With such inadequate facilities for securing reliable information concerning the farming interests, and the added fact that a correct report of crop yields cannot be made until enough has been marketed to give a fair indication of the total yield of the several crops, the requirements of the later enactment, that reports be made by October 31st, is impossible to comply with, except in a general way.

In general, the farmers of the State have had an encouraging year; not that every crop has fulfilled the hopes of the grower, nor that every farmer has had such encouraging returns. It would be an anomalous bestowment of nature if such were the case. All farmers do not farm with that degree of intelligence, that exactness of method and carefulness in detail that is necessary to secure best results.

Furthermore, there are variations in the amount of rain-fall, both as to its superabundance or the opposite extreme that causes dry weather, which affects growing crops adversely, no matter what care and skill may be used for their production. Then, too, there are the hordes of insect pests—blights—and fungous foes that come in varying numbers from year to year to prey upon the growing crops of the farmer.

The early part of the past summer was oversupplied with rain, so much so that most crops were retarded and some seriously injured. Strawberries, being oversupplied with water, were not sufficiently solid in texture to bear shipment to reasonably distant markets. Early peaches were similarly affected, and rotted on the trees before they were ripened. Continuous rains at blossoming time prevented full pollenization of the apple, with the result that there is practically no apple crop. Pears were reduced from the same cause.

Potato fields were so surcharged with water for a long period as to make timely cultivation impossible, and this condition solidified the soil to such an extent on most farms that subsequent cultivation, with the growing crop on the ground, could not restore the soil to that essential condition of looseness or friability so needful for best results. Added to the above early wet condition, a dry, hot spell beset the crop at the time when the tubers should have had the most favorable conditions. For the reasons named, the potato yield has been much below the average, and, to some extent, of inferior quality.

Some market-garden crops were also similarly affected. Wheat, too, and oats were reduced, the former by a weakened straw and the ravages of injurious insects, the latter by rust and blight. Corn, on the other hand, being a crop that requires the entire season for its development, was not injured, except locally, but gave a superior yield. Hay also shows a good return. Some of the later varieties of peaches were fine and returned good prices to the grower.

Some market-garden crops and an occasional potato field were so favorably located as to bring unusual rewards to their fortunate owners, owing to the general scarcity. But with all the drawbacks named, there is prosperity, and the farmers who

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farm in a business way are receiving a fair share of gain. The varying conditions named have always existed. Their form and extent changes from year to year. But they never have and should not now discourage the intelligent farmer. There is always something to hope for, something to gain by going straight forward. The world must be fed, and for the *best* products there is always a paying market.

The table of crop yields and prices given below, notwithstanding the drawbacks named, shows an increase in actual money value over that of last year of more than \$4,000,000, owing to increased yield and value of the corn crop, the increased price per bushel of potatoes and some other items. And this fact, which is not an unusual one, should teach with emphasis the importance of a mixed husbandry. It is well to have some special money crops, but always safe to have others to supplement should the former fail.

TABLE I.

Acreage, Yield and Price of the Principal Cultivated Crops for 1901.

The number of acres to each crop are taken from the United States Census returns for 1900; the average yield per acre and price are from returns made by reporters of the State Board.

Crop.	Acreage.	Yield per Acre.	Total No. Bushels.	Average Price.	Total Value.
Corn,	295,258	37	10,924,546	\$0.65	\$7,100,954.90
Wheat,	132,571	16	2,121,136	.70	1,484,795.20
Oats,	75,959	* 16	1,215,344	.50	607,672.00
Rye,	68,967	15	1,034,505	.55	568,977.75
Buckwheat,	15,762	19	299,478	.60	179,686.80
Hay (tons),	444,610	1.32	586,885	14.00	8,216,390.00
W. Potatoes,	52,896	59	3,120,864	.90	2,808,777.60
S. Potatoes,	20,588	113	2,296,444	.80	1,837,155.20
Total value,					\$22,804,409.45

Apples are twenty-one per cent. of a full crop.

Pears are forty-eight per cent. of a full crop.

Grapes are sixty-two per cent. of a full crop.

New Jersey exceeds in yield per acre of corn all the great corn States of the West, and is exceeded only by Maine, New

* A very poor year for this crop throughout the State.

Hampshire, Massachusetts, Connecticut and Wyoming, which States have a slight yield per acre above New Jersey.

With the exception of four States, where irrigation is used in crop production, New Jersey is exceeded by but three in the yield per acre of sweet potatoes, and it is a known fact that the quality and flavor of New Jersey sweets are excelled by none. So much so is this the case that some other States, both on the seaboard and in the Middle West, are branding and marketing this product under the name of *New Jersey Sweets*. This course, if allowed to continue, will bring into disrepute our product and seriously affect the popularity of and demand for the New Jersey product. New Jersey growers should look to their interest and find a remedy for this imposition. About 25,000 acres are devoted to this crop in the entire State, and the yield, as reported—113 bushels per acre—gives a total for 1901 of 2,825,000 bushels.

TABLE 3.—NUMBER AND ACREAGE OF FARMS, AND VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, JUNE 1ST, 1900, WITH VALUE OF PRODUCTS OF 1899 NOT FED TO LIVE STOCK, AND EXPENDITURES IN 1899 FOR LABOR AND FERTILIZERS, BY COUNTIES.

COUNTIES.	NUMBER OF FARMS.		ACRES IN FARMS.		VALUE OF FARM PROPERTY.				Value of products not fed to live stock.	EXPENDITURES.	
	Total.	With buildings.	Total.	Improved.	Land and improvements (except buildings).	Buildings.	Implements and machinery.	Live stock.		Labor.	Fertilizers.
The State,	34,650	34,027	2,840,966	1,977,042	\$93,360,930	\$69,230,080	\$9,330,030	\$17,612,620	\$35,052,609	\$6,720,030	\$2,165,320
Atlantic,	1,295	1,259	64,419	32,954	1,611,566	1,124,220	144,270	211,215	767,869	119,800	58,570
Bergen,	1,716	1,683	75,760	46,766	8,243,180	4,838,960	524,380	682,267	1,665,810	378,720	113,990
Burlington,	2,549	2,505	343,096	190,871	6,474,010	5,845,790	899,120	1,863,961	3,863,961	858,430	257,250
Camden,	1,133	1,109	76,535	55,370	3,873,320	2,258,700	332,920	513,482	1,487,394	274,370	130,170
Cape May,	601	596	54,366	24,387	784,450	631,520	92,300	183,087	438,702	57,000	30,310
Cumberland,	2,223	2,197	143,994	101,830	3,864,940	2,798,520	381,280	745,304	1,699,454	238,360	120,770
Essex,	1,003	981	31,169	18,975	6,978,660	2,678,460	288,150	501,304	1,550,976	319,440	48,190
Gloucester,	2,225	2,185	148,590	117,554	4,429,080	3,449,850	565,360	901,566	2,329,114	440,050	278,300
Hudson,	358	335	2,820	1,928	2,901,700	915,250	175,550	158,783	1,018,170	204,230	23,440
Hunterdon,	2,930	2,894	248,733	208,986	4,313,850	4,908,570	757,990	1,743,002	2,438,376	365,080	127,350
Mercer,	1,573	1,531	132,726	108,747	4,518,210	3,641,700	582,070	1,044,667	1,775,184	379,430	152,680
Middlesex,	1,750	1,719	129,317	96,782	4,631,230	3,519,430	511,910	750,229	1,385,804	264,520	128,480
Monmouth,	2,772	2,720	197,481	155,716	8,508,590	6,101,810	851,050	1,449,793	3,013,361	629,630	221,730
Morris,	2,305	2,281	206,759	118,212	7,477,170	6,483,820	631,020	987,558	1,974,241	461,680	82,000
Ocean,	984	954	84,856	40,141	1,501,760	1,189,980	139,380	266,382	420,661	76,700	23,670
Passaic,	916	892	69,820	28,721	2,976,860	1,908,610	180,160	361,578	817,903	148,350	33,290
Salem,	2,072	2,022	175,202	135,727	4,636,570	3,509,700	501,780	1,216,613	2,401,474	356,290	164,570
Somerset,	1,958	1,906	167,663	140,436	5,108,230	5,073,840	644,880	1,259,840	1,490,448	355,430	98,000
Sussex,	1,792	1,784	256,896	178,431	3,661,480	3,172,640	393,010	1,406,100	1,984,744	264,700	14,940
Union,	700	693	29,076	20,483	3,179,870	1,904,850	266,880	312,932	993,978	206,500	22,860
Warren,	1,795	1,781	201,688	154,015	3,686,210	3,273,860	466,570	1,046,957	1,562,045	231,320	34,760

(NOTE.—Believing that all who receive this report will not possess a copy of the Twelfth Census (1899) of the United States, and in order to give a uniform basis for future crop and stock estimates, I have deemed it advisable to reproduce from said census certain tables and explanations for reference. Table I, given above, explains itself.)

EXTRACTS FROM THE TWELFTH CENSUS OF THE UNITED STATES.

The following are verbatim from the census:

The only counties in which the number of farms is less than in 1890 are Somerset, Morris and Hunterdon, which show decreases of 3.5 per cent., 4.4 per cent. and 5.8 per cent., respectively. The largest relative increases are in Hudson, Atlantic, Cumberland, Essex and Ocean counties, in the order named.

The total area of farm land in the State is 6.7 per cent. greater than in 1890. The counties showing the largest percentages of increase are: Hudson, 119.5 per cent.; Ocean, 55.0 per cent.; Cumberland, 34.3 per cent.; Camden, 24.0 per cent., and Passaic, 21.0 per cent. The farm acreage has decreased slightly in Monmouth, Hunterdon, Morris, Somerset and Bergen counties.

The percentage of farm land improved is less than it was in 1890 in all counties except those in which there are marked increases in total farm acreage.

The total value of land and buildings has decreased in all counties along the western boundary, except Camden and Cumberland, where small gains, due to large increases in total acreage, are reported. The value per acre of land and buildings has increased in Atlantic, Bergen, Essex, Morris, Passaic, Somerset and Union counties. Of these counties all but Atlantic are in the northeastern part of the State, and the increased values are doubtless due to the rapid development in special branches of agriculture, stimulated by the proximity of New York City markets. The other counties, in each of which the value of farms has decreased since 1890, also showed decrease for the decade 1880–1890. The farms of these counties, as a

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rule, are better adapted to general agriculture than to the growing of fruits or vegetables, and are less intensively cultivated than the farms of those counties in which values are increasing.

The value of implements and machinery has increased since 1890 in every county, the largest relative gains being in the counties where dairying and market gardening are the leading branches of agriculture.

The total value of live stock has increased 11.4 per cent., Morris being the only county in which a decrease is reported. Hudson, Essex and Union counties show the largest relative gains.

The average expenditure per farm for labor was \$194 for the State, and ranged from \$78 in Ocean county to \$822 in Hudson county. In the latter county \$104 was expended for labor for every acre of farm land.

For fertilizers the average expenditure per farm in 1899 varied from \$8 in Sussex county to \$125 in Gloucester county, while the average for the State was \$62. In 1889 the State average was \$60 per farm, and the county averages ranged from \$2 in Sussex to \$175 in Hudson.

LIVE STOCK.

At the request of the various live stock associations of the country a new classification of domestic animals was adopted for the twelfth census. The age grouping for neat cattle was determined in accordance with their present and prospective relations to the dairy industry and the supply of meat products. Horses and mules are classified by age, and neat cattle and sheep by age and sex. The new classification permits a very close comparison with the figures published in previous census reports.

Table 14 presents a summary of live-stock statistics.

TABLE 14.

Number of Domestic Animals, Fowls and Bees on Farms, June 1st, 1900, with Total and Average Values, and Number of Domestic Animals Not on Farms.

Live Stock.	Age in years.	ON FARMS		Av. Value	Not on Farms
		Number	Value		
Calves,	Under 1,.....	39,685	\$349,937	\$8.82	1,238
Steers,	1 and under 2,	1,519	25,951	17.08	172
Steers,	2 and under 3,	928	27,329	29.45	173
Steers,	3 and over,...	588	23,818	40.51	3,938
Bulls,	1 and over,...	8,271	226,177	27.35	336
Heifers,	1 and under 2,	23,609	470,484	19.93	742
Cows kept for milk,...	2 and over,...	157,407	5,840,228	37.10	10,392
Cows not kept for milk,	2 and over,...	7,977	235,183	29.48	414
Colts,	Under 1,.....	1,826	153,251	83.93	107
Horses,	1 and under 2,	3,054	240,380	78.81	155
Horses,	2 and over,...	89,144	7,188,643	80.64	82,929
Mule colts,	Under 1,.....	67	2,844	42.45	1
Mules,	1 and under 2,	322	20,823	64.67	11
Mules,	2 and over,...	4,499	330,370	73.43	1,111
Asses and burros,....	All ages,.....	43	2,455	57.09	78
Lambs,	Under 1,.....	21,367	83,566	3.91	129
Sheep (ewes),	1 and over,...	24,744	109,540	4.43	9,408
Sheep (rams and wethers),	1 and over,...	1,619	9,384	5.80	764
Swine,	All ages,.....	175,387	926,179	5.28	25,954
Goats,	All ages,.....	699	3,006	4.30	1,750
Fowls *—					
Chickens, † .....	.....	1,993,594			
Turkeys, .....	.....	32,378			
Geese, .....	.....	10,518	1,300,853	....	....
Ducks, .....	.....	40,024			
Bees (swarms of),....	.....	14,118	39,219	2.78	....
Unclassified, .....	.....	.....	3,000	....	....

Value of all live stock,..... \$17,612,620

The total value of all live stock on farms June 1st, 1900, was \$17,612,620. Of this amount the value of horses constituted 43.0 per cent.; dairy cows, 33.2 per cent.; other neat cattle, 7.7 per cent.; poultry, 7.4 per cent.; swine, 5.3 per cent.; sheep, 1.1 per cent., and all other live stock, 2.3 per cent.

* The number reported is of fowls over three months old. The value is of all, old and young.

† Including Guinea fowls.

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Colts under one year have a higher average value than horses over two. This is due to the fact that New Jersey contains several very extensive stock farms, devoted exclusively to the breeding and training of horses for track purposes. This also explains the comparatively high value of "horses one and under two."

No report was secured of the value of live stock not on farms, but it is probable that such animals have higher average values than those on farms. Allowing the same averages, the total value of all live stock in the State, exclusive of poultry and bees not on farms, is approximately \$25,199,000.

CHANGES IN LIVE STOCK KEPT ON FARMS.

The following table shows the changes since 1850 in the number of the most important domestic animals:

TABLE 15.

Number of Specified Domestic Animals on Farms, 1850 to 1900.

Year.	Dairy Cows.	Other Neat Cattle.	Horses.	Mules and Asses.	Sheep.*	Swine.
1900,.....	157,407	82,577	94,024	4,931	26,363	175,387
1890,.....	161,576	50,486	86,925	8,227	55,409	224,388
1880,.....	152,078	71,808	86,940	9,267	117,020	219,069
1870,.....	133,331	64,157	79,708	8,853	120,067	142,563
1860,.....	138,818	99,976	79,707	6,362	135,228	236,089
1850,.....	118,736	92,525	63,955	4,089	160,488	250,370

The number of dairy cows is 4,169 less than that reported in 1890. The number reported in 1900, however, is exclusive of 7,977 "cows not kept for milk" (see Table 14), many of which were doubtless milch cows dry at the time of enumeration. The 39,685 calves reported in 1900 are included in the above table with "other neat cattle." It is uncertain whether calves were included under this head in the reports for previous census years. If not, they should be deducted from the total given for 1900 in making comparisons with previous reports.

A nearly continuous decrease since 1860 would then be shown in the number of "other neat cattle."

* Lambs not included.

The present census shows 47.0 per cent. more horses than were reported in 1850. The increase has been nearly continuous, but especially marked in the last decade, when it amounted to 8.2 per cent. Mules and asses increased steadily in number from 1850 until 1880, when a decline began. The report for 1900 shows 40.1 per cent. fewer mules and asses than were reported ten years before. The number of sheep has decreased steadily since 1850, and in the last twenty years at a very rapid rate, the present number being less than one-half the number reported in 1890. No regular movement is shown in the number of swine reported at the various decennial periods, but the general tendency since 1850 has been downward. There was a decrease of 21.8 per cent. in the last decade.

In comparing the poultry report for 1900 (see Table 14) with that for 1890, it should be borne in mind that in 1900 the enumerators were instructed not to report fowls less than three months old, while in 1890 no such limitation was made. This fact explains, to a great extent, the decrease shown in the number of fowls of all kinds. Compared with the figures for 1890, the present census shows decreases in the number of fowls as follows: Chickens, 33.3 per cent.; geese, 48.4 per cent.; ducks, 64.8 per cent., and turkeys, 80.0 per cent.

ANIMAL PRODUCTS.

Table 16 is a summarized exhibit of the animal products of agriculture:

TABLE 16.

Quantities and Values of Specified Animal Products, and Values of Poultry Raised, Animals Sold and Animals Slaughtered, on Farms, in 1899.

Products.	Unit of Measure.	Quantity.	Value.
Wool,	Pounds,.....	146,628	\$31,266
Milk,	Gallons,.....	* 77,714,055	
Butter,	Pounds,.....	5,894,363	8,436,869
Cheese,	Pounds,.....	24,377	
Eggs,	Dozens,.....	11,942,550	1,938,304
Poultry,			2,265,816
Honey,	Pounds,.....	174,250	.....
Wax,	Pounds,.....	7,640	23,479
Animals sold,			1,638,767
Animals slaughtered,			1,406,187
Total,.....			\$15,740,688

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The value of animal products in 1899 was \$15,740,688, or 36.1 per cent. of the value of all farm products, and 44.9 per cent. of the gross farm income. Of the above amount 53.6 per cent. represents the value of dairy products; 19.3 per cent. that of animals sold and slaughtered on farms; 26.7 per cent. that of poultry and eggs, and 0.4 per cent. that of wool, honey and wax.

DAIRY PRODUCE.

The steady growth of city population and the increasing popularity of Atlantic coast resorts have largely increased the demand for dairy produce in New Jersey. The present importance of the industry is shown by the fact that in 1899 the proprietors of 5,959 farms, or 17.2 per cent. of the farms of the State, derived their principal income from dairy produce, the total value of which constituted over one-half that of all animal products, and 24.1 per cent. of the gross farm income. The production of milk in 1899 was 18,710,102 gallons greater than in 1889, a gain of 21.4 per cent. The quantity of milk sold was 50,726,011 gallons. The milk sold in 1889 was not separately reported, but since 1879 there has been a gain of 35,253,228 gallons, or 227.8 per cent., the quantity having more than doubled in every county except Atlantic, Middlesex and Union.

Of the \$8,436,869 given in Table 16 as the value of all dairy products in 1899, \$1,265,980, or 15.0 per cent., represents the value of such products consumed on farms, and \$7,170,889, or 85.0 per cent., the amount realized from sales. Of the latter sum \$6,318,568 was derived from the sale of 50,726,011 gallons of milk; \$818,624 from 3,748,489 pounds of butter; \$31,508 from 35,986 gallons of cream, and \$2,189 from 20,909 pounds of cheese.

In 1879 9,513,835 pounds of butter were made on farms; in 1889 8,367,218 pounds, and in 1899 but 5,894,363 pounds. This decrease is due principally to the transfer of butter-making from the farm to the creamery, and to the increase in the quantity of milk and cream consumed in cities.

POULTRY AND EGGS.

Of the \$4,204,120 given as the total value of the products of the poultry industry, 46.1 per cent. represents the value of eggs, and 53.9 per cent. that of poultry raised.

The total number of dozens of eggs produced in 1879 was 6,686,142; in 1889, 8,031,571, and in 1899, 11,942,550. The increase in the last decade, amounting to 48.7 per cent., tends to confirm the statement, made elsewhere, that the reported decrease in the number of chickens is more apparent than real.

WOOL.

The raising of sheep is confined almost entirely to the north-western part of the State, the five counties of Warren, Hunterdon, Morris, Sussex and Somerset having reported more than three-fourths of the total production of wool in 1899. The clip has decreased almost constantly for more than fifty years, and in 1899 was 60.9 per cent. less than in 1849.

HONEY AND WAX.

In 1889 160,310 pounds of honey and 3,381 pounds of wax were reported, while in 1899 the production of honey was 174,250 pounds and of wax 7,640. In both years the greater portion of the product was reported from Hunterdon, Morris, Sussex and Warren counties.

CROPS.

The following table gives the acreages, quantities and values of the crops of 1899:

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TABLE 18.

Acreages, Quantities and Values of the Principal Farm Crops in 1899.

Crops.	Acres.	Unit of Measure.	Quantity.	Value.
Corn,	295,258	Bushels	10,978,800	\$4,533,473
Wheat,	132,571	Bushels	1,902,590	1,347,650
Oats,	75,959	Bushels	1,610,610	492,341
Barley,	336	Bushels	4,790	2,301
Rye,	68,967	Bushels	831,410	442,446
Buckwheat,	15,762	Bushels	234,275	120,479
Kafir corn,	4	Bushels	100	50
Clover seed, .....	.....	Bushels	181	977
Grass seed, .....	.....	Bushels	5,006	1,818
Hay and forage,	444,610	Tons	542,796	5,544,970
Miscellaneous, .....	.....	.....	.....	88,595
Tobacco,	2	Pounds	720	83
Dry beans,	201	Bushels	2,888	5,886
Dry pease,	45	Bushels	806	868
Potatoes,	52,896	Bushels	4,542,816	2,192,456
Sweet potatoes,	20,588	Bushels	2,418,641	1,213,010
Onions,	882	Bushels	163,728	105,327
Miscellaneous vegetables, ...	76,897	.....	.....	4,914,803
Sorghum cane,	6	Tons	* 1	3
Sorghum syrup, .....	.....	Gallons	450	160
Small fruits,	25,371	.....	.....	1,406,049
Grapes,	† 2,400	Centals	42,350	‡ 81,758
Orchard fruits,	† 80,634	Bushels	6,168,480	|| 2,594,981
Flowers and plants,	614	.....	.....	1,953,290
Seeds,	112	.....	.....	43,191
Nursery products,	1,728	.....	.....	339,926
Broom corn,	11	Pounds	4,810	266
Hops,	1	Pounds	75	9
Peanuts,	§	Bushels	7	10
Nuts, .....	.....	.....	.....	20,660
Forest products, .....	.....	.....	.....	469,005
Total,	1,295,909			\$27,916,841

Vegetables, including potatoes, sweet potatoes and onions, contributed 30.2 per cent. of the total value of crops; cereals,

* Sold as cane.

† Estimated from number of trees and vines.

‡ Including value of raisins, wine, etc.

|| Including value of cider, vinegar, etc.

§ Less than one acre.

24.8 per cent.; hay and forage, 19.9 per cent.; fruits, 14.6 per cent., and all others, 2.1 per cent.

The average yield per acre of hay and forage was 1.2 tons, and the average values \$10.22 per ton and \$12.47 per acre. The acreage devoted to hay and forage was 34.3 per cent. of the total acreage in crops, but yielded only 19.9 per cent. of the total receipts. The average values per acre of other crops were as follows: Flowers and plants, \$3,181.25; nursery products, \$190.76; miscellaneous vegetables, \$63.91; sweet potatoes, \$58.92; small fruits, \$55.42; potatoes, \$41.45; orchard fruits, \$32.18; and cereals, \$11.78. The crops yielding the highest average returns per acre were grown on land in a very high state of improvement. Their production requires a relatively large amount of labor, and, in addition, large expenditures for fertilizers.

VEGETABLES AND SMALL FRUITS.

The value of the vegetables grown in 1899, including potatoes, sweet potatoes and onions, was \$8,425,596, of which amount 26.0 per cent. represents the value of potatoes and 14.4 per cent. the value of sweet potatoes. Aside from the land devoted to potatoes, sweet potatoes and onions, 76,897 acres were used in the growing of miscellaneous vegetables. Of this area 15,426 acres were included in family gardens or farms, the vegetable products of which were not reported in detail. Of the 61,471 acres concerning which detailed reports were received, 25,332 were devoted to tomatoes; 11,646 to sweet corn; 6,548 to muskmelons, citrons, etc.; 5,121 to cabbages; 4,040 to watermelons; 2,089 to asparagus; 1,822 to green peas; 1,460 to green beans; 1,314 to cucumbers, and 2,099 to other vegetables.

The total area used in the cultivation of small fruits in 1899 was 25,371 acres, distributed among 10,342 farms. The value of the fruits grown was \$1,406,049, an average of \$136 per farm. Of the total area 8,746 acres, or 34.5 per cent., were devoted to strawberries. The total production for the State was 13,274,120 quarts, of which about one-third was reported by

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Cumberland county. Next in importance are cranberries, of which 8,356 acres were reported, or 32.9 per cent. of the total area used for small fruits.

The raising of cranberries is confined almost entirely to the southern counties, Burlington reporting the largest crop. The total production for the State was 240,221 bushels.

The acreage and production of other berries were as follows: Blackberries and dewberries, 5,254 acres and 3,918,320 quarts; currants, 161 acres and 264,740 quarts; raspberries and Logan berries, 2,240 acres and 2,506,730 quarts; gooseberries, 104 acres and 124,160 quarts, and other berries, 510 acres and 564,160 quarts.

FLORICULTURE.

In the raising of flowers and foliage plants New Jersey is surpassed by few States. In 1899 the proprietors of 630 establishments reported flowers and foliage plants grown for the market valued at \$1,953,290. Of these proprietors 494 made commercial floriculture their principal business, growing, in 1899, flowers and plants worth \$1,893,839, and other products worth \$66,719. They used 3,061 acres of land, valued at \$2,174,865. The value of their buildings, including greenhouses, was \$2,458,240, and, in addition, they had \$156,429 invested in implements and \$35,912 in live stock, making a total investment of \$4,825,446. Their expenditures for labor in 1899 were \$400,382, and for fertilizers \$48,334.

The comparatively large area of land under glass, 11,190,251 square feet, is due to the fact that many truck farmers use glass in growing early vegetables for the New York and Philadelphia markets. The 494 commercial florists report 6,195,903 square feet of glass surface, equivalent to 4,646,927 square feet of land under glass. In addition, there are 1,651 farmers who report a total area under glass 6,543,324 square feet.

The State Board is brought in touch with the farmers of the State through its lectures and addresses at the Annual Meeting

and in the Farmers' Institutes and County Boards; through its annual and other reports published by the State and sent into the farmers' homes, and by regular correspondence throughout the year with the office of the Secretary, which has become a bureau of interest and value to them.

The reports contain the best information available each year on the various subjects that concern the farmers, but others find these publications instructive and helpful; as, for example, the work on Entomology recently published. This book is of value to every owner of a tree or plant, as it treats of their insect enemies and, as far as known, the remedy for their extermination. Teachers and schools not supplied should send for it before the edition is exhausted. Any farmer in the State desiring the publications of the Board will be supplied on request.

The address of the Hon. James Wilson, Secretary of Agriculture, before the Board at the Annual Meeting of 1901 gave the farmers an enlarged view of the importance of their business and the requirements of intellect and knowledge necessary to succeed in it. This address also revealed the wide field now covered by the United States Department of Agriculture and what it is doing to establish in the United States the greatest, most productive and most profitable agricultural system in the world.

Every farmer has an interest in this department, not only in what it is doing to promote greater productiveness, but also in the efforts to increase foreign demand for our supplies. Although many adverse criticisms were made when this department was constituted as it now is, the history of its work under efficient management has proved the wisdom of its creation and its immense value to the country, as witnessed by the agricultural exports, after supplying the millions at home. Farmers should take an interest in this department and secure from it such publications as they may find of value to them.

In this connection I call their attention to the work of our State Agricultural College and Experiment Station. A valuable work along several lines of investigation is carried on there. The results of these investigations are published from time to time, and are of much value to the man on the farm. What per

cent. of our farmers receive these bulletins? What per cent. of those who receive them study their contents and apply their teachings to their business?

But not only the bulletins are valuable; the object lessons in general agriculture, special crops and dairying shown in actual work at the College Farm are also of exceeding importance to all persons interested in progressive agriculture. What per cent. of the farmers, even near New Brunswick, visit this farm and study the methods pursued? Should not our farmers more generally appropriate the knowledge there prepared and fully given? It is for them and all who wish to embark in the business of agriculture.

All reports received state there is a decrease in farm laborers. In this connection the question of the Middlesex Board is pertinent—"How to increase and improve the effectiveness of our farm help?" The cry is quite general throughout the entire State, What are we to do for farm help? There seems to be a growing distaste among laboring men for agricultural work. This question is one that may well claim the serious consideration of this Board.

In no case are farm wages reported as lower than last year; a number state they are higher; the average with board, by the month, is \$16.60; without board, average, \$26.70; wages per day, \$1.25.

Has the scarcity of farm help anything to do with the abandonment of farming by farmers? In former times it was expected that at least one son would continue in the farming business at the time-honored home. But now not only the sons leave, but the fathers also. The outlook for comfortable living and a sure competency in declining years is as good now on the farm as it ever has been, and for bright young men with some means no more hopeful business presents itself to-day.

The *Princeton* (Mercer county) *Press*, in commenting on this condition, says:

Are Americans going out of farming? If so, it will be an unfortunate day for the country. Farming conditions have been very discouraging for a number of years, although confessedly improving of late. The old style farming also with its rotation of staple grains and grass is no longer profit-

able in competition with the great West. And to all this it must be added that the present-day American farmer is not content to live as his ancestors did. He and his family want city comforts and advantages in the country. And his ambition, so far as it reveals a desire for education and the enjoyment of something of the treasures of art and literature and music, is to be praised. Still the unrest and discontent of the American farmer is to be deplored. Some of those who go from the country to the city strike it rich, as the expression goes, and their success is heralded far and wide through the rural districts from which they came. Workers in city missions know how many of the people crowding the tenement districts also came from the country hoping for ease and a fortune, but were sadly disappointed. Their condition is never reported. In our belief no pursuit is more ennobling and none on the whole brings more comfort than that of agriculture. Statistics show that there are fewer failures and more substantial gains of property among farmers than any other class of workers, while the intelligence and morality of their children is proverbial. It seems paradoxical, but it is true, that the blessings of the country life are its undoing, the ambitions it awakens, the high ideals it creates, leading the young to seek other fields for enterprise.

We believe there is still a future for the farmer. There undoubtedly must be changes in methods and crops to meet the changed conditions, but this is true in other lines of business as well. And it is hopeful when so many of those who come to us from foreign lands are taking the discarded farms of the native born. For their children will grow up under the best conditions to understand and love the institutions of this country. But it will prove a national calamity if generally the native born of this country discard farming. We read in the city papers that there is a very strong increasing tide towards the country at present, and the press is rightly rejoicing over the outlook. It may be, in time, that this spirit will also reach the country, and that, the true conditions of life in our overcrowded cities for the great majority of their inhabitants being known, contentment with the surroundings and labor of the country home will return and our rural districts will not present the eager haste of so many to change the country for the city life.

The prices paid farmers for milk run from two cents to three and one-half cents per quart; average price, 3.3. The retail price of milk in cities and towns is six cents for summer and eight cents for winter months. Creamery prices run from two to two and one-fourth cents per quart.

Farmers in some parts of the State are moving for a higher price for milk, owing to the advance in price of most feeding stuffs. If all the accessories to the production of milk, in any case, are of a high class, as healthy stock, milk rich and pure, stables properly constructed, ventilated and kept clean, feeds pure and wholesome, milk handled and delivered in a cleanly manner,

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for milk produced under such conditions the prices named are too low.

Four counties report spraying of fruit trees as slightly on the increase.

The acreage of winter wheat is reported at 100 per cent., or the same as last year; condition, 60 per cent. Rye acreage, 87½ per cent.; condition, 87 per cent.

In their efforts to avoid the injuries caused by the Hessian fly, our wheat producers have planted their wheat very much later than was the custom in years past. It is questionable whether they have not gone too far in the other direction, and sowed the wheat so late it has not been able to gain a top and root system capable of resisting the winter freezing and the high winds of spring. The outcome of the present seeding will be an object lesson on this point.

FARMERS' INSTITUTE.

The Farmers' Institute course for the season of 1901-2 began November 12th. So far as they have been held up to this date, there is clear evidence of deepened interest. This is shown by larger numbers in attendance, close attention to the more complex questions of agricultural principles and practice, and the comprehensive character of the questions asked.

There is also a co-operation on the part of leading men and women, farmers and others, with the State management to have the Institute occupy a popular and permanent place among the helpful agencies that work for a more prosperous business and a more intelligent citizenship.

The present series of meetings include the counties of Hunterdon, Monmouth, Cumberland, Gloucester, Salem, Middlesex, Somerset, Mercer, Sussex, Warren, Camden, Burlington, Cape May, Atlantic and Ocean. Other counties may be arranged for during the winter.

The practical benefit arising from the Farmers' Institute is evidenced by improvement in all agricultural and horticultural practice—greater economy in expenditure, utilization of that

that was formerly wasted, more intelligent selection of feeds and fertilizers, increasing production per acre, rather than increasing the acreage; selecting and breeding dairy animals capable of larger yield per head, thus reducing the cost, by eliminating unprofitable cows, while increasing the product; diversification of crops so as to utilize bi-products; manufacturing the products of the farm, particularly the cereals and hay, into pork, poultry, eggs, beef, etc., thereby retaining the fertility value of these crops on the farm, while selling the less bulky and more profitable resultant product.

Thus, while increasing the productivity of lands and stock, trade is enlarged, commerce increased, business becomes more active, property more valuable and taxes are paid without grumbling, schools are improved, roads made better, homes adorned and the neighborhood generally takes on a higher type of progress and intelligence.

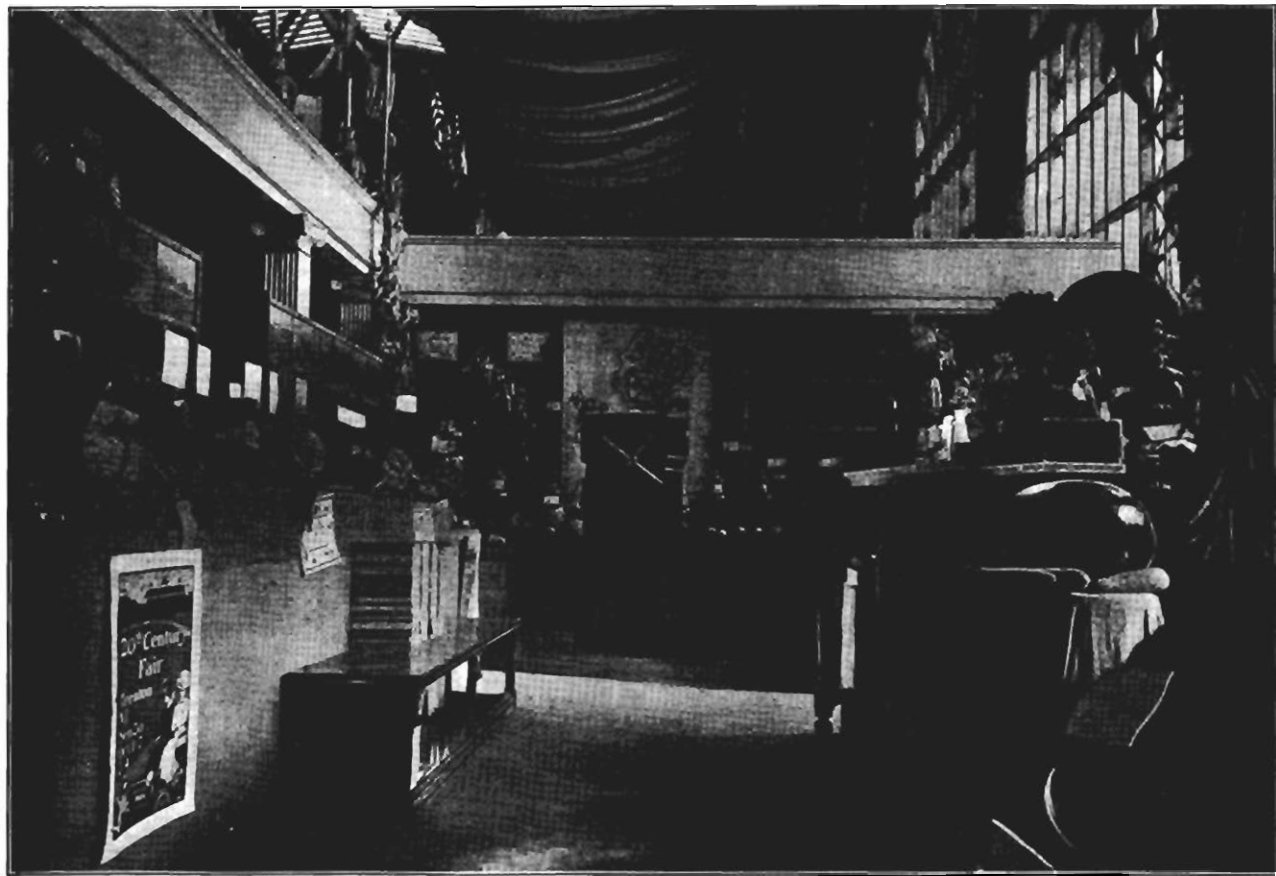
It is the established policy of this country that development be fostered, and that the purchasing power of all classes be increased by favoring legislation. The farmers have shared our national pride in the growth of manufacturing interests, and now in turn they need all the assistance that can come from the dissemination of accurate information about the very best farm practice. The State of New Jersey will not lose by this appropriation to the farming interests.

FOREST GROWTH AND PROTECTION.

The subject of forest growth or the development and protection of the wooded area of the State is of so much importance it deserves serious consideration on the part of our lawmakers, our farmers and our taxpayers generally.

Although there is a forest area in excess of 2,000,000 acres, much of that area is but sparsely covered with actual forest growth, and much of it has been subjected to annual destruction or impairment by forest fires.

It would seem the time has come for the State to introduce a series of object lessons on a large scale in the matter of forest



Interior View, New Jersey Agricultural Booth, Pan-American Exposition.

tree planting and subsequent care according to the most approved methods now known; that the proper way to harvest wood so as not to impair younger growth should be shown, and that some effort at guarding against and preventing forest fires, more effective than is supposed to be in force now, should be inaugurated.

Prof. C. C. Vermeule estimates the annual value of the forested area of the State to be worth probably \$4,000,000. By planting trees having the highest lumber value and giving the needed care and protection, the above-named sum could be soon doubled.

Farmers should be specialists in the preservation of the wooded area—their wooded area, indeed. Theirs for a time, when following generations will occupy these lands. Will they leave them denuded of forest trees; the country a glaring, unrelieved landscape; or shall the policy of the fathers be continued: preserve a wooded area on every farm, give shelter to insectivorous birds and game—beauty to the landscape, and increased value to the farm, and to preserve and conserve the water-supply? Any reasonable legislation along the lines suggested should, in my judgment, receive general approval.

PAN-AMERICAN EXPOSITION.

In the matter of having New Jersey represented at the Pan-American Exposition, appropriation was made during the last days of the Legislature, March 24th, 1901, for this purpose in the sum of \$27,500. Of this sum the Commissioners appointed by the Governor set over to the agricultural and horticultural interests the sum of \$5,000.

The Executive Committee of the State Board of Agriculture and of the State Horticultural Society held three several meetings in order to settle upon the best plan to carry out the purposes of the Legislature and the requirements of the enactment; and it was finally decided there was not money enough to enable the two Boards to make full displays of the two great industries represented by them. Whereupon the responsibility of doing something in the way of an exhibit was turned over to the State Board

of Agriculture, the State Horticultural Society deeming it better to make no attempt with the limited means at our disposal.

After this decision, the Executive Committee of the State Board very generously added to the duties of its Secretary that of collecting, setting up and maintaining an agricultural exhibit at Buffalo. The two committees having previously, by resolution, authorized the Secretary to secure space in the horticultural building later, to make special displays of fruit if, in his judgment, he deemed it advisable.

Accordingly, with the markets practically exhausted of vegetables, and nothing secured for the purposes of exhibition the previous year, the work was entered upon with the determination that whatever the beginning might be, the outcome should be a credit to the State.

After the delays usually incident in such enterprises, a booth for the agricultural exhibit was finally erected, and the meager samples then available were set up and the exhibit inaugurated. To these first samples were added, week by week as the growing crops came to maturity, the various products of the State on to the close of the Exposition.

It was soon apparent that these fresh, varied and worthy representatives of our products were attracting a large share of attention from the daily visitors.

To the above products of the soil there were included in the exhibit several cases of the various insects, injurious or otherwise, nicely mounted by Dr. John B. Smith, calling attention to the growing importance of the study of entomology. There were also a series of transparencies, prepared under direction of Prof. Voorhees, showing progress in dairy methods and the succession of forage crops required to carry a dairy herd through the summer without resorting to pasturing.

Two maps were prepared, the one showing the stone roads built in the State by State aid, the other designating the localities where the several fruits are produced and the proportion to each. The commercial dairy section of the State was designated, and, also, the acreage along the coasts at present devoted to the oyster industry.



Front View, New Jersey Agricultural Booth, Pan-American Exposition.

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There were also six representative views, from the State Museum, of as many points in the State, such as Lake Hopatcong, Palisades, Delaware Water Gap, Rumpson Road, Sandy Hook and Atlantic City, and a graphoscope containing one hundred views of farm scenes, dairies, road-building, etc., all of which were peculiar to the New Jersey exhibit, and attracted the interest and study of the Exposition visitors.

To the above was added during the summer a hand-book of the State, prepared under the supervision of the Secretary of the State Board, and, in part, written by him, which was freely distributed to interested visitors; the object being to advertise the possibilities and advantages possessed by New Jersey, both as an agricultural, horticultural, dairy, market-garden and manufacturing State.

This book was prepared and circulated in the hope that worthy immigrants and manufacturing industries might be attracted to our State. An edition of ten thousand copies of this publication was printed and eight thousand distributed, the balance being reserved for further distribution in our schools and the various industrial organizations and for answering inquirers in other States. Some strong testimonials as to the value of this book have been received.

In horticulture no attempt was made, nor intended to be, of a large and comprehensive showing. Had this been possible, the best space in the building was at our disposal early in the season. As the season advanced request was made by some growers for space to make collective exhibits of particular fruits, and, at the earnest suggestion of an official of the Exposition conversant with New Jersey's fruit products, a small space, all that was then available, was secured, according to the joint resolution of the two committees previously referred to.

The first special exhibit was a collection of strawberries. Later efforts with small fruits failed, owing to the soft condition of the fruit and our lack of means to have them shipped in ice. Samples of apples and pears were sent on from time to time, some of which were inferior specimens and not worthy of exhibition, but were used as space fillers. Later, however, fine samples of peaches were displayed, and collections of cranberries and grapes in large variety and great beauty adorned the space.

In both departments, particularly the latter, the expected voluntary adverse criticism was freely given, some of it published from time to time by these casual inspectors in the papers of the State. These saw the exhibits for one, two or three days and when they were not up, possibly, to their average attractiveness. But the Committee of Awards and the judges saw them through the entire season, and we submit their awards as the best answer to the character of our work and as a reply to our critics.

The agricultural exhibit received from the Committee of Awards a gold medal for the exhibit as a whole, a silver medal for the cereal exhibit and forty diplomas to the several exhibitors. The horticultural exhibit received an award of one gold medal, one silver medal, twelve bronze medals and several diplomas of merit.

The assistant in continuous charge of the exhibits—Mr. H. M. Davison—while giving constant and scrupulous care to the spaces and the exhibits, keeping everything clean and in order, and so arranged as to be attractive as it was possible to make them, was furthermore attentive and polite to all visitors, explaining to interested people the resources of the State, the variety and excellence of its products, the salubrity of its climate, the beauties of its scenery, the high character of its educational and other institutions, and withal the intelligence, integrity and stability of its people.

It is firmly believed that the expenditure by the State for the purpose covered by this report will pay, and a new demand will be manifested for our cheap farms, so near to the best markets in the country. If this should occur, a higher value will soon be realized and greater prosperity follow.

At this writing the expense account connected with our exhibit is not completed, but it is safe to say no expenditure has been or will be made beyond the sum appropriated to this use. It was the expressed desire of the Commissioners that this be so, and we have carefully worked so as to comply with their wish.

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WORLD'S FAIR, ST. LOUIS.

In this connection it is proper I should refer to the coming Louisiana Purchase Exposition and World's Fair to be held in St. Louis during season of 1903. I do this simply to urge the importance of immediate action on the part of our State authorities, if it is intended to have New Jersey represented there.

The causes that prevented a better showing of the varied resources of our State, both in manufacturing, education, agriculture, horticulture and in other lines, at the Pan-American Exposition can all be overcome if the several departments have authority given them this winter. Such action will enable them to mature plans during the year now entered upon for setting up and maintaining a combined exhibit that will do honor to the State.

Let us have creditable representation in this Exposition, which promises to be the largest and best the world has ever seen, and we can have this by utilizing the time intervening from this date to the opening of the Fair on May 1st, 1903.

CRANBERRY PRODUCTION.

I have received a brief report of cranberry production from Prof. A. J. Rider, Secretary of the American Cranberry Growers' Association, which is printed herewith.

The Thirty-second Annual Convention was held in Philadelphia, August 27th, 1901, and the Thirty-second Annual Meeting January 28th, 1902, in the same place, both being well attended. The President's addresses, "The Renovation of Cranberry Meadows" and "The Cranberry, an Unique Fruit," were leading papers presented and discussed.

The subject of "Insect Enemies" was treated by Prof. John B. Smith, of the New Jersey State Experiment Station. Probably the most important revelation in this line during the year was the discovery of the time and place of deposit of the eggs of the katy-did, and much of the credit of this belongs to Miss White, of New Lisbon.

Especial interest has been re-awakened in the subject of cranberry "rot" or "scald," which has devastated and rendered worthless so many cranberry plantations during the last quarter century.

With the kindly assistance of Professor Voorhees, Director of the New Jersey State Experiment Station, the Association has succeeded in securing promise of a thorough investigation of the disease by the Department of Agriculture at Washington.

Mr. C. L. Shear, Assistant Pathologist, has been specially designated for the work, which he has already begun. He has progressed sufficiently far in his preliminary examination to say that the disease is undoubtedly caused by an ingrowing fungus and that how to successfully attack it is no easy problem.

Full reports of discussions, investigations are found in the reports printed in pamphlet form and furnished to members.

The following officers were elected for the ensuing year:

President, Rev. Edward H. Durell, Woodbury, N. J.; First Vice-President, B. P. Wills, Mount Holly, N. J.; Second Vice-President, J. D. Holman, Whitesville, N. J.; Secretary and Treasurer, A. J. Rider, Philadelphia, Pa. Representatives in New Jersey State Board of Agriculture—Joseph Evans, Marlton, N. J.; Joseph J. White, New Lisbon, N. J. Executive Committee—Theo. Budd, Joseph J. White, E. H. Durell, A. J. Rider.

Table showing the crops of cranberries, in bushels, from 1890 to 1901, inclusive, as compiled from estimates and actual movement:

	1890.	1891.	1892.	1893.	1894.	1895.
New England,	375,000	480,000	375,000	575,000	185,000	420,000
New Jersey,	200,000	250,000	160,000	325,000	200,000	200,000
The West,	225,000	30,000	65,000	100,000	25,000	10,000
Totals,	800,000	760,000	600,000	1,000,000	410,000	630,000
	1896.	1897.	1898.	1899.	1900.	1901.
New England,	600,000	400,000	425,000	625,000	500,000	600,000
New Jersey and Long Island,	200,000	250,000	300,000	250,000	*300,000	350,000
The West,	30,000	50,000	75,000	110,000	55,000	90,000
Totals,	830,000	700,000	800,000	895,000	855,000	1,040,000

* Long Island restored to the New Jersey column.

Address and Discussion of Horticultural Questions.

BY H. E. VAN DEMAN.

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Address and Discussion of Horticultural Questions.

H. E. VAN DEMAN.

Prof. Van Deman—Mr. President and gentlemen, before coming here I had hoped that there would have been some suggestions made by some of you, through your Secretary, Mr. Dye, as to just the line that you would prefer to have discussed. But, inasmuch as he has not received anything of this character, I shall be compelled to fall back upon some suggestions that have occurred to me independently.

Now, we have before us a great subject in horticulture. One which the people of New Jersey, above almost all others in the entire United States, have to deal with. The situation of the State here in the heart of the great markets of the United States is unique. You have within your easy reach these great markets that all parts of the country are anxious to reach; and those who live on the Pacific slope, as you well know, when they set out orchards to-day, they are thinking of the markets which you have here ready at your doors. They plant with the confident expectation of marketing a considerable part of their products here in New York and these other great cities of the East.

And perhaps it would not be unwise for us to consider at this time something of the problem which we have before us in the competition between the Eastern and the Western States; and by that, of course, I mean all of the States—all of the country between here and the Pacific coast. And I might say we have to deal also with some of the foreign countries that send their products here. We have lately acquired a region in the tropics, in the island of Porto Rico, which may some day cut quite a figure in American markets with her horticultural products.

We have now one fruit in particular that is produced in the tropics that is a great factor in the horticultural markets, and

that is the banana. There is not a fruit with which it does not come in competition, because wherever the banana is sold it cuts out the other fruit just that much. And it compels the producer of fruits here in the United States to sell at a cheaper rate than he would if these bananas were not brought in and sold; and for a number of years past I have suggested that there might properly be a tariff on bananas. I really think it would be nothing more than fair that the banana should be taxed by an import duty. But, be this as it may, whatever we may or may not have sent to us from without the limits of the United States, we have a sufficient territory here at home to contend with, and the citizens of New Jersey who are in the fruit-growing business have this great factor to deal with, and may as well look at it fairly and squarely. No doubt you have already done so. And those of you who have traveled in the Western States will, no doubt, understand this better than those who have not, because you have seen how they produce their fruits, with what wonderful skill they cultivate, and under what very favorable conditions they sometimes grow their fruits.

There are sections of the country in which they have very few of the fungus diseases to fight. This is especially true in the regions beyond the continental divide, and to some extent in New Mexico and western Texas. In those dryer parts of the country the fungus diseases do not flourish as they do where the rainfall is considerable and where the air is humid, and those who have been there, as I have myself, no doubt have been very much surprised sometimes at the perfect color and the delicate complexion, if I may use that term, of the fruits that are grown there.

In western Colorado some years ago, while I was in the government service, I made very careful investigations of the conditions, especially in the Gunnison and Grand River valleys, where they have but very slight rainfall, and where they are growing principally apples, pears and peaches, and I hunted in vain for any sign of a fungus disease upon the leaf or any of their fruits. I did not examine with a microscope, but I did with my open eye, and at that time I was unable to discover a single fungus disease preying upon their fruits, which was twelve years ago. Then there were no fruit-destroying insects, except a very few coddling

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moths in the vicinity of Mountrose, but since that time this pest has increased wonderfully, and it has now become a necessity to spray there for coddling moths or else give up the business of apple and pear growing.

In Washington, Oregon and Idaho last winter I attended several horticultural meetings, and I there heard the discussions on fruit growing and the various subjects connected with that industry. I also visited a great many private places, and examined a great many of their fruits, and, while they have almost no fungus diseases, they do have the coddling moths in wonderful numbers. It was rather surprising to me to know that they have more trouble with this insect than we do in the Eastern States. The early brood is not such a great pest, but the later broods are very much worse, and they have to spray almost up to picking time to keep their apples from being devoured by the larvæ. In fact, several fruit growers said they did not need to spray until we were almost done spraying for it.

I was astonished to learn that after the first brood comes the conditions are so favorable to their production that they make brood after brood as long as the fruit stays on the trees, and the worms wander about and eat their way into fruit that was perfectly whole just a few days before.

Now, the conditions, as I have before said, are so favorable in many respects there for the growing of many of their fruits that it is almost impossible for us to compete with them successfully, even at that great distance, in our own markets. Take, for instance, the plums of California; they can grow them there so cheaply that they can ship them three thousand miles and lay them down in New York City as cheaply, if not cheaper, than you can.

Mr. Roberts—Do they have the curculio?

Prof. Van Deman—They do not. So far as my knowledge goes there has never been a curculio found on the other side of the continental divide. If such is the case I would certainly like to know it, and I am certain that a great many others would. I have often wondered why the curculio has never traveled across the Rocky mountains. I thought that some would take plums in their lunch-baskets or by some such means carry them from

the Eastern to the far Western States; but if that has been done, if the curculio has ever been carried there, it certainly never propagated so as to make itself known locally.

That is one reason why they can grow the plum so successfully, and the peach, too, because we know the curculio works on the peach as well as the plum and also on the apricot. Over there the stone fruits are all exempt from any insect enemies so far as I know.

When it comes to the pomes—that is, the apples and pears—they have about as much to contend with as we have in the way of insect enemies. They have the coddling moth, as I have just said, which is probably the greatest enemy of the apple and the pear.

Now, they have been practicing spraying for a good many years, and the present belief of those who are willing to take the pains to spray thoroughly is that they can keep it under control. I heard one gentleman say in a meeting of three States—Washington, Idaho and Oregon—in Portland, Oregon, last winter, that by the use of paris green he had been able to secure ninety-five per cent. of perfect fruit. This was in a very large orchard of several hundred acres. Another gentleman in the Hood river region, with the use of white arsenic, had been able to get equally as good results; and a good many others stated their experience, which was very much of the same character.

A Delegate—Do they use that spray with water?

Prof. Van Deman—Yes, sir. The paris green, of course, being a chemical that will not dissolve in water, is very much more difficult to spread evenly over the trees than the white arsenic preparation. I presume that you are all conversant with these two remedies or preparations of arsenic, because your State Entomologist and others have, doubtless, talked of them before.

A Delegate—If a person saved ninety-five per cent. by the use of paris green, it looks as if he was getting it down pretty fine.

Prof. Van Deman—Well, those statements were made in a gathering by men who were practical fruit growers, and I have not the least doubt they are true, and we must remember that that is where the coddling moth is much more difficult to fight than it is here, because of the late broods.

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A Delegate—How many broods do they have here? More than two?

Prof. Van Deman—Yes, I think sometimes three; but there they claim that they have four or five, and yet they do not get as early a start as they do here. There are some sections of Eastern Washington where they are now beginning to grow apples quite extensively, and it is claimed by some of those who are growing them in that section that the coddling moth does not bother them at all. That is, not enough to be anything serious. Because of the cold nights in the Palouse country, it is claimed that the moths do not fly and that they have almost no trouble with this insect. That perhaps may be all true, but I only have that as a statement from those who are growing them there. While I have no reason to doubt it, it seems quite strange that the nights should be so cold in any part of the country that the coddling moth will not fly enough to lay its eggs and become a serious pest.

And speaking of the Palouse country, which is a vast territory larger than the State of New Jersey, roughly speaking, where wheat and other small grains have long been the prevailing crops, they are beginning to grow apples, and if they can grow them there without the coddling moth to interfere, I don't know what these Western people may not do in the apple business. They will certainly make greater strides than in most other sections. The rainfall in the Palouse country is considerably less than it is in many parts of the State of Washington. It scarcely ever exceeds twenty inches, and sometimes not so much as that, there being almost no rain from the first of June to the end of the growing season. Their apples are smaller in size than those in most of the other apple-producing sections of the far West, but they are very highly colored and very fair in quality, and while they are only just beginning to be grown in any great quantities, the possibilities certainly are wonderful.

I was quite surprised at the character of this Palouse country, as it is commonly called, upon seeing it; instead of it being a rather level plain mostly devoid of trees, as I had thought, it is a succession of hills or soil dunes, which have been made by the disintegration of volcanic rock mixed with volcanic ashes, and

the geologists say that these soil dunes have been produced in situ—that is, right where they exist—simply by the action of the elements, there being no drift or anything of that sort, but simply the disintegrated rock has been blown into great hills, and, of course, there are the intervening valleys and some few plains, which are all exceedingly rich, especially in phosphoric acid and potash, but quite deficient in nitrogen, and yet they make the best of wheat fields.

The stations along the railroads in the Palouse country have platform after platform for the reception of the wheat crop. It is something that would be astonishing to us because of the wonderful ease with which wheat is grown. These fields are simply impossible to estimate except by careful statistics. They may yet become dotted with apple orchards.

But the fruit-growing region of the far Western States, as we well know, is mainly in California and in the western parts of Oregon and Washington.

East of the Rocky Mountains there are several places where fruits of the same character as those grown on the western side may be found. In the Pecos Valley, in New Mexico, they grow just as beautiful apples and pears as they do in any part of either Oregon, Washington or the hill regions of California. And already these fruits are being sent eastward. At the Pan-American Exposition, among other exhibits, was one of fruit from the Pecos Valley, and I well remember a remark made by one of the principal fruit growers of Western New York, who I had taken to this exhibit to show him what sort of fruit they grew in that country. He said to the gentleman in attendance upon the New Mexican exhibit, "Now, we are not afraid of you, but we are certainly very much afraid of your fruit. If you can grow this kind of fruit and send it here to come in competition with that which we grow in western New York, I don't know what we are going to do, unless we go there and raise some of the same kind, because we cannot do it here."

And it is certainly a serious problem with the Eastern people to be able to grow fruit of such character that it will meet those Western products in the Eastern markets and come out equally well in the close competition. There is only one way to do it,

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and that is to grow the very highest type that it is possible for you to grow.

There is no use to depend upon the old methods of fruit culture. The Eastern fruit grower has to be fully up to the times if he expects to come out even in the race. You have these markets at your doors, it is true, but the country is filled with all sorts of pests, fungus diseases and insects, particularly, and if you do not fight them from the time you plant the trees until you harvest the fruit, you will not be able to compete with these favorable conditions that they have in the West. You can do it. It is being done. There are, perhaps, some as good fruit produced in the State of New York and in Michigan and in other Eastern States as they have in the West. Not so good, perhaps, in color, not so delicately tinted in many cases, but I think, on the whole, better in quality.

You have that one point in your favor, as I view it, because I think that the fruits, as a rule, from the far West are not as good in flavor as those which you grow here.

Mr. Applegate—How does the keeping quality of their apples compare with ours?

Prof. Van Deman—I think their apples will keep fully as well as those grown in the East. Under the dry conditions that they have, especially in Oregon, Idaho, western Colorado and New Mexico, they seem to produce apples that will keep as late as any that grow in any part of the country.

Now, there is one fruit that I wish to mention in particular, and that is the Kieffer pear. We are all aware that New Jersey has many very large Kieffer pear orchards, and while we may not like to eat it, somehow the public will buy it. Taking the Bartlett into consideration, which is, outside of the Kieffer, the best market pear that I know of, there is no denying that the Kieffer pear is the business pear of the market at this time. Whether it will continue to be so remains to be seen. But you can grow good Kieffer pears, but you will have to do it by using the approved methods. You will have to feed the trees through the soil, and you will have to spray, and you will have to thin. Those things are essential in growing Kieffer pears that will bring the highest price on the market, because we all know that we have

the coddling moth, and we know that the trees will set too much fruit, and the pears will be small unless we take off a part of them.

I know there are some who think they grow too big Kieffer pears. I have heard people say in the State of New Jersey that their pears were larger than the market liked to accept. But I think that is a very rare case, and that as a usual thing they are too small. The only way to make them larger, aside from keeping the soil in a good state of fertility, and keeping up the cultivation, is to take off a part of the fruit.

In connection with this, I wish to give you a bit of information in regard to the storage of pears and their ultimate sale. As you may know, the United States Department of Agriculture is making experiments in storing fruits and in shipping them to foreign markets. There are at the present time a number of places, in Washington City, Buffalo, New York and Kansas City, and two or three other places, where the Department of Agriculture has fruits in storage at this time, and they put in apples and Bartlett, Kieffer and Angoleme pears. I think only those three varieties of pears have been tested so far, and quite a number of varieties of apples. The work has progressed far enough to have taught us several very valuable lessons, and, while I, perhaps, may be stating something in advance of what will be published later, I think it is no secret, at any rate, at the present time. The system of gathering the Kieffer pears at different stages of ripeness was a part of the effort. Some were taken off, for instance, the 15th day of September, some on the 1st of October, and some the middle of October, from the same trees in several cases. Some were put in cold storage at once, and some were kept for ten days, to determine what effect the early or late gathering and the keeping of the fruit would be both before and after putting it in cold storage.

It was found that if Kieffer pears were gathered a little too early, they were not so good; that is, earlier than we commonly gather them. The fruit lacked in quality. If gathered about the 1st of October in the latitude of Washington, D. C., that Kieffer pears gathered about the 1st of October seemed to be

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about right, and I think this would do for southern New Jersey, and, perhaps, for a large part of New Jersey.

Mr. Roberts—They will change their mind. Most Kieffers will not pick the first of October as well as they will two or three weeks earlier.

Prof. Van Deman—Perhaps so. Well, they found that to gather these pears and put them in cold storage immediately, without any delay, more than so much as was necessary in getting them from the orchard to the cold-storage house, that they kept over ninety days in almost perfect condition. They also found that fruit from the same trees, gathered the same day and left *out* of cold storage for ten days and then put in, was very seriously injured; that the process of ripening or decaying set in very much earlier, and it was not possible to hold the fruit in as sound condition as that which was put in cold storage immediately.

Of course, the exact date at which fruit should be gathered is something that will have to be worked out for each locality, because we have such a great range of territory that a statement that will hold good in one section certainly would not hold good in another, and as we go farther south, of course will have to gather much earlier. The seasons vary as well, and sometimes this makes a difference of two or three weeks. But, roughly speaking, they came to the conclusion at Washington that about the first of October was the proper time to gather Kieffer pears, provided they were put immediately in the cold storage; but if the storage was deferred considerable injury would result to the pears. They turn black inside, though they may look on the outside just as well as those that were stored earlier. Inside they are dark and very badly injured.

Experiments were also made in sending pears to the various markets. And that is something that comes right home to the people in New Jersey, because you have good soil and good climate for growing pears, and you are handy to New York, which, of course, is the great port of export.

The experiments were made with the Bartlett and with Kieffer pears. I am not certain as to whether they have shipped any Angoleme abroad or not. The Bartlett pears were gathered

in Niagara county, New York, and were sent in refrigerator cars to New York and then put in refrigerator compartments in the vessels, and they learned that it pays to export Bartlett pears to England, where, I think, the trial shipments were only made. The experiments certainly proved that Bartlett pears can be profitably exported.

Kieffer pears were also sent to the same market, but not under refrigerated conditions, neither in transportation to the seaboard nor in the vessels, and about the same price was obtained for the Kieffer pears; that is, the same net result. The price was not so great, but, considering the cost of refrigeration as charged up against the Bartlett, the Kieffer brought about the same money net to the grower.

Now, if this is true, and the Europeans want some of our Kieffer pears, we certainly have some to spare, and if we do not have enough to meet the demands now, we can grow plenty more. And it may be that these efforts, which are to be continued, will develop quite a foreign market. And I want to say that this is one of the things that Secretary Wilson and his assistants are striving earnestly to do—to determine what the other parts of the world want and how we can get it to them the most cheaply.

I assure you that everything is being done that can be done by the Department of Agriculture to learn just what is wanted abroad and how we can place it in the hands of those who will pay us a profitable price for it. And I would suggest that those who have something to sell in the State of New Jersey, that they suggest to the Secretary of Agriculture and his assistants that they make some experiments from your State.

We here in America have a region which will produce almost unlimited crops of various kinds, and so long as the rest of the world is a market for it we ought to make use of it.

But I will assure you that there is no use to expect any profit in fruit-growing if we do not follow the up-to-date methods, and that is the one idea above all others that I hope to lay stress upon, and if possible help you to impress upon yourselves that we must do our work *in the very best manner*.

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Mr. Roberts—Has there been any recent experiments with keeping fruit in carbonic acid gas, using that as a means for preserving fruit?

Prof. Van Deman—I don't know. I think that was tried by some of the California shippers, and failed.

Mr. Roberts—Well, it was reported to be a success, but it has not been repeated.

Prof. Van Deman—There is one more point with regard to this matter of storing fruits that slipped my memory for a minute, and it is this, that it pays to wrap fruit.

In those foreign shipments they experimented with several grades of fruit, wrapped and unwrapped, in different sized boxes and in barrels, and the smallest package, which was a twenty-pound box, with fruit of the highest grade and wrapped, kept the best.

We know that the Californians wrap a great deal of the fruit they send to our own markets, and it pays them or else they would not do it. In these trial shipments to Europe the Bartlett pears in twenty-pound boxes that were carefully wrapped, reduced to barrels, brought a net return of about \$7 a barrel. The same fruit in barrels brought about \$3.

In due time all this will be published, giving the exact figures, so that you will have it just exactly as it occurred.

I think that we can learn from this that if we expect to cater to the finest market we must take every precaution to put our fruit into the finest shape possible, or else we will come out behind. There are those who are willing to pay a good price for something good, and if we will only meet their requirements we will get their money; and unless we do meet their requirements we will not get it, or we will get it just in proportion as we meet those requirements.

Now, as to just what you should do, or what you should not do, I do not pretend to say. All that I do hope to do or expect to do is to lay before you the principles—the line of action that you will have to follow, and then each one will have to work it out for himself. But the course to me seems plain enough. Fruit-growing will continue to be profitable if we carry it on after advanced methods, and it will continue to be unprofitable, as it is

now to a great many, at least in some lines, so long as they continue to follow those slow, old-fogy methods.

I prefer to leave this subject with you, and wish you to indicate by asking questions what you desire to have discussed further; and, if I can answer satisfactorily, I will be very glad to do it.

Mr. Roberts—Professor, there is a most beautiful fruit that comes just a little to our market from the far west with which we are not very familiar here; I allude to the Jonathan Apple. What do you know about that?

Prof. Van Deman—I have been acquainted with the Jonathan for about forty years and I have never found a section where it was a poor apple. It is good everywhere that I have ever seen it tried, that is, where the tree is hardy. It has two faults. As we approach the more northern limit of its successful growth, that is, in Northern Michigan and New York State, it lacks in size. And as we go South, into Kentucky and Tennessee and North Carolina, it is affected with a little black speck, only skin deep, that is not bitter rot, but it is a little black speck that injures the appearance of the fruit. Over a large part of the country it is one of the handsomest and one of the best apples that I know.

Mr. Roberts—I have wondered why it has not been introduced here more.

Prof. Van Deman—According to my recollection it originated in New Jersey, and it seems to have worked its way westward until on the Pacific Coast it has reached the acme of perfection. The Jonathan apples of New Mexico, Colorado, Idaho, Washington and Oregon, are certainly a revelation, and I don't wonder that there is a demand for them in the markets. They are bringing now about \$2.50 a forty-pond box, in the Eastern markets.

Mr. Roberts—I brought some home from Chicago that I saw there in the market, some great big fellows, beautiful; and as soon as my son saw them he said, "They are grown on the Pacific slope."

Prof. Van Deman—Yes, sir, you can tell that quickly enough by the color, to say nothing of the size. The Jonathan of Washington and Oregon is not as large as it is further south. In New Mexico, Kansas and parts of Missouri they grow the largest

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Jonathan apples that I have ever seen from any part of the country.

Mr. Rogers—Isn't it grown in Illinois, too?

Prof. Van Deman—Yes, there are growers in Illinois who plant whole orchards of it. In Missouri and Kansas I know several orchards that have a hundred acres or more of the Jonathan growing.

Mr. Rogers—When I examined that question two years ago last fall in Illinois, I spent some ten days in the large orchards there that were given up to the growing of the Jonathan, and it was not proving successful. The crops were large enough but they did not keep well.

And another thing, the insects and fungi had just begun to come in and were ravishing their orchards at a great rate and they found that the Jonathan was one of the first attacked both by fungus and insects.

Prof. Van Deman—Well, I don't believe that the Jonathan is any more subject to the fungus diseases nor to insects than any other variety. At least that has not been my observation or my experience. I have grown the Jonathan in Kansas for many years, and while I know that the tree is not quite as rugged as the Ben Davis tree and some others that I might mention, yet, on the whole, it makes a very good orchard tree and it is certainly one of the best market apples that we have. It brings more money than any other apple in the St. Louis market and has done so for a great many years, and it is bringing as much or more money than any other variety now in New York City and other eastern markets. How well it will do in New Jersey I don't know. I presume there are those here who have tried it and can speak from experience, and I should be glad to have them do so.

Mr. Vandevere—It has been grown in Monmouth county, but I don't know how successfully.

Prof. Van Deman—It originated in the East and worked westward, and now it is working back eastward again. The eastern people are beginning to be interested in the Jonathan, and I am one that is very anxious to know just how it is doing.

There are two sections of North Carolina and Virginia in the mountains where I know of its having done very well indeed.

But it is apt to be affected with this little black speck. It is so in West Virginia, and I find the same true in western Maryland, where we have some of the finest apple-growing sections in the country.

Mr. Collins—We found the trees very poor. We had some young trees, about five years old. They bore a few last year, but they lost half their leaves. I don't know why it was, but it looked like a disease. Otherwise they did pretty well.

Now, about this export business, one of the most important things in my estimation with the whole export business with our fruits is, does the market want them, is there an opening for them at the time we will have them? Now, I read the other day there was not. They do not need them at the time we have them to export. Does the Professor know whether that is true or not?

Prof. Van Deman—Mr. W. A. Taylor, who has this matter in charge of the Government, said that the Kieffer pear came into the English market at a time when it was comparatively bare of pears. There are a few Belgian pears that can be kept until that time, the Angoleme and a very few others, but generally speaking, Mr. Taylor said the market was in very good condition to receive Kieffer pears.

Apples are still better and are worth more than oranges to-day in our own markets, and they are worth more to eat than oranges any day. (Applause.)

The Secretary—Is the prospect for a foreign trade in apples growing do you think, and will it continue to grow?

Prof. Van Deman—Yes, sir, it is growing. The foreign markets like our apples. I was in Canada this winter attending the Ontario Horticultural Society meeting and this matter of the export of apples was discussed at length. There were two or three points that I gained there that perhaps it might be well to call attention to, and one is, as I have just suggested, that they want our apples, they like them there. They are better than they are from any other part of the world, and if we will only give them to them in the right condition they will pay us a good price for them, but if we do not pack honestly they will not pay well for them. The Canadian Government is so thoroughly impressed with the importance of sending honestly packed fruits to foreign

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markets that they have passed what they call a "Fruit Marks Act," which permits the official examination of any package of fruit that is prepared for shipment to any point for either domestic or foreign consumption, and severe penalties are attached for dishonest packing.

I heard the officials of the Canadian Government talking this matter on both sides; in fact they had a very heated discussion on the subject, and the point that I gained from it is just as I have told you, that unless the fruit is packed alike from head to head of the barrel, or from top to bottom of the box, that the foreign people will not receive our fruits kindly, and a good many of the foreigners have written back and want to know of the Canadian shippers why they have sent them barrels of apples that were all right at the head and all wrong inside. And it is certainly one of the most suicidal and unprofitable things that anyone can do, to pack trash in the middle of a fruit package.

Mr. Angell—Is it not true, Professor, that the Canadian apples have brought more in the English market for twenty years than the American apples?

Prof. Van Deman—Yes, they have not packed as dishonestly as we have. I have seen a great many barrels opened in the markets of all parts of the country, and it is very rarely that you will find any of them packed alike all through.

There is one point where the boxes come in favorably. A box of fruit is nearly always packed alike from side to side. And that point was brought out by the discussion in Ontario at this meeting with regard to the apples in the market of Winnipeg. The apples that were sent from Ontario in barrels to Winnipeg were rejected and some of them shipped back or left at the call of the shipper, when they would take the western apples from the Pacific coast without question in boxes, because they were honestly packed.

This whole discussion about boxes and barrels, which of the two we will have, is one of very great interest indeed. Whether or not it is going to pay us to change from packing apples and pears in barrels and put them in boxes, time will tell.

They have apples in the eastern market from the West, so many in a box. They are all counted and packed in tiers. They

are sized up just like so many eggs. They are graded. And they are usually put into two grades, the lower grades they leave at home. They never send them anywhere. It does not pay. And that, I say, brings the question home to us, is it going to pay us to ship our apples in boxes? I believe it will. Some of the foreign dealers are very anxious on this point, to have our people put their apples in boxes instead of in barrels. They will pack closely in that shape. They do not take up so much room. They charge by the cubic foot in the hold of a vessel, and barrels of apples have a lot of cracks between them. The people of Nova Scotia have a different barrel from the kind we use—one that does not have such a large bulge. There is less difference between the diameter of the barrel at the head and at the bulge, so that they will pack closer than ours.

Mr. Roberts—Isn't there danger of their being too close?

Prof. Van Deman—No, sir, I think not. I think with proper ventilation that they find no trouble.

The Secretary—Professor Van Deman, will you name some of the most popular varieties of apples for the foreign market that we can grow here in the East?

Prof. Van Deman—The Baldwin has a good standing in the European markets. It is perhaps the best known of any of our apples. And those who live in the section where the Baldwin is a good winter apple will be safe in sending it to the market. As to whether it is just the apple that we ought to plant now is a question, even in the Baldwin region, because it has its faults, and serious ones. It is not a regular bearer.

The Secretary—Isn't it affected with a sort of a pithy formation through the flesh?

Prof. Van Deman—Yes, it has that, too, especially as you go south, a little dark speck through the flesh.

The Secretary—I have had to cut them half away before I got to the sound meat.

Prof. Van Deman—The farther you go south the more it is so. Of course there it is only a fall apple. But there is no doubt the Baldwin is a business apple.

There are other varieties that in the Baldwin region are coming to supplant it, and one of them is the Sutton, and if I lived in

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any part of New Jersey, or any State where the Baldwin is a success, I should grow the Sutton. It is the same color as the Baldwin and about the same size.

Mr. Roberts—It is a very good apple—better than the New Jersey Baldwin.

Prof. Van Deman—I am not certain but the York Imperial is one of the apples you ought to grow. How far north the York Imperial is going to be a success I cannot tell yet. I saw some last fall at the Exposition at Buffalo from Nova Scotia that were very good. They were not so large nor so red as I would like to have seen, but they were all right in flavor. York Imperial is a good keeper and of a fair size. It is coming to the front. It is well liked in the foreign markets. It has two faults—one is, it is rather uneven in size and irregular in shape. The shape is not a serious question except so far as the culls are concerned that are sold to the canners or dryers, because they will not work well on the peeler, and therefore this variety stands at quite a disadvantage. But it is one of the varieties I should try. I have no doubt there are people here who have got it bearing, and I should like to have them state, if they will, what they know about the York Imperial.

Mr. Roberts—It is no more regular in bearing than the Baldwins. They bear every other year.

A Delegate—It bears very heavily, though, when it does bear.

Mr. Roberts—Yes.

The Chairman—I have had a little experience with the York Imperial. I think, in addition to the faults mentioned by the Professor, there is another; it is rather more subject to the scale. It is a good reliable bearer and a reasonably good keeper.

The Secretary—Is the Ben Davis popular abroad?

Prof. Van Deman—It is. Mr. Goodman, of Missouri, shipped a carload of apples of different varieties to Holland on one occasion for the express purpose of learning what the Dutch wanted to eat in the way of Missouri apples, and he sent Ben Davis, Gano, Jonathan, Grimes, Winesap, and I think some others, and asked the dealer to take the pains to learn from those who consumed the apples in Holland what variety they liked the best, and they said Ben Davis. There is no denying the fact that the Ben Davis is a

business apple with all America to-day. It is overshadowing the Baldwin.

Mr. Roberts—What is the standing of the Rome Beauties in foreign market?

Prof. Van Deman—I want to say a little more about the Ben Davis and then we will take that up. Those of you who have been at the Pan-American Exposition had an excellent opportunity to see just what the Ben Davis was all the country over, and, for myself, I will say that I was astonished. I thought I had had my eyes somewhat opened before by what I had seen north, but I was astonished by the way the Ben Davis showed up from Ontario and New York. Why, they have them just about as large as they have here in New Jersey or in Missouri—very nearly so. Of course, the Missouri Ben Davis showed up better than it did from any other section, but New York can grow Ben Davis that will sell. There is no doubting it. And in Ontario they are planting orchards of Ben Davis to-day. They are doing it in Michigan, and they had Ben Davis from Nova Scotia that were pretty fair for a Ben Davis. And so we have the Ben Davis to deal with. There is no doubt about that. And while I am not an eater of the Ben Davis, I don't know but I should be a seller. I think if I were to plant in New Jersey to sell to-day, I should plant some Ben Davis.

The Secretary—We will have to plant anything the market will take.

Prof. Van Deman—We will have to do it, there is no use to butt our heads against a stone wall.

Mr. Roberts—It is the worst apple we have to suffer from the San Jose Scale, worse on that than any other apple we have.

Prof. Van Deman—Now, in answer to Mr. Roberts' question about the Rome Beauty. That is a variety that is coming to the front in New York and in Ontario, and its region of culture is evidently extending northward. It has long been grown along the Ohio river very profitably. It is a good apple in this State where I have known of it, and it is known in Europe. There is another variety that you perhaps are just beginning to grow here, and that is the Gano, which is a twin brother to the Ben Davis.

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It is redder than the Ben Davis; it is like it in quality, in shape, in size, in keeping qualities and in tree. In fact many of the lighter-colored specimens are very hard to tell from the Ben Davis. It is coming to the front as a business apple.

And still another is known as the Arkansas or Mammoth Black Twig. It is a seeding of the Winesap, very much larger than the Winesap and very much better in style of tree, but it is not so good in quality as Winesap. It does well in this section. I have seen it in a very few places in New Jersey and a number of places in Southern Maryland and Delaware and Virginia. And through New York I have seen it, where it is rather too small.

Mr. Roberts—For me the trees start slowly.

Mr. Collins—And another thing, it is said to be a slow bearer, is that so?

Prof. Van Deman—No, sir, that is not one of the common complaints. As far as I have known about it I have scarcely ever heard that said. It generally begins to bear rather early, about the same as Winesap.

Mr. Vanderveer—Do you know anything about the Wealthy?

Prof. Van Deman—Yes; the Wealthy is only a fall apple in New Jersey, and it is scarcely more than a fall apple in Wisconsin, and even in Minnesota where it originated. It is perhaps quite a profitable variety to use as a filler in the orchard. It will come into bearing early and die early and bear plenty of red apples as long as it lives.

Mr. Roberts—The tree is not very large?

Prof. Van Deman—No, it is not a large tree, but it is a very profitable variety for a nearby market.

Mr. Roberts—They ripen in August, and the trees are dwarfish, enormous bearers of beautiful apples, but easily killed; we had pretty nearly all of forty-one trees killed at one time. They are very sensitive.

Prof. Van Deman—Would you advise planting them again?

Mr. Roberts—No; life is too short; I don't want to be renewing them so often.

The Secretary—I want to ask you, Professor, whether the old

Newtown Pippin, in your judgment or observation, is declining, that is, whether they are planting it much now.

Prof. Van Deman—The Newtown is one of the most fastidious apple trees that I know of. It must have an ideal apple climate or it will not do at all.

Secretary Dye—But it is a choice apple.

Prof. Van Deman—Yes, and its most successful region in this country is the Blue Ridge—that is, the mountains extending from Maryland to North Carolina. And when you get up to an elevation of from a thousand to thirty-five hundred feet it is at home, and it grows there better than anywhere else I have ever seen it, except in some sections of the far West, as in the Hood River region of Oregon, it seems to grow perfectly.

Secretary Dye—I have had it grow beautifully up here on my farm, on fifty-year old trees.

Prof. Van Deman—Yes, the trees are large and long lived.

Mr. Roberts—On our home farm where I was raised there were some old trees that were famous for raising large Newtown Pippins when I was a boy. There came a time when they did not amount to anything much. They generally rotted and fell off and were imperfect, but for old acquaintance sake they were left, and since we have got to spraying our trees and taking better care of them, those old trees have borne just as fine apples as they ever did, and they are about as good bearers as we have, and there are customers in Philadelphia that have sent for them year after year.

Prof. Van Deman—I have no doubt that if the Newtown Pippin was planted in almost any good soil in the State of New Jersey, perhaps some of the sandier parts of the southern region would not be so good, but in almost any of the soils of the central and northern part of the State, and then thoroughly cultivated and sprayed, that it would be profitable.

Secretary Dye—I think our northern counties would be exceptionally good for this variety.

Mr. Vanderveer—Don't you think they need more fertilizer than any other variety?

Prof. Van Deman—Perhaps; it needs a good rich soil.

Mr. Vanderveer—And I think they would bring higher prices in the English market if we could grow them to perfection.

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Prof. Van Deman—It is one of the best market apples in England. The English, you know, have their own notions, and they are awfully strong notions; and they got set in favor of the Newtown more than a hundred years ago, and they have not forgotten it, and they don't want to forget it. They are going to keep on buying them as long as we can furnish them; and those who have these famous Newtown orchards in Virginia are reaping fortunes, as it were, from them. And still, as I said, it is very fastidious in its habits. Where the trees are given the right conditions they do well.

And now I would just like to say this much more on the subject of comparison between the old times and these times in fruit culture. When the country was first settled the fungus diseases and insect pests were almost unknown, and our grandfathers and our fathers and some of us, perhaps, can remember back to the days when we used to grow fruit without the need of any of these preventatives that we have had described here to-day, but as time goes on the pests increase on us. They have increased until it has come to be a hand-to-hand fight with them. Now, if we will pick up the implements of warfare and make the fight we will succeed, and not otherwise.

Mr. George T. Powell, of Ghent, New York, whom I think you all know very well, has repeatedly said in my hearing, and perhaps in yours, that he could grow just as fine Spitzenberg apples as he ever grew, or as he ever saw when he was a boy, by spraying.

And one more point comes up here in regard to this matter of the off year, the York Imperial and Baldwin both being every-other-year bearers we will say. If a part of the apples were picked off when the tree is heavily laden, so that it is not exhausted to a damaging degree, it will bear a crop next year. Mr. Powell showed apples several times from trees that he had thinned, and I remember some five years ago at a fruit show at Madison Square Garden, in New York, he had apples of the ninth successive crop that were on Baldwin and Spitzenberg trees. This he was able to accomplish simply by thorough spraying and thinning.

Now, I suppose if I were to say that it pays to thin apples on a big tree a good many people would think I was a little off in the upper story, but I believe it will pay. I do say that I have never had the nerve to go onto one of my apple trees and pick off a large part of the fruit in the growing season, in fact I have rarely had occasion to do so lately. But I believe it will pay.

Mr. Applegate—You spoke of finding a number of good varieties of apples in the mountains of North Carolina?

Prof. Van Deman—Yes, western North Carolina is a grand apple section, and they have a number of varieties there that are practically unknown to the public, but fortunately there are now a series of investigations being made by which a great many of these things will be brought to light. This is true of Arkansas also. I want to just here drop a word, a word of caution and suggestion at the same time, with regard to these new varieties that are being pushed by some of the western nurserymen, in particular these new Arkansas seedlings. I believe there is some good in them, but I am not well enough convinced of it yet to advise anybody to plant a whole row across the orchard. Plant a tree or two, or graft some scions on your old trees and try them. I think we will get some valuable things from these western seedlings, but beware of taking the advice that some nurserymen give to go ahead and plant a whole orchard. Don't do it.

The Black Ben Davis and the Gano are so near alike that I think they may be the same thing, and so do a great many others who have grown them and examined them side by side. Last winter at the Illinois meeting we had both these varieties from the same orchard, grown exactly under the same conditions, and there was no perceptible difference in them, and the gentleman who grew them said he could not tell any difference in the trees, and he thought they were identical. But if you want to plant Black Ben Davis know that you are planting something practically the same as Gano.

Secretary Dye—Returning to pears, Professor. You spoke of exporting the Kieffer pear. Are we to depend upon that only as an export pear? Dr. Ward tells us that the blight is threatening all varieties up in his section of the State, and blight is pretty general all over New Jersey. Do you know whether it

extends in New York State, and to the west of us and south of us, or is it just here?

Prof. Van Deman—They have blight pretty much all over the country, but it is worse in the more eastern States than it is in the far West. They have almost no blight on the Pacific slope, and for a time we thought they had no blight at all, but I found last year on hearing the discussions in Spokane, Washington, and in Portland, Oregon, that there are cases there in which whole orchards of pears had to be pulled out because of blight. It is in California also. The blight is one of the banes of pear culture in the Eastern States. New Jersey is right in the hotbed of it, but I don't know that we are reduced to the Kieffer pear for export purposes, because we have other varieties that can be grown fairly well now, as the Angoleme, which is about the only dwarf tree that we can afford to grow commercially. We commonly speak of it as the Duchess. It has been exported to some extent already, and there is no reason why it should not be grown in New Jersey and exported; and while the gentleman who spoke a moment ago said that the Bartlett was not a pear to be grown and exported from New Jersey, I am not sure that he is altogether right. I believe that you can afford to grow the Bartlett pear and export it.

A Delegate—Professor, it may be a little out of your line, but what is your idea with reference to the Scale? Can we get ahead of it? It is all over the country. In my neighborhood we have lots of orchards, and we have been following Prof. Smith's directions, but the Scale keeps just a little bit further ahead all the time. Where are we going to come out in a few years?

Prof. Van Deman—Well, I don't know. I want to drop one little word of comfort. Perhaps you have all read already about a little ladybug that Prof. Marlatt found in China last summer. He went to Asia to hunt up an antidote for San Jose Scale. He went to Japan first, from whence he thought it came to this country, and he found that in every case in Japan where it was found they claimed the Japanese had received it from trees and plants that they had introduced from this country. And so he went into China, where and in several places he found it quite bad, destroying the trees just as it does in the worst places here.

In the course of his investigations he traveled northward and westward, and before he reached the Great Wall of China, somewhere north of Pekin, he found this ladybug quite prevalent and keeping the San Jose Scale in check. He felt quite certain that if it would keep it in check there it would here, and so he has sent on importations of these insects and they have arrived at Washington in good condition. They are in the hands of the entomologist with the hope of having them prove helpful, and perhaps of finding in them great relief from the San Jose Scale.

Mr. Jessup—We saw that in the paper, too, and Prof. Smith told us that he had imported those very bugs here five years ago and placed them out; he has never found any trace of them since. So you see that knocks us out again.

Mr. Roberts—No, it don't quite knock us out. He put some of those bugs out on my farm.

Prof. Van Deman—Perhaps he did not get the same bug.

Mr. Roberts—He put the bugs, whatever they may be, on my farm, and we never saw them again, or else we could not tell them when we did see them. Only this, we had quite a peach orchard, a good many acres, terribly infested with Scale, and had started to take it out, and had got it all out with the exception of possibly an acre or an acre and a half on one side that did not get cut down; they were so badly infested that we did not think it worth while spraying them and did not spray them. And that was right where the bugs were put out. The next year there was a crop of peaches on those trees and they did not show any evidences of Scale. And this past year there was a big crop of peaches on them and they were clean. And in several other places I have known I could call attention to the Scale for some reason has disappeared. I don't feel that we are altogether knocked out.

Mr. Gillingham—Do I understand that you did not spray those two years at all?

Mr. Roberts—Not on those old trees. We sprayed our orchards, but those old trees were given up as a bad case.

Prof. Van Deman—Did you see these bugs, the ladybugs on those trees?

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Mr. Roberts—I cannot tell. They are like colored people, they look so much alike to me. But there are more black ladybugs in our orchards than there was years ago. Maybe I notice them more.

Prof. Van Deman—I think we have some hope for the San Jose Scale. Of course this is all to be determined yet as to whether this introduction from Asia will amount to anything or not, or whether or not they may find some other insect. But I say we will try, try again, anyway; and maybe we will succeed in the end. If we do not succeed with the spray remedies, maybe we will with something else.

Mr. Rogers—Professor, what do you think the best soil and location for an apple orchard?

Prof. Van Deman—An under-drained soil that would grow a good crop of wheat, corn, potatoes or any other ordinary farm crop, would be suitable, and I don't think it makes so very much difference about the presentation to the sun. There are places where the presentation does make a great deal of difference, especially in the Blue Ridge country where they are growing this Newtown Pippin apple, and where if they put them on the northern slopes they will be very seriously affected with a smutty fungus that makes the apples have black specks on the outside of the skin. The spray will counteract that to a considerable extent. I think the plan of taking the poorest piece of the farm to put into an orchard is all wrong. A great many farmers do that. If they have some out-of-the-way place that they do not care much about they put an apple orchard on it and then try to get some kind of a farm crop besides. Perhaps turn it into pasture, and finally, when the stock and general farming and all sorts of things don't kill it, they may get some fruit out of it.

Mr. Rogers, of Somerset—Professor, I fortunately come from that Blue Ridge section, and the experience there is that an apple orchard on the north side of the hill bears most reliably, bears fruit that will keep longest and shows up the best color. On the southern slope, within a half mile of that, I about two years ago picked 450 bushels of apples, and there were not two barrels of them that were any good at this time of the year, while the ones

from the northern slope, especially the Newtown Pippin, kept until May.

Prof. Van Deman—Don't you think if you had gathered those apples on the southern slope earlier than you did that they would have kept a little better?

Mr. Rogers—We picked them before we picked them on the north side and the latter kept better.

Prof. Van Deman—I think on the whole there are more good locations on the north slope than there are on the south slope. But in the famous Blue Ridge apple country of Virginia and North Carolina the southern slopes are very much better. But we must remember that the elevation there is considerable, scarcely ever less than fifteen hundred or two thousand feet.

Mr. Rogers—We are only five hundred.

A Delegate—That makes a big difference.

A Delegate—I would ask Mr. Roberts whether he sees any difference in the prevalence of San Jose Scale where he uses the gas lime among the trees and where he does not.

Mr. Roberts—We have not used the gas lime for several years. We used it before that, but they have got a new way of making gas so that they do not use the lime as they did before, and our source of supply is exhausted. It was a very good thing for the trees. It has a splendid influence over all manner of fungus, cleans it off; we have not used it lately because it has not been available.

Prof. Van Deman—How did you use it?

Mr. Roberts—We brought the lime from the gas works in wagon loads and spread it with big barn shovels, throwing it into the tops of the trees, a thoroughly good covering. We did not care anything about the ground. My neighbors, some of them, thought at first we had killed the orchard, but it worked out the other way. There was nothing but satisfaction, and I believe it was the best application for pear blight that we ever tried.

Mr. Rogers—Would not the other lime answer the same purpose?

Mr. Roberts—Not at all; it is not the lime that does the business, it is the poisonous nature of the things contained in it.

Prof. Van Deman—Perhaps it was the gas from the lime.

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Mr. Roberts—The poisonous nature of it is what we thought did the work.

Prof. Van Deman—Well, it might be that the poisonous character of the gas lime killed the germs of the pear blight or at least coated the trees so with some poisonous substance that the germs of the pear blight when they did light upon the pear trees did not take hold.

Mr. Roberts—The orchard was never troubled with blight as long as we used it. You must use it in the winter time when the trees are in a dormant condition.

Mr. Borton—I have some Fallawater apple trees in my orchard about eighteen years old. About four years ago some of them began to die, about one-third of a tree a year, finally at the end of two or three years they would be entirely dead. I wondered if there could be any explanation given. They were strong, healthy trees.

Prof. Van Deman—It is a weak tree. It is the fault of the variety. The trouble perhaps comes from adverse climatic conditions. The rapid and violent changes are apt to bring about such injury. The Tompkins King is another variety that is so affected, and it affects other varieties more or less.

Mr. Roberts—The Fallawater is one of the most thrifty trees there is, but of too short a life.

Mr. Bonham—Professor, when is the best time to pick apples of this variety?

Prof. Van Deman—That would be hard to say in words. I would have to see the apples. You will have to be guided by their state of maturity. They should be matured to the extent, usually, that you want to keep them. A winter apple that will keep must be picked rather early, and after you gather them you want to get them into a cold place as quickly as possible. That is all we can tell. This whole subject of storing fruit I think we have hardly got right yet. If we are going to put apples in cold storage we ought to gather them and put them in quickly. At the Pan-American Exposition we had some very remarkable examples of the long keeping of apples and pears, too. It is generally supposed that fruits when they come out of cold storage will go right down, but they did not do so at Buffalo at all. We had

apples that were taken out of cold storage on the 20th of May and were in pretty fair condition for as much as three months after they were put on the tables. But in every case where they kept well they had been picked a little immature. The Illinois fruit was picked earlier than that from any other State. The Stark, for instance, from that State, had been gathered so early that the stripes scarcely appeared on the fruit, and it kept well partly from the fact that the fruit was picked early. And when we were speaking of Jonathan a while ago that is a point that should have been mentioned at the time. The way to pick Jonathan and Grimes, which are both early winter apples, is to pick them quite early.

Mr. Roberts—You can easily pick them too green?

Prof. Van Deman—Yes, you can pick them too green, but it is a very delicate point to know just how soon to pick in order to get their good quality and yet not wait so late that they won't keep. That is a thing that requires constant observation each succeeding season as it comes.

Mr. Brown—Professor, I have had some experience in cold storage, and I find that the practice of cold storing fruits has retarded the ripening process. If fruit has reached perfection you cannot put it in and expect best results.

Prof. Van Deman—No, sir, you cannot put ripe fruit such as is in good condition to eat, or almost so, in cold storage and expect it to keep well. The ripening process will go on slowly even at a temperature of 32 degrees.

Mr. Roberts—Speaking of Grimes, it has been one of the most satisfactory apples that we have grown, and has done remarkably well in every way. In the past year we picked many of these apples most too green. Those that were allowed to stay on the trees doubled in size and were a great deal more salable and better in every way. That made me say that you could easily pick them too green.

Mr. DeCamp—Fallawater, Grimes and some other varieties are the same way, but if we should top-graft the trees we get at the nurseries would not that remedy it? I have one tree I grafted about a year ago, and it is all right while the others are gone. Why wouldn't it be a good thing to graft those apples onto strong trees?

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Prof. Van Deman—I have no doubt it would be a good plan to put them on some hardy stock. That principle is carried into effect in the northwest a great deal where they have those severe winters; in Wisconsin and Minnesota they use a hardy stock and top-graft their trees, and find that they will succeed with a variety in that way that would die if it was grafted down at the ground in the ordinary manner. The trunk is the first place often to give way. It comes, as I said before, in most cases, from the violent changes of temperature, where the sun thaws out the tree on a warm winter's day, after a severe cold spell, the bark is often injured by the great difference in temperature, or something of that kind. It is a little mysterious, but it is becoming to be understood that these violent changes in the temperature cause the death. That has just been described.

Mr. Vanderveer—A great many fruit-growers pick their apples and put them in heaps in their orchards and let them lay for two or three days. Does that injure their keeping qualities if you want to put them in cold storage afterwards?

Prof. Van Deman—Yes, it does. The sooner they get from the tree to the cold storage the better. In the experiments at Washington that were made last fall and on into this winter with pears and apples, in taking them out, from time to time, they found that in every case where the storage was delayed after the picking the fruit did not keep so well. A Kieffer pear off the tree ten days did not keep nearly so well as one that was left on the tree that ten days and then put in cold storage.

Mr. Hale—One object of putting the fruit in heaps under the trees is to have it color up somewhat. Now, if it is put in cold storage before that coloring, would they color up in cold storage?

Prof. Van Deman—No; it takes the sun to color the fruit red, and if you put it in piles and cover it up, there will be no more red coloring. They will color yellow, because the green will turn yellow, and will show out the red that was there before, but there will be no more red develop after they go into a dark place.

A Delegate—Is that true of apples and pears and peaches too?

Prof. Van Deman—I think it is entirely true. They will ripen and turn yellow.

Mr. Brown—The professor stated a while ago that we understood a great deal about pear blight. Now, we in New Jersey, I think, understand that if it gets on a tree, it is very apt to kill it, and that is about all we do know about it. If you have any information, we would be very much pleased to have it.

Prof. Van Deman—I simply referred to the fact that I supposed that we were all read up on the subject of pear blight. I might briefly say, that it is the effects of a little germ that exists in the living tissues of the pear, the apple and the quince, and to some extent in the wild crab-apple trees of the forests.

Mr. Brown—Where does it stay during the winter?

Prof. Van Deman—It stays in the half-dead or sickly shoots that had the disease the fall before.

Mr. Denise—How are you going to get rid of it? If that is the cause, we ought to know how it can be destroyed. We have had the blight for years, and I have never yet found anybody who was able to tell what was the cause of it and give us a remedy. If you can tell it, you will accomplish a great deal for us, I think.

Prof. Van Deman—Prof. Burrill, of Illinois, at least ten or fifteen years ago, in connection with Prof. Arthur, of Indiana, discovered the cause of pear blight. They two, working at it at about the same time, came to the same conclusions. It is just like small-pox in the human family. It comes from a specific germ that can be detected by scientists who know it when they see it through a microscope, just as well as we can tell a cow from a horse when we see it with our open eyes; and this germ propagates inside of the bark of the tree, and not outside; and it is held over the winter in those sickly branches for the most part. When apple or pear trees have the blight and a portion dies, the twigs dying back, we will say, a foot, two feet or more, usually the healthy tissue comes right up to the dead wood. In the pear tree, especially, it does not always kill the branch, and it lives in these sickly parts of the tree until the succeeding spring. In nearly all cases the disease is propagated the next spring from the holdover blight in the pear trees, but sometimes it does hold over in the quince and the apple too.

Now, to give a specific remedy for pear blight is like giving a specific remedy for small-pox. I will say that if you will stamp

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out all the germs of small-pox we won't have any of the disease; and if we will stamp out all the sources of infection of the pear blight we won't have it.

The question arises, can we do that? And that is where the trouble comes in, because we cannot always detect the pear blight even when we see it on the tree when the leaves are off, and in the summer time it is still more difficult to do so, because there is a great deal more of it in the tree then and it extends back a good deal even in healthy parts. But if we can see every sickly place on a pear tree or on an apple tree, and cut down below where the disease is existent and destroy that part of it, there would be nothing to propagate the disease the next spring.

Mr. Waite, of Washington, whom you know very well, and who is studying the pear blight, claims that it can be stamped out in a neighborhood, and at this present time he has selected a section in Texas where the pear blight is existing and where it is so situated that there is a surrounding country having no trees of any consequence to transmit the disease to the adjacent country, and there he is making an experiment for the purpose of attempting to entirely eradicate it from that neighborhood, to see if it can be done.

There would be no use to stamp it out on one farm if it was not done on the adjacent farms, just the same as it is with the San Jose Scale or any other of the pests or infectious trouble that we have. It all resolves itself into the question as to whether or not we are going to thoroughly cut out all the pear blight on our trees in a whole neighborhood, in a whole county, in a whole State or in the whole country. That is all there is to it.

I could not give you any remedy to apply to the trees to keep them from taking it, unless it would be some of these fungicides that doubtless have some restraining effect. But we cannot spray it out of the trees. That has been pretty well tried.

These sickly branches in the spring time are apt to crack and the juice exudes, and, as the juice is reeking with the germs of pear blight, it is often communicated to the blossoms.

A Delegate—Isn't it carried by the honey bee?

Prof. Van Deman—Yes, and by flies and various insects that

light on the branches and suck this oozing juice. They get it on their feet and fly off to some other tree, and lighting on the blossoms give it to that tree through these delicate organs.

Mr. Roberts—I imagined it was mainly transmitted through the blossoms.

Prof. Van Deman—I think it is quite largely so, but it is also transmitted, especially to the apple tree, through the tender delicate growth when it is in the tenderest growing stage. It cannot permeate the coarse bark of the tree, but it will the delicate parts.

Dr. Ward—Speaking of the cold-storage of fruit, our plan used to be where we refrigerated largely to commence while the fruit was in a hard green state, and begin picking in our locality about the 20th of August, and the fruit that was picked during the day was put into an ante-room, so called, and early the next morning it went into the refrigerator; the last fruit that went in, the last of the picking, was the first fruit taken out, and it was the earliest pick always that kept the longest.

Mr. Cook—What is the best way for a farmer who has no cold-storage to use to keep his apples longest?

Prof. Van Deman—Put them in the very coldest place that you have.

A Delegate—Wrap them with thin paper.

Prof. Van Deman—Yes, wrap them in paper, for in that way they would keep still better there is no doubt. Wrapping has two beneficial effects aside from their general appearance in the market. The people seem to buy fruits that are wrapped at higher prices than they pay for those that are not. Wrapping prevents it from evaporating and losing a part of the delicate aroma or flavor. A wrapped fruit is better in quality than one that is not wrapped. It also keeps it in a more even temperature and it will therefore keep longer.

Mr. Cook—Too much ventilation would be bad, would it not?

Prof. Van Deman—Yes. Take a rough-skinned fruit, like the russets. We know how it will become tough and spongy and lose its flavor, character and value. The Roman Stem acts the same way, and in all varieties they will lose their juices from the evaporation and become greatly damaged by it. If I was going

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to advise any farmer what to do with his winter fruit, I would say put it in the very coldest place that he has.

Mr. Cook—Would the dampness of the atmosphere injure it?

Prof. Van Deman—Not if it is cold enough, but dampness with warmth is very injurious. You can keep fruit in very damp atmosphere if you have the temperature very low. But the farmer can scarcely have very low temperature under natural conditions. Perhaps about the best place would be in some building. It might be his barn, fastened in barrels or tight boxes. It has been found that the heading-up of barrels tight is better than leaving them open. They keep longer and are better in the end.

A Delegate—Right in the cellar?

Prof. Van Deman—No; I don't think the cellar is a good place. The cellar is oftentimes rather warm, and you should have it in some building on the north side, where it will be thoroughly protected from the sun. In barrels, or even in piles, I have known them to keep for quite a while that way on the ground, covered with straw thoroughly; but apples or pears or anything that will keep should be kept covered and in as cold a place as possible.

Mr. Heritage—That has been my experience in keeping apples, putting them in tight barrels and heading them up and putting them on the north side of the building, where it is cold, and put a roof over them so they wont take in any wet, and you will find you can keep apples fine, even the Roman Stems. We keep them solid and nice.

Mr. Lippincott—I have had great success in keeping apples by picking them early and putting them in tight barrels and leaving them, out, stacked up under a tree near a building until about the time of frost, then put them down in the cellar alongside of the ice-house. I have kept them there until along in the following July.

Mr. Roberts—I don't believe you could have done better.

Prof. Van Deman—The cooler the place the better. I was in a cellar in Utah last winter that had a most remarkable condition. The cellar stood at a temperature of from thirty to thirty-five degrees for several months in succession, so the owner told me. It is dry there, and the condition of those apples I saw in this cellar was perfect. But this cellar was in an ideal place and ideal

in construction. It was made of stone with a lining of studding and boards and retained its temperature almost as perfectly as a cold-storage house under our modern conditions of cold storage.

Mr. Lindsley—Is it the custom in any place to make different pickings of apples, as they ripen every day, going over the same orchard to secure better size and color?

Prof. Van Deman—Not with winter apples, so far as I know. They do that with summer and fall apples; I hardly think that would be profitable, because the apples would come so near to ripening together at that late season of the year that it would not make much material difference.

A Delegate—Would it make any difference in the coloring of the fruit what fertilizer is used? And I would like to ask what fertilizer to use?

Prof. Van Deman—Yes. The more potash the more red color. While the sun does the work, the potash has a hand in it, and the more potash you put in the soil the more red you will have in your fruit.

Mr. Roberts—And the more iron in the soil the better color.

Prof. Van Deman—Well, it is the iron that does it, but it is the potash really that gets the iron there.

Mr. Roberts—Potash helps the iron do its duty, that is the point.

Prof. Van Deman—Yes, it does. And perhaps this further thought is not new, and even if it is not new, it won't hurt us to think it over. When we are manuring, if a soil lacks in any of the essential manures any of the ingredients which go into the composition of a plant or fruit, if it lacks any one of them, the amount of fertility of all kinds that that tree or plant will take up will be in proportion to the smallest amount of any essential ingredient applied, that is, the amount of the one ingredient that has the smallest proportion. It might be illustrated in this way: We have a plasterer or a stone mason who is going to make mortar for us, and we furnish him lime and sand and hair. Now, we say, we are a little short of lime, so I will haul more sand, because I have got plenty of it on the farm. But, he says, I will just make as much mortar as I have lime to make it, otherwise it will not be perfect.

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And that is just what the plant says to us, "I will use just as much fertility as I have of any one of the ingredients that I need in the smallest amount." If we can only think of that we will perhaps be able to solve some of the problems that sometimes present themselves to us.

You know if we add, we will say, muriate of potash, nitrate of soda or phosphate rock alone, and only the one ingredient to the soil, it often makes a wonderful difference. Now, it may be that was just what was lacking, and it helped the plant to take up not only an increased amount of that one element, but all others as well.

A Delegate—Is there any way for us to tell what is lacking in the soil?

Prof. Van Deman—You will have to ask the land itself through the plant. There is no chemist can tell you. You can put on a hundred pounds of potash or any other fertilizer, and there is no chemist living who can tell it by an analysis of the soil, and yet the plant can tell it very quickly. They are all good, but must be applied knowingly.

Mr. Bonham—Is there any means of staying the peach rot, either by spray or otherwise?

Prof. Van Deman—Yes; Bordeaux mixture is a good remedy. It won't destroy all the germs, but it will destroy a great many of them. Spray at this time of the year, or any time before the buds come out, with a very strong solution of copper sulphate in water, without any lime; but with the addition of the lime, making Bordeaux mixture, it will stay on longer, but it will not be quite so effective.

Mr. Jessup—What are your proportions for Bordeaux mixture?

Prof. Van Deman—They are now making it mostly four to four; that is, four pounds sulphate of copper and four pounds of lime in fifty gallons of water.

Mr. Jessup—Do you think that is as effective as six pounds of sulphate?

Prof. Van Deman—Six pounds of sulphate of lime is too much, and would be dangerous.

A Delegate—I use six pounds of lime and one barrel of water on pears, apples and grapes, and never had any trouble with it.

Prof. Van Deman—That would be much safer, and is the old formula for Bordeaux mixture. It certainly would be safer on peaches and other stone fruits.

The Chairman—We certainly have been favored with a very interesting and profitable discussion of this horticultural question. (Applause.) This Board is under great obligations to the Professor for the many practical and pointed impressions he has given to us, and taking those things home, we cannot help but be benefited by this discussion. Is there any further business to bring before the Board at this time?

Mr. Bonham—I move you, Mr. Chairman, that a rising vote of thanks be tendered to Prof. Van Deman for the very able and interesting address to which we have listened this afternoon.

Unanimously carried.

The Chairman—Professor Van Deman, I extend to you, on behalf of the Board, its hearty thanks.

Prof. Van Deman—Mr. President and gentlemen, I certainly appreciate your kindness. I am sure I have gained some information myself; I always do.

Reserve Forces in Plants.

BY BYRON D. HALSTED.

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Reserve Forces in Plants.

BY DR. BYRON D. HALSTED.

Plants, when well disposed, always have a stock in trade, forces in reserve, that they are willing to draw upon when the proper conditions obtain.

In previous illustrated papers before this Society the reader has endeavored to show how the plant traps the sunshine in the green granules of the leaf, and, with it as the motive power, to work over the substances that come up from the roots in the soil-water and the gasses that have entered the porous leaf from the surrounding atmosphere. In short, one talk was upon the role of leaf-green in the growth of plants and another has been upon the movements of liquids in plants. It seems the time and place now and here to continue the series and consider one portion of the question, namely, what becomes of this combination of forces and substances received from without, namely, the solar energy and the crude substances of earth and air?

To prepare us the more fully, let a moment be spent in the review. We have a seedling grown in darkness, and it is pale, sickly and dies unless soon brought into the light. Another seedling is germinated in full exposure to light, and it thrives for a time, but, not being fed with soil-water duly charged with soluble salts, it withers and dies. Another seedling has light and soil-moisture, but the plant being under a bell-jar, from which the air has been pumped, it is asphyxied and perishes. Of course, other untoward conditions, as super-heat or a freezing temperature, may bring death, but when all these secondary surroundings are right there must be an abundance of soil-water, of wholesome air and of sunlight for ordinary plants to perform their functions

regularly and well. These are the great fundamentals of plant growth, and as such cannot be too frequently placed in review by crop-growers. None of them are altogether under man's control, and this is the very reason why their importance should be strenuously insisted upon. It does not follow that when a plant is ailing that it is being deprived of one or more of these prime essentials, but it is usual that one or the other is below the normal.

In our climate winter is the season when vegetation is in repose. It is now that the green earth-cover is replaced by gray or over all is spread the white mantle of snow. Autumn brings cessation of growth and the fall of the foliage preceded by that gorgeousness of coloration that has made American landscapes so famous the whole world round. Under cover of this display the reserve materials that may have still lingered in the leaves drain out through the natural ways long months ago provided, and at the signal of the October wind away go the leaves, or, perchance, they hold more firmly, and the November blasts wrench them off and hurl them ruthlessly to the frozen earth, where, added to the accumulation of former years, they form that reserve of leaf-mold which lies as a thick cover upon the woodland slopes, and, yielding to decay, becomes a continuous supply of the compounds needed for the future growth of the trees.

But this is all an aside, for it is our purpose to follow the substances as they go from the leaf factories, all the season through, and locate them in the leafless trees and shrubs and herbs.

For the trees we might take the maple as a type. In early winter, if one pleased to make sections across the main stems and apply a solution of iodine, he would find that in the plates, radiating from the center, which we call the "silver grain," there would be an abundance of starch. Colorless until made blue by the iodine, this starch is there packed away in surprising quantities. In the younger twigs the reserve may be in the pith as well, and, in fact, in all places generally except the outer bark and the soft layer capable of growth that lies just outside the wood. The maple is not altogether inactive as it stands uncovered through the winter months, and before the days have lengthened much and but a suggestion of spring breathes over the willows and alders, the maple is awakening to renewed activity. The sugar-maker

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notes this, and gets himself ready; he thrusts his spiles into the trees and draws therefrom the sweetened sap. He is draining the reserve forces, sapping the life-blood, so to say, from the tree before it could use it for its new growth in the early spring. There is much for the tree to do before the leaves, young and tender, can be hung out in the sunshine and air for the new season's work. In fact, the leaves need to be made before they can be displayed, and all this painstaking work is done at the expense of the reserve materials which were held largely in the region of the buds, but generally throughout the tree.

If time permitted other illustrations might be brought from the South, where the sugar-cane is robbed bodily of its sugar by being cut and run between great rollers from which the sap flows to the evaporators and so on to the refinery and the barrel for shipment. Still further we might visit the great beet fields, where under the influence of the sun and soil and air the humble plants are storing sweetness in their roots for the next year's growth of stalk and seed. Man turns the current of their life, cuts off the plant in its prime and the reserve is made suitable for table use. The maple, the cane and the beet are the real sugar factories, and the great buildings we call such are at best only separators and refineries of a product they cannot make.

In the same way the great corporations and companies which display the names of starch manufacturers in glittering signs above their monstrous establishments are at best dealing with a product that was made by plants in their own quiet way. In every green leaf the potato plant gathers in the elements and sets them in proper order, and then the compound is stored up in the swollen stems below the surface of the soil, from which new plants are to grow the coming year. In like manner the corn makes starch and stores it in the grain as does the rye and rice. In this way these plants labor for posterity and fulfil their mission in so doing. Man sets them in rows or sows their seed in suitable situation, cares for them and profits by the increase. He throws around them his watch-care and succeeds in so far as he knows their wants and deals wisely with their reserve forces.

This dealing wisely with the reserve forces lies at the foundation of profitable crop-growing and deserves a further word. In

the case of the potato, that has been instanced, there is much still to be learned concerning the treatment of the tubers from which the future crop is to be grown. When ought such potatoes to be harvested and what are the most favorable conditions under which they should be kept until the time for planting? Being a native of a warmer climate than our own, frost is destructive to the tubers and excess of warmth and moisture starts them into growth too soon. Some of the latest experiments indicate that the reserve forces of the potato are best conserved by storing in an airy place until the earth is somewhat frozen, when the seed tubers are placed in heaps upon a thick layer of straw laid over the frozen ground and covered with straw and a thin coat of soil. As the cold increases the earth cover is thickened so as to keep out all frost. From such heaps the potatoes are removed plump and fresh in April, and a week or so before planting spread out in the sun to start good, strong buds. The northern grown seed potatoes are better than our own, largely because of the superior conditions for their storage in the colder climate. Any potato-grower who is thoroughly awake to the importance of a fine quality of seed is far on his way toward success in his business. He deals generously with the reserve forces that lie back of his future crop.

All this applies with equal force to bulbs and every form of propagation where a portion of a plant is made the beginning of a center of life and growth. The law of like producing like demands the most careful attention to details in the selection of scions and cuttings as well as of roots and bulbs. The person who is thoughtless here has sold his birth-right to progressive agriculture or horticulture for less than the savory lentils that pleased the palate of the short-sighted Esau.

The lower forms of plant-life are not without abundant illustrations of vital energy conserved. In fact they are only surpassed in this by the rapidity with which they multiply after a period of quiescence, and favorable conditions are found for growth. The mould flourishes upon the bread and the mildew upon the leaf, and as the food diminishes or surroundings become unfavorable the microscopic organisms quickly condense the protoplasmic substance into bodies of comparatively large

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size over which thick walls are placed and indurated spores result capable of resisting heat or cold or drought. The hard time once past the life renews itself, the confined energy bursts its bounds and a new generation of activity ensues. The examples of this are endless and upon every hand. In crop-growing there is a constant struggle against these unseen foes, which wage an ever-renewed warfare for the possession of the crops, in the form of grain rust and smuts, blights of the orchard, mildews of the vineyard and fungi peculiar to every plant of the field or garden. In the form of spores they are in hiding in the winter and seemingly inert as dust, are carried by every wind that blows. These reserve forces are as mighty as they are small and baffle because of their insidiousness. They remove crop-growing from the realms of certainties, unless it be that of a loss from their inroads. Vanquish one army of them and a reserve corps marches in and takes up the work of destruction; their name is legion. The crop-grower's hope is not so much in their extermination as their inaction and ineffectiveness. It is almost hopeless to directly stay the reserve myriads of any type of germ; but all rational efforts should be put forth to hold them in check or make their attacks of no avail. The microscope is a worthy weapon by means of which the dormant germs may be found in soil and air and every other material thing, but the grower's hope is in the application that prevents their entering the susceptible tissue, or the breeder's art by which the plant may be made immune.

Some striking examples of conservation of energy are met with in arid regions of any country. The supreme value of water is appreciated by the desert plants and by reducing their surfaces to a minimum and covering all with skin-like leather, the water is held within, even in the withering heat and drying winds. To guard themselves against the roving animals spines cover the globular or club-shaped cactuses. They may not increase in size for years, but at the proper time will thrust out a large flower and mature seed at the expense of long-time accumulations. Constantly on guard against their foes these plants stand as conspicuous examples of forces in reserve.

It is equally to our purpose to mention another tribe of plants also of the arid regions. Hugging the ground with long thick

lance-shaped leaves for defence and storage of food they may vegetate for a score of years, and then, at the expense of a hoard of starch and sugar, will quickly send up a flower stalk ten to twenty feet, bearing blossoms and seed capsules in great numbers. Of such is the century plant and its allies, some of which as *Yuccas* are to be found in our ornamental grounds.

The seed is the finest clean-cut instance of reserve forces that we have in plants. It is constructed to lie in waiting for its opportunity as a tiger crouches ready to spring upon its prey, or the dynamite as an inert and harmless powder until properly confined and the blow is struck.

The seed is the migratory condition of plants, and as a rule this is the only means they have of moving from place to place. For this transfer they are provided with various devices for clinging to passing animals, or have wings and airy balloons by means of which the winds take them on voyages of long or short distances.

Aside from these exterior modifications, which find their use in distribution, the seed has its coats that serve to protect the vital and delicate portion within. Coming now to the young plant enclosed by the seed coats and superficial outgrowths of hairs or hooks, wings or juicy pulp to pay the animal for the transportation accomplished while in its digestive tract, we find that it may either fill all the space within the hard, dry coverings as in the pea and bean or only a portion, the remaining space being occupied with substance upon which the embryo is to feed while undergoing the initial stages of growth. This substance is usually a mixture of several materials, but in some seeds it is largely starch, as in corn, wheat and other grains, in others mainly oil, as in cotton flax and castor bean, from all of which by pressure a commercial product is obtained that is used for food, in the making of paints or as a simple effective remedy for some of the ills that flesh is heir to.

When this reserve is largely outside, but close beside the embryo, it may be removed to a large extent and the effect of such mutilation observed upon the seedling. For example, fully three-fourths of all the starch in a grain of corn may be removed and the embryo will germinate and grow, but without the vigor that

would otherwise obtain. Similar results can be obtained with some of the larger seeds that have all the food substances stored in the embryo. Thus the beans may be cut through the middle by the shorter diameter and one-half will contain the parts that are for growth, while the other is to assist in that growth. Only a few tests will be sufficient to demonstrate the fact that is reasonable enough before, namely, that a whole bean or a whole grain of corn is better for seeding purposes than any fraction, large or small. There may be instances where the mother plant has stored an excess of reserve material, but such are still to be brought to the notice of the writer. He has found that mutilated corn and beans will germinate quicker than whole grains, but this gain in time is only due to better facilities for the absorption of water, and soon the lack of nourishment is shown by enfeebled growth.

This leads to a very practical matter, namely, that of seed selection. There is no more important operation upon the farm or garden than that of seeding. It is true in the literal sense as in the figurative that "whatsoever a man soweth that shall he also reap."

I have sometimes sifted a lot of seed into three sizes and sowed equally from each upon similar areas, and always with the same results. The large seed gave strong, fast-growing plants, with a deep shade of green in their early leaves that indicate vigor and health; the small seeds bring forth small, sickly plants, if they grow at all. Such seeds deserve no place in any seed-bed, whether it be in the grain-field or under glass, for truck crops. Large radish seeds will grow into marketable roots in much less time than small seeds; in fact, some growers by this selection gain a whole crop in a single winter season.

But size does not determine all of the reserve forces, and this brings us to a part of the subject none the less important because obscure. A seed represents a plant in embryo and the material substances its parent has accumulated and deposited in and around it. It represents much more than this, for it holds in reserve the accumulations of the race which are imponderable, and, therefore, beyond measurement by the steelyard or scale-pan. Even so they are the most weighty of all the elements that go to make up a good seed. Seeds to be the best must be trained for service; must

come from stock that has learned to do the will of man. Such seeds, when mature and plump, well mothered, we may say, are great with possibilities when they fall into the soil that is fitted for them. Pedigree seeds from plants bred along some particular line requires for their best accomplishment that the grower into whose hands they come shall have also a pedigree and have been trained to know the peculiar possibilities of well-bred seeds. Apply here the strictest rules that hold between the rightly bred animals and the painstaking herdsman, who knows the strength and weakness also of the specialized stock. In short, I may hold in my hands two dozen grains of corn. They are all of the same size, shape and color; in fact, indistinguishable by the closest physical inspection. The one dozen when grown will all produce stalks with two ears, large, of equal size, well filled out with rows the same in number in each instance, and the grains bearing all the points of resemblance of the parents. The other dozen gives as many different looking stalks, some with pink silks, some with green, and the product as unlike as it is unsatisfactory. The one lot shows a culture that is not confined to the care of the soil, but reaches back to the head of the corn grower. It is a breed. The other exhibits nothing more strongly than the absence of breeding, and is a mongrel lot from which the parent dozen grains were selected with difficulty to match the other twelve. One lot had uniformity and all that goes to make up an inherited way of doing things, while the other lacked all this. One has reserve forces that have accumulated for generations, the other is lacking in breeding. The one is trained for special surroundings and a special purpose, the other is a general purpose mongrel. One easily degenerates by withholding care, the other's chief merit is that it will not.

We say of one man that he has more reserve force than another. He may be a fat man and can live upon his adipose through a fit of sickness, while the thin man might die under the same circumstances. Again, he may have his flesh hard, the muscles tough, and yet weigh no more than the man who is flabby, as the term goes. The former has a larger percentage of solids than the latter, and, in so far, is better equipped for the battle of life. But the thought of reserve forces goes further back than percentages

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of liquid and solid, and includes that which has been termed vital force or vitality. Of two men of equal weight and equal percentages of chemical constituents one may be endowed with that something that makes him a Shakespeare or a Napoleon, while the other counterpoise may be very ordinary in his performances.

It is a great deal to be well-born, but that is not enough. The highest hopes are realized when the ancestral stock is high and the individual's own life reflects distinct credit upon the family to which he belongs.

It is hoped that enough has been said to confirm the previous statement that while size of seed of any particular kind is important as indicating individual endowment, it is far from everything. Cultivated plants should be cultivated in the sense that they come from stock that has felt the uplift of good breeding. Pedigree is not pounds weight, and the progeny of the largest pumpkin may be puny, provided there is no method in the grower's mind. The reserve forces in cultivated plants reach back of the vegetable kingdom, and in the last analysis are in the constructive, far-sighted mind of the progressive crop-grower.

The ideal tiller of the soil is sovereign over all, and each subject does his bidding. This is possible only when each seed and scion, herb and tree bears the impress of the royal will and is in full subjection to it, when the reserve forces are ample for all growth and trained to a profitable productive life that is satisfactory to the one who is in charge.

Progress of Agricultural Education

BY DR. A. C. TRUE.

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Progress of Agricultural Education.

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Mr. President and gentlemen—According to the program you came here to hear a talk on horses at this hour, and I know sections of this country where it would take a good deal of courage for the Secretary of the Board of Agriculture or any speaker to propose to substitute a talk on agricultural schools for a talk on horses. But I judge that you people here in New Jersey have gotten far enough along so that you see the importance of agricultural education, and so will be at least interested in the subject that I bring before you.

As your Secretary has stated, I am very busy in my work, especially at this season of the year. And as this call came suddenly upon me, I have not been able to make any very special preparation for my talk this morning, although this is a subject about which I have been thinking a good deal for some time, and in which I have a very great interest.

Agricultural education in this country has developed so rapidly in recent years that it has been difficult for a great many people to keep up with the progress of the movement, and so there is in the public mind a great deal of confusion as to the exact status of this movement. You know that when our newspaper cartoonists wish to represent a subject that is of a lively nature, by a progressive series of cartoons, they begin with pictures which portray the objects very clearly, but as the movement goes on, and the operations become more excited, the lines grow more obscure, until finally, at the highest pitch of excitement, the lines cross each other in various ways and the objects do not show at all.

Something of that kind has happened with regard to the popular understanding of this movement of agricultural education. The movement has been so rapid that the different agencies for it have overlapped each other to a considerable extent, and their distinctive functions have not been made to stand out clearly before the minds of the people, and so they do not understand the matter. Therefore, what I want to do this morning particularly, is to briefly define the specific functions of the different agencies which we have in this country for the education of farmers.

I think we may class these agencies under ten different heads. We have (1) the United States Department of Agriculture; (2) the State Boards or Commissioners of Agriculture; (3) the Agricultural Experiment Stations, and these three constitute a group by themselves. They have to do, in general, with the acquisition of new knowledge and the dissemination of knowledge through publications. They are not teaching agencies in the ordinary sense, and yet they are doing a great deal for the education of our farmers.

The second group comprises (1) the agricultural colleges; (2) the secondary schools of agriculture, and (3) the teaching of agriculture in the common schools. These agencies deal directly with the education in agriculture of the youth of the country.

The third group comprises (1) the Farmers' Institutes; (2) the agricultural societies; (3) the agricultural press, and (4) books on agriculture.

These agencies work primarily for the education of the adult farmer.

Now, let us look a little more closely at the distinctive work of each of these ten agencies for agricultural education.

The United States Department of Agriculture has complex functions. It is to a certain extent an administrative agency, as a branch of the Executive department of the government of the United States. It deals, for example, with the inspection of live stock and other matters that are purely administrative. But in the main the Department of Agriculture, as at present organized, is an agency for the investigation of the problems of agriculture and for the dissemination of information to farmers, which will be helpful to them in their business.

Unless you have kept up pretty closely with the development of this department, you can hardly realize how great and rapid has been its growth within the past few years. Under the administration of Secretary Wilson the department has flourished to an extent difficult to appreciate. It has grown in resources, in number of employes, in the kind and variety of work, so that to-day we have in many ways a new department as compared with what we had a very few years ago.

Recent statistics regarding the department show that it now has some thirty-five hundred paid employes. Not all of these are at Washington. There are less than one thousand there; the others are scattered over the country. This does not include the very large number of voluntary workers for the department, as weather observers and crop correspondents, and in such work as does not receive any pecuniary remuneration. Out of the 3,500 employes who are paid, over 2,000 are engaged in operations connected with the scientific work of the department. So that we have in the Department of Agriculture a scientific institution which is not exceeded in strength by any scientific institution in the world. The result of increased activity has been a great increase in the output of material. The publications of the department have greatly grown in number and variety, and, as we believe, in merit, both scientific and practical. We are issuing now from 500 to 600 different publications each year, and these are printed in editions which aggregate about eight million copies. So that as an institution for the general education of our farmers, the United States Department of Agriculture is without parallel in the world.

This department, as I have indicated, is not essentially a teaching agency. It is rather an investigating agency, but at the same time it is performing at present, in a way, teaching functions. For of late we have been taking young men who are graduates of our agricultural colleges and admitting them to work in the department, especially in its scientific laboratories, at nominal rates of compensation. While they are helping in the work of the department they are also acquiring the scientific knowledge and technical skill which will make them efficient workers in our agricultural colleges, experiment stations and other places

throughout the United States where scientific knowledge is needed in agricultural enterprises.

This movement has only begun within the last two or three years, but the ultimate result, we believe, will be that the department will be able to help to a considerable extent in the training of agricultural experts, who shall go back into the different States, and give to the service of the States the benefit of what they have received at Washington through the Department of Agriculture.

As regards the State Boards and Commissioners of Agriculture I need only say here that their work is being constantly increased in efficiency and effectiveness as agencies for the accumulation of information and its dissemination among farmers. So that they are playing a most important part in the general education of our farmers, and yet they are not distinctively teaching agencies as schools are.

You are all of you doubtless more or less familiar with the work of the Agricultural Experiment Stations. You have in this State an experiment station, which those of us who look on from the outside think is a very efficient one. It has done work of very great importance, not only to the State of New Jersey, but also to the United States. But it may be well to call your attention to the fact that the Agricultural Experiment Station is essentially an institution for the discovery of new truths. It is not a teaching agency, then, in the ordinary sense, but in connection with its work in the discovery of new truths and the dissemination of its results it does spread abroad a large amount of useful information upon a great variety of agricultural subjects. And when you take the work of the agricultural experiment stations of the country as a whole, information has been distributed on a very wide range of subjects.

It is important, however, that the farmers of the country should clearly understand that the distinctive work of the experiment station is the discovery of new truths, and that they should understand that the experiment station should be held quite strictly to that kind of work.

One of the difficulties which has arisen in the management of our experiment stations is that there have been so many calls on the officers of the stations to act as teachers in the colleges, as

speakers in Farmers' Institutes, and in other ways as teachers to the community; that they have not at all times been able to give as much time and energy as is desirable to the investigations for the discovery of new truths.

Now, we must be very careful in the development of our system of agricultural education that we keep the experiment stations to their proper work; that we supply them with men and with means sufficient for the carrying on of thorough investigations and the keeping up of active search after new knowledge. For, after all, it is such institutions as the Department of Agriculture and the experiment stations that are to be the fountain-heads of new information, which is to go out and diffuse itself through all our practical agriculture and through our system of agricultural education, and thus raise the level of practice and of knowledge on this subject; and if we draw away the men who are engaged in experiment station work from their work as investigators in order that they may teach us old things, we are in great danger of keeping down the amount of new knowledge which we ought to receive as the result of the work of these experiment stations.

One obstacle to a clear understanding of the proper functions of the experiment stations has grown out of the fact that, for the most part, they are under the law directly connected with the agricultural colleges, so that many men who work in the experiment stations also teach in the agricultural colleges. But this is, to a large extent, as it seems to me, a temporary condition of things, and as our system develops we shall hold the investigators more closely to their work, and have most of the teaching carried on by other persons, who can give their time and strength to the teaching. So that we ought never to forget that there is a line of demarkation between the work of the agricultural experiment station and that of the agricultural department of the college for the purpose of instruction.

Coming now to the group of agencies which work for the education of our youth, we have first the agricultural colleges. These, as you know, are organized under national and State laws in all the States and Territories of the United States, or, rather, what we now call the "Continental" United States, because they have not been organized yet in our island possessions.

They are doing a great work. The number of students who are taking courses in agriculture is increasing from year to year. These institutions have been so successful in their work, especially in the last decade, that they have, to a very much larger extent than formerly, gained the support of the people in the different States. This is most accurately reflected in the increasing resources which are given these colleges by the States. There never was a time when State Legislatures were so liberal to agricultural colleges as during the past winter; and that, I think, is a pretty good sign that the people want to have those colleges developed and increased in strength. Let me give you a few samples of appropriations that were made to agricultural colleges last winter.

I am speaking now particularly of special appropriations over and above the ordinary appropriations made for the maintenance of these colleges, many of which are permanent appropriations and do not require action on the part of the Legislature from year to year. Thus there were special appropriations for buildings, equipment, etc., as follows:

Kansas,	\$200,000
Minnesota,	90,000
Colorado,	40,000
California,	125,000
Indiana,	70,000
Missouri,	100,000
Washington,	120,000
South Dakota,	50,000
Oklahoma,	46,000
Florida,	60,000

Then the Legislatures of the States are not only making the special appropriations more liberal, but they are increasing the permanent resources of these institutions, which is the proper thing to do. In Michigan the last Legislature made a mill tax in such a way that the Michigan Agricultural College will have an annual revenue of \$100,000. And North Dakota, besides giving a special appropriation of \$50,000 for new buildings, made a one-fifth mill tax perpetual for the support of the agricultural college.

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Now, it is true that, when you consider the statistics of students attending courses in agriculture in these institutions, the number seems comparatively small. There were in the college courses in agriculture in the United States last year about 5,000 students. This is a small number compared with the mass of boys and girls on the farms. And that leads me to call your attention to the fact that in thinking of these colleges we must consider all the time what their real function in agricultural education is. Somehow our people have been led to think that the agricultural college might satisfy all the demands for agricultural education in schools. But if you will stop to think about that a little, you will see that is entirely out of the question from the very nature of the case. It is only a relatively small number of students who under any conditions will undertake the long four-years' college course in agriculture. Undoubtedly many more students might take it to their profit, and if they were more interested in the matter, we should have larger classes in the agricultural colleges, but in the long run it will be found to be true that these colleges will exist largely *for the education of the leaders in agricultural progress*. It is just as true of agriculture as it is of other subjects, that it is only a relatively small number of students who take the long course. And yet it is of the greatest importance that these institutions should be developed in order that we may have the best class of agricultural experts to lead us in progressive ways. From these colleges come the men who man the experiment stations, the Department of Agriculture, the larger enterprises in agriculture, which require technical skill and experience; and unless these colleges are strong, the whole system of agricultural education will be weak.

But the point that I wish especially to make is that we ought not to rest content with the development of the agricultural college. And so it is encouraging to find that we have in this country the beginning of a movement for the establishment of secondary schools of agriculture.

We have only gone a very little way in this, and yet far enough to say that they may be made practically successful. These are schools where the attempt is made to teach agriculture, both practically and theoretically, only to the extent that similar subjects

are taught in the high schools and other secondary schools of this country.

Perhaps the most successful of these schools at present is that in Minnesota, where it is connected with the University, but entirely separate from the agricultural college. The agricultural college of the University of Minnesota gives a thorough college course in agriculture to a comparatively small number of students, although the number is increasing. But the school of agriculture, which takes the student directly from the district schools of the State and gives him a high-school education, including a number of subjects ordinarily taught in high schools, and special instruction in agriculture of a similar grade—that school has several hundred students. And the movement has grown so that the farmers are agitating the establishment of other schools at different points in the State.

Now, you can see, I think, that a great many boys and girls from the farms could go to such school, where the course is not as long, the expense is not as great, and the instruction is in many respects of a more practical character, so that after graduation they naturally go back to the farms. It is that kind of a school that we need in all our States and Territories to supplement the work of the agricultural college.

The secondary schools of agriculture as organized in this country are taking different forms. In Minnesota we have a school of a more general character, where the course covers a relatively broad range. There is a similar school in connection with the University of Nebraska, and we have schools that are something like this in such negro institutions as Tuskegee, Booker Washington's school, where they are doing a great agricultural work, and also the Hampton Institute in Virginia, which has a very efficient agricultural course, but along this secondary grade.

Then there are special schools. A very successful one is the dairy school connected with the University of Wisconsin, where the whole course is made up with reference to making expert workers in dairies, creameries and cheese factories.

Then there are the private schools which have been established in some places. You have one here in the State of New Jersey, at

Woodbine, and there is one not far from Philadelphia, at Doylestown, Pennsylvania, and another one, recently established, at Briar Cliff, near New York City.

These institutions are aimed especially at people who live in cities, and they are drawing their students very largely from the towns and cities. Thus, in various ways, we are getting at this problem of secondary education in agriculture.

But beyond the establishment of these schools, which are separate institutions for agricultural instruction, we should have agricultural instruction in the public high schools, especially those that are in or near rural communities, and there is a beginning of a movement in that direction. In one or two places at least we have the teaching of agriculture grafted on to the regular course of the high school.

This is not a very difficult matter, and if it once was taken up, it would, I think, prove a success practically. In many of these high schools you already have the teaching of natural science in an elementary way, and for that purpose at least one teacher who is a college graduate is employed. Now, if in the rural high school that college graduate who has gone to teach natural science were a graduate of a college of agriculture, he could teach the ordinary natural science just as well, for it is nowhere better taught than in our agricultural colleges, and he could also give an elementary course in the principles of agriculture. In this way there would not be much additional expense in maintaining such a course.

This is a thing the farmers ought to think a great deal about. For if we can have these outline courses in agriculture in our high schools which are located near the farms, and to which the pupils can go at comparatively small expense (where, in fact, many of them are now going for their general education), a large number of young people will have an opportunity to obtain instruction in the progress and science of agriculture, which would give them an entirely different outlook regarding their farm work. And such a system would very materially broaden the basis of agricultural education in this country.

We ought to do in this country what is already being done in the countries of Europe; that is, put into our high-school system

the teaching of agriculture. This kind of thing is going on in our cities all the time. The high schools of the cities are more and more becoming schools which teach things that have direct relation to the business of the cities; they have all sorts of courses in business, in manual training and in other subjects directly related to the industries of the city.

In the city of Washington we not only have the ordinary public high school, but we have a separate business high school and a separate manual-training high school, and this is so in other places. So these cities are introducing courses in the high school more and more which relate directly to the industry of the cities, and there is no reason in the world why the teaching of agriculture should not be introduced into the high-school system. That branch of instruction should, of course, especially be introduced into those high schools which are located in or near the rural communities.

We hear a great deal also nowadays about the introduction of agriculture into common schools. Now, that is a subject that needs to be studied very carefully, if we are to get right views regarding it. It is very easy to say in a general way that there ought to be the teaching of agriculture in the common schools, but when you come right down to the practical proposition as to what should be taught, it is a very difficult thing. The common school is necessarily a school of low grade, and there is no such thing, from the standpoint of the educator, as the teaching of science, in the true sense of that word, in these common schools. To expect that you may have in them courses of instruction in agriculture which are anything like those which you have in high schools or in colleges is, of course, absurd.

While that is true, there is a great deal that can be done in the common schools to teach agricultural subjects, and to lay the foundation for more advanced knowledge regarding the theory and practice of agriculture in later years. Agricultural instruction in the elementary schools has taken form, especially in recent years, in what we commonly call "nature studies." What does that mean? It means essentially this: that there shall be taught in the common schools the observation of natural objects and phenomena and their classification, in an elementary way, and

facts regarding them which will be of interest and use to the young student.

That is a simple matter in the statement, but it is a difficult matter in the teaching, *i. e.*, to get the right things and to teach in the right way. And the great difficulty that we encounter in the introduction of nature studies, and especially nature studies which shall pertain to agricultural subjects, lies in the fact that the teachers in our elementary public schools, especially those in the country, are not trained to do this kind of work. In this movement we must begin with the training of teachers. We must give more attention to this matter in the Normal schools and other schools where teachers are trained, if we are to have any definite progress in the education of the children in the common schools along agricultural lines.

We must also give more attention to the general conditions which prevail in these rural schools. I have been looking into that lately a little. I do not know just how it is in New Jersey, for my inquiries have not covered the country entirely yet, but I can give you a few examples from other States. One great obstacle to the efficiency of the rural schools lies in the fact that many of them are so very small that school authorities cannot afford to employ in them well-trained teachers, and, even if they could, there are not students enough to keep up the proper interest in the school.

Experts in educational matters tell us that when the number of pupils in a single school falls below twenty-five there are too few to have that amount of mental competition, and consequently mental activity, which will give the best results in school work.

Let us see what is true of the country schools in some States. The State of Iowa justly prides itself on the general education of its citizens, and yet we find that Iowa has twenty-five hundred rural schools in which there is an average attendance of less than ten pupils, and nine thousand rural schools in which there is an average attendance of less than twenty. That is out of a total of thirteen thousand schools in the whole State, taking cities and country alike.

In Indiana four thousand schools, or half the entire number in the State, have an average attendance of less than twenty pupils.

Wisconsin has two hundred thousand pupils, or one-half the entire membership, in its ungraded schools, and out of these 95 per cent. go no further than the district schools.

In Iowa there are three hundred and seventy-five thousand pupils in the ungraded schools, and of the teachers licensed to teach in the State of Iowa in 1898, three thousand five hundred and eight had had no previous experience in teaching.

These facts will illustrate one of the difficulties of introducing improved courses of studies in the common schools. There is a movement going on with reference to improving these schools. I think it has already reached New Jersey, for there are some twenty States where the movement is in operation to a greater or lesser extent. It consists in the consolidation of schools as far as practicable, and the transportation at public expense of the pupils to a central school.

I have looked into this movement, and I am quite thoroughly convinced that consolidation will be a great benefit to the country schools. Certainly where it has been tried, in the vast majority of cases it has increased the efficiency of the schools, and it has made possible the enrichment of the courses through the employment of better teachers, better economy of time, and the providing of better facilities for skilled work. And the evidence seems to be that it has not increased, on the average, the expense of maintaining the schools. Usually there is no greater expense in maintaining one central school than in maintaining a number of small schools.

I call attention to some of the difficulties in the way of improved instruction, especially along the agricultural line, in our common schools, because I think the farmers of the country are not sufficiently alive to the importance of the improvement of these schools. They are perhaps not aware of the very rapid progress that has been made in the improvement of city schools. There is no reason, in my judgment, why, if we take hold of this thing actively, and have the support of the people living in the country, we should not very greatly improve the character of our rural schools within a few years, and as we do that, I am sure there will be increasing opportunity for the introduction of useful agricultural teaching into the common schools.

Coming now to the last group of agencies which have to do with the education of the farmer, the group which especially deals with the adult farmers, we have first the Farmers' Institutes. This movement, as you know, has been developed of late a great deal. It has gone out until it nearly covers the Union. I think Institutes are regularly held now in at least forty-three States and Territories. From somewhat imperfect statistics we have estimated that there are annually held in the United States some 2,000 Farmers' Institutes, and that these are attended by farmers aggregating at least half a million.

Now, you can see that this is already a great agency for the education of the adult farmer, but it is really just in its beginning. The movement is young; we are only reaching now about one in twenty of the farmers in this way, so that there is a great opportunity for development along this line.

As the Farmers' Institute develops there are important problems regarding it which were not thought of at first, so that the management of the Institutes is becoming each year a more complex matter and a more difficult matter to handle. When the Institutes were begun, the most common practice, which still continues to a considerable extent, was to employ as speakers practical men who had been more or less successful in the business of farming. These men were well greeted and popular, but as the Institute movement has grown, it is found that through the dissemination of information by other agencies, such as experiment stations, State Boards of Agriculture and the other agencies to which I have referred, the farmers are beginning to understand that after all it is not simply the result of individual experience that they need; they must get beyond and behind that, to what is the truth about matters in general, if possible. And so they are more and more demanding that speakers at Farmers' Institutes shall be men who have made a somewhat broad study of the subjects which they treat.

To make such a study requires time, energy and expense, and so, naturally, we are coming to realize that for the highest efficiency of our institutes we must develop a corps of trained workers who can give themselves very largely to the study of questions with reference to their presentation to bodies of farmers. One

result of that has been that there has been a great call upon the officers of the experiment stations to take part in the Institutes; that has gone to such an extent that it is beyond the ability of these men to attend the Institutes, if they are to give their proper time to other duties.

So one of the problems is how to get trained workers who can efficiently present agricultural matters to the farmers in the Institutes. It requires peculiar ability. It is not enough to study a subject. A Farmers' Institute lecturer ought to have experience, and successful experience. He ought to be a good talker. He must know how to get at his audience directly and effectually, and this requires a combination of talent which is comparatively rare. So there is not an over-supply of really first-class Farmers' Institute lecturers and workers.

Then there must be ways and means for getting at the farmers more completely, as I have indicated, so as to reach not only those who are accustomed to come, but also the mass of farmers who have not been in touch with the Institutes. That requires a variety of treatment, which, you will see at once, cannot be easily supplied by the Institute managers.

For instance, I was down a while ago at the negro institution at Tuskegee, Alabama, to which I have referred. About there is a large negro population, chiefly workers on the farms. Some of them are coming to own farms in a small way. These men have very little education. It is of little use to talk scientific farming to them, but they can be moved and instructed by the demonstration of improved methods. But they are poor people, and, naturally, unprogressive, so that you must get out among them to interest them. The Tuskegee Institute, in order to reach that class of people, has instituted a traveling campaign. They take a tent and a small dairy outfit, for example, and go out and pitch the tent at the cross-roads, and have some music and other attractive things to call attention to their presence. In this way they draw in the farmers that happen along or hear about it. These negro farmers come on their mules—that is the ordinary vehicle down there—and stay around the place two or three days, perhaps a week. In that way they get quite a little help and inspiration toward better things. That is simply an illustration. There are a

great many ways in which we ought to work to reach the farmers more widely and efficiently through the Farmers' Institutes.

This movement has thus far been entirely under the direction of the different States. This is very wise, and should, in a large sense, always continue, but there are certain ways in which the United States Department of Agriculture might help the Institutes, and we have been talking about this matter at the Department lately. Secretary Wilson has taken considerable interest in it, and so we are asking Congress this year to give us an appropriation of \$5,000 to enable us to employ an officer who can study the problems of the Farmers' Institutes in the different States and Territories and in Europe as well—for this movement, under different names, is going on there as well as here—and give the results of this study out for the benefit of the Farmers' Institute work in all parts of the country.

We think if we had officers who could go about in the different States, and consult with the Farmers' Institute managers, find out what problems are being studied, and go into the weaker places to encourage the movement where it is just starting, we might be able to render efficient service for the benefit of the Institutes; and, of course, in such a matter we desire to have the sympathy and support of people who are interested in the Institutes throughout the country. We want their advice and help, and if they really think the Department at Washington can do anything to help the Institutes, I am sure Congress will make the necessary appropriation to carry on such work.

It is not proposed in this work that the Department shall control the Institutes. It will act simply in an advisory capacity, helping where it can to spread and strengthen the movement. Just as in the experiment station work we have at Washington an office that advises them and helps them in any way, so we think a similar work might be done by the Department for the Institutes.

I have not the time to discuss the other agencies which deal with the education of the adult farmers. These, you remember, I named as (1) the agricultural societies, which certainly are developing in strength and importance throughout the Union; (2) the agricultural press, which, I believe, never disseminated more solid and useful information, and (3) books on agricultural

subjects. I want to say just a word on that last topic, and then I am through.

In my judgment, one of the most important outcomes of the work of agricultural colleges and experiment stations has been the collection of a great mass of material which is now being crystallized into good books for farmers. If you take the trouble to compare the list of books which publishers are now offering to farmers in America with similar lists fifteen or twenty years ago, you will see that there has been a vast improvement in the literature the farmers can obtain. This literature to-day has in it the sum and substance of the result of agricultural investigation and agricultural progress in this country and throughout the world.

We have now a distinctly American literature based on American experience and the results of investigations on American soil, whereas fifteen or twenty years ago our agricultural books were very largely based on the experience in England—experience which in very many respects had no direct relation to the conditions existing in this country. In those days if book-readers wanted to be a little more scientific, they went to Germany for their information. But that is no longer necessary, for we are turning out now from a number of book-publishing establishments a very high grade of agricultural books. So that the farmers who desire to gather information from books are vastly better off than they were a few years ago.

To leave off where I began, if we will study this subject, if we will try to understand separately the different agencies that are at work for the benefit of the farmer, and then if each one of us will work for the best development of these agencies, each in its proper sphere, the time is not far distant when the American farmer will have a system of education for his children and himself such as the world has never known. (Applause.)

Mr. A. S. Applegate called attention to the important work done and being done by the patrons of husbandry in the education of the agricultural people of this country, and suggested that Dr. True include this as one of the agencies in his list.

Dr. True—I am very glad the gentleman called my attention to that. As you saw, I cut my subject a little short, as I found the time was passing away. I did not leave it out of mind, how-

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ever. I meant to include under the general title of agricultural societies such organizations as the speaker has referred to. There is no question that the agricultural societies of various kinds have been among the most active agencies for the promotion of agricultural education, and that to them is due in a very large measure the institution and success of the other agencies to which I have referred. If I had another hour to talk I should be glad to go on and develop this thought, and speak more definitely of the work of the agricultural societies.

The Relation of the Live Stock Industry to New Jersey.

BY THOMAS F. HUNT.

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The Relation of the Live Stock Industry to New Jersey.

BY THOMAS F. HUNT, DEAN OF THE COLLEGE OF AGRICULTURE
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Twenty-three years ago the State of Texas desired a capitol building worthy of a great State. Having a sovereign right to one hundred and fifty million acres of public land within her borders, she deeded three million acres in northwestern Texas in return for a building second in size only in the United States to the capitol at Washington. This tract of land became and is the famous X. I. T. ranch. It reaches north and south a distance greater than that between New York and Washington, and contains an area slightly greater than the total farm lands of New Jersey. On this single ranch there has been ranged approximately one hundred and fifty thousand head of cattle. The calf brand for 1900 amounted to 36,675. The steers usually leave this ranch in the fall when they are two years old. For the past few years the price f. o. b. cars on the ranch has been \$30.00 for two-year-olds and \$25.00 for yearlings, while some calves have been sold at weaning time at \$20.00 to \$24.00 per head. These cattle go into feed-lots of the corn-growing States of the Ohio and Mississippi valley.

The Standard Cattle Company of Ames, Neb., has for more than a decade fed annually over four thousand head. Usually, however, these cattle are fed off on moderate sized farms, a few carloads at a place.

That good cattle may come from a western ranch is shown by the fact that at the great International Live Stock Exposition in

December a carload of steers, bred on a Texas ranch and fed on an Ohio corn farm, won the championship, weighing as two-year-olds 1,497 pounds, and bringing at public auction \$12.00 per hundred, or \$179.64 apiece.

Twenty years ago a Jew peddler walked into Deadwood, Dakota, with a pack upon his back. Last November this same peddler had for sale twenty thousand head of cattle, for which he was asking \$50.00 apiece, or a total of \$1,000,000.00. He is said to be worth \$3,000,000.00, all made from ranging cattle upon government land.

In one of our Northwestern States there is a vast area of government land, which happens to be so surrounded by mountains as to enable cattle to be herded in this natural enclosure by guarding a few passes in the mountains. The people who control this territory have so pooled their issues that they will receive cattle shipped into this ranch, unload them from the cars, keep them on this pasture two years, and put them on board cars again at the end of that time for \$2.00 per head, the owner of the cattle assuming all risks. These examples are related here simply as illustrations of the gigantic operations of the live-stock men of the far West and of the economy of production that have prevailed throughout that country during the past quarter of a century. What is the use of the Eastern farmer trying to raise beef cattle in the face of such competition? The Western man's view is that the New Jersey farmer had better buy his beef and continue to raise truck and Jersey cream, for which the State is justly noted. This is the Western man's view of the situation, but there is an Eastern man's view. I ask your indulgence while I present the Eastern man's point of view.

A word first about geography. An acquaintance recently visited in Maine, and while there two of her Maine friends informed her that they were going out West. Having heard something of the Eastern idea of the West, she thought they might be going not farther west than Buffalo, N. Y., but she was hardly prepared for the statement that they were going to the Berkshire Hills of Massachusetts. A glance at the map will show us that the United States may conveniently be divided into three somewhat equal portions. All the States east of the Mississippi river

constitute about one-third of the area of the United States, while all the States to be found west of a north and south line passing through Denver, Col., include the largest third of the United States, while the States between the East and far West, which we may call the Central West, constitute another third but slightly smaller than that east of the Mississippi. If we are to understand the past development and the probable future of the live-stock industry of this country, we must keep in mind the significance of these geographical divisions, and I beg you to remember that when I am speaking of the East I am speaking of the territory east of the Mississippi river.

It is less than one hundred years since George Renick drove from southern Ohio to Baltimore the first cattle that ever came across the Alleghanies to a seaboard market. Thus began a competition between the Eastern and the then far Western farmer, which has gone on year after year in an ever-changing theatre.

In 1825 the National road was completed into eastern Ohio. In quick succession followed the canals, railroads and steamboat navigation. These facilities enabled the farmers of Ohio, Kentucky, Indiana, Illinois and adjoining States, with their cheap and fertile soil, to market their crops at great economic advantage compared with the farmers east of the Alleghanies. These were days of great prosperity for the farmers of the Ohio Valley.

But with the close of the Civil War new forces arose. The population had begun to flow over the Mississippi river into the middle third of the United States. In 1869 began the consolidation of railroads into trans-continental lines, and the iron horse pushed its way, sometimes following and sometimes preceding the onflow of humanity, into the vast and treeless plains which lay ready for the plow. Farther east the States had, for the most part, been covered with stately forests. In these almost impenetrable forests the axman hewed his way tree by tree, but here on the Middle West lay a vast and treeless plain on which thousands and tens of thousands of cattle and sheep could be pastured without cost of land, and the pioneer had to but turn the furrow to convert it into a garden.

By 1850 the mower, by 1860 the reaper, and by 1880 the self-binding harvester made possible a development of the West,

the like of which the world had never before seen. With it came millions of bushels of oats and corn and millions of tons of hay and straw, which before they had any practical value must be turned into animal products. Some notion of the gigantic character of this enterprise may be had when we remember that since 1870 we have doubled our population and at the same time we have doubled our farm area and our agricultural productions. This means that the people of the United States have subdued to the uses of man in the past thirty years as much territory as they had been able to do in their whole previous history of two hundred and fifty years since the landing at Plymouth. Almost as by magic the Middle West has been changed from the wilderness to a prosperous, happy and contented community.

But there is still left the far West—the greater third in area of the United States, lying for the most part west of Denver, Colorado. What of it? While there are exceptions from which great States may be made, the region as a whole may be described in a word as one of high altitude and small rainfall, principally both.

As the Middle West became homesteaded, the ranchman was pushed farther and farther west until he has been pushed beyond the hundredth meridian and has been there largely for the past decade, although Oklahoma and parts of Texas form an exception to this general statement.

In 1875 sixty-five per cent. of the live stock of the United States were raised east of the Mississippi; fifteen years later, less than thirty-eight per cent. In 1875 seven per cent. of the live stock was raised on the ranches of the far West; fifteen years later one-fifth of all the live stock was raised in this territory. Over this vast area cattle and sheep have been reared without cost for land and at a trifle expense for labor. Ten or fifteen years ago it looked as if this area might become the pasture-land for the cattle and sheep of the nation.

In 1899 your President Voorhees chaperoned a party across the continent to San Francisco, of which the speaker had the honor to be a member. At 11 o'clock on Sunday evening we left Salt Lake City for the Golden Gate. The railway guide-book reads somewhat after this fashion: "After you leave Ogden you

pass through a pretty little valley and then comes the beautiful scenery of the Sierra Nevadas." It took us a half hour to pass through the pretty little valley. The beautiful scenery of the Siera Nevada comes all right, but before it comes you pass two nights and a day through an alkali desert, which, like the sea-sick voyager, you fervently declare you will never undertake again if you are spared this time, which declaration you are equally ready to break subsequently. Next morning when we got up we were still in Utah. I looked out upon this barren waste containing apparently no vegetation of any kind save sage-brush, and I was greatly mystified. I said to my companions: "Is this not the trail of the forty-niner?" "Yes." "How did the forty-niner ever succeed in crossing this desert? There is absolutely nothing containing animal or vegetable life upon which man or beast could subsist." I charged up and down the car repeating my inquiries until an experienced westerner took me by the button-hole and said: "When the forty-niner came through here the grass was knee high." I looked at him in amazement; not a spear of grass is now to be seen. "Right here in this country we are now passing through was formerly the feeding-ground of the sheep of Utah. They are now up in the mountains," he next remarked. If possible, I looked at him in greater amazement. "Now," said he, "I will explain this matter to you," and this in substance is what he told me: First came the cattleman, who ranged his cattle over this country and sought to control it by buying comparatively small tracts of land wherever water could be obtained. If a ranchman owned the water privileges he was in safe possession as against any other cattleman, of thousands of acres, it may be, that were tributary to the water. The cattleman, however, soon found to his sorrow that he was not in safe possession of this land as against the sheepman. Sheep will go much longer and farther without water. A physician, who was also financially interested in stock, asserted to me that they would go thirty days without water. Be this as it may, it has been abundantly proven that they can pasture clear around the cattleman's water privileges. This is death to the cattleman's interest. In the first place, it is well known that cattle will not follow large bodies of sheep; in the second place, the sheep eat

the grass too short. But these are the least important things. It does sometimes rain out there. When it does rain the soil gets a soft, adobe mud, quite different from eastern mud. Sheep must, of course, continue to eat whether it is wet or dry, and eating as they do with an upward lift, when the soil gets into this soft condition they pull up the grass by the roots. Where the forty-niner found the grass knee high, where only a few years ago thousands of cattle and tens of thousands of sheep fed, the country is a barren waste, which does not now even support jack-rabbits, sage-hens or rattlesnakes.

The condition in the State of Nevada, which is probably an extreme case, and perhaps not yet typical of other States, may be cited to bring the situation home to the eastern mind. Nevada in the past had had three sources of wealth, viz., pasture, lumber and minerals. I have told what has become of much of her pasture on the lower levels. There is still left some pasture higher up in the mountains.

I rode one afternoon, going from Lake Tahoe to Carson City, down the eastern slope of the Sierra Nevada for perhaps ten miles along a flume which had formerly been used in transporting timber to the box-factory at Carson City. No logs now floated down the flume—the box-factory was closed. The boxes were no longer made for lack of timber from which to make them. Standing in Reno, the principal town of the State, I looked out upon the mountains and said: “Your mountains here do not seem to bear any timber.” “Mackey, the lumber king, had two hundred and fifty men four years cutting timber in sight of this town,” was the reply. It is perhaps needless here to remark that the affecting of the water-supply is not the least of the consequences which have followed the destruction of these mountain forests.

In going from Carson City to Reno our train made a stop where I subsequently learned was once a thriving mining town of two thousand inhabitants. Not a sign of a dwelling is now to be seen. With its three principal sources of wealth gone or reduced, it is not surprising that the State should be decreasing in population.

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How does this view of the Easterner compare with the Western view of the situation? If a steer can be kept at a dollar a year, can a farmer raise cattle on land worth \$100.00 or \$50.00 or even \$25.00 per acre? Certainly not as long as these conditions last over a large area. Through the increase in the farm lands of the Middle West and through the destruction of the grasses in the far West, the free-range land is fast disappearing. Seven hundred and fifty thousand acres of the X. I. T. ranch have been sold since February 1st, and the owners are endeavoring to sell the rest at an average of \$2.00 per acre, preferably in lots of two thousand acres each. In a short time this ranch, perhaps the most famous in the world, will be no more. As time goes on, this must be the history of all lands out of which it is possible to make farm homes. Under range conditions, the three million acres of the X. I. T. ranch supported one hundred and fifty thousand cattle and a few hundred people at most. New Jersey, with an equal amount of farm land, supports about three times as much live stock, produces many other farm products, supports many and varied industries and houses within its borders nearly two million people.

Under farm conditions, it is probable that as much live stock, if not more, will be produced than was produced under range conditions, but during the past ten years all available statistics seem to indicate that we have been breeding people faster than we have been breeding domestic animals. This, with the increased foreign demand and an increased prosperity among our people, has brought about prices for beef cattle that have not been seen before in two decades.

Two things seem apparent: First, that the economic changes are such that the price of beef cattle will not soon, and may never, reach the low level that was possible when there was an abundance of free range; and, second, that the farmer east of the Mississippi hereafter has similar opportunities in raising cattle, so far as cost of production is concerned, and is much closer to a superior market.

The day of three-million-acre ranches is doomed, and we will return, to some extent doubtless, to the days of my boyhood and

yours, when we drove a few head of cattle each morning half a mile to pasture, and, after denuding a few raspberry and blackberry bushes, returned all too leisurely to other childhood duties.

If this condition comes about, as I firmly expect, it will mean not only increased financial prosperity, but, also, better intellectual and social conditions among our people. I have no time to dwell upon this phase of the subject, but I do not use these adjectives lightly.

Whether the soil and climate of New Jersey and its economic surroundings are such as to warrant the farmers of this State in embarking largely in beef raising, I am not well enough informed to venture an opinion. The fact that I have been invited to discuss the subject of beef raising leads me to suppose that some of you at least believe that the conditions I have been discussing apply to your State.

There has not been a day in three years in which two-year-old steers have not sold for more than \$75.00 per head, and on numerous days top prices have exceeded \$100.00 per head on the Chicago market. These same cattle are constantly being shipped to New York and Philadelphia, where they, of course, sell for enough to leave a profit for handling after paying for added freight and commissions.

I have always found it so difficult to make money myself that I shall not undertake to figure out for you the profit that may be made from beef raising, but shall confine myself to discussing a few of the necessary conditions to success in this business.

First, then, is the right kind of an animal. Among the essentials of a good beef animal may be mentioned size, form, quality, constitution, and in considering pure-bred animals may be added character, style and breed type.

Size—Mature bulls should weigh from 1,800 to 2,300 pounds, depending somewhat on condition. In like manner, cows should weigh from 1,400 to 1,800 pounds. Steers at thirty months of age should weigh from 1,200 to 1,600 when thoroughly fattened. There is a limited demand for good, well-fattened steers weighing over 1,600, but the demand is easily supplied, and such cattle are likely to sell at a discount unless strictly first-class in quality.

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Steers weighing between 1,400 and 1,500 pounds, of the proper form, quality and condition, will generally bring top prices, and there is always a good demand for pony-built, well-fattened steers weighing 1,200 to 1,300 pounds. The market demands quality rather than size.

Form—In contradistinction to the wedge-shape of the dairy cow, the beef animal should present a rectangular appearance. When viewed from the side the top and bottom lines should be straight and parallel. Looking down over the animal, we should find a broad, level back, and the side lines should be carried as nearly straight and parallel as possible. In like manner, when viewed from either end, the outline that meets the eye should be nearly that of a rectangle. The body of a beef animal may be likened to a shoe-box set on edge with the edges and corners rounded off.

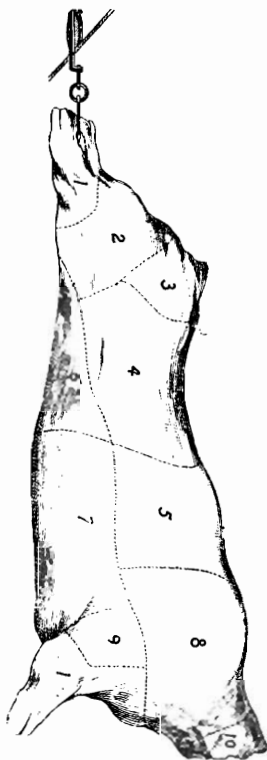
In early days of Shorthorn breeding the popular type was a rather upstanding, table-backed animal, with hips, buttock and shoulder points prominent. As soon as the block Scotch Doddies began to win their way to the front, it was seen that the low-down, rounded or cylindrical form was the more economical type, and since that time all strictly beef breeds have more and more approached this type. The idea involved has been popularly expressed as obtaining the largest carcass for the size of the hide, or as a large piece of meat in a small package.

The volume of a sphere is greater than that of a rectangle for the amount of the exterior surface. The smoother and more cylindrical form, therefore, produces the least offal.

But why this rectangular form? Is it merely the fad of sentimental breeders or is it based upon the demands of the trade?

Last April I called upon the head of the beef department of the Armour Company in Chicago, which butcher at this house alone five thousand head of cattle daily. This gentleman gave me the average percentage of the different cuts of beef to be found in the 700-pound carcass of native steers, which weighed alive a little more than 1,200 pounds. He also gave me the wholesale price at which they delivered these different cuts to retailers between Chicago and Missouri river points, effective April 1st, 1901.

This chart shows the methods of cutting up beef for the wholesale trade, and the following table shows the number of pounds in the different parts of the carcass, together with their wholesale price and value :



1. Shank.
2. Round.
3. Rump.
4. Loin.
5. Rib.
6. Flank.
7. Plate.
8. Chuck.
9. Clods.
10. Neck.

Tenderloins, Sirloin Butts and Strips cut from No. 4.
Rib Rolls cut from No. 5.

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CHICAGO WHOLESALE DEALERS' METHOD OF CUTTING BEEF.

		<i>Weight.</i>	<i>Price.</i>	<i>Value.</i>
4.	Loin,	119	\$0.15	\$17.85
5.	Rib,	63	.13	8.19
2, 3.	Round and Rump,.....	147	.09	13.23
9.	Clod,	23	.07½	1.73
8.	Chuck,	140	.06¼	8.75
7.	Plate,	112	.04½	5.04
6.	Flank,	21	.03	.63
1.	Shank,	47	.02½	1.18
10.	Neck,	7	.02	.14
	Tallow,	21	...	....
Total,.....		700		\$56.74

Ordinarily the division between the fore and hind-quarter is made by cutting between the last two ribs, although sometimes three ribs are left on the loin. The loin may be divided into three parts, beginning in the rear as follows: Sirloin, porterhouse and tenderloin. Sometimes the sirloin is removed from the loin, when it is called short loin. This short loin corresponds to what we call the loin in the living animal, and the price of this short loin in carcasses of the above class was 22 cents per pound; the sirloin by itself was worth 11 cents; the round with the rump removed was worth 9¾ cents, while the rump was worth 6½ cents. The wholesale price of different parts of the carcass of common native steers varied therefore from 2 to 22 cents. I have purposely selected as an example a grade of steers of which thousands are slaughtered daily. The steers of higher grade having a carcass weighing a thousand pounds, for example, greater contrast would be found. This suffices, however, to show that the highest-priced meat is to be found between the shoulder and a point half way between hip and rump and above a horizontal line passing through the point of the shoulder.

Come with me into the box-stall or the feed-lot while we examine the points of a beef animal. Standing a little in front and to one side so as to get a quartering view, the size is noted; also whether the animal presents the rectangular, yet somewhat rounded, form; whether the animal is close to the ground; whether his legs are short, trim, neat and not too large, indicating quality

and smallness of offal. It is also noted whether he stands squarely on his feet and whether his carriage and general control of his faculties denote good constitutional vigor, and whether he appears to have a contented, placid and even phlegmatic temperament in contradistinction to the rather nervous and active temperament of the dairy animal. The width of breast and size of the heart girth may next be noted. If breeding animals are examined a certain individuality is looked for. If we are examining a bull we note whether he has masculine characteristics; if a cow, whether she possesses those feminine qualities which properly belong to a female. We proceed now to look the animal over in detail: The head should be neat, not over-large but substantial; the face short; forehead broad; if horned, good width between horns; eyes large, clear, placid and wide apart; muzzle broad; and mouth and nostrils rather large, with strong jaw-bones wide apart. Large nostrils denote good lung power; large mouth and strong jaw-bones ability to masticate food. Good width between jaw-bones allows space for free passage of wind-pipe and gullet.

We next note that the neck is short and thick, insensibly joining the withers, shoulders and breast, and that the brisket is sufficiently advanced to make the front end of the body perpendicular.

Now, stepping quietly up to the animal, we place the left hand upon the neck and with the right take the skin between the thumb and forefinger, which should be rather thick but quite pliable and easily lifted, instead of stiff and tight, with soft velvety hair, assuming a thick, furry character in winter, rather than harsh or wiry on the one hand or silky on the other, as in some dairy breeds. Passing rapidly along, we examine with our left hand the points of the shoulder blade, which should lie close together so that no depression is noticeable between them. With our right we note that the shoulder blades are smooth and well covered with flesh. As we pass behind the shoulder we note particularly that the space just behind the shoulders, called the crops, is well filled, giving large heart girth, so that if a straight-edge was laid along the side of the animal it would touch at all points.

Running the palm of the hand along the back we note that the skin is not drawn tight but that it covers a mellow elastic cushion of evenly distributed flesh. The flesh here should be firm and

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elastic and not soft like putty, which indicates an over-fattened condition.

We next note that the ribs are long, well sprung, carried well back, close together and well covered by flesh. Here again we may examine between the thumb and forefinger the pliability of the skin and the character of the hair. Quickly slip the left arm over the back and thus estimate its width. We now come to the highest-priced meat, the loin, and it must, therefore, be examined carefully. We should note the covering and the width. With the left hand flat upon the edge of the loin, place the knuckles of the right fist under the edge of the loin and note its thickness. Next grasp the flank in the hand and note the fullness, indicative of the condition or fatness of the animal. With this thought in mind we may now feel on the side of the neck just in front of the shoulder point for the bunch of fat and for indication of fatness over the pin-bones on each side of the tail-head. These places are the best to fill up in a fattening beast, and are, therefore, indications of ripeness—sometimes over-ripeness.

Leaving the loin we notice the width of the hips, their covering and smoothness. While wide hips are desirable, according to present ideals they must not be too prominent, especially in bulls and steers. The rump should be long, wide and level, well covered with flesh so as to carry width back in parallel lines.

The tail-head should be broad and flat, rather than narrow and high, and there should be no lumps or patchiness over the pin-bones, sometimes described as "gaudy."

The buttock should drop down rather straight instead of being too rounded and should descend well down towards hock.

Standing behind the animal, note that the thighs are well filled so that the point where they join, called the twist, is low down. The thigh or round is not the highest-priced meat, but the inner two-thirds is much better than the outer third. The inner filling of thighs is, therefore, important in the beef animal. This leads to the remark that those parts of the animal are choicest, from an epicurean standpoint, which are the least exercised. The muscles of the loin and back being the least exercised, are, therefore, the tenderest, while the neck, which is constantly exercised from holding and moving the head, is toughest. The aim of him who

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feeds for meat should be to get the largest amount of unexercised muscles, nicely embedded in fat, with the least amount of bone and other offal consistent with a robust constitution and large digestive capacity.

Early Maturity—When the Fat Stock Show was established in Chicago in 1878, prizes were offered for four-year-old steers. Two years later the four-year-old class was abandoned, while in 1890 the three-year-old class was abandoned on the ground that it was not wise to stimulate the growing of unprofitable cattle.

The reason why early maturity is important is shown by the records of this same show :

PRIZE ANIMALS AT FAT STOCK SHOW.

AVERAGE WEIGHTS AND GAINS.

	<i>Age Da.</i>	<i>Weight.</i>	<i>From Birth. Gain per Da.</i>
Calf,	295	842	2.82
One-year-olds,	662	1377	2.07
Two-year-olds,	988	1751	1.77
Three-year-olds,	1364	2007	1.47

BY YEARS.

	<i>No. of Da.</i>	<i>Increase.</i>	<i>Gain per Da.</i>
First year,	295	842	2.82
Second year,	367	535	1.46
Third year,	326	374	1.15
Fourth year,	374	256	.61

Nothing could show in a more striking manner the importance of early maturity than these tables, based upon actual results of the feed-lots. Not only is there a marked decrease in the rate of gain, but, as the animal constantly grows larger, more food is required per day. The candle is being burned at both ends.

How may size, form, quality and early maturity be obtained?

First, by using pure-bred sires of any of the beef breeds upon native cows possessing in some measure the characteristics desired. Without disparaging any other breeds, Aberdeen-Angus, Herefords and Shorthorns, including Polled Durhams, possess

the characteristics above mentioned in about equal degree. Each and every breed has its place, but no one should undertake to breed Herefords for dairy purposes nor Jerseys for the production of high-class beef.

The second essential to success is proper feeding. They have a way in the Mississippi valley of speaking of the corn-crib cross. Your experiment station officers are much better able to advise you concerning the details of feeding than I, who am not acquainted with your possibilities in raising forage crops. A word before closing may be said, however, concerning the general principles involved. In the past beef cattle have been grown on cheap lands where a nitrogenous diet fitted to the needs of the growing animal was furnished. In many places the food cost practically nothing. The principal problem was to breed the animals fast enough to eat the nitrogenous grasses. Under these conditions the animals were kept until they were pretty well grown before any attempt was made to fatten them. Thousands of cattle have been bought each year from these breeders and grazers to go into the feed-lots of the great corn-belt, where marvelous results are obtained by feeding thin but well-grown cattle on highly concentrated and carbonaceous food.

The general practice is to buy these cattle in the fall when they are two years old; that is to say, the breeders keep them through two winters and three summers. When they go into the feed-lots they are from twenty-six to thirty months of age, and after three to five months of feeding go to the shambles.

Men who feed the cattle which they rear themselves on high-priced land are finding that their profit lies in breeding cattle only of the highest quality, and keeping them only through one winter and feeding them off during the fall and winter when they are yet yearling. That this is being done successfully is shown by the fact that yearlings weighing 1,400 pounds have been sold in car-lots in Chicago this winter.

This calls for a different system of feeding. These cattle are being fattened while they are still growing rapidly and before they have developed their bone and muscle. Corn for breakfast, corn for dinner and corn for supper will not suffice. They must

have a more nitrogenous diet than that afforded by Indian corn and corn stover. One of the problems, therefore, which the New Jersey farmer must solve, unless he has already solved it, is to grow cheaply crops of a nitrogenous character on which his beef may be fattened. The farmer who, for example, can grow alfalfa successfully has a priceless heritage.

In conclusion—Nearly three centuries ago our forefathers started in to subdue a continent. “By 1800 the United States nowhere touched the Gulf of Mexico and nowhere crossed the Mississippi.” By 1850 we had acquired our present continental territorial limits, Alaska excepted, but the West and Northwest was agriculturally an undiscovered country. As late as 1875 central Iowa was a wilderness. Besides having two cabinet officers, Iowa is now one of the greatest agricultural States in the Union. Since 1870 we have doubled our population and doubled our agriculture. Since that time we have swept the continent with our agricultural operations, and have rolled up against the Pacific coast with such force that the shock has sent us thousands of miles across the sea. The free ranges on which for a century cattle and sheep have been grazed almost without cost have been reduced by homesteading in the Central West and by the destruction of the grasses in the semi-arid region of the far West to such a point that competition from this source in the case of cattle no longer prevents the raising of cattle on Eastern farms.

For a decade we have been breeding people faster than we have been breeding domestic animals. Prices have advanced to where beef raising may be profitably engaged in on small farms. To be profitable it is necessary to raise cattle which in form and quality will satisfy the market demands for choice meat. Only pure-bred sires of recognized beef or dual purpose breeds must be used. They should be ready for the market after one winter and two summers’ feeding. They must be kept constantly growing on grains and forage crops which will make not only fat but bone and muscle. The benefits which will accrue will not be chiefly in the direct financial profits from the cattle, but in the increased prosperity of the farming operations. The past century has seen changes in practical and scientific agriculture amounting to a

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revolution. Great progress has been made in the use of chemical fertilizers and in amelioration of the soil through leguminous crops. Notwithstanding these and other agencies, the old Flemish proverb remains generally true: "No grass, no cattle; no cattle, no manure; no manure, no crops."

Breeding the Dairy Cow.

BY EDWARD VAN ALSTYNE.

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Breeding the Dairy Cow.

BY EDWARD VAN ALSTYNE, KINDERHOOK, N. Y., SUPERINTENDENT
DAIRY TESTS, PAN-AMERICAN EXPOSITION.

Mr. Chairman and Gentlemen of the State Board of Agriculture of New Jersey—It is a pleasure to me to come and meet you in a body to-day. I had the pleasure of being down here in the early part of the winter as your servant, and meeting a good many of the New Jersey people, and not a few of those that I see here to-day, and it is a pleasure for me to meet you again, and a pleasure that I hardly know how to express in being able to address a body of men of this kind. So often in agricultural meetings we have those that come partly out of curiosity, partly out of criticism, and those who are so far behind in the procession that it is difficult to talk to them in a way that would interest them and give them something to carry home, and yet be talking of something that is not entirely out of date to the better class of the audience; and so I am glad to have an audience of this kind to-day.

In speaking of the breeding of a dairy cow I do not want to be misunderstood. I want to talk a little in the beginning about the pure-bred animal, and I want to say that there is no man that holds a pure-bred animal in higher esteem than I do; and I do not want you to confound anything I say later on about breeding grades and construe it to mean that I do not value pure breeding.

They tell a story of an old elder who was a very devout man in the church, and yet he had a little sporting blood in his veins, and he would come to church on Sundays driving his horses tandem. He was remonstrated with by the session. "Why," he said, "it is all right, I like to drive that way. My horses are broken that way." But they said, "Elder, it don't look well; don't seem to be becoming on the Sabbath with your position." They could not convince him, and they tried to use an illustration. "Now, Elder,

when you pray you hold up your hands in this fashion, both of them straight up, and it is very proper, and so it is when you drive your horses side by side to your carriage; but we don't think it is proper to put those horses one before the other any more than it would be proper if when you prayed you raised your hands to your nose in tandem fashion."

So I say you want to look at the thing from a proper position.

I want to talk to you about the pure-bred animal. I do not know that I need say much, because we have had so much that is excellent along this line that ought to emphasize the point, but when we are going to build up a dairy herd the first thing is to get some type in mind. If the first thing is to be the production of butter, then I think it is established beyond doubt that what we want to breed for that purpose are the Channel Island cattle. Why? Because they have been bred for two centuries just for the purpose of producing butter. They are rather small animals, have adapted themselves to their environment in the Channel Islands, with their rather bleak climate in some parts of the year, and rather scant forage—animals that have been bred along one line, cows that can produce a pound of butter-fat cheaper than any cows in the world. These are the Channel Island cattle. I do not think this admits of any doubt. Not only that, but from animals of that line of breeding can more readily be made a fine line of butter products, more easily churned, at a higher temperature, superior grain and higher color.

On the other hand, if our idea is to produce milk, without much regard to its fat, then I think it admits of no doubt that we can produce a quart of milk from a type of animal of the Holstein breed—that for more than 2,000 years have been bred for that. While the Jersey and the Guernsey cows have been bred in these little islands, with the food rather scanty, the Holstein has been bred in the fertile pastures of Holland, where she can get all she wants of food with the least possible exertion; her food has been of a bulky nature, and it has developed an animal just the counterpart of the Channel Island cattle. If our environment is of that nature, and we want that kind of a product, then I believe that is the kind of a cow to turn our attention to.

If our pasture-land is more abundant and rougher, and the cattle must spend more time and more of an effort in gaining the food, if we want the milk that is very well balanced in fat and solids, then I believe the farmer will do better to take up a cow of the Ayrshire type. Then, again, if his feed is scant, and he wants an animal that will take a good bit of roughing, and his place is of a limited acreage, so his food is reduced, then I think it will pay to turn his attention to something along the line of the French-Canadian cattle.

I need say nothing about the beef cattle, because we just listened to Dr. Hunt on that theme. I speak of this to emphasize this point, that not all the good animals are in any one breed. If any man made any such statement to-day he is certainly egotistical or foolish; that was demonstrated at Buffalo.

I speak of this for another reason, that all these high attainments have come through line-breeding, not through cross-breeding. The Holstein cow being bred with her kind for all these years, and the Channel Island cattle being bred with their kind, just as these elegant beef cattle have been bred with their kind, one of the greatest fallacies of to-day is this notion of cross-breeding. I am asked this question more than any other: What do you think of this cross, or what do you think of that cross, or what animal shall I put with my cows to bring me better results? For instance, a man comes to me and he says what will I use to cross on my Jersey cow to give me more milk, or to cross on my Holstein to give me more butter.

It is a very common thing to think that we can take a Holstein, that is so pre-eminently a milk-producer, and a Jersey which is so pre-eminently a butter-producer, and can combine those two strong bloods, and then will get an animal that has some of the good qualities of the Jersey and some of the good qualities of the Holstein, and is about medium as between the two in size. How does it work out in practice? Once in a while we will get a superior animal from a cross of this kind, and nineteen out of twenty times we get an animal that is neither Holstein or Jersey or much of anything else.

I have made a statement of this kind, and I have had men say, I have made a cross like that and I had a splendid cow. I do not

doubt that, but those are the rare exceptions, and I leave it to your good judgment, if you will carefully go over in your mind the crosses of that kind that have been made in all the history of breeding, and if you can show me where there has been any great attainment, I would like to see it. The attainment in breeding has been breeding along pure-bred lines, and pure-bred lines only. A man asked me awhile ago what bull he should put on an Ayrshire cow to give her larger teats and more milk? And I said an Ayrshire. And he thought I had misspoken myself, and he asked me again, and I repeated the answer, an Ayrshire. And he said "I have got Ayrshires," and I said "I know you have, stick right to them." If you want to put larger teats on your Ayrshire cows, and want more butter-fat, then get an Ayrshire bull that comes from a family of rich milkers; from a family that have large teats, and the bull itself has large and well-placed rudimentaries, and you will attain what you want a good deal faster and a good deal surer than by attempting to get it by a cross of some kind. And if you ask me what place I would go to to find poor dairy cattle, I would take you every time to the community where they had started out on this line: A man says he wants some more milk, and so he uses for a period of years the Holstein bull, and then he says I am not getting rich enough milk, and then he gets a Jersey bull. And that does not satisfy, because he hears Dr. Hunt talk about the beef cattle, and he says I would like to have a little of this strain in mine and he buys a short-horned bull, and when he gets done with that combination he has got the most worthless lot of cattle on earth.

It is with cattle like with the Frenchman that we had in our community when I was a boy. There used to be some lumbering done, and some of the parties bought one of the old farms that had its original timber on, and brought down from Canada a lot of Kanucks to cut it. They spoke a little broken English. You know some of these people of other countries get some of our ideas, and this fellow had been some place where they gave him an old-fashioned drink, and he wanted more. He came to one of the rural tavernkeepers, and he said, "Monsieur, I want some of that drink, what you call that liquor, Jacob?" And he said, "I don't know what you mean; we haven't any such drink." He

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said, "I got her here before." He said, "Tell me how it was made." And the Frenchman said, "I tell you, you put in a little whiskey to make him strong, and then you put in a little water to make him weak, and you put in a little lemon to make him sour, and then you put in a little sugar to make him sweet." "You mean a flip," said the tavernkeeper. "Well, give me some fillip." (Laughter.)

What has been attained by years of careful line-breeding we expect to better by crossing in nine months. Why is this? There are always two tendencies in our domestic animals, the one is to perpetuate themselves, their characteristics, the other to revert to the original stock. I believe that tendency of reversion is stronger when we take in all this blood that I have mentioned, when we combine them, than when we take animals of no particular breed and combine them.

Let me give you a concrete illustration. When Darwin wrote his "Origin of Species" in the course of his investigation he became satisfied that all the variety of pigeons had originated from the Blue Rock pigeon of the Mediterranean Sea; any one of you who have been to a poultry show, as you pass by the coops you will see varieties as different as they can be. There is a pouter pigeon, with its immense crop, and there is a pigeon with its great fan-tail, dissimilar in plumage and make-up and everything else. And yet Darwin contended that they came from the same source. What did he do? He crossed the pouter pigeon and the fan-tail. Neither of them had a blue feather in their plumage, and hadn't for generations. The first crop developed a blue feather, and when they were crossed again they went right back to the original condition. That is the danger when we do this cross-breeding.

I was speaking on this subject not long ago, and a gentleman came to me and said, "What do you think of the Jersey and Guernsey cross?" I said, "I don't think anything of it. What are you going to gain?" You say those are not so dissimilar as the others you have been speaking of, the Holstein and Jersey. No, that is true; their line of breeding has been quite similar, yet I think if you will trace up the origin of those two breeds, you will

find that they are quite dissimilar, quite a difference in the blood that enters into the Guernsey from her cousin the Jersey. I tried that kind of breeding to my sorrow ; that is why I speak of it with so much emphasis.

Seven or eight years ago I got the idea in my mind that if I took my Jersey cows, that were not quite as large as I wanted them to be, and crossed them with a Guernsey bull, I would get an animal that was larger than the Jersey, and that had more constitution, and that would give more milk. So I bought just as good a Guernsey bull as I could find, and went to crossing, and I lost two years of breeding. I got a beautiful animal, and now and then one that was very fair, but four out of every five were inferior to their dams. I would have done infinitely better had I bought a Jersey bull from a family of larger animals and good milkers and used him on those Jersey cows, and so have built up my size a little and got a little more milk, and I would have had just as much constitution. So I say, my friends, don't be led away by any such foolishness.

If you want an illustration of the value of line-breeding, I do not know where you will find one that is equal to the Jew. Here is not only a race of people the result of line-breeding, but, to a degree, of in-breeding, and everywhere where the Jew goes on the face of the earth, I do not care what climate or nation, his characteristics stand right out, and they are usually such that he makes himself a formidable competitor wherever he is, whether in commerce, music, politics, finance or agriculture. He is the result of line-breeding, and where will you find a race of men anywhere that are cutting the figure that the Jews are? You want to study a little Scripture ; take your Bibles and go back to the book of Exodus, and read the pedigree of Moses. He was an in-bred man. So much for that.

Let me say, in the next place, to that farmer who wants to build up a herd for production (and I suppose almost all farmers want that here in New Jersey) I do not believe it is necessary, I do not believe that it is wise for that man to think that he had better go and put in a herd of pure-bred animals. I yield to no man in respect for pure breeding. I repeat again that all the permanent advantage that we have has come from line-breeding,

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and I say then that the man that is going to do that must do it by itself. That is not the business of a dairyman who makes production his main thing. Now, why? Because, simply that an animal has a registry; simply that an animal is pure-blooded, it does not necessarily follow that that animal is all right. I believe in breeding in man and beast. I believe in pedigree, but you know, gentlemen, that there are families in every community whose very name is synonymous with honesty, uprightness and integrity. You know there are other families whose name is synonymous with everything that is the reverse. I will take a young man that will come out of the first-named family, and he goes into life with a wonderful advantage over the other. I will take his chance of success, because he has a line of breeding of the right kind behind him, and the other goes out handicapped; but, in spite of that, I leave it to you if there are not in these families that have been noted for their admirable characteristics, every now and then, one of whom it is charity to say that it would have been better for them and for their friends if they had never been born. And if that is true of the human race, how much more must it be true in the brute creation?

How are we working a dairy cow? We ask her to become a mother at two years of age, and then we ask her to produce a total weight of solids that is equal at least to two-thirds and more of the weight of her body, and at the same time to give us a calf at the end of the year that is healthy and strong. Is there any domestic animal that we are taxing to that extent? What does that mean? To my mind it means that unless we select and care for her very carefully we must have, even in the animals of the best strain, those that are inferior, no matter how excellent their breeding may be.

So I say that the man who is going to breed pure-bred animals wants to make that a business. He wants to make it a business to breed them for show, for the perpetuation of their kind, and for the work of producing. I would not give a cent for a pure-bred animal that was not a producer.

Let me go a little further on that line before I leave it. I have no sympathy or patience with this breeding of pure-bred animals simply for the artificial points, the black muzzle and the black

switch in the Jersey and about the reverse in the Guernsey, and a whole lot more that has nothing to do with dairy production. Here is an illustration: I have a couple of photographs lying on the table, and if some one will pass them through the audience I would like you to see them. From these photographs I have had these two drawings made of two cows that were in the dairy test at Buffalo, two Guernsey cows, and they will illustrate this point and another one that I want to bring out a little later on.

Here was a cow, she was a handsome cow to look at, and she was selected to go into the dairy test because she had a light muzzle and because she conformed, in some superficial points of color, a little nearer to the Guernsey type than another cow that was there equally accessible, but had a black muzzle, and she didn't have these artificial or exterior points that are so desirable or thought to be in the Guernsey. What was the result? That black-nosed cow was sent home and this creature was put in the dairy. The only point that she had of excellence was her udder. She had a most beautiful udder when she was fresh.

Here is a picture of Mary Marshall, the cow that stood highest in the dairy for butter production, a cow that in six months made a net profit of nearly \$60.00. "Look on *this* picture and then on that." It was very readily seen that unless that cow was very carefully handled she would eat her head off, and she would go dry. She was fed with the greatest care, and it didn't make any difference, she gave less milk every day, and when the test was closed that cow was giving ten pounds of milk a day, and in the six months that follow that test wherever she may be she will be eating up the profit she made in the test.

There is a living illustration of superficial, artificial points, and not those that indicate dairy production. That cow was registered, she had a pedigree, yet a man that buys her simply because she is registered, simply because she is pedigreed, what is he doing? Why he is breeding down instead of up.

The ordinary farmer who is building up a dairy herd cannot afford to do that. What shall he do? I want to give you something that is practical, something that is going to be of value, the bulk of it is based on my experience along this line. Take the *good* cows that we have and mate them with a pure-bred sire;

a herd the foundation stock of which, with the exception of the sire, is going to cost very little. Breed them into a herd that in the course of ten years is going to be as valuable as most herds of pure-bred animals, but remember we must have a type in mind. I don't care whether it is Channel Island or Holstein cattle, or whether it is something else, get the ideal in your mind and work to that, and don't bring in a half dozen different things.

Let me say in this connection that the man who starts out to make butter with the beef cow is going to make an awful mistake. He will be like the calf that the boy was leading. He was driving a cow with a calf; as he went along he met a herd of steers going to market, and the calf left the cow and started off after the steers; the old cow mooed and bellowed and the boy called "Co, Bossey," but it didn't heed, so the boy tied the cow to the fence and he ran after it; bye and bye he got to the top of the hill, he saw the steers and the calf following, the boy was out of breath, and he expressed himself as some of us perhaps would. He said, "You fool calf, you darn fool calf, you will be sorry when supper time comes." (Laughter.)

So I say the man that starts off to get milk and butter with a beef cow will be sorry when supper time comes. (Laughter.)

The man who takes grade animals, or native cows, such as he can get, and breeds them into a herd of producers, by the aid of a pure-bred sire, that I will speak of, is entitled to more honor and credit than the man who goes down into his pocket and gets there that which never cost him any effort, and buys a pure-bred herd, the result of some other man's brains.

Now, let us see what type a dairy cow is. All these different breeds have their scale of points, that vary a little with one breed and the other, yet if you will look at them carefully you will find that they all point just about to such a type of animal, a type of cow that we find in Mary Marshall, and we find her in Belle of Scituate and Pauline Paul a little more pronounced than in this cow perhaps. You find a cow that is wedge-shaped. First of all we want in that cow constitution. We don't care what else you have or have not, if she has no constitution she is of very little worth. We want a cow that is well developed about the heart and lungs. That cow is doing a great deal of work, and

must have plenty of blood, and plenty of lung-power to purify that blood. Then we want the long slim neck, the wide face, the bright eye, the rather slim horns, the pointed shoulders and the wide barrel, just the reverse of the beef cow, because she has got to have a reservoir to take care of her food.

What about this dairy cow that we have to-day? She is an artificial animal; she has been brought about by artificial means. In the early days we had a little bit of that type over there. When she roamed about among the wild beasts she had to fight for her living, and she wanted the heavy and the long, wide horn, the heavy neck, the heavy shoulders, so that she could fight for her life, and she wanted a body of this shape, because the cow with that body could run more easily through the underbrush and escape, where one of this kind would be at a disadvantage. And that wild cow had to have her body protected from the wild beasts, so she wanted a coat of mail around her, and she had her ribs very close together, and zoölogists tell us that the ribs extended from the shoulder way back to the hip.

To-day the cow has to do none of those things. If she is going to do her best, she has to have her food provided in abundance, and without very much effort on her part to gather. She has to make no fight for her existence, so the horns are not needed. That short bull-neck we don't want, nor those close ribs, because all the ribs do to-day is to assist in breathing; so, in the process of time, we have eliminated the ribs, and I ask you if it is not a fact that the space between the hip-bone in your best cows and the first or floating-rib is not very great. What does that mean? It means that as we have been raising the cow for a different purpose from that for which she was originally intended; we have eliminated the extra ribs. They are wide apart and less of them, because there is a tendency of nature to do away with the unnecessary. If you will note in some of your best dairy cows, you will find that space not only very wide, but you will find that floating-rib very short, and in some cases it is gone.

Take a good cow of the dairy type that I am describing, and you breed her to a bull of superior dairy excellence, and nine times out of ten that short floating-rib in her heifer is gone. There is a reason for all these things.

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We want a big chest, the reverse from the steer, and the mellow skin and the long tail, that is an elongation of this spinal column, and for that reason an advantage. We want a large, tortuous milk-vein, with a large orifice at the end, then we want a good udder.

I admire the udder on a dairy cow, but an udder alone without these other points is of very little worth; I speak of this because it so readily fills our eye when we come to purchase the dairy cow that we overlook her other points. This cow has a most beautiful udder, and that is the only thing she did have, but it looked so well that they failed to see her lack of other points.

Take the best that we have in our herd, if they are bred along one line so much better; if not, let us select the best that conform to that type, then let us breed them to the dairy sire, always the pure bred. I hope if you gentlemen have anything to do with making out the premium lists of any exhibition that you will cut off premiums for grade males, however excellent they may be. You never know whether they will perpetuate their good qualities or not. How shall we select that sire? We have a breed now in mind, whatever it may be, and will purchase a sire of that breed, and there is the time and the one time that we have got to go into our pockets. And the poorer we are the better animal we need to have; we can't afford to fool away any time.

I want to speak strongly of this because we are so apt, when we are selecting a male, to say I want a pure-bred animal, and we buy the first one that is available; or worse yet, we buy the one that we can get for the least money; he may have a pedigree behind him; I would not buy one to breed from unless he has in his pedigree cows of superior excellence; and his sire comes from a family of the same kind, animals that were of superior excellence as producers. I would not stop there; if that animal was not of superior excellence himself I would not take him.

There is where we make a mistake, you cannot buy a gold dollar for fifty cents, you cannot buy a bull of superior excellence, both as to breeding and producing, for a small sum. I would rather buy him a little mature, a bull that has passed six months, than to buy a calf, because you cannot tell how he is going to develop. I have come to the point, I am sorry to say, that I would

not buy a bull to head my herd unless I went into the dairy and picked him out myself or had somebody in whom I had equal confidence do so. I do not mean to say that breeders are dishonest, but I do say that they want to make money, and want to sell stock, and there are very few breeders that are willing to sacrifice an animal that is registered. I would not buy him unless he had the points of excellence. You may not agree with me, I do not suppose you will, that the bull should be of a feminine type. The great value of a bull is in his ability to reproduce himself. What do you want him to produce? Why dairy cows that are going to be producers. Then it seems to me that he should be prominent along the feminine lines. He does not need to be a fighter any more, so you want rather the light horns than the heavy ones. We want rather the slim neck, and the shoulder the same as in the dairy cow. I like to see a good crest as an evidence that he has power to reproduce himself. I think that this is quite important in the bull, also that his eye is bright and clear. Then the ribs wide apart, and the general contour of his hind parts as we should like them in the good cow.

We want to find underneath his abdomen, on either side, well defined milk-veins, and at their end one orifice at least not quite as marked as in the dairy cow, but they should be there, and well placed, in front of the scrotum four teats; they are very sure indications of the form of the udders that his heifers are going to have both as to position and as to length of teats.

I could take the loose skin under his belly, just ahead of the scrotum, if there is a great amount of flexible skin; what does that mean? Why that corresponds to the udder in the dairy cow. Take this bull and put him at the head of the herd, but don't use him for breeding purposes until he is at least a year old.

There are more failures from using immature animals than from any other source that I know of. Above all things, don't give the bull excessive service. One service is better for a cow, and more sure, than the repeated services that are so often allowed where the bull is allowed to run at liberty.

It may be that we have secured this bull and put him at the head of our herd, and he is individually good, and has breeding behind him, still his cows will not come up to the standard that

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we expected. For some reason he fails to reproduce himself. I do not think that often occurs, but I have known instances of that kind.

There is only one thing to do. No matter how much he cost, no matter how good he may seem to be individually, if he shows, after his heifers come into milk, that he has not the power of reproduction, sacrifice him. I do not think you will make a mistake the second time, because that occurs rarely, but still it does occur.

Here is another mistake: saving the calf from every cow. We want to select our best dams (the same will apply equally well to the pure-bred herd), and save the calves from those cows only, and only those that come up to the standard of excellence. We save everything; that is the rule, and we save for superficial rather than individual points on the calf itself. I never save the first calf from the cow. I don't know what she will be, and I do not think the first calf is as well developed. It is certainly smaller. So the first calf of a heifer is always discarded, save those that come up to the general line of excellence. If that is done, it will mean in a grade herd 50 per cent. of the calves can be saved. In a pure-bred herd it ought to mean more, if the original stock is well preserved and well selected.

After the animals are six months or more old, select them, and we had better sell those not up to the standard for what we can get, even for their hides, than to keep them in the dairy, eating expensive food, and then have disappointment all along the line. I have got a couple of such heifers. They come from excellent cows, and they were excellent themselves, and yet we found before six months that they were not good feeders, and I kept them for what their parents had done, and I would be money in if I had put the knife in their throats and given them to the swine.

The first requisite is constitution, the next is the general type that we must have in the cow. If the sire shows power to reproduce, I would use him again on his daughters. Then I would have half the blood of the sire in the first and three-quarters in the next generation. Don't you see, we have fixed the strain there? I would use that sire as long as he was capable of repro-

ducing. I do not care if he is six or seven years old, keep him. When you purchase another don't follow some fashionable fad that comes in, but stick right to that same breed, and, as far as possible, to that same strain, and then you have perpetuated in your herd those qualities you are aiming for; and in ten years' time, I believe, it is possible to have a herd of animals of beauty, of uniformity, of power of production that are as valuable, more valuable, than most pure-bred herds as we find them to-day.

There has got to be a great culling out among the pure-bred of those that don't come up to the standard, those that are bred along the fancy lines, if we are going to improve the dairy cattle.

I was very much interested in your discussion this morning about raising dairy cattle. I do not think it is practical for a farmer to raise his own calves and sell all his milk. I do not believe there is anything made by using any kind of patent calf-food; that you are going to make them grow as the calf should. There is nothing equal to the mother's milk, or its mother's milk with the fat taken out. It has been said that we are breeding men faster in this country than cows, and I find when we buy our cows that it is a pretty expensive matter, and a very difficult matter, to find those that are worth keeping. Where is this going to end? I don't know; it is going to be worse and worse. I believe there is going to be a very profitable industry for men to raise cows to sell. I mean just that. How are you going to do it if you sell the milk? In that case it will pay us to put on two or three cows that are large producers of milk solely to furnish their milk to grow calves.

I have gone over this matter pretty thoroughly, and I have told you what I believe. I have tried to give the reasons that lay behind, because I have very little patience with a statement that has not a good reason behind it, and I say to you, by way of recapitulation, get the good cows, whether they be pure-bred or graded, whatever their line of breeding may be; have a type in mind, a productive type, with a sire of individual excellence, with pedigree behind him, of one selected type, a pure-bred sire, either used on a pure-bred or graded, carefully-selected mother, a carefully-selected calf that comes from this mother; and then a word about the proper feeding of this calf, because many a calf

BREEDING THE DAIRY COW.

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has been ruined in the first six months of its life. But the time is late, and I am going to stop right here, thanking you for your kind attention. (Applause.)

The Chairman—Does any gentleman desire to ask any questions of Mr. Van Alstyne?

Mr. Wright—May I ask the gentleman if we can do anything by breeding to perpetuate disposition or influence disposition?

Mr. Van Alstyne—Most emphatically.

Mr. Wright—You left that out.

Mr. Van Alstyne—I believe that good disposition is very essential in the dairy cow, and it is fully as likely to be perpetuated as any of these other points.

Mr. Wright—I know this; after spending a couple of days at Buffalo I had been acquainted with Mary Marshall for sometime, and I wondered whether the disposition was not one of the strongest points. I noticed she stood perfectly still and let the other cows switch the flies off. My son and I watched her two different times, and she stood as content as if she was at home. The other cows switched the flies off, and she stood there attending to one job, and one job only, and it was the most positive proof of the matter of disposition in a dairy cow of anything I ever saw in my life. I just wish to speak of it.

Mr. Crane—We had quite an argument in our County Board at the last meeting in regard to the farmer or dairyman raising his own stock. I found that the Board mostly were against it. I took the stand that a man that was raising milk for the market had no right according to his own interests to go into stock raising. He wanted to raise milk, and that was his business, and I believe that will hold true in most everything. I believe that a man that gets too much on hand is a jack of all trades and master of none, and I was very glad to hear the gentleman reiterate my sentence, if only to prove that great minds run in the same channel.

A Member—Mr. Van Alstyne mentioned the possibility of raising milch cows as a business. At the State Board of Agriculture in Connecticut I found a man there who had come in possession of a lot of ground thirty miles from a railroad, and it was a problem what he would do in order to make the farm pay

his money. He concluded it would have to be something that would carry itself, and he found it would do to raise milch cows, and that is the business he carried on. He does nothing else and he gets good prices. I am glad you mentioned that matter; I think there is a great deal in it.

The Secretary—Here is a question: What makes the best dairy ration with silage?

Mr. Van Alstyne—I don't believe any man can answer that. At ordinary prices I have been able to get more milk with ensilage from gluten food, about 27 per cent. or 28 per cent. protein; but that gluten food is \$30.00, and cotton-seed meal is about the same price. The cotton-seed meal is cheaper, and I think we can only answer that with the silage we want protein food. I repeat what I said, we don't want to add to it under any condition cornmeal if we have got sufficient corn on the stalk. Then buy the protein feed in which we can get for the time being the greatest amount of digestible protein for the least money. I am milking a herd of twenty-five cows, and we feed them from six to eight pounds a day average. I believe that is as much grain as can profitably be fed to a good cow.

I think we make a mistake when we take grain away when they are dry, particularly if they are great producers. We want to keep that cow up in her muscle, and we want to provide a material that she grows the calf on—for a rough food nothing better than silage. I think a very fine food usually is a little bran or oats. They are too high this winter; a little linseed meal tends to keep the cow in proper condition. It is very rich in protein and the cow needs it. A little protein, not too much, will not only give better and stronger calves, but will put her in a better condition to deliver that calf, and put her in better condition to give milk than if she is entirely deprived of it. I would not feed any cornmeal to a cow that is dry unless I meant to beef her—unless she was exceedingly poor. I would give her this protein feed, and that would build her up structurally as well as in milk.

Report of the Tuberculosis Commission.

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Report of the Tuberculosis Commission.

Under the law approved May 22d, 1894, and its amendments, the Tuberculosis Commission has carried on the examination of dairy cows constituting the herds already within the State, in all cases where application has been made according to law, as far as the appropriation would permit. Sufficient funds were not available for the later demands, and these were deferred to the next fiscal year.

The physical condition of the cattle removed from the herds examined justifies the work committed to the Commission. Such animals were a menace to the health of the other members of the herd from which they were removed. Consumers of milk are entitled to protection by the State from diseased or unwholesome milk.

Applications for examination are increasing. This, we believe, is owing to the fact that milk producers are finding such inspection valuable for the cleansing and healthfulness of their herds, and the fact that they are thus inviting the State to assist them in this particular popularizes their product. This is as it should be.

There are over 225,000 milch cows in the State. The total number of applications for examination is 190. Number of animals comprised in these herds is 2,512. Number condemned, 342. For these there has been paid to the farmers who have had animals destroyed a total of \$7,260.75.

It should be noted that very many of those condemned were worth to their owners, to keep or sell, far more than the allowance paid them. In no case can the owner receive more than \$30.00, and the majority of those condemned were not appraised so high as to allow that much to be paid. This fact is to the credit of all those who are willing to have their cattle examined and condemned, if that is necessary, even though they do so at a loss.

CATTLE IMPORTED.

Under the law requiring the inspection and testing of cattle imported from other States, approved March 24th, 1899, and which went into effect November 1st of the same year, there have been inspected by the tuberculin test, either before entering the State or afterwards, those brought in under permit for the fiscal year ending October 31st, 1901, 11,634 animals.

These figures show the large number of cows that are being purchased annually by our farmers, the magnitude of the business, largely in the hands of cattle dealers, and the possibilities there are for introducing into the herds of the State diseased animals, were there no safeguards thrown around the business.

It is impossible to state definitely the number that are condemned on testing, especially those examined in the States from whence they are shipped. The general rate of condemnations is from two to two and one-half per cent., but some of our records show that condemnations as high as twenty-five per cent. of those purchased for shipment failed to pass the test and were not shipped.

Of the large number brought in under test but eight cases have been subsequently reported to the Commission as diseased. This is an encouraging feature of the character of the work done, but no test can be a perpetual guarantee from subsequent infection.

The inspection of cattle prior to their entering this State is done chiefly by approved veterinarians in the States where the cattle are purchased. By "approved veterinarians" is meant such as have the endorsement of lawful Veterinary State Associations, or boards appointed for this purpose, and in almost all cases graduates of veterinary colleges. Cattle brought in under permit are held in quarantine until examined by the veterinarians of New Jersey who may be nearest the point of arrival.

The law and its administration seem to be giving satisfaction. The desire and efforts of the Commission is to so administer the law as not to make it burdensome to any farmer or dealer, while yet carrying out its spirit and purpose.

TUBERCULOSIS COMMISSION.

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If those interested will co-operate with the Commission by *early* and prompt notice of their desires in the way of purchases, giving *State* and *place* they intend to ship from, and the *point* or *destination* in New Jersey they intend to ship to, many annoyances, caused by delay in notifying the Secretary or lack of such information as is indicated above, would be overcome.

With the co-operation of the cattle dealers and dairymen of the State the work of the Commission will be made more generally effective and valuable. They are carrying out the provisions of both acts in as conservative a way as it is possible to do, consistent with efficiency.

To all owners of cattle, and especially those who are depending upon outside purchases to maintain their dairy herds rather than on raising calves from home-grown stock, the Commission urge the great importance of buying only healthy animals and of isolating all animals whose health is at all suspected. No animal affected with tuberculosis should be allowed to live among others that are supposed to be free of disease.

Cases are numerous that have come under our observation, in the prosecution of this work, where one affected animal introduced into the herd has, in the course of two or three years, communicated the disease to so many others that, to rid the herd of the disease, has required the slaughter of almost the entire number. No other solution of the infection of these herds was in evidence; the conclusion was inevitable. It is neither safe nor wise to keep sick and healthy animals together.

Owners of dairy cows are equally concerned with everybody else in all efforts to stamp out tuberculosis in cows. Consumptive cows are worthless property to the owners, for they are short-lived and yield poorly. Only healthy herds can be profitable herds, and every intelligent farmer will welcome every effort made to free dairy herds in general of diseased cows.—*New York Farmer*.

The report of examinations made, cattle condemned, &c., is as follows:

STATE BOARD OF AGRICULTURE.

<i>County.</i>	<i>Total No. Examined.</i>	<i>Total No. Condemned.</i>	<i>Total Sum Paid.</i>
Burlington,	249	58	\$1,377.00
Cape May,	63	17	270.00
Cumberland,	83	8	141.75
Essex,	1	1	27.00
Gloucester,	93	9	174.00
Hunterdon,	132	34	780.75
Mercer,	463	54	1,289.25
Middlesex,	48	15	384.75
Monmouth,	28	6	115.50
Morris,	23	4	86.25
Passaic,	1	1	18.00
Salem,	877	78	1,561.50
Somerset,	156	24	459.75
Sussex,	245	24	451.50
Union,	2	2	45.00
Warren,	48	7	78.75
	<hr/> 2,512	<hr/> 342	<hr/> \$7,260.75

Total appropriation,	\$10,000.00
Total sum paid for cows,	\$7,260.75
Expenses of inspection,	813.78
Expenses of commission,	450.32
Secretary, assistant and stenographer,	1,413.92
Stationery and blanks,	61.23
	<hr/> \$10,000.00

CHAS. HOWELL COOK,
Treasurer.

Report of State Board of Health.

Report of State Board of Health.

Mr. Franklin Dye, Secretary Board of Agriculture, Trenton, New Jersey:

DEAR SIR—In conformity with the provisions of the act approved March 4th, 1886, we herewith submit a report of the action taken by the Board of Health of the State of New Jersey for preventing the spread of contagious diseases of animals during the year ending November 30th, 1900:

In the report for the year ending November 30th, 1900, allusion was made to the fact that an unusual number of cases of glanders had been reported from various parts of Essex county. It was apparent that there must be some central point from which these cases were emanating, and investigation showed that extensive work had been carried on in the improvement of roads in various parts of Essex county, and that glanders had been introduced by infected horses brought into the county to be used in road-making. W. F. Harrison, D. V. S., of Bloomfield, was requested by the State Board of Health to take charge of this district, and to make a full examination of all stables, for the purpose of discovering cases and to take the necessary action where the disease existed. The ground was covered with a good deal of rapidity, and a number of cases were discovered.

During the year ending November 30th, 1901, a report was received from Gloucester county that several cases of a suspicious nature had occurred among cattle, and the attending veterinarian feared that the animals which had died had contracted anthrax. An immediate investigation of the locality was ordered, and specimens which were sent to the laboratory from the diseased animals showed that anthrax was not present.

The following is a statement of the cases of contagious diseases of animals brought to the attention of the State Board of Health during the year ending November 30th, 1901, together with the action taken in each case:

December 1st, 1900, W. F. Harrison, D. V. S., of Bloomfield, reported a case of glanders at Verona, owner Mr. McWade. The animal was destroyed and the premises disinfected under the direction of the veterinarian.

December 5th, 1900, Dr. Fell, health officer of Trenton, reported an outbreak of tuberculosis among cows owned by Henry Satterthwait, of Fallsington, Pennsylvania. Eighteen animals were affected and were destroyed under the direction of the Trenton city Board of Health.

December 5th, 1900, D. W. Benjamin, health officer of Jersey City, reported that thirteen horses were affected with glanders in the stables of the Windsor Trucking Company, of Jersey City. These animals were destroyed by Dr. Mathews, veterinarian, under the direction of the local and State Boards of Health.

December 5th, 1900, D. W. Benjamin, health officer of Jersey City, reported a case of glanders at the National Storage Company's stables, and the animal was destroyed under the direction of E. Mathews, D. V. S.

December 6th, 1900, a case of glanders was reported at Washington avenue, Bloomfield. The owner was Mr. Ramsey. The animal died.

December 10th, 1900, two cases of hydrophobia were reported as existing at Jobstown. The owner was Abram Ege. Both animals died.

December 13th, 1900, D. D. Chandler, health officer of Newark, reported a case of glanders at Reinhart's express stables. The animal was destroyed by the owners, and the premises disinfected under the direction of the city Board of Health.

December 14th, 1900, two cases of rabies were reported upon the premises of George Frace, Norton, Hunterdon county. E. R. Voorhees, D. V. S., of Somerville, was sent to advise with the owner as to the proper action to be taken.

December 24th, 1900, E. Mathews, D. V. S., Jersey City, reported a case of glanders at 436 Grand street, Jersey City, the owner being J. P. Moran. The animal was destroyed and the premises disinfected under the direction of Dr. Mathews.

December 24, 1900, W. F. Harrison, D. V. S., reported a case

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of glanders at Clinton, west of Caldwell. The animal was destroyed and the premises disinfected.

December 26th, 1900, James J. McDonough reported a case of glanders upon the premises of Frank Goodrich, Verona, and that six animals had been exposed to the disease. The case that was reported had died and the premises were thoroughly disinfected.

December 27th, 1900, several cases of spinal meningitis were reported as existing upon the premises of George Harley, of Clementon, Gloucester county, New Jersey. Two animals died.

January 4th, 1901, W. F. Harrison, D. V. S., reported two cases of glanders in animals owned by Stiles Van Ness, Horse Neck, New Jersey. The horses were destroyed under the direction of the veterinarian and the premises disinfected.

January 4th, 1901, W. F. Harrison, D. V. S., reported a case of glanders at Verona upon the premises owned by James Harkey. The animal was destroyed under the supervision of the veterinarian and the premises disinfected.

January 4th, 1901, Dr. Harrison reported a case of glanders upon the premises of Frank Goodrich, Verona. The animal was destroyed and the premises disinfected.

January 8th, 1901, six cases of varicella were reported to the board as existing upon the premises owned by J. H. Darrah, and located near Lawrenceville, Mercer county, New Jersey. An examination was made by E. R. Voorhees, D. V. S., of Somerville, and a diagnosis of varicella rendered. The owner had already separated the infected cattle from the rest of the herd, and had taken prompt action to prevent any spread of the disease.

January 10th, 1901, E. R. Voorhees, D. V. S., Somerville, reported a case of glanders on the premises of John O'Mara, Montclair. The animal was killed and the premises disinfected.

January 11th, 1901, W. F. Harrison, D. V. S., reported a case of glanders upon the premises of Charles Bahr, Verona. The animal was destroyed and the premises disinfected under the supervision of the veterinarian.

January 12th, 1901, Mr. West, of Metuchen, reported a case of glanders upon his premises. Dr. Pocock, of Plainfield, and E. R. Voorhees, D. V. S., Somerville, examined the case and the animal was destroyed. The horses that had been exposed to the

disease were examined from time to time until all danger of infection was past.

January 16th, 1901, Mr. Leighton, health officer of Montclair, reported a case of glanders upon the premises of David Howell, St. Luke's Place, Montclair. The animal was destroyed under the direction of W. F. Harrison, D. V. S., and the premises disinfected.

January 17th, 1901, D. D. Chandler, health officer of Newark, reported a case of glanders upon the premises of E. C. Hay, Plum Point Lane, Newark, New Jersey. The animal was destroyed under the supervision of the city Board of Health and the premises disinfected.

January 21st, 1901, D. D. Chandler, health officer of Newark, reported a case of glanders at Mangel & Schmidt, Hunterdon and 13th street, Newark, New Jersey. The animal was destroyed under the direction of W. Runge, D. V. S., and the premises were disinfected.

January 21st, 1901, D. D. Chandler, health officer of Newark, reported a case of glanders upon the premises of Mr. Bishop, 192 Newark street. The animal was destroyed by the owner and the premises disinfected under the supervision of W. Runge, D. V. S.

January 25th, 1901, R. S. Van Dyke, reported a case of glanders upon the premises of W. T. Regee, Maple avenue, Morristown. E. R. Voorhees, D. V. S., of Somerville, confirmed the diagnosis. The animal was destroyed and the premises disinfected under the supervision of the local Board of Health.

January 27th, 1901, W. F. Harrison, D. V. S., reported two cases of glanders upon the premises of J. S. Van Nest, Clinton. The animals were destroyed and the premises disinfected under the supervision of the veterinarian.

January 30th, 1901, W. F. Harrison, D. V. S., reported a case of glanders upon the premises of Andrew Parkhurst, Verona. The animal was destroyed and the premises disinfected.

February, 1901, W. F. Harrison, D. V. S., reported a case of glanders upon the premises of Frederick Fierst, West Orange. The animal was destroyed and the premises disinfected.

April 14th, 1901, W. F. Harrison, D. V. S., reported a case of glanders, the owner being W. F. Alworth, Montclair. Dr. Mc-

Donough, of Montclair, was in attendance. The animal was destroyed and the premises disinfected.

May 23d, 1901, W. F. Harrison, D. V. S., reported a case of glanders at Savali's 63 Freeman street, Orange. The animal was destroyed and the premises disinfected.

June 19th, 1901, W. F. Harrison, D. V. S., reported a case of glanders upon the premises of Mr. Personette, Cedar Grove. The animal had been destroyed by the owner and the premises were disinfected under the supervision of the veterinarian.

June 19th, 1901, W. F. Harrison, D. V. S., reported a case of glanders upon the premises of H. Parkhurst, Verona. The animal was destroyed and the premises disinfected.

June 19th, 1901, W. F. Harrison, D. V. S., reported a case of glanders at J. J. Vreeland's, Cedar Grove. The animal was destroyed, the premises disinfected, and horses which had not been exposed to the disease were removed to other premises.

August 2d, 1901, W. F. Harrison, D. V. S., reported a case of glanders at 376 Plane street, Newark. The animal was destroyed and the premises disinfected.

August 24th, 1901, W. F. Harrison, D. V. S., reported a case of glanders at Orange Valley. The animal was owned by C. L. Shipman, 293 South Jefferson street, Orange. The horse was destroyed and the premises disinfected.

August 31st, 1901, W. F. Harrison, D. V. S., reported a case of glanders upon the premises of M. Hoey, Mechanic street, Orange. The animal was destroyed and the premises disinfected.

August 31st, 1901, W. F. Harrison, D. V. S., reported a case of glanders upon the premises of Bergen Holey, South Jefferson street, Orange. The animal was destroyed and the premises disinfected.

September 4th, 1901, T. B. Rogers, D. V. S., reported that three cows had died upon the premises of John Costello, living near Woodbury, and as anthrax had existed in this neighborhood within two years, it was thought that possibly the deaths might have been caused by that disease. A specimen was sent by Dr. Rogers to the State Bacteriological Laboratory in Princeton for examination. The result of the examination was negative.

September 17th, 1901, D. D. Chandler, health officer of Newark, reported a case of glanders on the premises of Koch & Company, Academy street, Newark. The animal was destroyed under the supervision of the State Board of Health and the premises disinfected.

September 28th, 1901, two cases of glanders were reported by Mr. Schluer, health officer of Orange. The animals were destroyed and the premises disinfected.

November 2d, 1901, a case of glanders was reported in Jersey City by D. W. Benjamin, health officer. The animal was destroyed and the premises disinfected.

November 3d, 1901, W. F. Harrison, D. V. S., of Bloomfield, reported a case of farcy on the premises of Charles Feint, of Salem. The animal was destroyed and the premises were disinfected.

December 19th, 1901, a case of glanders was reported by A. Woods, Secretary of the Board of Health of Little Ferry. The animal was destroyed and the premises were disinfected.

December 30th, 1901, J. Payne Lowe, D. V. S., reported a case of glanders at 65 Second street, Passaic. The animal was destroyed and the stable was disinfected.

Summary of cases receiving attention during the year :

Glanders, number of cases, 52.

Tuberculosis, number of cases, 18.

Hydrophobia, number of cases, 4.

Bovine varicella, number of cases, 6.

Anthrax, three cases reported, but diagnosis was not confirmed.

Very respectfully,

HENRY MITCHELL,

Secretary.

Report of the State Entomologist.

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Report of the State Entomologist.

The work in my Department has been along the same general lines as in previous years, but with some new departures, looking to an extension of the scope of the office. Heretofore the San José or pernicious scale has absorbed all the time and funds of the Department, and through the past year the bulk of the work has been in the same direction.

The policy of persuasion rather than of force has been continued, and, I think, with good results. My aim has been to convince the fruit-grower that the office was a place of appeal for assistance rather than of dread lest it cause expense or order destruction.

There have been several reasons for that policy: *First*, I believe that most men would rather be led than driven; *second*, convincing a man that to take action will be for his own benefit, will secure better work than to compel him to do something for the benefit of the community, for which he cares nothing if it means an outlay; *third*, the powers conferred by our law are not adapted to secure radical measures promptly, and, *fourth*, if I once began to force applications upon unwilling persons, there would be no point where I could stop. I would have whole townships and even counties to deal with.

Some fault has been found because forcible measures to compel treatment for scale have not been taken in some cases, but whenever I have asked any individual to make a formal complaint upon which to base action under the law, he has always declined to do so. The truth is very few men feel safe concerning this insect, and all have an uneasy suspicion that if complaint is made against a neighbor, it may not be long before they may themselves have to answer to a similar process.

Another reason is that I have watched closely the operation of the most drastic laws in neighboring States, and I have seen failure everywhere.

I have seen thousands of dollars spent for inspections, surveys and treatments; thousands of trees destroyed in the effort to exterminate the scale, and other thousands treated at State or individual expense to prevent all possible spread, and I know that conditions, in spite of all these most radical measures, are now quite as bad as they are in our own State, where nothing of the kind has been done.

I have studied this pernicious scale for sever or eight years, and know its possibilities. There is no more chance of checking its spread once it gains a foothold in any locality than there is of staying the rising tide. California suffered from 1873 to 1893 before the insect was completely under control there. I showed, in 1896, what natural conditions had co-operated to secure that control. We know that even now in New Jersey, where the scale has been longest, its virulence is not so great as it has been, and it has been with us scarcely more than ten years. Too much prosperity is bad for insects as well as for men, and there is bound to be, sooner or later, a return swing of the pendulum. My aim has been to assist this natural tendency by a systematic warfare against the insect, keeping it down to a point where the natural checks may get a better chance to secure a maximum result.

The fruit growers in the sections of the State most recently attacked are now alive to the importance of the problem, and I have attended meetings at their request on several occasions to answer questions and explain the practical details of the applications to be made. I have considered this one of the functions of the office and as the most practical way of securing that universal co-operation that is so desirable in dealing with this pest. At one of these meetings, in Hunterdon county, fully one hundred interested peach growers were present.

In 1896 the State appropriated \$1,000 for a study of the natural enemies of the San Jose scale in California, and the result was presented to this body in due course. While the attempted introduction of the Australian lady-birds was not successful, the line of work then started has not been lost sight of. In 1898 I secured through a Japanese correspondent a shipment of Coccinellids from that country and liberated what few remained alive, in Burlington county. The reason for this attempted intro-

REPORT OF STATE ENTOMOLOGIST. 239

duction was the belief that Asia would be found ultimately to be the true home of the pernicious scale, and the species imported was one that was allied to our own twice-stabbed lady-bird and a known scale feeder.

Recent investigations by an agent of the U. S. Department of Agriculture have made it almost certain that Asia is really the native home of this pest and also that it is normally kept in check there by the very species brought in by me in 1898. Systematic efforts will now be made to introduce this species on a large scale, and with the resources of the National Government to draw upon, the success may be greater than my own. I have arranged that, as soon as there are specimens available for distribution, some of them will get into New Jersey.

All of which does not mean that even if established here the scale will be controlled by it.

It may be just mentioned that two predatory insects have been brought into our State as possible effective enemies to our injurious forms, but it is too early as yet to speak as to the outcome.

I have made, or caused to be made, close inspection of orchards in several districts to ascertain the spread of the pernicious scale, and have called the attention of growers to it where they had no suspicion of its presence. In other cases I have examined orchards at the request of growers and have suggested such methods and measures as were indicated. In short, I have made use of the office to get as close to the practical horticulturist as possible, and to help him to help himself.

To some extent the Commissioners have been called upon for information and assistance; and in Monmouth county Mr. Lafayette S. Schanck has made a systematic study of the conditions about the Freehold district. Circular letters were printed, of which the following is a copy:

FREEHOLD, N. J.,, 1901.

Mr.

DEAR SIR—As one of the commissioners under the insect law in this State, having been informed you have the San Jose Scale upon some trees on your premises, the law requires me to notify you of such infestation and “demand

that they be cleaned, disinfected or destroyed immediately or within a period of five days from the date of service of this notice."

I shall be pleased to give any information within reach, if it is desired.

Very respectfully,

L. F. S. SCHANCK.

Nearly two hundred of these letters were sent to as many persons, and I understand that there was a very general, though by no means universal, response to the suggestions made. At all events, general attention was drawn to the presence of the insect and a great point was gained in this way.

The matter of nursery inspection and control continues as one of the most important, not only in New Jersey but in other States. In November, 1901, a meeting of Inspectors was held at Washington, D. C., at which were representatives from nearly or quite 20 States. There was not only a free interchange of experiences, but an agreement as to certain lines of practical work to avoid friction and delay in stock shipments.

There is now also an organization for ascertaining the standing of any nurseryman, and for notifying all officials of the discovery of any infested stock received under certificate. In some States the policing of nurseries is very strict. For instance, in New York State from 4 to 6 men are constantly in the field and nurseries are examined as often as may be deemed desirable, at no expense to the nurseryman. During the shipping season, all the stock received on the packing grounds is inspected and all freight and express agents are required to notify the Commissioner of Agriculture of all shipments of plants received and handled by them.

No such control is possible in New Jersey, and, under conditions as they exist, is not even desirable; but I have had inspections made during the past year in several localities to supplement the formal inspections made by myself.

Inspection in California is very strict, especially of all stock coming into San Francisco harbor, and nothing that is in the least suspicious is allowed to land if addressed to Californian points. But the local inspectors have no right to meddle with parcels addressed to points in other States, and the practice is, therefore, to notify the proper officer in the consignee's State,

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that he may adopt such measures as are deemed desirable. In this way I get a record of all stock coming into New Jersey from foreign ports, via San Francisco, and always inform myself as to its character and condition when it reaches here.

So the Pennsylvania Railroad accepts no nursery stock from European ports unless accompanied by proper certificate. I keep track of many, if by no means all, such importations, and while probably few *new* pests are kept out, some old ones need not gain a new hold—e. g. the sinuate pear borer. I found this, by the bye, in a lot of *Crataegus* from France, during the past fall.

It need scarcely be said that nurserymen in general are extremely anxious to avoid all danger of infestation and to take all possible measures to destroy such as may occur. Almost or quite all the more important establishments have erected fumigating houses in which all stock is or can be treated before being sent out. Proper fumigation is almost certain death to the pernicious scale, hence well-treated stock is, in some measure, preferable to untreated stock from any locality. I have inspected all fumigating houses so far as possible and have given proper formulas; so, while they are by no means perfect, they are at least fairly adapted for their purpose.

From half a dozen States, including New Jersey, the report was, at the Washington meeting already referred to, that it was decidedly questionable whether, in the future, it would be possible to issue clean bills of health to any nurseries. That is, the scale is so generally spread and the nursery surroundings are so unsafe that it becomes impossible to say with certainty that a given block of young trees is really free from infestation.

It has been attempted, therefore, to secure a modification of the certificate requirements, that thorough fumigation may be accepted as presumptive evidence of freedom.

It is impossible to go into the details of what has been done in the office, but enough has been said to indicate the character of the work so far as it deals with the pernicious scale.

The number of circulars of information has been increased to thirty-eight, and these are freely used in replying to questions coming to the office.

Early in the season of 1901 there was some correspondence with the authorities at Hammonton, Atlantic county, relative to the abundance of bag-worms on the shade trees and evergreen hedges in the town. They stripped foliage from deciduous trees and killed many of the evergreens, the result being unsightly gaps and a decided impairment of the summer beauty of the streets and avenues. After visiting the town during the winter and consulting with a representative of the Council, M. L. Monfort, one of the Commissioners for Atlantic county, resident at Hammonton, was authorized to make a systematic inspection, to notify all persons having infested trees and shrubs and to supply information and copies of Circular No. 8 whenever desired.

There was no attempt to *force* action, but, with comparatively few exceptions, owners and householders responded readily to the suggestions made. It illustrated, as Mr. Schanck's efforts did, that it needs a direct notice to bring the necessity for action to the due appreciation of many persons. Indeed, in some cases, while the injury had been long deplored, the fact that it could be obviated had not been realized. So the importance of having centers of information throughout the State seems to be well illustrated. Through the commissioners I am kept in touch with any unusual occurrences, and to them I turn for assistance and information whenever I need it. Mr. Henry Pfeiffer, of Cologne, has made quite a number of inspections for me, has sent me many specimens of various sorts and has been of material assistance to his neighborhood in the fight against the pernicious scale.

I have had the assistance during a part of the season of Mr. Edgar L. Dickerson, to whom I intrusted the preliminary inspection of some of the large nurseries during the growing season. He has also assisted me in the preparation of the insect cases shown at Buffalo in connection with the exhibits made by your Board and by the State Museum.

These cases are now in the State Museum and illustrate the work and development of some of our chief injurious insects, not on field crops only, but in Forestry. It is the intention to add to this collection from time to time so as to inform the visitors to the Museum, and to show that the interests of the agriculturist and fruit-grower are not entirely neglected in our State.

The Mosquito Pest and How it May be Abated.

BY JOHN B. SMITH, ENTOMOLOGIST.

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NEW JERSEY STATE LIBRARY

The Mosquito Pest and How it May be Abated.*

BY JOHN B. SMITH, ENTOMOLOGIST.

Mosquitoes have always been recognized as a nuisance and as an objection to localities where they occur in considerable numbers. It has not been until recently that it was realized that they are also dangerous to human life, because of their agency in the transmission of certain febrile diseases. It has been almost conclusively demonstrated that malaria is transmitted by mosquitoes of the genus *Anopheles*, and in no other way. It is almost certain that yellow fever depends for its transmission upon a mosquito belonging to the genus *Stegomyia*, which, fortunately, does not occur in the State of New Jersey. Other tropical fevers and diseases are known to be carried by other species, and it has even been charged that leprosy is communicated through the agency of these insects. The latter point is extremely doubtful, however, and may illustrate the tendency to charge everything to one suspected agency.

In certain parts of New Jersey malaria is a very prevalent disease, and we have in this State no less than three species belonging to the genus *Anopheles*, any one of which may serve as a host and an agency for the transmission of the disease from one individual to another. Only two of these are at all common, but one is sufficiently common to account for the distributing agency wherever the disease occurs as an epidemic. Briefly stated, the disease and the mosquito are related to each other much as is the tape-worm parasite to the human being and to the hog; that is, the one parasite passes one of its stages in the hog, the other passes a corresponding stage in the mosquito. If an individual

* Abstract of a lecture delivered before the Board and illustrated by a series of fifty-five lantern-slides.

afflicted with malaria be bitten by a mosquito, the blood taken in by the insect contains some of the malarial germs. These minute organisms are single-celled animals, so small that they find it possible to live in the red corpuscles of the blood. It is a species of *Plasmodium*, and the time required for reproduction in the individual varies from one to two or three or four days. When the individual reproduces there is liberated from the affected blood corpuscle a swarm of minute cells, each of which makes its way into another blood corpuscle. The time when this occurs corresponds to the period at which the patient has an attack of "shakes" or a "chill."

The organisms taken into the body of the mosquito begin a different course of development from those in the human blood. Two forms of cells are produced which correspond to male and female elements. These conjugate, make their way into the body tissue of the mosquito, and, after a few days, produce an immense number of very minute, sporulating bodies. These make their way throughout the body of the insect and into the poison gland. When a mosquito so infected bites a healthy individual, the poison injected into the wound carries with it a number of these malarial organisms that at once begin to multiply—and the patient has caught malaria. Not every individual is susceptible to malarial attack, but given a susceptible individual, the proper surroundings and the bite of such an affected mosquito will almost inevitably result in the development of the disease.

These mosquitoes occur throughout the State. I have found the larvæ in the brackish pools on the Elizabethport meadows; they have been found by my assistant near the top of Mount Olive in a temporary rain-pool; they have been found by myself and others from Cape May to the northern borders of the State. There is no place so high or so low, no pond so large, no puddle so small that it will not afford opportunities for the development of these mosquitoes. I have even found them in a pail of water in my garden.

The eggs are laid on the surface of the water and hatch very soon, the resulting larvæ developing in a few days. The pupal stage lasts anywhere from one day to ten, according to tempera-

THE MOSQUITO PEST.

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ture, and the whole life of the early stages may be crowded into a single week.

These mosquitoes occur in many parts of the State where malaria is not an original disease. It is by no means certain that the occurrence of a case of malaria, even where the *Anopheles* are abundant, can set up an epidemic. In fact it seems certain from the experiments and observations made that something more is required than the presence of a malarial individual and an *Anopheles* mosquito. Just what that factor is remains to be discovered, but it is certain that there can be no transmission of malaria unless the mosquito is also present. Therefore the problem to be investigated is, wherever a malarial district is discovered or known, discover also the breeding places or sources of supply for the species of *Anopheles*. By destroying the mosquitoes we lessen or prevent malaria, even if other conditions should favor its development. We know that the insects live through the winter in the adult condition, and sometimes congregate in great numbers. The cellar and out-buildings of a single farm-house in Ocean county turned out no less than five thousand individuals of *Anopheles punctipennis*.

Among the common species referable to the genus *Culex*, the so-called house mosquito, *Culex pungens*, is the most annoying and generally distributed throughout the State. It breeds everywhere wherever there is liquid, but I have not found it in salt water. It will, however, breed in cesspools, in manure pits, in waste water, in gutters, in sunken lots in and near cities where rain water accumulates, and in fact anywhere. It is a mosquito that must be dealt with by local action, and a great deal can be done to lessen or destroy this pest. The question to be investigated regarding this species, is the general character of the breeding places other than those local pools that require individual treatment; the natural enemies that can be employed in larger bodies of water where treatment is for any reason not desirable.

The commonest mosquito throughout the southern part of the State, and the species that makes life along shore a burden, is the so-called "salt marsh mosquito." This breeds in salt water only. There are immense tracts of marsh land along our coasts

and in the tidal portion of some of our rivers that furnish ideal breeding places for this insect. Enormous swarms of them rise during the night and fly long distances, or allow themselves to be carried by the wind. They are found inland anywhere from twenty to forty miles, the latter an extreme. Throughout South Jersey, in the pines and in the villages and towns back of the coast, this is the common mosquito. Destroy this, and two-thirds of the South Jersey mosquitoes would be at once wiped out. Investigations, so far as made, show that there is no particular difficulty in controlling the breeding places of the insect, provided uniformity of action can be obtained. The fact that the insect migrates, removes the dealing with it from the list of local problems. Newark, Elizabeth, Jersey City and a number of other cities near the coast get a large portion of their mosquito supply from the salt marshes over which they have no jurisdiction. Some of our seashore resorts have, by permanent improvements, destroyed the breeding places of these mosquitoes; but whenever they get a wind from unimproved marshes it brings with it clouds of mosquitoes, all of them of this species. These individuals will live three or four weeks and then die off, because they have no power of reproducing in fresh water. The life history of this mosquito is not yet completed. Up to the present time no one knows where or how the insect spends the winter. There are other points in its history that are still obscure, and this particular species will best pay close study. I need hardly say that the removal of this mosquito pest would enormously increase shore values and would be a great benefit to agriculture, because it would increase the local market for truck and fruit produce. The methods of dealing with the insect must be made of a permanent character, so that improvements once made would require no further attention except the mere maintenance.

There are a considerable number of other species of mosquitoes that breed in this State; but most of them are confined to specific localities and do not occur in cities or towns. Some of them will breed only in woodland springs or in cold clear water. The adults are local and will not fly far from the places where they were originally raised. These mosquitoes need not be considered.

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A third species that is more or less troublesome breeds in the eddies of slowly running streams and at the edge of fresh-water marshes. It is a little black mosquito that bites hard; but this is not one of those that is apt to get into houses or to be troublesome in towns or villages. This species also requires further study, because we know of this that it breeds very late in the season, even under icy coverings, and we do not know with any degree of certainty just where the winter is passed. Mosquito larvæ are much more hardy than is often supposed. They can be frozen solid in ice, can be thawed out and induced to develop. The whole subject is one that requires further study. It should be the work, not of one man, but of a dozen men, under one general direction, so that the same species may be under continuous observation for the period of an entire year, and that the chance of missing any essential feature in the history of the insects might be reduced to a minimum. The problem is an important one in the State of New Jersey. It involves sanitary considerations and land values. It is one that appeals to the residents of our largest cities and it is of importance to a greater number of individuals than any one similar problem in the State.

Attention was also called to a species which breeds only in the pitcher plants and which does not bite human beings. This is interesting, because its life history throughout the winter has been traced, and it has been found that the insect can remain under water for a very considerable period. Experiments made with this insect in Washington showed that it could live under a coating of oil for a period of thirteen days. Fortunately this is not an economically important species, otherwise the methods that have been found useful against species of *Culex* would be of little value.

It was indicated that to make such a study as was required in a limited time would require about ten thousand dollars.

Report of New Jersey State Grange

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Report of New Jersey State Grange.

It is very gratifying to me to be able to report the Order of Patrons of Husbandry in New Jersey in a satisfactory condition. The Secretary reported the standing of the Subordinate Granges throughout the State the best since he had held the office, and that covers a period of seventeen years. The Order is growing in popularity among the farmers; they are beginning to realize that it is the only organization that has stood the test of time. The old-time prejudice is fast wearing away, and all you good brothers who are not members of the great national farmers' organization, we invite you and your good wives to unite with us and assist in the grand work of organizing the American farmers, so they may stand side by side with all other industries, and reap the same reward for this labor as they do for theirs. I am not one to criticise these people for looking after their own interest, I say they are showing their business tact, they are quicker to grasp the situation than we have been, and I give them great credit for it. Organization is the watchword of the twentieth century. Now, fellow-farmers, let's get in it.

The National Grange has decided to assist in strengthening the Order in New Jersey. The National Master, Brother Jones, met with the executive committee of the State Grange and offered us the service of an organizer if we would assume a part of the expenses, and the executive committee recommended that a sum be set apart, known as the extension fund. We have already done some preliminary work and expect to commence with the organizer the twentieth of this month, and I am sure we will obtain good results. The State Grange again reaffirms its former position along the lines of legislation.

1. Further extension of rural free mail delivery.
2. Submit an amendment to the Constitution granting the power to Congress to regulate and control all corporations and

combinations of capital, of a monopolistic nature. Thus preventing the use of their corporate power to restrain trade or arbitrarily fix prices.

3. Establishment of Postal Savings Banks.
4. A pure food law.
5. Completion of the Nicaragua Canal by the United States.
6. Additional powers to the interstate commerce commission.
7. Election of United States Senators by popular vote.
8. Opposition to the Ship Subsidy Bill.
9. Prohibit the fraud in colored oleomargarine.

Resolutions were also passed favoring the repeal of the law which prohibits trolley roads from carrying freight, also that pears be taken from the fourth-class freight and be placed in the fifth.

The State Grange had as its guest the Hon. Aaron Jones, the Worthy Master of the National Grange. His presence added greatly to the interest of the session; his words of encouragement and good cheer seemed to inspire every member to make some personal sacrifice and assist in extending the Order to new territory. The State Grange is ever ready to co-operate with the State Board in any way possible that will be advantageous to agriculturists.

Officers of the State Grange of New Jersey, P. of H., 1902.

Master, GEORGE W. F. GAUNT,.....Mullica Hill, Gloucester county.
Overseer, HARRIS A. GODFREY,.....Stewartsville, Warren county.
Lecturer, GEORGE L. GILLINGHAM,.....Moorestown, Burlington county.
Steward, WINFIELD S. BONHAM,.....Shiloh, Cumberland county.
Assistant Steward, HARRISON QUINBY,.....Parsippany, Morris county.
Chaplain, JOHN M. TAGGART,.....Williamstown, Gloucester county.
Treasurer, CHARLES COLLINS,.....Moorestown, Burlington county.
Secretary, M. D. DICKINSON,.....Woodstown, Salem county.
Gate Keeper, ISAAC H. HOFFMAN,.....Baptisttown, Hunterdon county.
Ceres, ALDONA L. DICKESON,.....Woodstown, Salem county.
Pomona, SUSAN R. HERITAGE,.....Mickleton, Gloucester county.
Flora, MARY B. WALTON,.....Hartford, Burlington county.
Lady Assistant Steward, LAURA E. STRONG,.....Ringoos, Hunterdon county.

EXECUTIVE COMMITTEE.

GEORGE W. F. GAUNT,.....Mullica Hill, Gloucester county.
ALBERT HERITAGE,Mickleton, Gloucester county.
NICODEMUS WARNE,.....Broadway, Warren county.
J. T. COX,.....Readington, Hunterdon county.
A. E. HEDDEN,.....Verona, Essex county.
M. D. DICKINSON,.....Woodstown, Salem county.
State Grange meets first Wednesday in December, 1902.

POMONA GRANGES.

MASTERS AND SECRETARIES, WITH ADDRESSES.

1. Burlington—*Master*, ISAAC LIPPINCOTT, ..Moorestown, Burlington county.
Secretary, GEO. L. GILLINGHAM,.....Moorestown, Burlington county.
3. Hunterdon—*Master*, W. W. LAMBERT,.....Locktown, Hunterdon county.
Secretary, THEODORE LA RUE,.....Copper Hill, Hunterdon county.
6. Salem—*Master*, L. H. GARRISON,.....Friesburg, Salem county.
Secretary, ABIGAIL W. BATTEN,.....Woodstown, Salem county.
8. Gloucester—*Master*, JOHN TONKIN,.....Aura, Gloucester county.
Secretary, BELLE KIRBY,.....Harrisonville, Gloucester county.
9. Centre District—*Master*, J. H. M. COOK,.....Caldwell, Essex county.
Secretary, CHARLES E. BRYER,.....Hanover, Morris county.
10. Warren—*Master*, N. WARNE,.....Broadway, Warren county.
Secretary, JOHN M. MACKEY,.....Harmony, Warren county.

STATE BOARD OF AGRICULTURE.

COUNTY DEPUTIES.

Burlington—EDMUND BRADDOCK,.....Medford, Burlington county.
Camden—CHARLES C. STEVENSON,.....Blackwood, Camden county.
Cumberland—DAVID H. BURGE,.....Vineland, Cumberland county.
Cape May—THEODORE BROWN,.....Swedesboro, Gloucester county.
Essex—W. W. DECAMP,.....Roseland, Essex county.
Gloucester—ASA MOORE,.....Mullica Hill, Gloucester county.
Hunterdon—JOHN T. COX,.....Readington, Hunterdon county.
Mercer—THEODORE CUBBERLEY,.....Hamilton Square, Mercer county.
Morris—CHARLES E. BRYER,.....Hanover, Morris county.
Salem—
Somerset, Bergen and Middlesex—J. B. ROGERS,.....1195 Broad St., Newark.
Sussex—JOHN DEKAY,.....Papakating, Sussex county.
Union—J. H. DOREMUS,.....Lyons Farms, Union county.
Warren—NICODEMUS WARNE,.....Broadway, Warren county.
Passaic—A. E. HEDDEN,.....Verona, Essex county.

SUBORDINATE GRANGES.

GRANGES.	MASTERS AND ADDRESSES.	SECRETARIES AND ADDRESSES.	LECTURERS AND ADDRESSES.
Swedesboro,	Robert H. Raincy, Swedesboro, Gloucester co.,..	Mary R. Brown, Swedesboro, Gloucester co.,..	Elmira H. Rulon, Swedesboro, Gloucester co.
Moorestown,	D. L. Ballinger, Moorestown, R. F. D., Bur. co.	Carrie B. Zelle, Moorestown, R. F. D., Bur. co.	Ada W. Lippincott, Moorestown, Burl'ton co.
Woodstown,	Clarence M. Wiley, Sharptown, Salem co.,....	John D. Coles, Woodstown, Salem co.,.....	Lizzie Coles, Woodstown, Salem co.
Vineland,	Charles Chalmers, Vineland, Cumberland co.,..	Ann Chalmers, Vineland, Cumberland co.,....	George A. Mitchell, Vineland, Cumberland co.
Ringoes,	Frank S. Trout, Lambertville, Hunterdon co.,..	John Q. Holcombe, Ringoes, Hunterdon co.,...	F. N. Strong, Ringoes, Hunterdon co.
Hopewell,	Walton E. Davis, Shiloh, Cumberland co.,....	Winfield S. Bonham, Shiloh, Cumberland co.,..	L. F. Glaspey, Shiloh, Cumberland co.
Cumberland,	Henry Bacon, Greenwich, Cumberland co.,....	Morris H. Goodwin, Greenwich, Cumberland co.	A. T. Goodwin, Greenwich, Cumberland co.
Fenwick,	W. W. Patrick, Hancock's Bridge, Salem co.,..	Anna E. Harris, Harmersville, Salem co.,....	Levanus Myers, Canton, Salem co.
Harrisonville, ...	E. Arlington Jones, Mullica Hill, Gloucester co.,	Belle Kirby, Harrisonville, Gloucester co.,....	Ella Lippincott, Harrisonville, Gloucester co.
Pittsgrove,	Hamlin Woolman, Elmer, Salem co.,.....	John M. Woolman, Elmer, Salem co.,.....	Not reported.
Bridgeport,	S. Lewis Kille, Bridgeport, Gloucester co.,....	Wm. A. Shiveler, Swedesboro, Gloucester co.,..	Emma L. Kille, Bridgeport, Gloucester co.
Medford,	Charles I. Hollinshead, Medford, Burlington co.	Sarah J. Dudley, Medford, Burlington co.,....	Hannah L. Braddock, Medford, Burlington co.
Haddon,	Andrew J. Watson, Haddonfield, Camden co.,..	R. Levis Shivers, Box 93, Camden, Camden co.,	Lizzie Stafford, Ashland, Camden co.
Mantua,	John Lyons, Wenonah, Gloucester co.,.....	Hiram S. Leap, Wenonah, Gloucester co.,....	Sallie Dilks, Wenonah, Gloucester co.
Hope,	Not reported,	P. L. Wheaton, Bridgeton, Cumberland co.,...	Not reported.
Rancocas,	Joseph Lundy, Bougher, Burlington co.,.....	J. Barclay Hilyard, Rancocas, Burlington co.,..	Not reported.
Pemberton,	George W. Lundy, Birmingham, Burlington co.	Henry R. Lippincott, Pemberton, Burl'ton co.,	Not reported.
Mullica Hill,....	Jas. C. White, R. F. D. 2, Sewell, Gloucester co.	Geo. H. Pimm, R. F. D. 2, Sewell, Glo'ster co.,	Jesse R. Woodruff, Mullica Hill, Gloucester co.
Deerfield,	Robert Peacock, Deerfield, Cumberland co.,....	Leander S. Padget, Seeley, Cumberland co.,...	Not reported.

SUBORDINATE GRANGES—CONTINUED.

GRANGES.	MASTERS AND ADDRESSES.	SECRETARIES AND ADDRESSES.	LECTURERS AND ADDRESSES.
Centre Grove,...	Wm. H. Taylor, Millville, Cumberland co.,...	John D. Zimmerman, Millville, Cumberland co.,	Not reported.
Columbus,	Lewis C. Gauntt, Bordentown, Burlington co.,	Ethel W. Zelley, 2 R. F. D., Burl'ton, Bur. co.,	Martha W. Gauntt, Bordentown, Burl'ton co.
Woodbury,	Joseph Low, Thorofare, Gloucester co.,.....	Thomas Eastlack, Thorofare, Gloucester co.,...	Not reported.
Courses Landing,	Joseph H. Webber, Sharptown, Salem co.,.....	Helen Webber, Sharptown, Salem co.,.....	Hettie Gardiner, Sharptown, Salem co.
Pennington,	John Flemming, Pennington, Mercer co.,.....	Ira Stout, Pennington, Mercer co.,.....	Andrew H. Burroughs, Pennington, Mercer co.
Wantage,	Richard M. Holly, Deckertown, Sussex co.,...	Julia Vandruff, Deckertown, Sussex co.,.....	Christopher Standback, Deckertown, Sussex co.
Hamilton,	Thomas O. Taylor, Hamilton Sq., Mercer co.,...	C. N. Hutchinson, Robbinsville, Mercer co.,...	Laura E. Cubberley, Hamilton Sq., Mercer co.
Friesburg,	John D. Horner, Friesburg, Salem co.,.....	Lillie M. Irwin, Friesburg, Salem co.,.....	Rev. L. B. Hafer, Friesburg, Salem co.
Williamstown, ..	Jacob Harper, Williamstown, Gloucester co.,...	James M. Tweed, Williamstown, Gloucester co.,	Not reported.
Locktown,	Manning F. Sherman, Locktown, Hunterdon co.	G. J. Fisher, Sand Brook, Hunterdon co.,.....	E. M. Heath, Locktown, Hunterdon co.
Blackwood,	Theodore Hyder, Blackwood, Camden co.,.....	C. C. Stevenson, Blackwood, Camden co.,.....	Emma Trefy, Turnersville, Camden co.
Hightstown,	Wm. P. Forman, Hightstown, Mercer co.,.....	Forman A. Updyke, Hightstown, Mercer co.,...	Not reported.
Liberty,	H. D. Polhemus, Bradevelt, Monmouth co.,...	S. B. Wells, Bradevelt, Monmouth co.,.....	Jennie E. Polhemus, Wickatunk, Monmouth co.
Sergeantsville, ..	N. B. Rittenhouse, Sergeantsville, Hunt'don co.	Percy W. Bush, Stockton, Hunterdon co.,.....	Frank Venable, Sergeantsville, Hunterdon co.
Livingston,	H. F. Harrison, Roseland, Essex co.,.....	Kate M. Condit, Roseland, Essex co.,.....	Mary J. Condit, Roseland, Essex co.
Morris,	James Cook, Hanover, Morris co.,.....	William A. Howell, Afton, Morris co.,.....	C. E. Bryer, Hanover, Morris co.
Kingwood,	James S. Kerr, Barbertown, Hunterdon co.,...	Ellis B. Huffman, Barbertown, Hunterdon co.,	H. Rittenhouse, Barbertown, Hunterdon co.
Caldwell,	A. E. Hedden, Verona, Essex co.,.....	F. C. Gobel, Verona, Essex co.,.....	C. Crane, Caldwell, Essex co.
Roseland,	H. F. Harrison, Roseland, Essex co.,.....	Hattie May Condit, Roseland, Essex co.,.....	Mary J. Condit, Roseland, Essex co.

SUBORDINATE GRANGES—CONTINUED.

	GRANGES.	MASTERS AND ADDRESSES.	SECRETARIES AND ADDRESSES.	LECTURERS AND ADDRESSES.
9	Enterprise,	H. M. Ball, Boonton, Morris co.,	Harrison Quinby, Parsippany, Morris co.,	Julia Ball, Boonton, Morris co.
0	Warren,	John T. Oberly, Broadway, Warren co.,	Mary Oberly, Broadway, Warren co.,	Henry J. Beers, Broadway, Warren co.
1	Mickleton,	Walton Tomlin, Mickleton, Gloucester co., . . .	Walter Heritage, Mickleton, Gloucester co., . .	Hannah L. Hendrickson, Mickleton, Glo'ster co.
2	Lyons Farms, . . .	George Spendlove, Lyons Farms, Union co., . .	D. H. Doremus, Lyons Farms, Union co.,	Dr. J. B. Ward, Lyons Farms, Union co.
3	Pohatcong,	D. C. Donnelly, Springtown, Warren co.,	Hattie Donnelly, Springtown, Warren co.,	Henry W. Pursel, Shimers, Warren co.
5	Hurffville,	Charles Turner, Hurffville, Gloucester co., . .	C. J. Davenport, Hurffville, Gloucester co., . .	W. H. Chew, Hurffville, Gloucester co.
6	Rocksburg,	J. H. Young, Belvidere, R. F. D., Warren co.,	Warren Herman, R. F. D., Belvidere, War'n co.	Irwin Miller, Harmony, Warren co.
7	Washington, . . .	Samuel Bowman, Washington, Warren co., . .	Mary Lewis, Washington, Warren co.,	Henry Race, Cornish, Warren co.
8	Mansfield,	R. A. Osmun, Shippensburg, Warren co.,	E. J. Vosler, Port Colden, Warren co.,	Jacob Miller, Anderson, Warren co.
9	Oak Grove,	F. J. Tomlinson, Pittstown, Hunterdon co., . .	Mary E. Race, Pittstown, Hunterdon co.,	Joseph E. Hampton, Pittstown, Hunterdon co.
0	Spring Mills, . . .	M. W. Angell, Holland, Hunterdon co.,	Mary E. Woolf, Milford, Hunterdon co.,	S. S. Frey, Warren Paper Mills, Hunterdon co.
1	Stewartsville, . .	Geo. W. Carhart, Stewartsville, Warren co., . .	John C. Boyer, Stewartsville, Warren co.,	Mrs. George Hager.
2	Aura,	Joseph Woodruff, Clayton, Gloucester co., . .	Isaac B. Pancoast, Clayton, Gloucester co., . .	Carrie Pancoast, Clayton, Gloucester co.
3	Cross Keys,	Charles L. Evans, Cross Keys, Gloucester co.,	Joseph H. Evans, Cross Keys, Gloucester co., .	Richard Evans, Cross Keys, Gloucester co.
4	Grandview,	Wm. Y. Holt, Flemington, Hunterdon co.,	Thomas B. Hampton, Croton, Hunterdon co., . .	Mrs. Gussie Higgins, Flemington, Hunt'don co.
5	Riverside,	David H. Agans, Three Bridges, Hunterdon co.	J. S. Dilts, Three Bridges, Hunterdon co.,	J. R. Foster, Three Bridges, Hunterdon co.
6	Delaware,	J. E. Albertson, Belvidere, Warren co.,	F. Russell Addis, Delaware, Warren co.,	Samuel Reed, Mt. Vernon, Warren co.
7	Iona,	Frank J. Van Valin, Iona, Gloucester co.,	Bessie Broman, Iona, Gloucester co.,	Mrs. B. F. Dixey, Malaga, Gloucester co.
8	Cape May,	Frederick Kein, Dias Creek, Cape May co., . .	A. T. B. Howell, Dias Creek, Cape May co., . .	Ella Vannaman, Dias Creek, Cape May co.

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 55	100	20	\$1 00	50	20	\$0 85	..	..	..
Bergen, .....	..	..	..	..	..	..	..	..	..	..	..	..
Burlington,	125	50	70	75	15	70	75	15	65	20	10	\$0 50
Camden,	100	35	55	80	17	63	..	..	..	..	..	..
Cape May,	200	30	75	105	15	75	100	12	70	..	..	..
Cumberland,	175	50	68	100	19	70	..	..	..	100	40	45
Essex, .....	..	..	..	..	..	..	..	..	..	..	..	..
Gloucester, .....	..	..	..	..	..	..	..	..	..	..	..	..
Hunterdon,	100	32	70	125	17	75	100	15	55	..	..	45
Mercer,	100	45	64	80	20	63	100	16	50	25	20	50
Middlesex,	110	45	65	100	20	70	90	15	50	100	5	50
Monmouth,	100	56	65	100	25	70	75	14	56	..	..	..
Morris,	75	25	70	100	20	75	100	20	65	20	8	50
Ocean, .....	..	..	..	..	..	..	..	..	..	..	..	..
Salem,	120	45	50	100	20	65	..	..	..	..	..	..
Somerset,	105	36	56	100	20	70	100	19	53	30	16	40
Sussex,	115	90	70	95	..	80	90	15	65	25	..	50
Union,	90	30	65	..	..	..	90	18	65	50	20	40
Warren,	50	40	65	25	8	70	70	20	65	25	10	40

STATISTICAL TABLE OF FARM CROPS AS REPORTED BY SECRETARIES OF THE COUNTY BOARDS.

COUNTIES.	BUCKWHEAT.			HAY.			WHITE POTATOES.			SWEET POTATOES.		
	Product compared with last year—per cent.	Average yield per acre—bushels.	Average price.	Product compared with last year—per cent.	Average yield per acre—tons.	Average price per ton.	Product compared with last year—per cent.	Average yield per acre—barrels.	Average price per barrel.	Product compared with last year—per cent.	Average yield per acre—barrels.	Average price per barrel.
Atlantic,	100	20	\$0 55	95	1½	\$10 00	80	25	\$2 25	100	75	\$1 40
Bergen,												
Burlington,				75	1¾	15 00	50	20	2 40	75	25	1 50
Camden,				110	1¾	14 00				75		
Cape May,				125	2	16 00	50	10	3 00	125	40	1 50
Cumberland,				100	1¾	12 00	100	18		100	40	1 50
Essex,												
Gloucester,												
Hunterdon,												
Mercer,	125	25	50		1	12 00						
Middlesex,				125	1½	13 00	50	75	2 25	100	30	70
Monmouth,	50			100	1¾	15 00	50	20	3 00	50		2 75
Morris,				100	2	14 00	65	45	2 00	50	25	2 00
Ocean,				100		18 00	20	10				
Salem,												
Somerset,				105	1½	12 00	85	25	2 50	100	40	1 75
Sussex,	63	20	50	107	1½	13 00	55	25	2 38			
Union,	100	25	60	110	1	16 00	120		2 00			
Warren,	100	25	57	100	1	16 00	50	30	2 75			
				50	1	18 00	70	20	2 40			

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,	10	5	\$2 50	100	30	\$2 90	125	150	\$0 75	75	600	\$0 02
Bergen,	10	5	4 00	50	75	1 50	20	20	1 00	50	500	02
Burlington,	10	5	4 00	70	100	1 25	20	20	1 00	50	6,000	02
Camden,	10	5	4 00	100	100	1 50	50	40	40	50	6,000	01½
Cape May,	25	2	2 00	50	50	1 00	125	40	40	50	6,000	02
Cumberland,	25	2	2 00	50	50	1 00	125	40	40	50	6,000	02
Essex,	25	2	2 00	50	50	1 00	125	40	40	50	6,000	02
Gloucester,	25	2	2 00	50	50	1 00	125	40	40	50	6,000	02
Hunterdon,	25	2	2 00	50	50	1 00	125	40	40	50	6,000	02
Mercer,	10	5	2 00	75	25	2 00	100	40	40	50	6,000	02
Middlesex,	20	3	3 50	70	20	4 00	100	40	40	50	6,000	02
Monmouth,	20	3	3 00	70	20	1 00	100	40	40	50	6,000	02
Morris,	20	3	3 00	70	20	1 00	100	40	40	50	6,000	02
Ocean,	20	3	3 00	70	20	1 00	100	40	40	50	6,000	02
Salem,	10	2	2 50	30	100	1 87	62	55	55	50	6,000	02¾
Somerset,	17	2	2 50	30	100	1 87	62	55	55	50	6,000	02¾
Sussex,	10	4	4 00	100	100	1 87	150	400	75	90	6,000	05
Union,	30	15	3 00	100	100	1 87	80	400	60	90	6,000	05
Warren,	20	45	3 00	100	100	1 87	50	50	75	50	6,000	05

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,	95	1,500	\$0 04	85	1,000	\$0 09	75	1,000	\$0 06			
Bergen,												
Burlington,	100	2,000	06	100	2,000	10	50	500	08	100	800	\$10 00
Camden,												
Cape May,	50	1,000	05							100		8 00
Cumberland,	100	1,000	05									
Essex,												
Gloucester,												
Hunterdon,												
Mercer,	60	600	07	75	1,450	09	75	1,200	06	90		
Middlesex,	100									90		
Monmouth,	100	5,000	08	100	1,000	10	100	1,500	10	65		8 00
Morris,	50			10			50			25		
Ocean,												
Salem,										100		6 00
Somerset,	50		09	50		11	40		12½			
Sussex,												
Union,												
Warren,	50		10	40		10	60		08	100		20 00

STATISTICAL TABLE OF FARM CROPS AS REPORTED BY SECRETARIES OF THE COUNTY BOARDS.

COUNTIES.	CITRON MELONS.			CUCUMBERS.			CABBAGES.			TOMATOES.		
	Product compared with last year—per cent.	Average yield per acre —baskets.	Average price per basket.	Product compared with last year—per cent.	Average yield per acre	Average price per basket.	Product compared with last year—per cent.	Average yield per acre.	Average price.	Product compared with last year—per cent.	Average yield per acre —tons.	Average price per basket.
Atlantic,							100	2,800	\$1 50	85	2	\$0 60
Bergen,												
Burlington,	100	200	\$0 25	25	500	\$0 50	100	4,500	2 50	25	3	50
Camden,										30	3	
Cape May,	125		25							40	3	30
Cumberland,	80	150	40				100			50	3½	
Essex,												
Gloucester,												
Hunterdon,												
Mercer,										50	3	7 00
Middlesex,												
Monmouth,	50		30	100		50	30		5 00	75		75
Morris,										50		
Ocean,												
Salem,	75		20							50	4	
Somerset,										60		40
Sussex,												
Union,							75	30	5 00	50	4	30
Warren,				30			100		5 00	90		40

* Per ton.

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	\$65 00	100	\$68 00	100	\$37 50
Bergen,	100	125 00	100	150 00	100	40 00
Burlington,	100	100 00	100	100 00	100	40 00
Camden,	100	100 00	100	100 00	100	45 00
Cape May,	100	160 00	100	100 00	100	40 00
Cumberland,	100	105 00	100	100 00	105	35 00
Essex,	105	125 00	100	100 00	105	40 00
Gloucester,	100	100 00	100	100 00	95	35 00
Hunterdon,	100	120 00	100	150 00	100	40 00
Mercer,	100	75 00	100	100 00	100	35 00
Middlesex,	100	100 00	100	100 00	100	45 00
Monmouth,	100	112 50	100	100 00	110	37 50
Morris,	100	120 00	100	140 00	110	45 00
Ocean,	100	80 00	100	100 00	100	45 00
Salem,	50	100 00	100	100 00	75	40 00
Somerset,						
Sussex,						
Union,						
Warren,						

STATISTICAL TABLE OF FARM STOCK AS REPORTED BY SECRETARIES OF THE COUNTY BOARDS.

COUNTIES.	VEAL CALVES.		SHEEP.		LAMBS.		SWINE.		TURKEYS.		CHICKENS.		WINTER WHEAT.		WINTER RYE.	
	Total number compared with December 1st, last year, per cent.	Average price per pound for season.	Total number compared with December 1st, last year, per cent.	Average price per head for store sheep.	Total number compared with December 1st, last year, per cent.	Average price per head for spring lambs.	Total number compared with December 1st, last year, per cent.	Average price per pound December.	Total number compared with December 1st, last year, per cent.	Average price per pound November and December.	Total number compared with December 1st, last year, per cent.	Average price per pound November and December.	Area sown compared with last year—per cent.	Average condition December 1st.	Area sown compared with last year—per cent.	Average condition December 1st.
Atlantic,	100	\$0 07	.....	.....	.....	.....	100	\$0 06	100	\$0 12	100	\$0 13	100	100	100	100
Bergen, .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Burlington,	100	06	125	\$4 00	125	\$5 00	130	07½	100	16	100	14	75	40	75	40
Camden, .....	.....	.....	.....	.....	.....	.....	100	08	.....	.....	.....	.....	100	100	100	100
Cape May,	105	06	.....	.....	.....	.....	100	07	100	18	100	15	90	80	100	70
Cumberland, .....	.....	.....	.....	.....	.....	.....	95	06	100	.....	100	.....	100	100	.....	.....
Essex, .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gloucester, .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hunterdon,	105	06	.....	.....	.....	.....	105	07	90	15	110	10	105	90	110	90
Mercer,	100	06	.....	.....	.....	.....	100	08	100	16	100	12½	100	60	100	80
Middlesex,	90	06	.....	.....	.....	.....	90	08½	90	16	100	12	95	75	100	80
Monmouth,	100	06	100	4 00	100	6 00	100	07	100	14	100	11	100	100	100	100
Morris,	100	06½	.....	.....	.....	.....	100	08½	100	15	100	13	100	100	100	.....
Ocean, .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Salem,	100	06	.....	.....	.....	.....	65	08½	50	15	100	16	.....	.....	.....	.....
Somerset,	105	06¼	95	4 50	95	4 50	85	07½	75	12½	100	10½	100	90	105	85
Sussex,	100	07	100	5 00	100	.....	100	07	100	13	150	10	100	100	100	100
Union, .....	.....	.....	.....	.....	.....	.....	100	08	.....	.....	.....	10	.....	.....	100	90
Warren,	100	06	50	4 50	50	4 50	60	08	80	11	100	09	80	50	100	60

Reports of County Boards of Agriculture.

Atlantic County.

OFFICERS FOR 1902.

<i>President</i> , PHILIP BERGMANN,.....	Egg Harbor City.
<i>Vice-President</i> , PETER H. BROWN,.....	Hammonton.
<i>Secretary</i> , VALENTINE P. HOFMANN,.....	Egg Harbor City.
<i>Treasurer</i> , FREDERICK FIEDLER,	Egg Harbor City.

DELEGATES TO STATE BOARD OF AGRICULTURE.

L. H. PARKHURST, for two years,.....	Hammonton.
V. P. HOFMANN, for one year,.....	Egg Harbor City.

BOARD OF DIRECTORS.

J. E. HOLMAN, Hammonton Shippers' Union,.....	Hammonton.
JESSE R. ABBOTT, Hammonton Fruit Growers' Union,.....	Nesco.
CHARLES KRAUS, Atlantic County Agricultural and Horticultural Association,	Egg Harbor City.
HENRY PFEIFFER, Germania Fruit Growers' Union,.....	Cologne.
WILLIAM KRIEG, At-Large,.....	Pomeran.a.

REPORT.

BY THE SECRETARY.

The Annual Farmers' Institute was held in Union Hall, Hammonton, N. J., on December 19th, 1901, and was well attended.

Secretary Franklin Dye, of the State Board of Agriculture, opened the Institute with the subject, "Methods of Improving Worn-out Soils." It was discussed by Prof. George A. Mitchell, of Vineland, N. J.; John Gould, of Ohio; Mr. Myrick, of Hammonton, N. J., and others. Incidentally Mr. Myrick remarked that he has a habit of growing his peach trees on the poorest soil of the farm with the best results.

After this subject had been disposed of the annual routine business of the County Board was transacted.

"New Phases of the Insect Question—Injurious Insects and How to Destroy Them," was thoroughly and elaborately explained by the State Entomologist, Prof. John B. Smith. "A Short Talk on Feed and Care of the Dairy Cow," by Mr. Gould, of Ohio, was treated in a comprehensive manner.

The next subject, "Improved Methods of Marketing Farm Produce," was discussed by Mr. Mitchell, of Vineland, N. J. He suggested the plan of interchange of farm produce between different sections of the country.

Mr. P. H. Brown, of Hammonton, N. J., showed some fine samples of "Early Eureka Potatoes" as a second crop and his method of growing them.

The final topic was "The Fruits to Grow—How to Grow Them—How and When to Market." It was opened by A. T. Jordan, Horticulturist of State Agricultural Farm.

GENERAL REMARKS.

The season of 1901 was a peculiar one for the farmer and horticulturist. It opened quite cool, with frequent rains until towards July, followed by cycles of high temperature. Autumn was more favorable.

In consequence there was quite a scarcity of many products, but the prices realized more than compensated for the general shortage of crops.

Corn, owing to lateness of season, and no heavy frost occurring until November, proved to be a satisfactory crop; sweet potatoes also.

Blackberry vines were severely winter-killed, and in consequence there was a short crop with fair prices. Raspberries were also a short crop. Strawberries proved remunerative.

Apples were very scarce, and the few grown were of poor quality. In pears, the Kieffer variety returned an excellent crop, while other varieties were scarce. Peaches proved to be an exception and generally were a fair crop. Hay was only a medium crop, the incessant rains impeding the harvesting thereof.

Grapes were a shorter crop than during the previous year. The rains falling during the blossoming time prevented a full setting

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of berries, so that for the first time in many years the Norton Virginias and kindred varieties gave but poor returns. The black-rot was not so prevalent as in previous years.

Farm animals were quite exempt from contagious diseases.

Forest fires set in early in the season and continued until in the fall, devastating large tracts of lands. It would be a wise move for our Legislature to create forest reservations in this State, and very extensive tracts of land in Mullica, Beuna Vista, Hamilton and Egg Harbor townships could be secured and acquired for this purpose.

Bergen County.

OFFICERS FOR 1902.

<i>President</i> , MALCOLM H. ANGELL,.....	Etna.
<i>Vice-President</i> , H. W. COLLINGWOOD,.....	Woodcliff.
<i>Secretary</i> , HARRY M. ANGELL,.....	Englewood.
<i>Treasurer</i> , DAVID I. DEMAREST,.....	Oradell.

BOARD OF DIRECTORS.

ABRAM C. HOLDRUM,.....	Westwood.
SAMUEL R. DEMAREST, JR.,.....	Hackensack.
MARTIN J. MEYERS,.....	Woodcliff.
JOHN HECK,	Westwood.
JOHN C. VAN SAUN,.....	Maywood.
JOHN F. BOWNE,.....	Westwood.
DAVID A. PELL,.....	Saddle River.
JOHN CURTIS,	Harrington Park.

DELEGATES TO STATE BOARD.

SAMUEL R. DEMAREST, SR. (two years),.....	Hackensack.
JOHN H. ACKERMAN (one year),.....	Englewood.

No report furnished.

Burlington County.

OFFICERS FOR 1902.

President, HOWARD D. TAYLOR,.....Riverton.
Vice-President, JOSEPH ENGLE,Hainesport.
Secretary and Treasurer, HENRY I. BUDD,.....Mount Holly.

DIRECTORS.

HARVEY DARNELL, Mount Laurel Farmers' Club,.....P. O., Hartford.
HOWARD RUSS, Cooperstown Farmers' Club,.....P. O., Delanco.
CRESSMAN DARNELL, Medford Grange,.....P. O., Medford.
JOSEPH C. ARMSTRONG, Columbus Grange,.....P. O., Columbus.
HENRY R. LIPPINCOTT, Pemberton Grange,.....P. O., Pemberton.
CHARLES JESSUP, Moorestown Grange,.....P. O., Moorestown.
EDWARD ROGERS, Director-at-Large,.....P. O., Moorestown.

REPORT.

Our annual meeting was held on Saturday, December 14th, 1901, in connection with a Farmers' Institute, and we had the advantage of the presence of some of the State lecturers. The attendance was larger than at any previous meeting.

The following subjects were discussed :

"Insect Happenings for 1901," Prof. John B. Smith, State Entomologist, New Brunswick, N. J.

"Will an Agricultural Education Pay," Dr. Edward B. Voorhees, State Chemist and Professor of Agriculture, New Brunswick, N. J.

"Individual Types of Cows," John Gould, Ohio, which covered the essential points in dairying.

Much discussion followed all these papers.

CROP REPORT, BY THE SECRETARY, H. I. BUDD.

The year ending December, 1901, has been one of reasonable prosperity for the average farmer of Burlington county.

Although the majority of crops have not been large in volume, the supply was just below the demand.

When consumption or demand equals or exceeds supply, prices are generally held at an exceptionally high level. This is demonstrated by the present condition of corn. Very little of it is moving from the West to the seaboard, hence at many points in the West corn is higher than at Chicago. Only about one-eighth as much was shipped abroad as during the corresponding period last year. During the past season there has been but few times when our produce markets were broken by a glut of produce. The condition of the weather and the prevalence of insects and fungous diseases have produced some phenomenal results in the growth and the outcome of our crops during the past season.

When planting season commenced in April an excess of cloudiness and cold weather and winds prevailed, causing seeds and potatoes to rot in the ground. The month of May was more favorable for farming operations, and crops were largely planted. June presented all the conditions necessary for growth, except deficiency of water. Crops which flourished best in moderately cool weather, such as wheat, rye, clover and cabbage, grew well, but all plants requiring warm weather made very slow growth. On cold, clay soils grass was stunted and did not recover during the whole season. The intensely hot weather of July and heavy rains interrupted harvest, and caused much grain to sprout in the stack, and large quantities of hay to be damaged before it could be gathered. The result was, the yield of potatoes and wheat was disappointing, and much fruit rotted and fell from the trees before perfection was attained. In August, on account of heavy rains in all sections late potatoes did not set, and the first blooming of tomatoes dropped off without perfection. All kinds of vine truck and delicate fruits suffered by aphids and fungous diseases. Corn obtained a fine growth.

Caterpillars were extremely troublesome, destroying the foliage of most of our fruit trees, especially apples; very many orchards were as badly defoliated as they are by the frosts of November. The moist season stimulated the farmers to seed large quantities of land to clover and timothy, and also to scarlet clover, which made a good growth until the dry weather of October and November checked it. Then for nearly eight weeks we had very little rain, enabling the farmers to gather their corn in good condition.

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There has been a great scarcity of farm laborers, on account of which farmers have not always been able to till and harvest their crops in season. The great manufacturing industries of the country are so flourishing and pay so much better wages to their operatives, that the number of those willing to work upon the farm is growing less each year.

There is the usual demand among farmers for hard roads. Burlington county now has about 125 miles of improved roads, and is fighting for 125 miles more. If the farmers want their roads improved more rapidly they will have to increase their road assessment from one-fourth to one-half per cent. If not increased, and the State appropriation remains the same, no more can for two years be approved in Burlington county. The enjoyment of good roads by many is a strong temptation for all to have the same pleasure.

The farmer now seems to be joining with those receiving a share of the prosperity of the country. He is beginning to realize better prices for his crops. We have no doubt if this condition continues for a time that it will have a stimulating effect upon the price of land. The following statements, applying to the whole country, may have a tendency to encourage farmers:

American cities are gaining in population much more rapidly than the country, but the country has not stopped growing. It will be a sad day when it does. There is an impression that the cities of the United States are swallowing the country, that the farming population has ceased to multiply, and that farmers' sons and daughters are moving away to work in factories. On the contrary, the census shows a growth of the rural population; at the end of the century there were nearly ten times as many people in the rural districts as at the beginning, and more than twice as many as at the end of the census enumeration of 1850. Labor-saving machines and improved processes have been working their magic in country as well as city. Forty years ago it required four hours and thirty-five minutes to produce one bushel of corn, now only forty-one minutes are required. The cost to produce this bushel has declined from thirty-five and three-quarter cents to ten and one-half cents; the amount of human labor to produce a bushel of wheat has declined from three hours in 1850 to ten

minutes in 1890. The time of human labor to produce and press a ton of hay has declined from thirty-five and one-half hours to eleven and one-half hours. The cost of labor has declined from \$3.06 to \$1.29 per ton, and the economical effects of the use of these upon the farm is illustrated in the production of all crops. These effects are that in 1850 the rural population was twenty millions, in 1900 forty-three millions; in other words, the rural population has more than doubled in the half century. Yet note the vastly greater output of the farms in 1900 compared with those in 1850: Corn four times as much, wheat six to eight times as much, oats five times, barley eleven times, cotton eight times, wool six times, hay, pork, beef, mutton, chickens, eggs, butter twenty to one hundred times as much. The number of farm-workers has nearly doubled; the quantity and value of farm produce has been multiplied by twenty, all showing how so many men can be spared to go from the farm to the factory without interfering with the national prosperity. Here we discover how the cities in half a century can multiply by ten, in the same time the farming community multiplies by two, and that without any false calculation or insecure foundation for the great industrial structure to stand upon.

Wheat.—Wheat has been a moderate crop; much damaged by the angoumois miller; most of the grain was so badly damaged that it cannot be used for flour, consequently many farmers are using it for feed. As the millers' prices for wheat are about the same as corn, they find it more profitable to grind and use it for feed instead of bran. The acreage sown has been much lessened this year on account of these destructive pests and the prevailing low prices, so that grass fallow has been sown over large areas.

Rye.—Rye has been a moderate crop, relatively better than wheat. The price is fair and the demand for the straw is liberal.

Hay.—The average hay crop was better than last year; last year there was one-half a crop, this year three-quarters of a crop. On old meadow and timothy sods the grass was generally short; on young clover and timothy sods the growth was fine and the crop large. The cold weather of springtime and the hot, dry weather during June seemed to check the growth of the old sods,

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so the crop only ranged from one-fourth to one-half; price ranges from twelve to fifteen dollars a ton.

Oats.—Oats a very poor crop; did not yield enough to pay for the sowing, consequently very scarce and the prices high.

Corn.—Corn on high or well-drained land was a very large crop, one of the best that has been grown in our county for years; on the low-lands not well drained the planting was late, and the continued wet weather prevented its growth, consequently there is not on these much more than a quarter of a crop. The husking was late, but the fodder has been gathered in very good condition. The extreme drought prevailing in the great corn districts of the West has reduced the yield fully one-half, consequently there is little corn coming to the eastern market; therefore the price promises to be very high.

Pasture.—Pasture has been good throughout most of the season, particularly fine the latter part on account of the heavy rains; but the early coming of winter has lessened the period for its growth.

Growing Winter Grain.—For fear of the fly most of the farmers have been very late in sowing their winter grain, so the dry weather and early freezing of November have prevented any great growth; very much of it hardly shows above the soil. Of the few fields sown early some show the ravages of the fly.

Milk.—Milk has been in demand the whole season and found a ready market at increasing prices. The high price of feed necessitates better prices for milk to make it profitable.

Apples.—The heavy bloom of the trees promised a very large crop of apples, but the result has been the smallest ever known in our section; there was continued dropping until the most of the trees were bare, and those that succeeded in attaining full growth were very imperfect. The ravages of insects and fungi were very much in evidence. Many young apple orchards are suffering badly with the San Jose scale, and prices are such as to place them on the list of luxuries.

Kieffer Pears.—Many orchards were almost entirely bare of fruit; others were quite full, the average yield was about one-half a crop. The market for them has been very active, at a price ranging from eighteen to thirty-five cents a basket. The fruit

from young trees was much finer than that from the older ones. Much of this fruit was very imperfect, being punctured and cloudy.

Peaches.—Peaches promised a large crop on the few orchards remaining in the county, but they rotted so badly that the average amount realized from them was small. The San Jose scale is still claiming many of the trees.

Grapes.—Grapes promised well but rotted badly. What remained found a good market.

Cranberries.—Cranberries on the large bogs where easily flooded were a good crop; on many of the small bogs they rotted badly. We have noted yields of ten, twelve, thirteen, eighteen and twenty-three thousand bushels. Prices realized about two dollars per crate, six dollars per bushel.

Cherries.—Cherries a moderate crop; rotted badly but sold well.

Currants.—Currants a poor crop; sold for good prices.

Plums.—Plums a moderate crop; rotted so badly that few of them found a market.

Strawberries.—Strawberries a fair crop; sold for good prices.

Raspberries and Blackberries.—Raspberries and Blackberries sold for profitable prices.

Tomatoes.—Tomatoes made a very fine promise of vine, but the early blossoms fell off, also many of the later ones. The result was that the canneries were not able to obtain enough to supply one-tenth of the demand. Prices through the whole season were so high and the markets absorbed them so rapidly that the canneries had little show for obtaining them.

Melons.—The vines were heavily laden with fruit, but the aphid and blight destroyed them so that many large fields were not marketed. Watermelons met with the same fate on some fields, on others escaped, and the prices realized from the fruit were good the whole season.

Pickles.—Pickles almost a failure prices realized were good on account of scarcity.

Asparagus.—Asparagus has been in great demand and has produced better and brought higher prices than in any previous year. The blight has not been so destructive.

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Cabbage.—Cabbage was a fairly good crop and sold well. Caterpillars were very much in evidence and caused many patches to present a very ragged appearance.

Boiling Corn.—Boiling corn was a good crop throughout the whole season and brought remunerative prices.

Sweet Potatoes.—Sweet potatoes two-thirds of a crop; sold well early; moderate prices in the middle of the season; later brought good prices; ranged from twenty-five to fifty cents per basket.

White Potatoes.—Those that succeeded in growing white potatoes found them a very profitable crop, a number of farmers realizing from two to seven thousand dollars for their crops. The dry, hot season checked the growth of the potato vines at the most critical moment, and in many cases so destroyed the vitality of the vines that the potatoes did not set at all; where they had set well the potatoes were small, consequently all over the early potato-producing sections there was grown the shortest crop ever known.

Peas.—Early peas produced well and sold for a good price. The pea louse got in its good work on the later crop, and, where they were not sprayed, destroyed most of them.

Lima Beans.—Lima beans were a good crop and sold well in the market.

Pork.—Pork is at present quite a profitable crop, selling at from seven to eight and one-half cents a pound. There is a very active demand for pork; the price seems to be high both in the East and West. The short crop of corn in the West will make a resultant short pork crop, as farmers largely sold their hogs before fattening. Some sections have lost heavily with cholera.

Poultry.—The usual crop of poultry has been raised; prices not quite so high as other meats. Some flocks were threatened with cholera.

Squabs.—The growing of squabs for market is a constantly increasing industry. It is said to be quite profitable.

Eggs.—Eggs, except for a short period in the summer season, have been excessively high, the price at present writing being three to four cents apiece.

Diseases.—There are some occasional outbreaks of the roup and cholera among the chickens, and cholera among the hogs; not very much difference in the nature of diseases.

CLIMATIC HISTORY OF BURLINGTON COUNTY, N. J., IN RELATION
TO AGRICULTURE, FOR THE YEAR 1901.

Observation near Moorestown. Lat. 40° ; Long. $74^{\circ} 54'$.
Above mean tide, 71 feet.

	TEMPERATURE.			Rain and Melted Snow. In.	Snow. In.	No. of days on which 1.01 in. or more rainfell.	No. of clear days.	No. of partly clo'dy days.	No. of clo'dy days.
	Max. Deg.	Min. Deg.	Mean. Deg.						
January,	61	4	32.0	2.83	10	11	8	13	10
February,	47	5	26.1	0.84	3.4	3	14	9	5
March,	64	10	41.6	4.35	2	14	8	9	14
April,	83	34	49.3	5.91	.....	11	7	5	18
May,	84	38	59.5	5.78	.....	16	7	8	16
June,	97	48	70.5	2.21	.....	7	16	6	8
July,	102.3	57	77.9	5.53	.....	18	7	9	15
August,	90	57	74.8	10.37	.....	11	13	11	7
September,	90	42	67.9	3.21	.....	12	13	9	8
October,	80	31	55.7	2.53	.....	5	19	10	2
November,	62	16	39.8	4.23	1.1	8	11	12	7
December,	67.1	1	33.2	8.18	6.7	13	11	13	7
Year,	102.3	1	52.4	55.97	23.2	129	134	114	117

The year 1901, odd in its figures, stands unique and apart from its fellows in its individuality.

There was little snow for winter protection of vegetation. The latest killing frost in spring was on March 31st, 32° . The earliest in autumn on October 25th, 32° , making 208 days for out-of-door growth of cultivated tender vegetation. During the month of April the sheltered thermometer did not indicate lower than 34° at any hour, nor were the early setting of tender plants or blossoms of strawberries injured by atmospheric temperature or by radiation.

There was a period heated beyond our record of thirty-eight years, viz.: from June 26th to July 6th, during which on every day the maximum temperature was above 90° ; on July 1st, maximum temperature was 101° ; on July 2d, 102.3° and the mean temperature for the day 89.5° . This occurring during the only dry period of spring and summer was very influential,

resulting in serious injury to the white potato crop on the greater part of the farms of the county.

The rainfall for the year (55.97 inches) was far greater than the average, and the only dry period during the growing season was in the latter part of June, which, conjoined with the extreme heat of same period, checked the growth of white potatoes on the warmer soils and the illy-cultivated ones, so that the subsequent very favorable conditions stimulated, not resumed, but protuberant growth of the checked potatoes. At digging, many were of small size and the aggregate crop was so much below the average, that prices were higher than for several years. In exception, there were many fields enabled by native quality or by generous cultivation to retain available moisture for continuous growth during the brief dry period, that produced good crops of potatoes that were exceedingly profitable. One such crop furnished 13,000 baskets for market, all of which were sold at high prices. The month of August had 10.37 inches of rainfall, and where the water stood over the ripe undug potatoes many of them rotted.

The grass and winter grain that were given such a good start by the favorable autumn of 1900, made good crops, but because of frequent rains and moist atmosphere, was difficult to harvest. Much grain threshed from the stock was so damp that it could be sold only at a very low price. Much was injured in the mow and delay in threshing permitted depredation by the angoumois grain moth, and the very inferior milling quality of the crop of 1901 was directly traceable to excess of moisture.

The aggregate effects of nature's ministering forces did not seem to supply a balanced ration to many crops. Tomatoes, lima beans and eggplants were long-vined, profusely blossomed, but unfruitful beyond precedent, the blossoms and just-formed fruit blighting. Late tomato vines were feeble and not productive as usual. The yield of these was so light that the market was often illy-supplied and prices high.

Apples did not seem endowed with vital vigor to resist harmful influences, grew feebly, fell badly and were lacking in size, flavor and beauty.

When melons and cantaloupes had developed about half of their fine crop, their foliage suddenly blighted and vines died with much fruit unfit for market. There was much of insect and fungous depredation and notable caterpillar devastation.

There were influences, outside the line of man's endeavor, not measurable, but perceptible, whose variant effects on our crops we can note, but whose causes are a mystery to us. Among possible agencies was, between our crops and the life-giving sun, cloud intervention, an enveloping humid and often saturated atmosphere, unusually frequent rains: in April, 11 days; May, 16 days; July, 18 days, 8 and 7 of which were consecutive; August, 11 days, four of which brought plant-beating, surface-washing down-pours, that of the 12th being 3.01 inches, or nearly 300 tons of water per acre that would in porous subsoils carry down contributed soluble plantfood below reach of feeding roots. The visible result of untoward causes was our plants, and especially their foliage, without physical vigor for a successful disease-resisting, insect-repelling life. An organism, to be capable of highest achievement, must be perfect in all its parts.

The season for sowing of crimson clover was unusually favorable for its germination and growth, and at date the plants are very promising, as are those of summer-sown clover and timothy.

The corn crop was good and exceptionally well ripened. There was a dry period of beautiful weather in October very favorable for gathering crops, but preventing the growth of winter grain and grass seed, and present condition is much below average.

December was stormy, with heavy rainfall that has generously filled springs and wells.

Camden County.

OFFICERS FOR 1902.

President, HOWARD H. BELL,.....Mt. Ephraim,
Vice-President, R. COOPER MORGAN,.....Blackwood.
Secretary and Treasurer, DANIEL W. HORNER,.....Merchantville.

EXECUTIVE COMMITTEE—Sarah M. Bell, Eliza Browning, Elizabeth Batten, Elwood Evans, Amos Ebert, Daniel W. Horner, Samuel Batten, John M. Garwood, M. Cooper Browning, R. Cooper Morgan, Charles Barton, E. W. Hunt, Jacob Lippincott.

DELEGATE TO STATE BOARD OF AGRICULTURE—R. Cooper Morgan (two years).

A meeting of the Camden County Board of Agriculture was held at Blackwood, November 21st, 1901, when the officers were elected.

“A Practical Demonstration in Protecting Chicken-houses from Thieves by Electricity,” given by Mr. Robert Engle, assisted by the President, proved very interesting. It was shown that by an expenditure of less than five dollars for material an ordinary chicken-house could be wired by an ingenious farmer boy in a very effective manner.

The great advantages of feeding cows a balanced ration was told by Elwood Evans, who also deplored the fact that farmers were so little concerned in the matter.

A paper entitled “I Don’t Know,” by a successful lady farmer, read by Mrs. Howard Bell, was so full of truisms and sterling facts that it was greatly regretted that the author could not be made known.

Mrs. Hannah Browne, of Blackwood, read a paper on “How to Relieve the Woman of Farm Drudgery,” which was full of hints to the husbands that they were not as attentive as they were before they were husbands.

Mr. H. H. Bell gave a formula for home-made fertilizers, considered by him a good and cheap one:

100 pounds nitrate of soda.
 150 pounds muriate of potash.
 500 pounds acidulated phosphate.
 1,200 pounds chicken manure.
 Cost of mixture, \$11.56. Real worth, \$16.75.

Ex-Judge D. J. Pancoast, of Camden, gave an address full of valuable information, suggestions and hints which was greatly appreciated, as was shown by a rising vote of thanks. It was ordered that the address be printed for distribution.

ACCOUNT OF FARM CROPS FOR YEAR 1901.

Peas.

To Rent of land, one-half acre,.....	\$4 00	
Preparing soil,	1 50	
Manure,	8 00	
Seed, one bushel,	2 75	
Planting and cultivating,	2 00	
Picking, at 12½ cents per basket,.....	10 00	
Ferriage and time to market,.....	2 00	
Commission,	4 40	
By Eighty baskets peas, at 55 cents per basket,.....		\$44 00
Profit,	9 35	
	<hr/>	<hr/>
	\$44 00	\$44 00

(These peas were grown in rows six feet apart; another crop between.)

Beans.

To Rent of land, one-half acre,.....	\$4 00	
Preparing soil,	1 50	
Manure,	20 00	
Seed,	7 50	
Planting and cultivating,	6 00	
Picking 300 baskets, at 10 cents per basket,.....	30 00	
Ferriage and time to market,.....	6 00	
Commission,	12 00	
By 300 baskets beans, at 40 cents per basket,.....		\$120 00
Profit,	33 00	
	<hr/>	<hr/>
	\$120 00	\$120 00

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Strawberries.

To	Rent of land, one acre,.....	\$8 00	
	Preparing soil,	1 50	
	Cost of plants,	10 00	
	Setting plants,	1 50	
	Cultivating and weeding,	25 00	
	Manure,	25 00	
	Picking 2,780 quarts, at 1½ cents per quart,.....	41 70	
	Ferriage and time to market,	5 00	
	Commission,	18 77	
By	2,780 quarts, at 6¾ cents per quart,.....		\$187 65
	Profit,	51 18	
		<hr/>	<hr/>
		\$187 65	\$187 65

Squashes.

To	Rent of land, one acre,.....	\$8 00	
	Preparing soil,	1 50	
	Manure and fertilizer,	20 00	
	Seed,	2 00	
	Planting, cultivating and picking,.....	20 00	
	Ferriage and time to market,.....	10 00	
	Commission,	10 05	
By	457 baskets, at 22 cents per basket,.....		\$100 54
	Profit,	28 99	
		<hr/>	<hr/>
		\$100 54	\$100 54

Cabbage.

To	Rent of land, one-half acre,.....	\$4 00	
	Preparing soil,	1 50	
	Manure and fertilizer,	25 00	
	Plants,	10 00	
	Setting plants and cultivating,.....	15 00	
	Picking,	5 00	
	Ferriage and time to market,.....	14 00	
	Commission,	15 51	
By	660 baskets, at 23½ cents per basket,.....		\$155 10
	Profit,	65 09	
		<hr/>	<hr/>
		\$155 10	\$155 10

Cucumbers.

To	Rent of land, one-half acre,.....	\$4 00	
	Preparing soil,	1 50	
	Manure and fertilizer,	20 00	
	Seed,	2 00	
	Planting and cultivating,	10 00	
	Picking,	5 00	
	Ferriage and time to market,.....	3 00	
	Commission,	11 98	

By 203 baskets, at 59 cents per basket,.....		\$119 77
Profit,	\$62 29	
	<hr/>	<hr/>
	\$119 77	\$119 77

White Potatoes.

To Rent of land, one-half acre,.....	\$4 00	
Preparing soil,	1 50	
Manure and fertilizers,	25 00	
Planting and cultivating,.....	10 00	
Seed,	5 00	
Picking and sorting 215 baskets, at three cents,.....	6 45	
Ferriage and time to market,.....	4 00	
Commission,	9 89	
By 215 baskets, at 46 cents per basket,		\$98 90
Profit,	33 06	
	<hr/>	<hr/>
	\$98 90	\$98 90

Tomatoes.

To Rent of land, one-half acre,.....	\$4 00	
Preparing soil,	1 50	
Manure and fertilizer,	45 00	
Plants,	22 50	
Setting and cultivating,	10 00	
Picking 312 baskets, at 2 cents per basket,.....	6 24	
Ferriage and time to market,.....	8 00	
Commission,	19 66	
By 312 baskets, at 63 cents per basket,.....		\$196 56
Profit,	79 66	
	<hr/>	<hr/>
	\$196 56	\$196 56

Cantaloupes.

To Rent of land, one-half acre,.....	\$4 00	
Preparing soil,	1 50	
Manure and fertilizer,	20 00	
Seed,	2 00	
Planting and cultivating,	10 00	
Picking,	5 00	
Ferriage and time to market,	2 00	
Commission,	4 00	
By 100 baskets, at 40 cents per basket,.....		\$40 00
Loss,		8 50
	<hr/>	<hr/>
	\$48 50	\$48 50

(Plant-louse partially destroyed this crop.)

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Sweet Potatoes.

To	Rent of land, one acre,.....	\$8 00	
	Preparing soil,	3 00	
	Manure,	25 00	
	Plants,	9 00	
	Setting and cultivating,	9 00	
	Picking 427 baskets, at 2 cents per baskets,	8 50	
	Ferriage and time to market,	10 00	
	Commission,	13 60	
By	427 baskets, at 32 cents per basket,.....		\$136 64
	Profit,	50 54	
		<hr/>	<hr/>
		\$136 64	\$136 64

Table Corn.

To	Rent of land, one-half acre,.....	\$4 00	
	Preparing soil,	1 50	
	Fertilizer,	4 00	
	Seed,	1 00	
	Planting and cultivating,	8 00	
	Picking 182 baskets, at 3 cents per basket,.....	5 46	
	Ferriage and time to market,.....	5 00	
	Commission,	10 01	
By	182 baskets, at 55 cents per basket,.....		\$100 01
	150 bundles of fodder,		3 00
	Profit,	64 13	
		<hr/>	<hr/>
		\$103 10	\$103 01

Mr. Henry W. Hopkins, of this county, sends a statement, showing the amount of sales made by him from 60 acres. The crops grown being strawberries, white potatoes, cabbage, sugar-corn, asparagus, tomatoes, grapes, pears, hay, wheat and hogs, aggregating \$4,128, and if the vegetables and fruit, consumed for family use, had been sold, the proceeds would have been still greater.

Cape May County.

OFFICERS FOR 1902.

President, DR. E. H. PHILLIPS,.....Cape May City.
Vice-President, A. B. WALTERS,.....Cold Spring.
Secretary, J. W. PINCUS,.....Woodbine.
Treasurer, VOLNEY VAN GILDER,.....Ocean View.

DELEGATES TO STATE BOARD.

J. W. PINCUS, two years,.....Woodbine.
VOLNEY VAN GILDER, one year,.....Ocean View.

DIRECTORS.

HARRY LEAMING, Lower Township,.....Cold Spring.
HOWARD HOFFMAN, Lower Township,.....Cold Spring.
FRANCIS HARRIS, Middle Township,Rio Grande.
WINFIELD COOMBS, Middle Township,Goshen.
HON. F. LUDLAM, Dennis Township,.....South Dennis.
HON. J. D. LUDLAM, Dennis Township,.....South Dennis.
H. P. MICKLE, Upper Township,.....Petersburg.
A. STRATTON, Upper Township,.....Beesleys Point.
J. SPECK, West Cape May Borough,.....Eldredge.

PROCEEDINGS OF THE BOARD.

Two meetings were held by the Cape May County Board of Agriculture during the past year. The spring meeting was held at Woodbine on March 8th, 1901, and the winter (annual meeting) at Court House on October 18th, 1901. Besides these meetings the annual Farmers' Institute was held at South Seaville on December 10th, 1900.

The Farmers' Institute was fairly well attended, and the following gentlemen addressed the farmers: Secretary Franklin Dye on "What Are We Farming For?" Prof. C. B. Lane, of N. J. Experment Station, "System in Dairy Management;" J. C. Rice,

of Yorktown, N. Y., "Poultry Culture" and "Improving our Light Soils," and Dr. B. D. Halsted, of Rutgers College, "Success in Horticultural Work."

A large delegation of students from the Woodbine Agricultural School, as well as the School Brass Band, was present. The latter rendered several very pleasing selections. At the spring meeting held at the Agricultural School Hall at Woodbine the reports of Messrs. V. Van Gilder and J. W. Pincus, delegates to the State Board of Agriculture, and Messrs. A. B. Walters and F. Schmidt, delegates to the State Horticultural Society, were heard. Besides the reports, Messrs. F. L. Mulford and R. M. Lipman, of the Agricultural School, spoke on "Spraying" and "Raising Early Truck" respectively. It was voted at this meeting that the secretary, with the help of a committee, should make out a program for each meeting of the Association and send out printed copies of the program to all the members a few days in advance of each meeting, and spare no means in advertising the meetings of the Board.

The Annual Meeting was widely advertised and a very interesting program was arranged, but still the attendance was poor. At this meeting, held at the Court House, the officers for 1902 were elected. It was voted that the County Board should pay the expenses of the delegates to the annual convention of the New Jersey Horticultural Society. A committee was appointed at this meeting to make out a written constitution of this organization. The following addresses were made: "Dairy Suggestions" by Dr. E. H. Phillips; "Reclaiming Waste Land" by Prof. H. L. Sabsovich; "Our Canning Industries," by V. Van Gilder; "Forage Crops for Cape May County," by J. W. Pincus. The addresses were frequently interrupted by practical questions and discussions. The address on "Reclaiming Waste Lands" by Prof. H. L. Sabsovich, Superintendent of The Baron de Hirsch Agricultural and Industrial School, is of general interest and will be found at the end of this report.

GENERAL STANDING OF AGRICULTURE.

The past season has been more favorable to most crops, white potatoes and strawberries and some fruits forming the exception.

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The early white potato crop yielded fairly, but the late crop was a complete failure, and many of the farmers left them in the ground, as it did not pay to dig them. Corn, particularly if planted late, made splendid growth. The corn worm, however; did a great deal of damage to the ears. Crimson clover and other soiling crops have done very well. A four-acre field of wheat at the Agricultural School farm yielded 78 bushels of prime wheat. Alfalfa is being tried by several farmers in the county; the success so far, seems to be doubtful. Cow peas and soja beans are grown for hay and for grain. Concentrated feeds are so high that the farmers are looking for some home-grown protein. They could not find better crops for it than cow peas and soja beans.

Our Canning Factories are located as follows: one at Rio Grande, one at South Dennis, and one at Cape May City. The two former ones can tomatoes only, the latter can peas also. The average was about 500 acres of tomatoes and 150 acres of peas. Peas were troubled with lice and tomatoes with wet weather, so that only half crops were reported, and none of the factories had a pack equal to their capacity. Farmers are complaining that they cannot raise tomatoes for six dollars per ton and want higher prices.

Sweet potatoes were selling well before Thanksgiving and Christmas and farmers shipped a great deal to Newark and New York.

Poultry is on the increase, and some of the fowls have captured some of the best prizes at the Orange Poultry Show.

RECLAIMING OF WASTE-LANDS IN SOUTH JERSEY AS ACCOM-
PLISHED IN WOODBINE.

Woodbine, in 1891 and 1892, was a desolate stretch of scrub-oak, black-oak and pine. Large fires, caused by the railroad companies and huckleberry pickers, have destroyed the vegetable matter, stored up through the accumulation of fallen leaves and pine-needles, often to the depth of six to eight inches. The value of the land was estimated by the number of cords of wood which

could be cut—4,800 acres paid \$72.00 taxes. The natives had a very low opinion of the farm value of the Woodbine tract. In fact, they even discouraged us from work. Happily the perseverance of the new settlers was not broken down by the failures of the first two years, and now the Woodbine farmer can feel assured that the hungry years are of the past, and he can look hopefully to the future.

To illustrate the methods used by us to make our lands yield paying crops, I will take a small field, which was yet under woods in 1893; the field contained $8\frac{1}{4}$ acres—33 rods by 40 rods. The soil represents fairly well the general character of the Woodbine soil, namely, it is a sandy loam with a gravelly subsoil. The character of the soil is quite uniform with the exception of a small concavity, where its soil seems to have more vegetable matter and less clay and gravel, the top and subsoil being rather sandy. The field is almost level, slightly sloping towards N. E. and E. The texture of the soil is such that after the heaviest rains water does not remain very long on the surface, though the moisture is kept quite a long time in the soil, especially if it is cultivated often; at least once a week. It also retains manures and fertilizers well.

As stated before, this field was still in woods in 1893—good-sized wood—pine, oak and underbrush (scrub-oak). During the latter part of 1893 and in the beginning of 1894, the wood and underbrush were removed; the scrub-oak and small pines grubbed, at the cost of \$30.00 per acre; the removing of the large timber was paid by the cord-wood and fire-wood obtained. In the fall of 1894 the land was plowed for the first time, at \$5.00 per acre, and in March of 1895 50 bushels of gas-lime to the acre, at 8 cents per bushel, or \$4.00 per acre, were spread and harrowed in as soon as the weather permitted, at \$1.80 per acre. In April, 1895, the whole field was cross-plowed, harrowed and cleared of rubbish, roots, briars, etc., at the cost of \$7.00 per acre, and planted to corn, which gave 20 bushels shell-corn to the acre worth \$10.00, and stalks worth \$6.00. Four bags of a mixed fertilizer containing 5 per cent. of ammonia, 13 per cent. P_2O_5 and 12.75 per cent. K_2O at \$36.00 per ton, and four bags of muriate of potash at \$4.00 per ton were scattered in the hills

CAPE MAY COUNTY.

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over the whole field; or 100 pounds of mixed fertilizer, worth \$1.80, and 100 pounds KCl, \$2.10 worth; altogether \$3.90 worth of chemicals were given to one acre.

In November, 1895, the field was plowed at \$3.50 per acre, and in December 600 pounds of Kainit, \$3.30 worth, 150 pounds ClK, worth \$3.15, and 150 pounds K_2SO_4 , worth \$3.37, were spread broadcast over all the field, or at the cost of \$1.20 per acre, and twice harrowed in at a cost of \$1.50 per acre.

In the spring of 1896 40 tons of city manure, at \$2.50 per ton (cost of hauling and spreading included), or \$100.00 worth, or about \$12.25 per acre, and the same quantity of chemicals as applied in the winter, *e. g.*, \$1.20 per acre, were simultaneously harrowed in.

During April and May of 1896 five varieties of potatoes were planted, namely, Early Vermont Rose, Farmers' Alliance, Beauty of Hebron, Dakota Red and Rural New Yorker No. 2, and 720 pounds to the acre of a potato fertilizer, worth \$10.80 (mixed by ourselves), and containing 5 per cent. NH_3 , 8 per cent. available P_2O_5 and 8 per cent. K_2O were scattered in the rows between the potato cuttings. The yield was 125 bushels to the acre, at 60 cents per bushel, or \$75.00. The purpose at this time was to build up our field.

Let us sum up the expenses and incomes of the two crops:

1894.	Cost per Acre.	
Clearing,	\$30 00	
Plowing,	5 00	
Gaslime,	5 00	
Harrowing in of lime,.....	1 50	
	<hr/>	\$40 50
1895.		
Cross-plowing, harrowing and removing rubbish, roots, briars, etc.,	\$7 00	
Chemicals for the corn crop,.....	3 90	
Corn seed and planting,	2 50	
Five cultivations,	3 75	
Harvesting of the crop,.....	5 00	
	<hr/>	24 15
Twenty bushels of corn, at 50 cents per bushel,.....		10 00
Corn stalks,		6 00

Fall of 1895.		
Fall plowing,	\$3 50	
Chemicals,	1 20	
Spreading of same and harrowing,.....	1 50	
Spring, 1896.		
Manure,	12 25	
Plowing under,	3 50	
Chemicals,	1 20	
Harrowing,	1 00	
Striking out for potatoes,.....	50	
Ten bushels potatoes, seed,.....	10 00	
Planting potatoes and scattering fertilizer,.....	1 00	
Potato fertilizer,	10 80	
Covering potatoes,	50	
	<hr/>	\$46 95
Four cultivations,	2 00	
Two hand hoeings,	1 50	
Harvesting,	5 00	
	<hr/>	8 50
Total,.....		\$55 45
125 bushels of potatoes gathered, at 60 cents per bushel,	\$75 00	

If we should not count the cost of removing the wood and other initial outlays, as first plowing and liming, \$40.50, we will see that the incomes for the two working years covered the outlays for the crops, namely, as follows:

Cost of corn crop of 1894 and 1895,.....	\$22 15	
Cost of potato crop of 1895 and 1896,.....	55 45	
	<hr/>	\$77 60
Value of corn crop of 1894 and 1895,.....	\$16 00	
Value of potato crop of 1895 and 1896,.....	75 00	
	<hr/>	\$91 00

This gives us a small profit of \$13.40.

Now, let us follow up the subsequent improvement of the field.

In the fall of 1896 crimson clover was sown in after the potatoes were dug (September 15th) at the following cost:

Fall, 1896.		
Plowing, sowing, harrowing in clover,.....	\$5 00	
Twenty pounds seed, at 7 cents,.....	1 40	
Spring, 1897.		
Harvesting,	2 50	
	<hr/>	\$8 90

Income, 1.5 tons at \$10 per ton, \$15.00.

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Plowed and harrowed for corn,	\$3 50	
Striking out and planting and covering,.....	2 00	
Corn, seed,	60	
600 pounds fertilizer, at \$25 per ton,.....	7 50	
Five cultivations,	2 50	
Harvesting,	5 00	
	<hr/>	\$21 10
1897, Fall, income—		
Twenty-five bushels corn,	\$12 50	
Corn stalks,	8 00	
	<hr/>	\$20 50

SUMMARY FOR THE THIRD YEAR.

Expenses for 1897 for clover,.....	\$8 90	
Expenses for 1897 corn,.....	21 10	
	<hr/>	\$30 00
Income for clover,	\$15 00	
Income for corn,	20 50	
	<hr/>	\$35 50

Profit, \$5.50.

Fall, 1897, crimson clover sown in corn and harvested in spring of 1898, all at the cost of about \$9.

Harvest, 2 to 2½ tons, \$25.

In spring of 1898, the field was planted in sweet potatoes;

no manure, but 800 pounds fertilizer at \$28 per ton, or \$11 20

Plowing, harrowing, making hills,

7 50

Plants,

6 00

Cultivating, hoeing, etc.,

4 00

Harvesting,

5 00

 \$33 70

The yield was 40 barrels, at \$1.50 per barrel, \$60.

SUMMARY FOR THE FOURTH YEAR, 1897-1898.

For clover,	\$9 00	
For sweet potatoes,	33 70	
	<hr/>	\$42 70
Income—		
Clover,	\$25 00	
Sweet potatoes,	60 00	
	<hr/>	\$85 00

Profit, \$42.30.

The winter of 1898 the land rested.

The fifth year, spring, 1899, the land was broken up and planted in strawberries. The expenses incurred, including labor, plants and fertilizers, were \$31.50. In spring, 1900, we harvested about 2,000 quarts, at 2¼ cents per quart net, or about \$50.00 profit.

In the early spring of 1901 nitrate of soda was spread, the cost of the chemical and work being \$10.00. In June, 1901, part of the strawberry field (about two acres) was plowed up and sown broadcast to corn fodder. Thanks to favorable weather conditions, the two acres have yielded not less than six tons of cured fodder, worth at least \$5.00 per ton. The cost of producing this crop was about \$10.00, thus giving a profit of \$10.00 per acre. Added to this year's income, the corn crop will raise the latter to \$60.00 per acre.

SUMMARY FOR THE FIFTH, SIXTH AND SEVENTH YEARS.

Expenses for account of the first strawberry crop,.....	\$31 50	
Expenses for account of the second crop,.....	10 00	
Expenses for account of the fodder crop,.....	10 00	
	<hr/>	\$51 50
Income, 1900,	\$50 00	
Income, 1901,	60 00	
	<hr/>	\$110 00
Net income, \$58.50.		

The following is the summary for all the years, including the initial outlay of removing the woods, etc.

	<i>Expenses.</i>	<i>Income.</i>	<i>Minus or Plus.</i>	<i>Crops.</i>
1894.....	\$40.50	....	—\$40.50	Preparatory work.
1895.....	22.15	\$16.00	— 6.15	Corn.
Winter, 1895 & 1896,	55.45	75.00	+ 19.55	Round potatoes.
1896 & 1897,	30.00	35.50	+ 5.50	Crimson clover and corn.
1897 & 1898,	42.70	85.00	+ 42.30	Crimson & sweet potatoes.
Spring, 1899,.....	31.50	....	— 31.50	Strawberries.
1900,.....	....	50.00	+ 50.00	"
1901,.....	15.00	60.00	+ 45.00	Strawberries and corn.
	<hr/>	<hr/>	<hr/>	
	\$237.30	\$321.50	+ \$84.20	

On the surface of these book statements it may seem that, after all, the investment of money and labor in this field of 8½ acres was not profitable. The \$237.30 gradually invested during the seven years in any other enterprise might have been more profitable. Well, I do not know. You could, as well, lose them, while your labor in improving the soil is never lost, and then the greater part of this investment is labor paid, as the cash outlays for seeds,

CAPE MAY COUNTY.

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manures and fertilizers is equal to only \$92.25, as per the following table:

1894-1895,	\$4 00
1895-1896,	4 50
1896-1897,	35 45
1897-1898,	9 50
1898-1899,	21 40
1899-1900,	15 30
1900-1901,	2 10
	———— \$92 25

The balance of \$145.05 represents the cost of the labor, and, consequently, the earnings, with the exception of \$50.00 for horse work, thus raising the income of capital expended to \$84.20 + \$95.05 = \$179.25. The small capital of \$92.25 + the cost of the land, \$10.00, invested in any other legitimate business, could not bring in more in the seven years than it did in our case, about 12 per cent. yearly, besides paying for the labor, 9 per cent., and creating a value equal to itself, because the land could not be bought now for less than \$100.00 per acre.

I have attempted to prove that with judicious cropping and fertilizing, we can, with small expense and intelligent labor, reclaim the so-called waste or barren lands of South Jersey, and make them raise the finest fruit and vegetables, and quite large fodder crops. Crimson clover and cow peas, together with chemicals, are a great help to our work in Woodbine. Our lands are deficient in humus, and we replenish them by green crops of crimson clover and cow peas. A fertilizer containing from 4 to 5 per cent. NH_3 , 8 per cent. P_2O_5 and 10 per cent. K_2O was found the most suitable for all our crops. Liming of our new lands and repeated liming every five years are another necessity.

Cumberland County.

OFFICERS FOR 1902.

President,.....W. S. BONHAM.
Vice-President,JOHN RINEAR.
Secretary and Treasurer,.....H. O. NEWCOMB.

EXECUTIVE COMMITTEE.

WALTON E. DAVIS,.....Hopewell.
FRANK GOODWIN,Greenwich.
MORGAN R. SMALLEY,.....Stow Creek.
D. H. BURGE,.....Vineland.
JEREMIAH CHAMBERS,Maurice River.
WM. M. BROWN,Lawrence.
ARTHUR SEABROOK,Deerfield.
OLIVER GANDY,Downe.
J. S. TURNER,.....Commercial.

DELEGATES TO STATE BOARD—W. S. Bonham, two years; A. W. Onthank, one year.

REPORT.

BY THE SECRETARY.

We have had two meetings this year, one in March, the other in connection with the Farmer's Institute at Shiloh; have had very good attendance. Farming throughout the county has been far above the average the past season, both in regard to crops and prices. The average farmer has made a living, while some have made more.

CROP YIELDS.

Corn has been far above the average; better crop and better prices than for many years.

Wheat.—About the same as last year, but not raised to any great extent.

Oats.—A fair average crop

Hay.—Average crop.

White Potatoes.—Good early, but late planting came up poor, but what did come turned out well; prices good.

Apples.—Scarcely any.

Pears.—Fair.

Strawberries.—Fair crop, prices good.

Citron Melons.—Only fair.

Cabbage.—Good crop early, and much better late than last year.

Tomatoes.—Early, good crop; late, very much below average.

The Institutes held in the county have been well attended, and the interest taken in farming is on the increase.

Essex County.

OFFICERS FOR 1902.

President, WM. DIECKS, SR.,.....Livingston.
Vice-President, CYRUS B. CRANE,.....Caldwell.
Secretary, J. H. M. COOK,.....Caldwell.
Treasurer, GEO. E. DE CAMP,.....Roseland.

DIRECTORS—A. E. Hedden, I. S. Crane, S. H. Burnett, August Fund,
J. B. Ward.

..DELEGATE TO STATE BOARD—J. B. Rogers, two years.

REPORT.

BY THE SECRETARY.

Our Board has held three meetings the last year. The annual meeting was held December 12th, 1900, at Roseland, with good attendance. After the usual annual business the subject of the adulteration of foods was introduced and discussed. It was resolved that we should use all possible means to secure the passage of the Grout bill and other pure food laws.

The second meeting was held January 9th, 1901, at same place, with the usual attendance. Our delegates to State Horticultural Society favored us with comprehensive reports of their meeting at Trenton, and the subject of the cultivation of small fruits and the advantage of Essex county for marketing them occupied the attention of the Board.

The third meeting was held on November 14th, 1901, no special program having been prepared. The meeting took the shape of an experience meeting, and the results of the past summer's work were reviewed with much interest.

We also had interesting reports from our members who visited the Buffalo exhibit.

The farmers of Essex county were obliged to contend with more unfavorable conditions than usual the past season, and the result is that good crops are the exceptions; the grass and pasturing were good, but continuous rainy weather interfered with curing the hay, and it was impossible to store it in first-class condition, Notwithstanding the damaged condition it is selling to consumers at twenty dollars per ton. The wet weather prevented proper tillage of corn fields, and the crop is one-third less than last year. Potatoes were very poor crop, except on a few dry and sandy locations, and we are learning that potatoes are not a paying crop in our county. Fruit of all kinds is scarce and of poor quality, excepting the different kinds of berries, which gave an ordinary yield. The market gardeners who have dry and sandy soils had a successful season.

The rapid rise of all kinds of cow feeds at this time, when our barns and silos are not full, presents a discouraging outlook for our dairymen. The price of milk is somewhat advanced, but not in proportion to the price of feeds.

The heavy rains of this summer brought destruction to the Passaic Valley; the crop of hay on our lowland meadows, which was an exceptionally good growth, was entirely destroyed by flood, resulting in thousands of dollars loss to our farmers and a serious menace to the public health. While retarding the growth of the whole western half of the county, the drainage of this valley is a *public necessity*.

Gloucester County.

OFFICERS FOR 1902.

<i>President</i> , JOHN C. TONKIN,.....	Aura.
<i>Vice-President</i> , JOS. T. CARTER,.....	Mickleton.
<i>Secretary</i> , A. C. GARDINER,.....	Mullica Hill.
<i>Treasurer</i> , WM. H. BORDEN,.....	Mickleton.

EXECUTIVE COMMITTEE.

WESLEY B. GILL,.....	Swedesboro.
GEORGE H. HORNER,.....	Mullica Hill.
ESTHER L. RULON,.....	Mickleton.
BELLE KIRBY,	Harrisonville.
L. M. SHOCH,.....	Swedesboro.

DELEGATES TO STATE BOARD.

THEODORE BROWN, two years,.....	Swedesboro.
ASA MOORE, one year,.....	Mullica Hill.

REPORT.

BY THE SECRETARY.

We have held four meetings of the Board during the year, with large attendance, both of men and women, and much interest taken by all. We have had some very able papers on some of the questions, especially by the sisters. The Executive Committee assign three or four questions for each meeting, and two speakers on each question.

The Annual Institute held at Swedesboro, November 20th and 21st, was well attended, and the program was carried out and enjoyed by all. The display of flowers, fruits and vegetables, was not up to the average owing to there being such a scarcity of fruit.

The Annual Grange picnic at Alcyon Park was held three days, and the first and second days were better attended than ever before. The display of farm products, implements and machinery was quite large. It reminded us of a county fair. The Sisters made quite a display of fancy work, cakes, pies, bread, butter, cheese and canned goods.

We were addressed the first day by National Lecturer Bachelder, of New Hampshire, and Mrs. J. J. Woodman, of Michigan. The second day, by Mrs. J. J. Woodman, and Mr. Mayo, of Connecticut.

I think the farmers of Gloucester county have had another exceptionally good year.

White potatoes, a good crop, and sold high; sweet potatoes, not so large a crop as last year, but selling better this winter; corn, a good crop; wheat, a good crop also, but much damaged by fly; hay, 70 per cent. of a crop; tomatoes, more than an average crop; apples, almost complete failure; pears, light; watermelons and citrons, fair, troubled some with lice; asparagus, average crop; pork has paid well, have not heard of any cholera; poultry-raising seems to be on the increase, and prices have been good all the year.

Hunterdon County.

OFFICERS FOR 1902.

<i>President</i> , E. M. HEATH,.....	Locktown.
<i>Vice-President</i> , WM. DUBON,.....	Pittstown.
<i>Secretary</i> , WM. W. CASE,.....	Baptisttown.
<i>Treasurer</i> , F. J. TOMLINSON,.....	Pittstown.

DIRECTORS.

H. F. BODINE, Hunterdon County Pomona Grange.
JOHN Q. HOLCOMBE, Ringoes Grange.
WM. B. HOCKENBURY, Locktown Grange.
JOS. HAGERMAN, Sergeantsville Grange.
A. G. HAWK, Kingwood Grange.
WM. DUBON, Oak Grove Grange.
M. W. ANGELL, Spring Mills Grange.
JOSIAH PRALL, Grand View Grange.
DAVID H. AGANS, Riverside Grange.
URIAH SUTTON, New Jersey Fruit Exchange.
A. B. ALLEN, Hunterdon County Peach Exchange.

DELEGATES TO STATE BOARD.

H. F. BODINE, one year,.....Locktown.
WM. DUBON, two years,.....Pittstown.

COMMITTEE ON PEACH STATISTICS AND REPORTER TO STATE BOARD—Wm. W. Case, Baptisttown.

Other organizations in county:

NEW JERSEY FRUIT EXCHANGE.

President, JOHN T. COX,.....Readington.
Secretary, H. F. BODINE,.....Locktown.

HUNTERDON COUNTY PEACH EXCHANGE.

President, A. B. ALLEN,.....Flemington.
Secretary, P. M. MECKLING,.....Pittstown.

REPORT.

BY THE SECRETARY.

Two general meetings of the Board have been held the past year, besides several meetings of the Executive Board. The August meeting was held at Oak Grove, Grange Hall, and was well attended. Prof. John B. Smith, of the Experiment Station, ably addressed those present on "Our insect friends and enemies; how to recognize the first and destroy the latter." Specimens of the tent caterpillar (moth and larvæ) were exhibited and life history given. This caterpillar almost completely denuded many orchards of foliage during the summer. F. J. Tomlinson also exhibited a diseased grape vine which the Professor pronounced infected with anthracnose—a new disease in this section.

The annual meeting was held at the county seat and was generally a business meeting, canvassing the crops of different parts of the county being one of its most important acts.

FARM VALUES, ETC.

On the whole, farm values seem to be taking an upward turn, at least not going below values of a year ago; but, generally speaking, rising slowly, though still far below price of improvements. We hope the change will be a permanent one, but fear it is caused by the fictitious price of pork and corn caused by failure in the West. The four to fifteen per cent. decline in the price of milk at our creameries the past year is not a very hopeful sign of permanent advancement in the price of purely agricultural lands.

Our barbarous roads are a very potent factor in keeping our lands at a low value. Were the principal roads connecting our more important places macadamized, and a system of trolley lines on which the products of the farm might be quickly and cheaply shipped to their destination, our county, one of the finest agricultural ones in the State, would awake from its Rip Van Winkle sleep and be clothed in beauty and wealth, as it once was.

HUNTERDON COUNTY.

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No fruit that grows in our latitude but what will grow to perfection in Hunterdon county, but such are our transportation facilities that fruit cannot be produced at nominal prices. The basket of peaches selling in New York markets at 25 cents brings the grower not a single cent of profit, the grower having to pay \$72 per car for carriage, less than fifty miles, of 800 baskets of fruit—rates higher than from New York to Chicago—and the same cars used every day during the season and making the full round trip daily.

FARM CROPS, ETC.

For the last few years both wheat and rye have been sure crops, and have only been curtailed by unfavorable weather conditions at harvest, or, in a few instances, been injured by the fly from having been sown too early. Practically no grain is sown now until October, and a good stand is thereby assured. The wheat crop this year will average 17 bushels per acre for every acre seeded in fall of 1900, and rye follows closely with an average yield of 15 bushels to the acre.

The fields of wheat and rye at or just before harvest time are a beautiful sight and one that our county may justly feel proud of. The acreage is gradually increasing year by year, many farmers seeding to rye ground from which corn has been removed, preferring this to the uncertainty of an oats crop the following year.

Buckwheat produced an average crop of 25 bushels to the acre, being one of the best in quality and quantity grown in years.

Generally speaking, the corn crop has been very satisfactory, although mostly planted late owing to adverse conditions last spring. Our warm fall was favorable to late ripening, and the quality was greatly improved thereby. The crop will average 32 bushels of shelled corn per acre.

The hay crop, while not heavy, was of fair quality, averaging one ton per acre and selling December 1st at \$13 for best timothy, against \$15 one year ago.

Prices of cereals at Frenchtown, December 1st: Wheat, 75 cents; rye, 55 cents; corn, 60 to 70 cents; buckwheat, 45 to 50 cents.

The oat crop was about as nearly worthless as any ever grown and potatoes were nearly as bad.

The tomato pack is quite small, the fruit being nearly ruined by bad weather conditions. Everitt & Scarborough, of Lambertville, report a pack of only 126,000 No. 3 cans and Ringoes Canning Company only 18,000.

The bee industry still seems to be on the decline, while tons of the best honey is going to waste for the want of bees to gather and store it for the use of man.

FRUITS.

The fruit crop, including nearly all kinds, was nearly a failure. In a few localities cherries were fairly abundant while the strawberry crop was generally short.

Apples were almost a total failure, although, strange to tell, an orchard here and there was literally loaded, bringing their owners fancy prices. The peach crop amounted to only 339,008½ bushel baskets and 96 carriers, against 1,029,106 last year. The increase in price, however, helped to make up the loss in bulk.

The Hunterdon County Peach Exchange, at Pittstown, sold 12,086 baskets at an average of 49 cents per basket this year, against 17,805 baskets last year at an average of 33 cents per basket. The Jutland branch of the same exchange sold 6,713 baskets at an average of 46 cents, against 5,717 last year at an average of 36 cents.

The New Jersey Fruit Exchange, from being in the center of the peach failure, sold at their Flemington warerooms only some 5,000 baskets at an average of 47 cents, against 24,000 at an average of 33 cents last year.

POULTRY.

The production of turkeys seems to be on the decrease, mainly because their roaming habits are incompatible with our present system of intensive farming, and not from any fall in price. Prices range from 13 cents per pound live weight to 15 cents dressed.

HUNTERDON COUNTY.

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Like the turkey, and from somewhat the same conditions, ducks and geese get less each year.

The hen is now receiving more attention than ever before, and more careful attention and scientific feeding is resulting in a large increase in the egg product. H. S. O. Van Doren, of Flemington, has developed a flock of hens that yield on an average more than 200 eggs each per year.

Many others are doing nearly as well, and many farms to-day contain 4 and 5 well populated hen-houses.

DAIRYING.

The creamery business still is on the upward trend, nearly all the creameries reporting a large increase of receipts of milk, but a slight decrease in the price paid for same. A new creamery will probably be erected at Barbertown during the ensuing year.

Cherryville Creamery reports receipts of 801,107 pounds of milk against 713,511 pounds last year, and 547,564 pounds the year before. Oak Grove reports 747,575 pounds against 670,954 pounds last year, and 438,072 pounds the year before. Both show remarkable gains in patronage, and both paid an average price of 90 cents per cwt. for the year. The creamery at Everittstown received 838,246 pounds and paid an average of $23\frac{1}{3}$ cents per pound for butter-fat.

The other creameries throughout the county probably have done as well, but have neglected to answer my questions, Locktown excepted, which has furnished the usual complete and comprehensive statement which is appended to this report.

STATE BOARD OF AGRICULTURE.

REPORT OF THE WORKINGS OF THE LOCKTOWN CREAMERY FOR THE YEAR ENDING
OCTOBER 31ST, 1901.

Compiled by George W. Hockenbury, Secretary and Superintendent.

	No. lbs. milk received.	No. lbs. butter made.	Butter sold for	Skim milk sold for	Ave. test of all milk received.	Price per lb. paid for butter-fat.	Ave. price paid per 100 lbs. milk.
1900.							
November,	126,921	6,704	\$1,865 24	\$62 00	4.64	\$0 29	\$1 44—
December,	126,022	6,661	1,788 26	61 00	4.60	28	1 29—
1901.							
January,	133,452	6,941	1,606 25	63 18	4.38	25	1 09+
February,	123,216	6,373	1,525 09	59 20	4.44	25	1 11
March,	140,789	7,190	1,610 29	67 28	4.36	24	1 05—
April,	138,678	6,989	1,598 08	69 99	4.12	25	1 03
May,	158,279	7,695	1,642 45	81 06	4.18	23	96+
June,	172,804	8,381	1,658 26	89 00	3.96	22	87+
July,	152,973	7,085	1,604 26	79 90	3.89	24	93+
August,	146,036	7,086	1,665 28	78 18	4.07	25	1 02—
September,	156,649	7,661	1,808 38	81 45	4.25	25	1 06+
October,	164,592	8,100	2,028 63	83 70	4.33	27	1 17—
Total,	1,740,411	86,866	\$20,400 47	\$875 85	.....	.....	.....
Average, .....	.....	.....	.....	.....	4.26+	\$0 25%	\$1 08½

The great injury to stock, and even to human beings, caused by mad dogs, is detailed by the Secretary, with the statement that the freedom allowed dogs to run at liberty where and when they please, is a serious menace to public safety. They have practically destroyed the sheep industry, and yet some people think more of their dogs than they do of other stock. The law passed by the Legislature a few years ago, requiring dogs to be registered, is the best law on our statute books, but township committees do not enforce it.

Mercer County

OFFICERS FOR 1902.

President, HENRY E. HALE,.....Princeton.
Vice-President, J. M. DALRYMPLE,.....Hopewell.
Treasurer, I. J. BLACKWELL,.....Titusville.
Secretary, FRANKLIN DYE,.....Trenton.

DIRECTORS—J. V. Green, J. B. Horn, A. L. Holcombe, H. E. Hale, D. C. McGalliard, T. B. DeCou, Charles Black, Gilbert D. Rue, I. J. Blackwell.

DELEGATES TO STATE BOARD.

S. B. KETCHAM, two years,.....Pennington.
J. M. DALRYMPLE, one year,.....Hopewell.

REPORT.

BY THE SECRETARY.

Mercer county comprises an area of two hundred and forty square miles, with 1,573 farms. The soil is variable—south-east of Trenton, well adapted to market garden crops, fruit, etc.; while the northern section is well adapted to cereals, grass, dairying and the larger fruits.

The several branches of husbandry are well maintained throughout the county, with dairying gradually on the increase. In this branch Ewing township leads. Both local markets and shipping facilities in this county are unsurpassed. The railroads on either side of the county, put its people in hourly touch with New York City and Philadelphia, and the increasing trolley lines give additional facilities for passenger traffic.

These are of special advantage to parents who desire to educate their children at the State Normal and Model Schools at Trenton. Educational facilities abound in this county how-

ever—Princeton, Pennington, Hightstown have their University, Seminaries, and schools for higher education.

The season past has not differed materially in financial results to the farmers from the year 1900. Although some crops, as apples and potatoes especially, gave poor returns, yet some other crops gave increased yield, and prices of some advanced above the year previous. The yields are given in the tables herewith.

The condition of farm stock, as to health, compares very favorably with other counties. Farmers are giving better care than formerly, they are studying the requirements of dairy stock—for example, as to their needs in matters of feeding not only, but also the essentials in stable construction, ventilation, etc., so as to maintain healthy animals.

There seems to be a purpose to put on the market milk that is pure and clean, as well as free from disease contamination. It will be a good thing for milk consumers in the city of Trenton when all those who bring milk to them can guarantee their product to be worthy of the best market, because it is above suspicion as to richness, purity, healthfulness.

The Hopewell Valley Canning Company, at Hopewell, N. J., set 90 acres of tomatoes during 1901, and received at their factory, 324 tons, a very light crop, owing to the unfavorable season. They filled 136,000 cans (tomatoes). They paid out in wages \$1,656, not including the Superintendent's and Treasurer's salaries. They paid the farmers for tomatoes \$2,109.

The Pennington Canning Company secured from the farmers in the neighborhood, during the season of 1901, 190 tons of tomatoes, for which they paid the growers \$1,334, or an average of \$7 per ton. The total pack was 8,700 cans. Operating expenses, exclusive of Secretary's and Treasurer's salaries, were \$1,000.

It would seem that, with our diversified soils capable of producing the best fruits and vegetables, as well as general crops, more attention could be given to the canning industry with profit. With a consuming population so large as here exists, if the canned food could be grown and packed near to or within the city of Trenton, items of cost that now obtain might be overcome,

MERCER COUNTY.

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and our producers and consumers both be benefited. Co-operation will be needful to make this a success.

Mercer is one of the counties whose taxable property has increased during the past year. Valuation of 1900 was \$45,732,805; valuation in 1901, \$47,363,488; showing an increase of \$1,630,683. Seventy-seven per cent. of this is in real estate.

The county has in round numbers 1,500 farms. Acreage of improved lands 105,851 acres. The principal crops and acreage are as follows:

<i>Crop.</i>	<i>Acres.</i>	<i>Bushels per Acre.</i>	<i>Total No. Bushels.</i>	<i>Average Price.</i>	<i>Total Value.</i>
Corn,	22,000	45	990,000	\$0.64	\$633,600
Wheat,	12,000	20	240,000	.63	151,200
Rye,	4,000	16	64,000	.60	38,400
Oats,	10,000	20	200,000	.50	100,000
Hay,	23,000	1½ tons	34,500	13.00	448,500
W. Potatoes,....	1,800	75	135,000	.80	108,000
S. Potatoes,....	.....	80	.....	.70	.....

The following is taken from Census Report of 1900, showing number of farms, buildings, etc., with their estimated values.

Number of farms, 1,573; with buildings, 1,531; acres in farms, 132,726; improved, 108,747; value of land and improvements, except buildings, \$4,518,210; buildings, \$3,641,700; implements and machinery, \$582,070; live stock, \$1,044,667; value of products not fed to live stock, \$1,775,184; expended for labor, \$379,430; for fertilizers, \$152,680.

The County Board has shown increased interest in meetings and subjects of importance to farmers presented and discussed.

The Annual Meeting held in Trenton, March 8th, 1901, was well attended by a class of representative farmers. Addresses were made by President Hale, D. D. Denise, Ex-Governor William A. Newell and others. Special crops for special markets, potato production, sheep business and forage or soiling crops for dairy animals, were some of the questions discussed. Officers elected at this meeting are given at the head of this report.

The Summer meeting was held with the Harvest Home of Hamilton Grange. It was very largely attended, and bid fair to be one of the best yet held, but a heavy rain came in time to prevent carrying out of the program.

The Autumn meeting was held in Pennington in connection with a Farmer's Institute, arranged for by the State Board. The attendance and interest were well maintained. "Soil Formation and Requirements;" "The Dairy Cow, her Feed and Care," were presented and discussed.

Delegates were elected to State Board and Horticultural Society, and the crop report made up.

The Pennington Post has taken active interest in advertising and popularizing these meetings, and farmers in any locality intending to hold meetings in the interest of agriculture and horticulture, will do well to secure the co-operation of the local press.

Middlesex County.

OFFICERS FOR 1902.

President, GEORGE SMITH,.....South River.
Vice-President, DAVID J. PERRINE,.....New Brunswick.
Secretary and Treasurer, WM. FITZ RANDOLPH,.....New Market.

DIRECTORS.

LEWIS D. WALKER,.....New Market.
D. C. MERSHON,.....Prospect Plains.
W. H. GILES,.....Dayton.
H. B. HERBERT,.....New Brunswick.
GEORGE W. MOUNT,.....Kingston.
WALTER GREEN,Browntown.
W. H. DEBOW,.....Prospect Plains.
DEHART VOORHEES,Franklin Park.
W. T. WOERNER,.....New Brunswick.

DELEGATES TO STATE BOARD.

DAVID J. PERRINE, one year,.....New Brunswick.
WM. FITZ RANDOLPH, two years,.....New Market.

The Board of Agriculture has held four meetings during the year, on the last Saturdays of February, May, August and November. In February we discussed the subject "How can we best reduce our taxes?" Mr. I. S. Bennett thought that all officials should be as careful as possible of expenses; that all property should be taxed equally; all corporations should be taxed in proportion to private property. Much discussion followed. Delegates to State Board made their reports.

On May 25th the subject for discussion was "Banking with the soil and dairy." Mr. Clarence B. Lane delivered the address and was highly entertaining and instructive.

On August 31st, after the regular meeting, the members were for the second time taken for a delightful sail on the launch of

President George Smith, going out through the winding Raritan river to Raritan bay as far as Boynton Beach and return.

A very successful Institute was held at Stelton on November 25th. The program was an excellent one. The speakers were all unusually interesting and those present felt that they had gotten ideas which if put into practice would be of value to them.

Farmers of our county have been fairly prosperous during the past year, though some crops have been almost entire failures. Prices are good, as a rule. The oat crop was almost a dead loss, many fields not being harvested at all, and others that were did not pay for threshing. Wheat and rye each gave a good yield, though injured to some extent by the moth. Those who use bisulphide of carbon have found it a remedy if used according to instructions of Prof. J. B. Smith.

Corn yielded more than an average crop, and the fodder was secured in the best condition. Much corn is grown especially for green fodder, and when the Southern White variety is raised and properly cured it makes a dry feed that is most excellent. Several new silos have been built during the year. The yield of hay was much better than last year, and prices are good.

Potatoes varied in yield in different sections. In the northern part of county the crop was poor, not paying for seed and fertilizer in many cases, while in the lower part many farmers received more money per acre than for many years. President George Smith reports a yield of 275 bushels per acre, which at \$3 or \$3.50 per barrel proves a very profitable crop. Many yields of 200 bushels per acre are reported.

Apples were a short crop, as were pears. Peaches a fair crop. Other fruits an average. Much milk is raised and finds a ready sale in surrounding cities and towns, and not much is shipped any distance. Cranbury contains the only creamery there is in the county. Farm help has been scarce during the year, and wages higher. Rural free delivery well established throughout the county and gives entire satisfaction. What we need here is one or two good canneries. Have many stone roads and are building more every year.

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Farmers have not seeded as much to wheat this fall as usual, owing to ravages of fly and moth. Rye has taken its place. There will be less ground sown to oats next spring, as many corn fields have been sown with rye and many more will be planted to potatoes.

Monmouth County.

OFFICERS FOR 1902.

<i>President</i> , GEORGE W. PATTERSON,.....	Ardena.
<i>Vice-President</i> , DANIEL JONES,.....	Freehold.
<i>Secretary</i> , D. AUG. VANDERVEER,.....	Freehold.
<i>Treasurer</i> , JOHN B. CONOVER,.....	Freehold.

EXECUTIVE COMMITTEE.

JOHN H. DENISE,.....	Freehold.
WM. H. REID,	Tennent.
H. V. M. DENNIS,.....	Freehold.

DIRECTORS.

JAMES H. BAIRD,.....	Marlboro.
JOHN H. DUBOIS,	Freehold.
G. B. CONOVER,.....	Englishtown.
EDGAR H. SCHANCK,	Holmdel.
E. A. SEXSMITH,	Como.
H. E. HULSHART,.....	Lower Squankum.
HENRY D. MOUNT,	Highstown.
JOHN STATESIR,	Colts Neck.

DELEGATES TO STATE BOARD.

GEORGE W. PATTERSON, one year,.....	Ardena.
E. A. SEXSMITH, two years,.....	Como.

REPORT.

BY THE SECRETARY.

Two meetings have been held during the year, the first on March 13th. The reports of G. S. Jones, delegate to the Annual Meeting of the State Horticultural Society, and of G. W. Patterson, delegate to the State Board of Agriculture, were read.

An address was delivered by Prof. H. W. Wiley, Chief Chemist, Department of Agriculture, Washington, D. C.; topic, "The Adulteration of Food." An address by Dr. Byron D. Halsted, State Botanist; topic, "Success in Crop Growing." An address by Prof. John Enright, County Superintendent of Public Schools, Freehold, N. J.; topic, "The Proposed New Apportionment of School Money." The second and annual meeting was held on November 23d. Officers were elected for the ensuing year. Prof. John B. Smith, State Entomologist, addressed the Board on "Scales and Other Crop Pests," followed by a discussion on potato culture, by W. H. Reed, H. V. M. Dennis and others. A Farmers' Institute was held at Keyport on November 15th and 16th by Secretary Franklin Dye, of the State Board. This Institute was largely attended and interest in its proceedings has not been surpassed.

CONDITION OF CROPS.

Asparagus, the first to bring the farmer early returns, was not a large yield, but owing to a late cold spring and short crop prices were high and profitable; large quantity is grown in the county for city market and canning. The next in order—small fruits—strawberries yield 100 per cent.; quality inferior; season too wet and cold; average price 8 cents per quart; varieties mostly grown here: Charles Downing, Lady Thompson, Kentucky, Gandy, Manchester.

Raspberries and blackberries, yield 100 per cent.; price, 10 cents. Currants, 80 per cent.; varieties, Fay, Cherry and Red Dutch. Gooseberries, 100 per cent.; leading variety, Downing. Cherries, 30 per cent.; almost a total failure on account of the black-lice. Grapes, 75 per cent.; loss by black-rot where not sprayed; prices too low for profit in this county. Plums, 80 per cent.; loss by rot; the only varieties grown here are the Japan.

Cranberries, not a full yield; 5,000 bushels less than last year; prices good. Peaches, yield 100 per cent.; average price 40 cents per basket; quality, small and inferior in flavor. Pears, Keiffer, 75 per cent.; poor in quality and small in size; very rusty; other varieties yield 15 per cent; prices low. Apples, yield 20 per cent.;

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cold and wet at time of blossoming; prices high, \$2.00 to \$3.25 per barrel in orchard. Some new orchards are being planted; as many of the old have been taken out. The leading money crop of the Monmouth county farmer is the potato. This has been a very peculiar year for that crop; yields have varied from 20 to 125 barrels per acre. The average yield for the county is 65 per cent. of a full yield. The quality has been poor, but owing to a short crop in other parts of the country prices have been good, averaging for the season \$2.00 per barrel. The principal variety grown for market is the Giant. Several growers around Freehold, who make a specialty of growing potatoes, have received from \$4,000 to \$5,000 for their crop, a few even more. There has been grown in Freehold township this year about 75,000 barrels of three bushels each. Sweet potatoes, 50 per cent.; lack of moisture at proper time caused one-half crop; price \$2.00 per barrel. Watermelons, 65 per cent.; average price \$8.00 per 100. Citron melons, 50 per cent.; price 30 cents per basket. Cucumbers, 100 per cent.; 50 cents per basket. Cabbages, 30 per cent.; 5 cents each. Cannery tomatoes, 75 per cent.; 75 cents $\frac{5}{8}$ -bus. basket; \$8.00 per ton at cannery. Corn, 100 per cent., an average yield of 56 bushels per acre. Some of our best lands yield from 75 to 80 bushels of shelled corn per acre; varieties, Yellow and White Dent with a few hybrids; price, 65 to 70 cents per bushel. Wheat, 100 per cent.; price, 70 cents. Rye, 75 per cent.; price, 56 cents. The quality of wheat and rye injured by too much rain at harvest time. Hay, 100 per cent.; quality good; selling here for \$14 to \$16 per ton. The acreage sown to wheat and rye about the same as last year.

There is very little change in live stock as to number, but there has been an advance in prices for most all kinds; horses are 20 per cent. higher than last year; cattle, lambs and swine higher. There has been some disease with cows and swine. Very few horses are raised in the county for farming purposes. Most of them are brought from the West by dealers and sold to farmers, some handling as many as 500 or 600 in one year.

THE CANNING INDUSTRY.

There are four canning factories in the county—Joseph Brakely, Freehold; Bucklin's in Atlantic township; Stout's and E. C. Hazard's, at Shrewsbury. All kinds of vegetables, small fruits and mushrooms are packed in large quantities. Mr. Brakely planted the past year in peas 1,300 acres; lima beans, 600 acres; spinach, 125 acres. He used 4,000 bushels of peas for seeding, 525 bushels of beans, over 700 tons of fertilizer, costing \$18,000; employed 58 teams of horses and a large number of men; for seeding the land after cropping he used 1,000 bushels of wheat and 225 bushels of crimson clover. The yield of the crops was large. During the busy season over 100,000 cans of peas are packed per day.

GENERAL REMARKS.

During the past year all of the turnpike companies have sold their roads to the county, doing away with the old system of charging toll. These roads in time will become stone and gravel roads. There is an effort being made to procure the right of way for a trolley line from Freehold to the shore by way of Colt's Neck and Eatontown which promises to be successful. The San Jose scale is doing some injury to fruit trees. Crude petroleum is used for spraying.

Morris County.

OFFICERS FOR 1902.

<i>President</i> , LYMAN J. FISH,.....	Afton.
<i>Secretary</i> , W. F. ELY,.....	Madison.
<i>Treasurer</i> , WESLEY D. HOPPING,.....	Hanover.

BOARD OF DIRECTORS.

JOHN S. GOLDBERG,	Chatham Township.
S. E. YOUNG,.....	Chatham Township.
EDGAR C. HOPPING,	Chatham Township.
W. JAMES,	Chatham Township.
JOHN J. MITCHELL,.....	Hanover Township.
JAMES COOK,	Hanover Township.
B. S. CONDIT,	Hanover Township.
WM. H. LITTELL,.....	Hanover Township.
FRANK P. COOK,.....	Hanover Township.
JOHN OLIVER,	Passaic Township.
W. B. LINDSLEY,.....	Passaic Township.
N. D. GOBLE,.....	Passaic Township.

DELEGATES TO STATE BOARD.

S. E. YOUNG, one year,.....	Afton
W. B. LINDSLEY, two years,.....	New Vernon.

REPORT.

BY THE SECRETARY.

At the annual meeting of the Morris County Board of Agriculture held November 23d, 1901, the above officers were unanimously elected for the coming year.

Under a call of the president, Hon. Oscar Lindsley, a meeting

was called for Thursday, April 4th, for the purpose of hearing Prof. E. B. Voorhees, President of the New Jersey State Board of Agriculture, give an address upon the farmers keeping up and improving the fertility of the soil. The meeting was attended by most of the largest farmers of Passaic township, and was called to order by the secretary, who spoke of their meeting under the great cloud which had fallen upon them so suddenly and unexpectedly this morning since arriving there in hearing of the death of their friend and president.

Prof. Voorhees, upon being introduced, made some appropriate remarks on their great loss, and then proceeded to give them an address on the value of clover, cow peas and lime as fertilizers. It was listened to with the greatest interest, and many pronounced it the most interesting address they had ever heard.

A resolution was offered and unanimously carried that W. F. Ely prepare resolutions for the Board on the death of our late president, which were as follows:

WHEREAS, the Morris County Board of Agriculture having been called here this day by our late president, Hon. Oscar Lindsley, for the purpose of hearing an address by Prof. E. B. Voorhees, has, since assembling here, heard of the death of our late president, wish to express our great sorrow at this time,

Be it Resolved, That because of the sudden and unexpected death of our late president we have reason at this time to mourn the loss of one who has always taken an interest in the Board from the time of its organization in 1883, and who was continually elected as one of its directors until elected as its president to succeed the Hon. H. W. Cutler at his death in 1897;

One who was always working to promote its welfare and success, being always ready and willing to contribute his time and money to sustain it; one who was always ready to welcome its members and all others with hearty greetings; who has filled the chair so ably since the death of our former president that we realize at this time that this Board may well take pride in the fact that we have always had one filling this position who has advocated and worked for the interest of the farmer; who never deserted us, but stood with us in legislation and all places, at all

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times, on whatever was right. By his death we not only lose a president, but a true friend and compatriot.

Which was unanimously adopted.

After a rising vote of thanks to Prof. Voorhees, the meeting was adjourned.

Ocean County.

OFFICERS FOR 1902.

<i>President</i> , C. M. RORER,.....	Cassville.
<i>Vice-President</i> , PATRICK DAVITT,.....	Toms River.
<i>Secretary</i> , A. B. CLUTE,.....	Toms River.
<i>Assistant Secretary</i> , C. R. GRAHAM,.....	Red Valley.
<i>Treasurer</i> , H. R. WILLS,.....	Toms River.

DIRECTORS.

MANESE APPLGATE,	Toms River.
S. GIBERSON,	Toms River.
J. POST,	Toms River.
C. C. REED,.....	Cassville.
C. E. PATTERSON,.....	Cassville.

DELEGATES TO STATE BOARD.

C. M. RORER, two years,.....	Cassville.
H. R. WILLS, one year,.....	Toms River.

The usual interest has been manifest in the Board during the past year. Holding the meetings alternately at Toms River and Cassville, most of the members attend the nearest meeting and take an active part. Being convinced it is no political machine, but an institution run in the interest of agriculture and its branches, more visitors are taking advantage of the benefits to be derived from it. There has been more interest taken in trying to solve the problem of graveling our roads with the least cost for the benefit of all. Poor roads take a large share of profits in moving our crops to market and add to the cost of hauling lime and fertilizer in return.

The strawberry is our leading crop; the soil is adapted to its growth, and very few land-owners have less than one-half acre and up to ten or twelve. Huckleberries were a light crop in part of the county, and in others a full crop, which pickers took the advantage of by going twelve to fifteen miles, some making two

dollars a day. The apple crop was the smallest in years, not enough to supply home demand. Peach, pear and cherry, less than one-half crop. White potatoes, short crop, not up to standard in quality and size, but ready sale at \$1 per bushel. Hay crop fair in quantity; the rainy weather spoiled some in gathering, making the quality below average; it brings good price and finds ready market. Rye crop short in measure, the kernels being small in size. Wheat, a fair crop but much damaged in the stack by the angoumois miller.

Poultry raising not as profitable as might be, owing to the worthless dogs running at large, owners taking advantage of dark nights to let them loose from chain; they not only destroy eggs, but kill and devour young poultry. Past year very few turkeys raised.

Cranberry crop was a good crop and paid well for the money invested in the bogs. The growers have learned it pays as well to care for the berry as any other crop they grow, and the acreage is increasing. Oysters and clams bring a large revenue to our county.

Free mail delivery has come to a few who are enjoying the benefit of two deliveries a day, bringing them in touch with the markets, and have taken the advantage of them. The addition of telephones with which our county is well supplied, with more free mail, and trolley roads to carry freight, thousands of acres of land now lying idle would come under cultivation.

Our schools in the rural districts are not supplied with as high grade and efficient teachers as we need. They are no better than under the old law, except they cost more for books than under the former system. All interested in education would rather have shorter term and higher grade teachers, even if more money was required; the result would be in favor of the children.

Thousands of acres of valuable timber have been destroyed by fire, causing a heavy loss to the owners, who have been letting it grow for fifty years and paying taxes on it. Most of these fires are caused by persons wanting better huckleberry grounds. We need fire wardens who will bring the guilty ones to justice. A few lessons would put a stop to the most of it.

Salem County.

OFFICERS FOR 1901.*

<i>President</i> , E. L. BORTON,.....	Woodstown.
<i>Vice-President</i> , SAMUEL FLITCRAFT,.....	Pittsgrove.
<i>Secretary</i> , CLARK FLITCRAFT,.....	Woodstown.
<i>Treasurer</i> , JOEL BORTON,	Woodstown.

DIRECTORS.

M. D. DICKINSON,.....	Woodstown.
S. JACKSON MORGAN,.....	Woodstown.
C. FRENCH MOORE,.....	Woodstown.
JOEL BORTON,	Woodstown.
CLARK FLITCRAFT,	Woodstown.
GEORGE H. KIRBY,.....	Woodstown.
CHARLES F. DICKINSON,.....	Cohansey.
E. ATKINSON,	Woodstown.
JESSIE L. COLSON,.....	Woodstown.
SAMUEL FLITCRAFT,	Pittsgrove.
B. F. STRAUGHEN,.....	Pedricktown.
HARMON HITCHNER,	Elmer.
WILLIAM A. HARRIS,	Harmersville.
JAMES C. BIVINS,.....	Shiloh.

DELEGATES TO STATE BOARD.

C. R. LOVELAND (one year),.....	Cohansey.
JOEL BORTON (two years),.....	Woodstown.

SOCIETIES REPRESENTED.

Salem County Pomona Grange, No. 6.
Woodstown Grange, No. 9.
Fenwick Grange, No. 20.
Courses Landing Grange, No. 60.
Friesburg Grange, No. 81.
Naturalists' Field Club, Woodstown.

* From last year's report.

REPORT.

BY THE SECRETARY.

Salem County Board of Agriculture held four meetings the past year. The Annual Meeting was held in Borough Hall, at Woodstown, January 22d, 1901. Reports of Secretary and Treasurer were read and accepted. New officers and a Board of Directors were elected. Joel Borton and C. R. Loveland, Delegates to State Board, gave interesting accounts of the meeting held in Trenton. The question "What are Some of the Greatest Needs of the Salem County Farmer?" was opened by S. J. Morgan, which brought out a general talk. A paper written by Annie Robbins "Reminiscences of Olden Times," was highly appreciated.

The second meeting was held at Woodstown, April 24th. Small attendance on account of heavy storm. Much interest was taken by those present; one question was the "Economical production of Milk." Professor E. B. Voorhees followed on "Summer Feed." We then had a talk on the egg question, "Are Hens Profitable, Kept Expressly for Eggs?" Our third meeting was held in Woodstown, July 31st, with a fair attendance. "Can the Farmer Afford to Neglect the Garden?" was opened with a paper by Emily Kirby. Professor Smith gave us a talk on insects, which was very interesting and instructive.

The fourth meeting was also held at Woodstown, October 24th, with fair attendance. Professor E. B. Voorhees was with us at this meeting, and gave us a talk on "The Natural Improvement of the Soil." A talk on "Farm Help" was opened by Phebe M. Lawrence, which brought out different views on the subject. Delegates to State Board, also State Horticultural Society, were named, also committee to arrange for Institute to be held December 20th and 21st.

Crops and prices have been fair the last year, excepting the tomato crop, which was very poor. I think farmers have had a good year. Fruit has been scarce; apples hardly worth gathering. Help is scarce and wages are getting higher every year.

Somerset County.

OFFICERS FOR 1902.

President, HON. EDWARD E. COOPER,.....Plainfield.
Vice-President, C. M. WYCKOFF,.....Bedminster.
Secretary and Treasurer, ARTHUR P. SUTPHEN,.....Somerville.

DIRECTORS.

C. M. WYCKOFF,.....Bedminster.
WM. C. LANE,.....Bedminster.
JOHN A. LAYTON,.....Bernards.
LEWIS C. ACKEN,Bernards.
WILLIAM J. LOGAN,Bridgewater.
WILLIAM H. WOODRUFF,Bridgewater.
DR. J. D. VANDERVEER,.....Branchburg.
HON. LOUIS H. SCHENCK,.....Branchburg.
ARTHUR F. RANDOLPH,.....Franklin.
ABRAM B. VOORHEES,.....Franklin.
PETER SUTPHEN,Hillsborough.
HENRY S. VAN NUYS, JR.,.....Hillsborough.
HON. H. W. HOAGLAND,.....Montgomery.
STEPHEN S. VOORHEES,.....Montgomery.
A. P. VOORHEES,.....North Plainfield.
CHARLES F. DELELE,.....North Plainfield.
WILLIAM H. ROGERS,.....Warren.
THOMAS C. BIRD,.....Warren.

DELEGATES TO STATE BOARD—William H. Rogers, one year; Henry S. Van Nuys, Jr., two years.

REPORT.

BY THE SECRETARY.

Three meetings have been held during the past year. At the last meeting the members of the Board voted to hold six meetings during the coming year, and, by the distribution among the farmers in the county of an address, to make an attempt to increase the membership to at least five hundred farmers. Fruit

and berry-growers ought to become members of this Board, then it would be able to get about what it ought to, both for the benefit of its members and of the county.

There should be a trolley road from Peapack to the Mercer county line, so that both limestone and burnt lime could be transported cheaply all the way down through the center of this county. Peapack can furnish an inexhaustible supply of the best lime. When the time comes (and I trust it will be soon) that our railroad companies as public servants are compelled to accommodate the people who gave them their franchise, and cart coal at living rates, and not at the exorbitant prices now demanded for freight, then lime can be burnt and furnished the farmers at reasonable rates, and will be more generally used as a fertilizer, and thus our farms will become better for all kinds of crops, and much freer of noxious weeds. In the meantime, and while waiting for this cross trolley through the county, the farmers should take advantage of the stone road from Far Hills through Somerville and Harlingen, and with the use of lime, barn-yard manure and composts they can greatly enrich their farms, and their crops will richly pay them. In proof of this, visit the Peapack Valley and the limestone sections of the Musconetcong and German Valleys, where lime is freely applied. Crops are kept clean, and the soil is much more easily cultivated. Lime applied judiciously upon our red shale proves a wonderful incentive to the growth of grass, and if a farmer can produce grass he is almost sure of corn and wheat.

The oat crop in this county was a failure. Corn, wheat and hay yielded fairly. Prices are much better, and the outlook for farmers is encouraging. Take advantage of the times by intelligent, earnest effort, confer with each other, attend the Board meetings. See that the prices of your products are fixed by you, that the cost of production is reduced, and that you get the right kind of fertilizers and apply them to the best advantage. Raise the best, and get the highest market price!

It is noted that the organization of this Board has proved very beneficial to farmers in the county, that many have improved their methods of farming and become more successful, and we hope to increase the interest in the meetings of the Board.

Sussex County.

OFFICERS FOR 1902.

<i>President</i> , B. K. JONES,.....	Beaver Run.
<i>Vice-President</i> , T. C. ROE,.....	Augusta.
<i>Secretary</i> , E. N. MILLEN,.....	Sussex.
<i>Treasurer</i> , Wm. H. LEPORT,.....	Sussex.

DELEGATES TO STATE BOARD—B. K. Jones, two years; J. A. McBride, one year.

REPORT.

BY THE SECRETARY.

For all the abundant rainfall of last summer the season was not a successful one for Sussex county farmers. The hay crop, so important up here, was scant. After the prolonged droughts of previous years it will take several wet seasons to bring our hay lands back into proper productiveness. The corn crop was good, rather above the average. Wheat an average crop, but oats were a failure. In many instances oats were cut early and made into hay, as they did not promise to pay for threshing. The rye crop is usually quite reliable in this county, and the past season was no exception.

That terror of the peach grower, "yellows," has put a damper on the fruit industry among us, though a few skilled and pains-taking men have managed to grow good crops, and come out ahead of the situation. The average farmer is so busy with his profitless cows that he has little time for trees.

The milk business has something more than the "yellows." It is easy to prove that, when figured on a business basis, there is absolutely nothing in it. As an old worthy who lived in this region years ago used to say, when under the old, out-of-doors,

wintering system, his cows died off in the spring of "holler horn" and "wasp in the tail": "Well, there is *some* gain, there is the hide." And if there is any gain in the average Sussex county dairy it is in the manure pile, that being, by the way, too often under the drip of the barn eaves where it washes down stream and finds its way to New York along with the rest of the fertility of the farm. Not one man in a hundred among the milk-producers does bookkeeping enough to know whether his cows are paying or not. He is going it blind, and if he gets through by hook and crook the cows get the credit. It is safe to say that a stable full of bicycles would be as profitable at the present prices of feed and milk. It is the policy of the New York Milk Exchange to let the producer just get through by "the skin of his teeth," for they cannot get along without him, but they have things all their own way, and *grind*. We have occasionally a man among us who has some money, handed down to him from the old butter-making days, or the first milk boom perhaps. This he has out on bond and mortgage, pools the interest with his milk checks, comes out a little ahead in the spring, by rigid economy, again gives the cows the credit, and tells you that milk production pays. An agricultural industry so toilsome should be better rewarded, but it never will be so long as our milk producers are so subservient to the wishes and interests of the middleman. They will soon be forced to kick, and kick together, or give up the business. There has been an unusual number of fall sales this year, and where the business has not been abandoned a reaching out after other and more promising lines of agricultural industry.

Poultry products are claiming much attention, and almost every farm, large or small, now has its comfortable and commodious hen-house, well stocked in many instances with thoroughbred fowls. This helps out the family larder and adds shekels to the annual income. "Hens pay better than cows" is the universal testimony of our farmers up here, but then that is not doing justice to the hens. A record of the eggs and meat furnished by the flock for the home table is surprising in the aggregate. We buy our butter of the lucky fellow who is out of reach of a railroad; few of us use milk as food; our cows are so old and tough when

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we get through with them that the butchers won't buy them, and they go to New York by the carload for from five to fifteen dollars per head "to feed the animals." Then we pay fifty or sixty dollars for a new cow, kicked out of some western herd by a discriminating owner, and begin over again. Evidently "Biddy" and the egg basket have the best of it, and they are rapidly growing into our appreciation. This is an ideal country for sheep, and they certainly pay more for their care than cows; still, few of them are kept in this county.

The apple crop was very scanty with us, Baldwins, our most reliable market sort, being particularly scarce. Greenings did better, but were not plentiful. Berries are little grown here. The local market is limited and shipping expensive. Reports of ravages by the San Jose scale come in from various parts of the county. It is evident that in the future if we get fruit we must fight for it.

Some favorable tendencies are noticeable in farming methods. More cows are reared on the farm and fewer purchased from western lots. Many silos have been erected during the past year and the farms furnish more of the grain than formerly. More diversity in farming is noticeable, and this is certainly a move in the right direction, and savors of independence. There must be better things ahead for the farmer, and the only plucky, manly thing for us to do is to put up the best fight we can while we wait and watch for our fuller futures.

Union County.

OFFICERS FOR 1902.

<i>President</i> , JAMES L. HEADLEY,.....	Union.
<i>Vice-President</i> , D. T. MAGIE,.....	Lorraine.
<i>Secretary and Librarian</i> , F. E. WOODRUFF,.....	Cranford.
<i>Treasurer</i> , OGDEN WOODRUFF,.....	Elizabeth.

DIRECTORS.

G. E. LUDLOW,.....	Cranford.
E. P. BEEBE,.....	Elizabeth.
J. O. MAGIE,.....	Elizabeth.

DELEGATES TO STATE BOARD—Ogden Woodruff, two years; F. E. Woodruff, one year.

ALTERNATES—G. E. Ludlow, D. T. Magie.

The Union County Board of Agriculture has held nine meetings during the year, in the Court House at Elizabeth. The following subjects were discussed: "Liming Soils," "Seeds and Fertilizers," "Trimming and General Culture of Fruit," Reports Delegates to State Board, etc. The interest and attendance has not been as good as formerly. June 13th the Board held a picnic. The day was a very fine one, and there was a large attendance of farmers, their wives and children, and quite a number of invited guests. President Beebe opened the exercises with a welcome to all present, and gave an interesting history of the Board, telling of its object, etc. Dr. Jos. B. Ward read a paper on "The Home Flower Garden and Its Influence." Addresses were also made by J. B. Rogers, of Newark, Rev. J. T. Kerr, of Elizabeth, and others. Refreshments were served in abundance. There were quite a number of large berries on exhibition, grown by members. The picnic was one of the most largely attended and enjoyable ones the Board has ever held.

CROP REPORT.

The weather of the past season has been very unusual. The spring was the wettest one in our memory and the exceedingly hot, dry weather in June damaged crops to some extent. The crop of cereals was fairly good, with the exception of oats, which was only 50 per cent. of a crop. Hay was a large crop, but much of it was damaged by the wet weather in July. Potatoes were only 50 per cent., and much damage by rot was reported. Apples and pears yielded a small crop, many being damaged by the aphid, which caused the leaves to curl and the fruit to drop before it matured. Peaches and grapes yielded well and brought fair prices. Strawberries were only 40 per cent. of a crop, being damaged by continued wet cloudy weather of the spring. Cabbage was 75 per cent. of a crop. Tomatoes yielded 50 per cent., being damaged also by the wet cloudy weather which prevailed a great part of the summer. Farmers find it almost impossible to secure experienced, reliable farm help, the demand being greater than the supply.

The increased prices of feeding stuff has cut off the profits of our dairymen to a great extent, the greater part of whom purchase their feed. There are no creameries in our county, and only one cannery that we know of. They pack only tomatoes, and because of the short crop, were enabled to pack only one-quarter as much as usual.

Warren County.

OFFICERS FOR 1902.

President, WILLIAM C. ADDIS,.....Delaware.
Vice-President, N. WARNE,.....Broadway.
Secretary, WM. EUGENE OBERLY,.....Broadway.
Treasurer, OWEN OBERLY,Stewartsville.

DIRECTORS.

HENRY PURSEL,Phillipsburg.
DANIEL FITTS,Washington.
SAMUEL REED,Mount Hermon.
A. D. ROSEBERRY,.....Belvidere.
WM. O. WARD,.....Hainesburg.
ALBERT FLEMING,Stephensburg.

DELEGATES TO STATE BOARD.

HENRY PURSEL, two years,.....Phillipsburg.
JOHN H. ALBERTSON, one year,.....Delaware.

REPORT.

BY THE SECRETARY.

We have held four stated meetings the past year, and the usual interest was manifested in our Board, and there has been a good attendance at the regular meetings, when the weather permitted. The following subjects were discussed:

“Stone Road Construction,” “The Maintenance of Dairy Fertility,” by Prof. E. B. Voorhees; “Nitrogen,” by Jos. Roseberry, Belvidere; “Would Farmers be Benefited by Organizing?” by John T. Cox.

This section was again visited by a most persistent drought and crops were generally shortened.

STATE BOARD OF AGRICULTURE.

Wheat yield was badly damaged by the fly, from too early seeding in many sections; the demand is small from the local millers, prices ranging from 70 to 80 cents, too low for any profit in its production. Rye averaged half a crop.

Corn average crop, with the exception of a few fields damaged by worms; oats, an entire failure; buckwheat, a good crop; hay, half crop at fair prices, \$16 to \$18 per ton; apples, crop an entire failure.

Milk, price very low most of the season, but at present time is in great demand on account of the advanced price in feed.

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